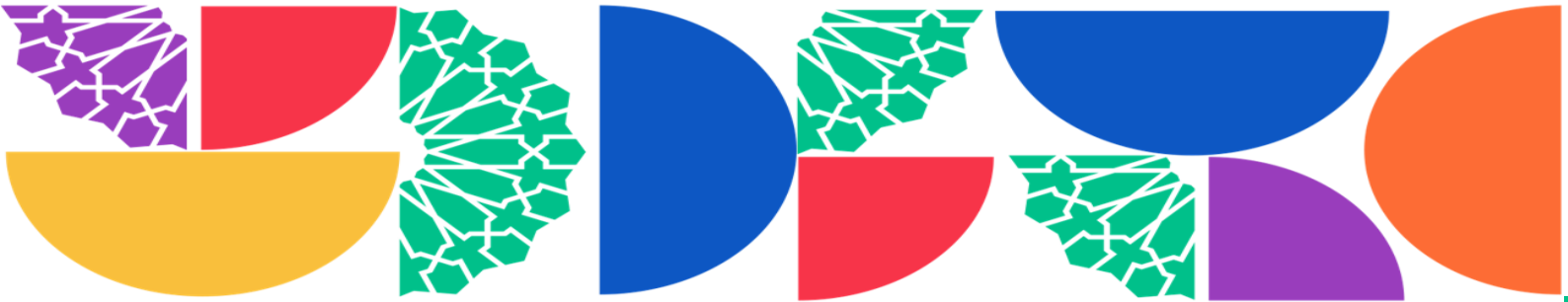




جامعة الشارقة  
UNIVERSITY OF SHARJAH

# University Catalog 2022-2023



## Table of Contents

|   |     |
|---|-----|
| NOTICE .....  | 3   |
| MESSAGE FROM THE CHANCELLOR .....                                       | 4   |
| BOARD OF TRUSTEES .....   | 5   |
| BOT ACADEMIC COMMITTEE.....   | 6   |
| BOT FINANCE COMMITTEE .....   | 7   |
| BOT COMPLIANCE AND INTERNAL AUDIT COMMITTEE .....                       | 7   |
| ACADEMIC CALENDAR 2022/2023.....  | 8   |
| DIRECTORY .....   | 10  |
| THE UNIVERSITY .....  | 13  |
| VICE CHANCELLOR FOR INSTITUTIONAL EFFECTIVENESS AND ACCREDITATION ..... | 24  |
| DEANSHIP OF ACADEMIC SUPPORT SERVICES .....                             | 25  |
| ADMISSION DEPARTMENT .....  | 26  |
| REGISTRATION DEPARTMENT .....   | 29  |
| UOS LIBRARIES .....   | 31  |
| THE CENTRAL LABORATORIES .....  | 33  |
| CAREER ADVISING AND STUDENT TRAINING OFFICE .....                       | 35  |
| STUDENTS DOCUMENTS AND STUDENT FILE ARCHIVING OFFICE .....              | 37  |
| LANGUAGE OF INSTRUCTION .....   | 51  |
| ACADEMIC ADVISING .....   | 64  |
| INFORMATION TECHNOLOGY CENTER.....                                      | 97  |
| THE MARKETING AND STUDENT RECRUITMENT DEPARTMENT (MSR) .....            | 99  |
| STUDENT AFFAIRS .....   | 100 |
| CENTER FOR CONTINUING EDUCATION AND PROFESSIONAL DEVELOPMENT .....      | 104 |
| THE INSTITUTE OF LEADERSHIP IN HIGHER EDUCATION (ILHE) .....            | 106 |
| LANGUAGE INSTITUTE.....   | 107 |
| ELC CONTACT INFORMATION .....   | 110 |
| DISABILITY RESOURCE CENTER.....   | 113 |
| SHARJAH ACADEMY FOR ASTRONOMY, SPACE SCIENCES AND TECHNOLOGY .....      | 114 |
| GRADUATE STUDIES .....  | 116 |
| COLLEGE OF SHARI'A AND ISLAMIC STUDIES .....                            | 118 |
| COLLEGE OF ARTS, HUMANITIES AND SOCIAL SCIENCES .....                   | 136 |
| COLLEGE OF BUSINESS ADMINISTRATION .....                                | 203 |
| COLLEGE OF ENGINEERING.....   | 258 |

|  |     |
|--|-----|
| COLLEGE OF HEALTH SCIENCES (CHS) .....     | 390 |
| COLLEGE OF LAW .....                       | 496 |
| COLLEGE OF FINE ARTS AND DESIGN .....      | 521 |
| COLLEGE OF COMMUNICATION .....             | 554 |
| COLLEGE OF MEDICINE .....                  | 570 |
| COLLEGE OF DENTAL MEDICINE .....           | 599 |
| COLLEGE OF PHARMACY .....                  | 612 |
| COLLEGE OF SCIENCES .....                  | 630 |
| COLLEGE OF COMPUTING AND INFORMATICS ..... | 739 |

## Notice

Information in this catalog applies to the academic year 2022-2023 as of September 1, 2022. The University reserves the right to make changes without prior notice in programs, course offerings, academic requirements, and teaching staff as deemed necessary.

This catalog has been drafted to conform to the related UAE laws and Ministry of Education (MOE) rules and regulations. In the event of a contradiction, the UAE laws and MOE rules and regulations take precedence.

## Student Responsibility for Catalog Information

Students are responsible for reading, understanding and adhering to the information in this catalog. Failure to comply with the stated University, college and program regulations will not exempt students from the ramifications of their ignorance and the penalties that may incur. **The terms and conditions in this catalog are considered as a part of contract between students and University of Sharjah.**

## University of Sharjah Contact Information

PO Box: 27272 Sharjah  
Postal Code 211  
Sharjah  
United Arab Emirates

Telephone +971 6 5585000  
Fax +971 6 5585185  
E-mail [info@sharjah.ac.ae](mailto:info@sharjah.ac.ae)

This catalog can also be viewed at <http://www.sharjah.ac.ae>



## Message from the Chancellor

I am delighted to welcome you as we begin this new academic year at the University of Sharjah and steadfastly pursue our mission of excellence in education, research and community service.

Our task, as a university community, has never been greater than it is today.

As we enter this new academic year, we continue to adapt to new modes of learning and teaching in response to the global Covid-19 pandemic. Of course, this has required the implementation of new online applications and improving our technological infrastructure, which will no doubt add value to our educational process post Covid-19 and ensure a more promising future for our students. Throughout all of these challenges, our determination to be the best university in the country and region has remained strong thanks to the efforts of our student body, faculty and administrative staff. Our academic programs have continued and developed without interruption and we continue to graduate some of the finest students in the country and region, students who exhibit high academic standards and leadership skills in fields vital to the socio-economic progress, development and sustainability of the country, region and global community.

As the largest university in the country, both in terms of student numbers and programs, the University of Sharjah offers a vast array of academic specializations in traditional and emerging fields of knowledge. These include undergraduate and graduate programs in the sciences, engineering, renewable energy, sustainability, astronomy and space sciences, communications, sociology, medicine, dentistry, pharmacy, health sciences, the arts, humanities and social sciences, law, Sharia and Islamic studies, computer and informatics, business administration, and fine arts and design. Additionally, our faculty members and students continue to embark upon new research, in collaboration with our international partners, and share their experience through virtual workshops, conferences and seminars. In fact, our interaction with the international community has expanded across all academic, research and professional fields, which is consistent with our core mission of preparing our students for citizenship, a lifetime of public service and active participation in the local, regional and international communities.

These tremendous accomplishments have been made possible through the support and guidance of His Highness Sheikh Dr. Sultan Bin Mohammed AL Qasimi, Member of the Supreme Council, Ruler of Sharjah, and President of the University of Sharjah. Indeed, the strategic intellect and foresight of His Highness, Ruler of Sharjah, have sustained the University throughout the current challenges to ensure its path of excellence. In fact, the University of Sharjah now represents a model of higher education in the Middle East and internationally, distinguished by its intrinsic cultural values and heritage, global outlook and advancements in science and technology.

As you pursue your education, I hope you refer to this catalog, where you will find information about the University and its academic programs, facilities and services. Additionally, you will find admission guidelines, registration procedures, study plans for all college programs, and information on policies and regulations, such as transferring to a new program, student absences, academic integrity and disciplinary measures.

In closing, I would like to welcome new students and thank each one of you for your outstanding work and perseverance as we confront today's extraordinary circumstances. Your collective talents, creativity, energy and dedication to UOS give me much pride.

Wishing you all good health and much success.

**Professor Hamid M.K. Al Naimiy,**  
**Chancellor of the University of Sharjah**

**Board of Trustees:**

His Highness Sheikh Dr. Sultan bin Mohammad Al Qasimi, Member of the Supreme Council,  
Ruler of Sharjah and the President of the University of Sharjah

H.E. Dr. Obaid Al Muhairi  
Former Executive Dean of Arabic Language and Emirati Studies, Higher Colleges of Technology

H.E. Mr. Mohammed Abdallah  
Chief Executive Officer, Sharjah Islamic Bank

H.E. Dr. Tarek bin Khadem  
Member of the Sharjah Executive Council and Chairperson of the Directorate of Human Resources  
– Government of Sharjah

H.E. Dr. Muhadditha Al Hashimi  
Chair of the Sharjah Private Education Authority

H.E. Mrs. Noura Al Noman  
Chair of the Executive Office of H.H. Sheikha Jawaher Bint Mohammed Al Qasimi

H.E. Dr. Khawla Abdul Rahman AlMulla  
Secretary General of the Supreme Council for Family Affairs in the Emirate of Sharjah

H.E. Mr. Saeed Sultan buljaiw Al Suwaide  
Chairman of the Sharjah Electricity, Water and Gas Authority

H.E. Dr. Mansour Mohamed Bin Nassar  
Legal Advisor and Chairman of the Sharjah Government Legal Department and Senior Lecturer of  
Constitutional Law and Administrative Law – Sharjah Police Academy

H.E. Prof. Jacques Frémont  
President and Vice Chancellor of the University of Ottawa

H.E. Prof. Guenter Meyer  
Director of the Center for Research on the Arab World (CERAW) at the University of Mainz,  
Germany, Chairman of the German Middle East Studies Association (DAVO), President of the  
European Association for Middle East Studies (EURAMES) and Chairman of the International  
Advisory Council of the World Congress for Middle Eastern Studies (WOCMES).

H.E. Prof. Alexander Kuleshov  
President of the Skolkov Institute of Science and Technology, Russia

H.E. Prof. Kamal Youcef-Toumi  
Professor of Mechanical Engineering and Co-Director of the Center for Clean Water and Energy at  
the Massachusetts Institute of Technology (MIT), USA

H.E. Prof. Abdallah I. Husein Malkawi  
Chancellor of the Fahad Bin Sultan University, KSA

H.E. Prof. Martin Barstow  
Pro-Vice Chancellor Strategic Science Projects, Director of the Leicester Institute of Space and Earth Observation, Professor of Astrophysics and Space Sciences at the University of Leicester, U.K.

H.E. Prof. Hamid M.K. Al Naimiy  
Chancellor of the University of Sharjah, and President of the Arab Union for Astronomy and Space Sciences.

**BoT Academic Committee:**

|   |          |
|---|----------|
| H.E. Dr. Obaid Al Muhairi<br>Former Executive Dean of Arabic Language and UAE Studies,<br>Higher Colleges of Technology   | Chairman |
| H.E. Dr. Muhadditha Al Hashimi<br>Director of the Sharjah Higher Colleges of Technology   | Member   |
| H.E. Ms. Noura Al Noman<br>Chairman of the Executive Office of H.H. Sheikha Jawaher Bint<br>Mohammed Al Qasimi  | Member   |
| H.E. Dr. Mansour Mohamed Bin Nassar<br>Legal Advisor and Chairman of the Sharjah Government Legal<br>Department and Senior Lecturer of Constitutional Law and<br>Administrative Law – Sharjah Police Academy  | Member   |
| H.E. Dr. Jacques Frémont<br>President and Vice-Chancellor of the University of Ottawa   | Member   |
| H.E. Dr. Guenter Meyer<br>Director of the Centre for Research on the Arab World (CERAW) at<br>the University of Mainz, Germany, Chairman of the German<br>Middle East Studies Association (DAVO), President of the European<br>Association for Middle East Studies (EURAMES) and Chairman of<br>the International Advisory Council of the World Congress for<br>Middle Eastern Studies (WOCMES) | Member   |
| H.E. Prof. Alexander Kuleshov<br>President of the Skolkov Institute of Science and Technology,<br>Russia  | Member   |
| H.E. Professor Kamal Yousef-Toumi<br>Professor of Electronics Engineering and Co-Director of the Center<br>for Clean Water and Energy at the Massachusetts Institute of<br>Technology (MIT), USA  | Member   |

H.E. Professor Abdallah I. Husein Malkawi  
Chancellor, Fahad Bin Sultan University

Member

Professor Martin Barstow  
Pro-Vice Chancellor Strategic Science Projects, Director of the  
Leicester Institute of Space & Earth Observation, Professor of  
Astrophysics and Space Science at the University of Leicester, UK.

Member

H.E. Professor Hamid M.K. Al Naimiy  
Chancellor of the University of Sharjah, and President of the Arab  
Union for Astronomy and Space Sciences.

Member

#### **BoT Finance Committee:**

H.E. Mr. Mohammed Abdallah  
Chief Executive Officer, Sharjah Islamic Bank

Chairman

H.E. Mr. Tarek bin Khadem  
Chairman of the Directorate of Human Resources – Sharjah Government

Member

H.E. Mr. Saeed Sultan buljaiw Al Suwaide  
Chairman of the Sharjah Electricity, Water and Gas Authority

Member

H.E. Dr. Khawla Abdul Rahman AlMulla  
Secretary General of the Supreme Council for Family Affairs in the  
Emirate of Sharjah

Member

H.E. Professor Hamid M.K. Al Naimiy  
Chancellor of the University of Sharjah, and President of the Arab Union  
for Astronomy and Space Sciences.

Member

#### **BoT Compliance and Internal Audit Committee:**

H.E. Mr. Tarek bin Khadem  
Chairman of the Directorate of Human Resources – Sharjah Government

Chairman

H.E. Dr. Muhadditha Al Hashimi  
Director of the Sharjah Higher Colleges of Technology

Member

H.E. Ms. Noura Al Noman  
Chairman of the Executive Office of H.H. Sheikha Jawaher Bint Mohammed  
Al Qasimi

Member

H.E. Dr. Mansour Mohamed Bin Nassar  
Legal Advisor and Chairman of the Sharjah Government Legal Department  
and Senior Lecturer of Constitutional Law and Administrative Law – Sharjah  
Police Academy

Member

## Academic Calendar 2022/2023

### Fall Semester 2022/2023

| Day       | Date         |                       | Description   |
|-----------|--------------|-----------------------|---|
|           | AD           | H.                    |   |
| Mon       | 27 Jun       | 28 Dhi Al-Qida        | Beginning of regular admission in Fall 2022/2023 for bachelor programs          |
| Fri - Mon | 08 - 11 July | 09 – 12 Dhi Al-Hijja  | Arafah + Eid Aladha   |
| Sat       | 16 July      | 17 Dhi Al-Hijja       | The last day of regular admission for Colleges of Medicine and Dental Medicine. |
| Sat       | 30 July      | 01 Muharam 1444       | Alhijiri New year   |
| Wed       | 17 Aug       | 19 Muharam            | The last day of regular admission for other colleges                            |
| Mon       | 22 Aug       | 24 Muharam            | Return of Academic Staff  |
| Mon - Thu | 22-25 Aug    | 24-27 Muharam         | TOEFL exam for new students<br>+ New Students Registration                      |
| Thu       | 25 Aug       | 27 Muharam            | Last date for new students to postpone their admission                          |
| Mon       | 29 Aug       | 02 Safar              | Classes begin   |
| Thu       | 01 Sept      | 05 Safar              | Last day for incomplete exam  |
| Thu       | 01 Sept      | 05 Safar              | Last day for Add/Drop   |
| Mon - Thu | 17-27 Oct    | 21 Rabi I- 02 Rabi II | Midterm exams   |
| Thu       | 03 Nov       | 09 Rabi II            | Last day for dropping courses without 'F'                                       |
| Thu       | 24 Nov       | 30 Rabi II            | Last day for withdrawal from semester   |
| Thu       | 01 Dec       | 08 Jumada I           | Martyr's Day  |
| Fri - Sat | 02-03 Dec    | 09-10 Jumada I        | UAE National Day  |
| Thu       | 08 Dec       | 14 Jumada I           | Classes end   |
| Sat - Tue | 10-20 Dec    | 16-26 Jumada I        | Final exams   |
| Mon       | 26 Dec       | 02 Jumada II          | Winter break starts   |
| Sun       | 01 Jan 2023  | 08 Jumada II          | New Year  |

### Spring Semester 2022/2023

| Day       | Date            |                            | Description   |
|-----------|-----------------|----------------------------|---|
|           | AD              | H.                         |   |
| Sun - Wed | 04 Dec – 04 Jan | 10 Jumada I – 11 Jumada II | Regular admission in spring 2022/2023 for bachelor programs |
| Mon       | 09 Jan          | 16 Jumada II               | Return of Academic Staff                                    |
| Mon - Thu | 09-12 Jan       | 16 - 19 Jumada II          | TOEFL exam for new students + New Students Registration     |
| Mon       | 09 Jan          | 16 Jumada II               | Classes begin   |
| Thu       | 12 Jan          | 19 Jumada II               | Last day for Incomplete Exam                                |
| Thu       | 12 Jan          | 19 Jumada II               | Last day for Add/Drop                                       |
| Thu       | 12 Jan          | 19 Jumada II               | Last date for new students to postpone their admission      |
| Mon - Thu | 06-16 Mar       | 14 – 24 Shaban             | Midterm Exam  |
| Thu       | 23 Mar          | 01 Ramadan                 | Last day for dropping courses without 'F'                   |
| Mon - Thu | 27 Mar - 06 Apr | 05-15 Ramadan              | Spring break  |
| Wed       | 19 Apr          | 28 Ramadan                 | Last day for withdrawal from semester                       |
| Thu - Sun | 20 – 23 April   | 29 Ramadan – 03 Shawal     | Eid Al-Fitter Holidays                                      |
| Sun - Thu | 30 Apr – 01 Jun | 10 Shawal - 12 Dhi Al-Qida | early admission in Fall 2023/2024 for bachelor programs     |
| Thu       | 04 May          | 14 Shawal                  | Classes end   |
| Sat - Tue | 06 - 16 May     | 16 – 26 Shawal             | Final exams   |

### Summer Semester 2022/2023

| Day       | Date         |                      | Description                                     |
|-----------|--------------|----------------------|---|
|           | AD           | H.                   |   |
| Mon       | 05 Jun       | 16 Dhi Al-Qida       | Summer session begins                           |
| Tue       | 06 Jun       | 17 Dhi Al-Qida       | Last day for Add/Drop                           |
| Tue - Fri | 27 - 30 June | 09 – 12 Dhi Al-Hijja | Eid Al-Adha Holidays                            |
| Mon       | 03 July      | 15 Dhi Al-Hijja      | Last day for dropping courses without grade 'F' |
| Tue       | 18 July      | 30 Dhi Al-Hijja      | Summer classes end                              |
| Wed       | 19 July      | 1 Muharam 1445       | Alhijiri New year                               |
| Thu - Wed | 20 - 25 July | 02 – 06 Muharam      | Final exams                                     |
| Mon       | 21 Aug       | 05 Safar             | Return of academic staff                        |

\* Holidays and graduation ceremony dates are subject to change.

### Directory

|   | Tel.    | Fax     |
|---|---------|---------|
| Chancellor's office   | 5050001 | 5585185 |
| Vice Chancellor for Academic Affairs                              | 5053032 | 5053034 |
| Vice Chancellor for Medical & Health Sciences Colleges            | 5057011 | 5057015 |
| Vice Chancellor for Research and Graduate Studies                 | 5053004 | 5053011 |
| Vice Chancellor for Finance & Administrative Affairs              | 5050103 | 5050101 |
| Vice Chancellor for Community Affairs                             | 5057030 | 5057013 |
| Vice Chancellor for Public Affairs                                | 5050020 | 5585099 |
| Vice Chancellor for Institutional Effectiveness and Accreditation | 5053026 | 5053020 |

|  |         |         |
|--|---------|---------|
| College of Graduate Studies and Research         | 5050301 | 5050303 |
| Deanship of Academic Support Services            | 5053014 | 5050139 |
| Registration Department                          | 5050751 | 5050717 |
| Admission Department                             | 5166753 | 5053717 |
| College of Shari'a & Islamic Studies             | 5050181 | 5050334 |
| College of Arts, Humanities & Social Sciences    | 5053201 | 5053222 |
| College of Business Administration – Men         | 5053501 | 5050100 |
| College of Business Administration – Women       | 5053502 | 5050513 |
| College of Engineering – Men                     | 5053901 | 5585191 |
| College of Engineering - Women                   | 5050952 | 5585191 |
| College of Law - Men                             | 2020211 | 5053155 |
| College of Law - Women                           | 5053187 | 5053155 |
| College of Fine Arts & Design                    | 5057851 | 5053444 |
| College of Health Sciences - Men                 | 5057501 | 5057502 |
| College of Medicine                              | 5057201 | 5057244 |
| College of Dentistry                             | 5057333 | 5057322 |
| College of Pharmacy                              | 5057401 | 5057430 |
| College of Sciences                              | 5050225 | 5050489 |
| College of Computing & Informatics               | 5050523 | 5050524 |
| Dean of Student Affairs - Men                    | 5050759 | 5585174 |
| Dean of Student Affairs - Women                  | 5050701 | 5585160 |
| Enrollment Management and Academic Guidance Unit | 5053871 | 5053872 |
| Facilities Management and Planning Department    | 5050058 | 5050051 |
| Human Resources                                  | 5050036 | 5585200 |
| Public Relations                                 | 5050020 | 5585099 |
| Media Center                                     | 5050050 | 5050119 |
| Office of Grants and Sponsorships                | 5057013 | 5057022 |



|                              |         |         |
|------------------------------|---------|---------|
| Alumni Association Center    | 5057017 | 5057022 |
| Finance Department           | 5050040 | 5585183 |
| Health Clinics – Men         | 5050244 |         |
| Health Clinics – Women       | 5053291 |         |
| Libraries (Men & Women)      | 5053851 | 5585186 |
| Medical Colleges             | 5057161 |         |
| Procurement Department       | 5050081 | 5050419 |
| Business Services Department | 5053122 | 5053107 |
| Passport Unit                | 5050008 | 5050093 |
| IT Department                | 5050014 | 5585101 |
| University Operator          | 5585000 | 5585099 |

## **The University**

### **Senior Administration**

#### **Overview**

#### **University Administration**

Prof. Hamid M.K. Al Naimiy, Chancellor

Prof. Esam El-Din Agamy, Vice Chancellor for Institutional Effectiveness and Accreditation

Prof. Maamar Bettayeb, Vice Chancellor for Research and Graduate Studies

Prof. Qutayba Hamid Al Heialy, Vice Chancellor for Medical Colleges and Health Sciences and Dean of College of Medicine

Dr. Gordon Handke, Vice Chancellor for Administrative and Financial Affairs

Dr. Salah Taher, Vice Chancellor for Community Affairs

Dr. Amina Al-Marzouqi, Assistant Chancellor of Branch Affairs

Mr. Majid Al-Jarwan, Vice Chancellor for Public Relations

Dr. David Carter, Director of the Office of Strategic Planning

#### **Council of Deans**

Prof. Hamid M.K. Al Naimiy, Chancellor

Prof. Sherif Sedky, Vice Chancellor for Academic Affairs

Prof. Maamar Ali Bettayeb, Vice Chancellor for Research and Graduate Studies

Prof. Qutayba Hamid Al Heialy, Vice Chancellor for Medical Colleges and Health Sciences and Dean of College of Medicine

Vice Chancellor for Financial and Administrative Affairs

Dr. Salah Taher Al Haj, Vice Chancellor for Community Affairs

Mr. Majid Mohamed Al Jarwan, Vice Chancellor for Public Relations

Prof. Adnan Ibrahim Sirhan, Assistant Chancellor of Branch Affairs

Prof. Esam El-Din Agamy, Dean of the Vice Chancellor for Institutional Effectiveness and Accreditation

Dr. Hussein El Mahdi, Dean of Academic Support Services- secretary of the deans council

Prof. Raafat El-Awady, Dean of the College of Graduate Studies

Prof. Awad Al Khalaf, Dean of the College of Shari'a and Islamic Studies

Prof. Hussein Mohammad Al Othman, Dean of the College of Arts, Humanities & Social Science

Prof. Dima Rachid Jamali, Dean of the College of Business Administration

Prof. Ahmed Al-Shama'a, Dean of the College of Engineering

Prof. Mohamad Alameddine, Dean of the College of Health Sciences

Prof. Imad El Din Ahmad Abdul Hay, Dean of the College of Law

Prof. Nadia M. AlHasani, Dean of the College of Fine Arts and Design

Prof. Essam Nasr Selim, Acting Dean of the College of Communication

Prof. Qutayba Hamid Al Heialy, Dean of the College of Medicine

Prof. Qutayba Hamid Al Heialy, Acting Dean of the College of Dental Medicine

Prof. Karim El'Zubi, Dean of the College of Pharmacy

Prof. Nouar Tabet, Dean of the College of Sciences

Prof. Abbes Amira, Dean of the College of Computing and Informatics

Prof. Eid Mohammad Kanaan, Dean of Men's Student Affairs

Dr. Salama Al Rahooji, Dean of Women's Student Affairs

Prof. Taleb Al Tal, Director of the Institute of Medical and Health Sciences Research

Prof. Abdallah Shanableh, Director of the Institute of Sciences and Engineering Research

Prof. Faker Al Gharaibeh, Acting Director of the Institute of Humanities and Social Sciences Research

Prof. Sam Souliman Dalla, Legal Consultant

### **Deanship of the Academic Support Services**

Dr. Hussein El Mahdi, Dean of Academic Support Services  
Ms. Aisha Mohamed Bukhatir Al Shamsi, Director of the Admission Department  
Mrs. Nadia Masoud, Director of Libraries  
Eng. Mahmoud Abu Shammeh, Director of the Central Laboratories  
Ms. Reem Al-Hashemi, Director of the Registration Department  
Mrs. Rana Kabani, Head of Career Advancement Section

### **Financial and Administrative Affairs**

Dr. Gordon Handke, Vice Chancellor for Administration and Financial Affairs  
Ms. Shaikha Al-Naqbi, Director of the Department of Human Resources  
Eng. Alain Eid, Director of the Physical Plant Department  
Mr. Sebastian Priou, Director The Finance Department  
Mr. Mohammed Al-Saidat, Director of the Information Technology Center

### **Human Resources**

Dr. Gordon Handke, Vice Chancellor for Administrative and Financial Affairs  
Shaikha Al Naqbi, Director of the Department of Human Resources

### **Centers and Units**

Prof. Esam El-Din Agamy, Vice Chancellor office for Institutional Effectiveness and Accreditation  
Prof. Shehdah Fareh, Director of the English Language Center  
Dr. Salah Taher AL Haj, Vice Chancellor for community Affairs  
Mr. Malik Moh'd Mihdawi, Director of Community Cooperation Office  
Ms. Fatima Hassan Sajwani, Director of Conferences Office  
Mr. Majid Al-Jarwan, Vice Chancellor for Public Relations  
Mr. Khaled AlRaboy, Director for the Department of Public Relations  
Mrs. Hala El Kady, Director of the Child Care Center  
Mr. Abdulrahman Al Hashimi, Director of Business Services Department  
Dr. Nadia Farhat, Director of the Marketing and Student Recruitment Department  
Prof. Radhi Al Zubaidi, Director of the Center for Continuing Education and Professional Development  
Dr. Shareefa Rahmatallah Al Marazooqi, Director of the Media Center  
Mrs. Rana Kabbani, Head of Career Advancement Section  
Prof. Ahmed Falah Alomosh, Director of Disability Resource Center  
Prof. Maher Omar, Director of the Institute of the Leadership in Higher Education  
Dr. Tarek Merabtene, Director of the Office of International Relation

### **Research Institutes**

Prof. Faker Al Gharaibeh, Acting of the Institute of Humanities and Social Sciences Research  
Prof. Abdallah Shanableh, Director of the Institute of Sciences and Engineering Research  
Prof. Prof. Taleb Al-Tal, Director of the Institute of Medical and Health Sciences Research

### **Regional Campuses**

Dr. Amina Al-Marzouqi, Assistant Chancellor of Branch Affairs  
Dr. Saleh Muhammad Zeki, Vice Assistant Chancellor of Branches Affairs (Aldhaid Branch)  
Dr. Usama EL Rouby, Vice Assistant Chancellor of Branches Affairs (Khorfakkan Branch)  
Dr. Ali Al Zaabi, Vice Assistant Chancellor of Branches Affairs (Kalba Branch)

## About University

### Background

The University of Sharjah (UoS) is recognized among the reputable and comprehensive universities around the world for its excellence in teaching and learning, research, and sustainable academic programs that provide quality services to the community and contribute to the well-being of society. The University has achieved significant milestones in a short span of time since its inception in 1997. A summary of these achievements is highlighted below:

- The academic programs offered by the University of Sharjah have grown to encompass 122 accredited programs across 14 colleges and many new programs have been planned to meet emergent community needs in new fields of knowledge. The University has two main campuses in Sharjah University City as well as campuses Aldhaid and Kalba.
- The UoS Medical Complex is home to four medical colleges (Medicine, Dentistry and Pharmacy) and the College of Health Sciences as well as two teaching hospitals. This makes UoS unique in providing comprehensive health and medical education in the UAE.
- The number of teaching faculty has surpassed 710 and an intense recruitment effort is underway to hire many more highly qualified faculty members. Additionally, 1644 administrative staff members serve to support the educational process at the University.
- The number of memoranda of understanding (MoU) that have been signed with regional and international universities and institutions since 1998 is 140. And, the total number of MOUs & Agreements with local entities (Non-academic) is 270. The UoS website includes and publishes the most important agreements and global Alliances.

<https://www.sharjah.ac.ae/en/about/agc/Pages/Affiliations.aspx>

- Many active research institutes, centers and groups have been established over the years and engage in a wide spectrum of interdisciplinary research geared to advance development in the region and beyond.
- The number of enrolled students has steadily grown from 676 in 1997 to 18464 students in 2022. This is the highest number of students among peer institutions in the UAE, with an average annual increase of about 10% in enrollment over the span of the past 20 years.
- UoS students come from more than 100 countries, which make UoS among the leading diverse universities in the world.
- The quality of admitted students has improved considerably as the high school threshold score of admitted students has been raised from 70% in 1997 to 92.5% in 2022.
- More than one third of the University's students receive scholarships from various governmental authorities and the private sector.
- UoS houses nine impressive library buildings, which occupy more than 30,000 square meters and hold vast print and electronics resources to support the mission of the University.
- UoS has more than 206 modern laboratories that provide a strong applied learning experience and support research in many disciplines.
- More than 60 networked computer labs are equipped with the latest hardware and software tools and complete modern athletic facilities enable students to engage in a wide range of pastime and competitive sports so that they may attain a holistic University experience.
- Three on-campus mosques allow people to congregate to renew their faith and commitment to higher values.
- Modern dormitories provide a home for those away from home.

These phenomenal accomplishments over the past short number of years provide the thrust that propels the University to reach its goals in providing the highest quality educational experience to

its students. This will enable them to gain adequate knowledge and experience to ensure that they are well prepared for life beyond graduation. It will also strengthen the University's role in providing the local community with technical services as well as scientific consultations. In research, the state-of-the-art facilities available at the University support faculty and students so that they may excel in their in-research endeavors.

### Vision

The University of Sharjah is an innovative world-class teaching, learning and research institution providing a distinctive, inspirational, creative and supportive environment.

### Mission

The University of Sharjah is committed to providing a world-class educational experience that prepares lifelong learners and leaders with integrated knowledge and skills. We are passionate about building a collaborative and sustainable environment that cultivates twenty-first century skills and fosters pioneering research and scholarship. We seek to serve the current and future needs of our local community and beyond by offering innovative academic and professional programs.

### Core Values

The University of Sharjah is united by six core values that underpin our daily actions as students, staff, faculty, administrators and alumni. They are as follows:

1. **Integrity and Ethics:** Ethical standards at the University of Sharjah are founded on ethical and civic responsibility in accordance with progressive Arab and Islamic ideals.
2. **Dedication:** Dedication to providing students with knowledge and support, so they are fully prepared to be the leaders of the future.
3. **Inclusiveness:** We welcome and value each other and embrace the diversity of ideas and people.
4. **Excellence with limitless Drive:** For quality enhancement and continuance improvement.
5. **Accountability and Transparency:** We pride ourselves on our responsibility, and transparency in our actions, providing a fair and positive work environment.
6. **Innovation and Creativity:** We work without bounds to improve lives through creativity and innovation in the pursuit of academic excellence

### Goals

The University goals are categorized as follows:

#### Student

1. Make the University of Sharjah campus more welcoming and supportive for all, focusing on the wellbeing of our students.
2. Enhance programs, services and facilities for people of determination.
3. Enhance student advisory and support for academic achievement.
4. Increase the employability of University of Sharjah students, while improving internship and cooperative opportunities.
5. Enhance facilities and services at our branches.

#### People

1. Recruit, develop, retain talented faculty and professional staff.
2. Empower faculty and professional staff through professional development.

3. Develop the Emiratization program.
4. Enhance employee wellbeing, safety and healthcare.
5. Develop an environment of service excellence.

#### **Innovation**

1. Build an agile governance and operating model with the aim of establishing a robust and efficient operations platform on which to grow.
2. Unify and integrate IT systems to serve education, research and operation activities.
3. Establish a financially sustainable institution with diverse sources of income.
4. Efficiently manage resources to establish a sustainable financial base and examine the distribution of resources across programs, revising uneconomical academic programs.
5. Improve the University of Sharjah branding and internationalization.
6. Develop an environmentally sustainable campus.

#### **Research**

1. Support research management and dissemination.
2. Support and reward researchers, while engaging students.
3. Establish sustainable dynamic priority research areas in service of the community.
4. Expand and equip state-of-the-art research facilities.

#### **Industry and Community**

1. Communicate more effectively with society to increase local, regional and international relations in a bid to foster research and innovation through greater collaboration.
2. Establish a philanthropy and endowment program.
3. Increase alumni involvement in fundraising and networking.
4. Provide professional development, continuing education and consultancy services for industries, the community and society.

#### **Teaching and learning**

1. Enhance our teaching and learning environment by incorporating leading edge technology.
2. Develop and support innovative teaching methodologies and course design and delivery.
3. Review, develop and accredit academic programs to meet the 21st century job market.
4. Strengthen the pedagogical knowledge and skills of faculty members.

### Location and Climate

The University campus is located within Sharjah University City, which also includes the American University of Sharjah, Sharjah Higher Colleges of Technology and Sharjah Police Academy. Located in the Muwaylih Suburb, about 12 Kilometers from the Sharjah City Center, the university is conveniently accessible via numerous roads and highways.

The main campus includes separate men's and women's facilities housed in new buildings with classrooms, laboratories and IT support units that are all well equipped with the latest instructional and educational technology. The Medical Colleges implement a co-educational system. The university fosters social, cultural, and extra-curricular activities and sports. The university campus, which is spacious and beautifully landscaped, houses student dormitories, sports facilities, and medical clinics. Its architectural design is monumentally harmonious and inspires innovation, reflecting the peace emanating from the perennial surrounding desert environment. Many buildings are connected with each other, making it easier for faculty, staff and students to move between facilities in air-conditioned corridors.

## Program Accreditation, Recognition and Licensure

### National Accreditation

The University is fully licensed and all its programs (currently 123 programs) are accredited by the Commission for Academic Accreditation (CAA) of the Ministry of Education in the United Arab Emirates

### International accreditation:

The University aims to obtain accreditation and recognition for its programs from international accreditation and recognition.

### ABET Accreditation

The following programs offered by the College of Engineering are accredited by the Accreditation Board for Engineering and Technology (ABET):

1. Bachelor of Science in Civil Engineering
2. Bachelor of Science in Electrical and Electronics Engineering
3. Bachelor of Science in Architectural Engineering
4. Bachelor of Science in Industrial Engineering and Engineering Management
5. Bachelor of Science in Sustainable and Renewable Energy Engineering
6. Bachelor of Science in Nuclear Engineering
7. Bachelor of Science in Mechanical Engineering

The following programs offered by the College of Science are also accredited by ABET:

1. Bachelor of Science in Mathematics
2. Bachelor of Science in Chemistry
3. Bachelor of Science in Biotechnology

The following programs offered by the College of Computing and Informatics are also accredited by ABET:

1. Bachelor of Science in Computer Engineering
2. Bachelor of Science in Computer Science
3. Bachelor of Science in Information Technology – Multimedia

### AACSB Accreditation

The following programs offered by the College of Business Administration are accredited by the Association to Advance Collegiate Schools of Business (AACSB):

1. Master of Business Administration
2. Executive Masters of Business Administration
3. Bachelor of Science in Accounting
4. Bachelor of Science in Business Administration - Management
5. Bachelor of Science in Business Administration - Marketing
6. Bachelor of Science in Finance
7. Bachelor of Science in Public Administration
8. Bachelor of Science in Management Information Systems



### **ACEJMC Accreditation**

The following programs offered by the College of Communication are accredited by the Accrediting Council on Education in Journalism and Mass Communications (ACEJMC):

1. Bachelor of Arts in Communication - Electronic Media
2. Bachelor of Arts in Communication - Graphic Design and Multimedia
3. Bachelor of Arts in Communication – Journalism
4. Bachelor of Arts in Mass Communication
5. Bachelor of Arts in Public Relations

### **Recognition**

The Sharjah Surgical Institute (SSI) offers training program for surgeons from the region, in cooperation with international partners, including Johnson and Johnson and Olympus.

The Clinical Training Center (CTC) is accredited as a medical training and testing center by the:

1. Royal College of Surgeons in England.
2. International Federation of Surgery and Obesity and Metabolic Disorders (IFSO).
3. European Association for Endoscopic Surgery (EAES).
4. American Heart Association.
5. Ministry of Health in United Arab Emirates.

The Bachelor of Science in Biotechnology is recognized by the Royal Biological Society.  
The Bachelor of Science in Chemistry is recognized by the Royal Chemical Society.

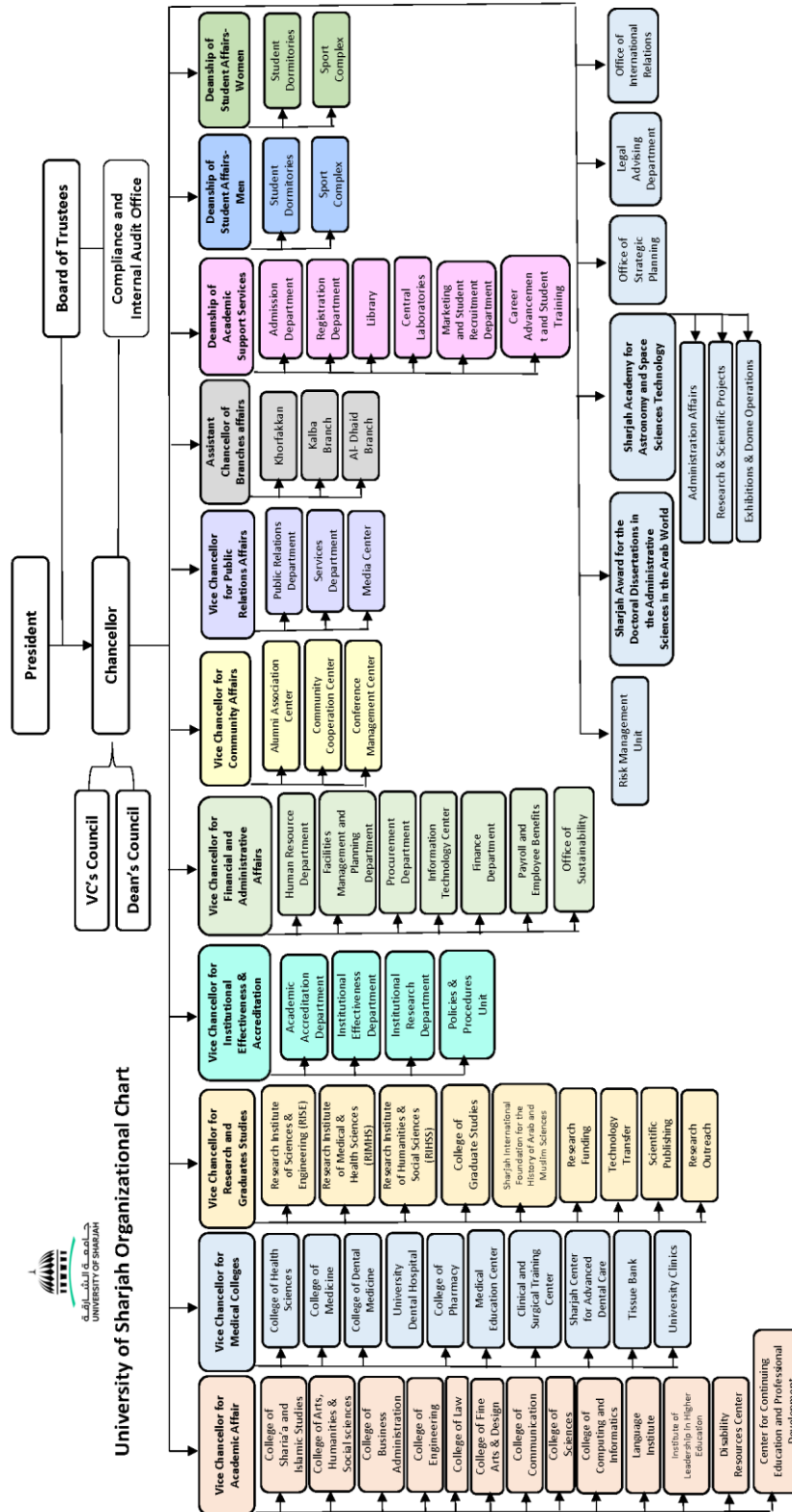
### **Licensure**

UoS has institutional Licensure from Ministry of Education (CAA) for whole institution. The UoS certificate and Testation are recognized and approved from MoE. This licensure makes the certificate generated by UoS more trust locally and internationally. In addition, the medical colleges' students have extra recognition from Ministry of Health (MoH). All students graduated from college of medicine, College of Dental Medicine and health science can apply for licensure after fill the MoH requirements. College of Science is working to get MoH recognition for the biotechnology students to give them more opportunities in the career and make their certificate more confidence.

The Ministry of Education has approved the renewal of Licensure for the University of Sharjah which is Located in the Emirate of Sharjah to allow the university to work in the field of higher education and award degrees/ qualifications in higher Education from the period 15/11/2018 to 19/09/2023. This Licensure is reviewed periodically every seven years by the Ministry of Education and the CAA Evaluation Process. In 2022, UoS received the High Confidence Status from the Ministry of Education because it proves the ability to meet the requirements of the standard CAA-2019.

## Organization Chart

<https://www.sharjah.ac.ae/en/about/Pages/OrgChart.aspx>



## General Financial Policies

University fees as well as any other fees are paid in the financial department which also provides students with financial details regarding any deductions or fees they have to pay during their study. Students may also pay fees through Sharjah Islamic Bank in order to save time and effort.

## Financial Policies and Tuition Fees

The University tuition fees are determined by the Board of Trustees with the approval of the Supreme President of the University on an annual basis. It may introduce an increase in tuition fees between 3% and 5% to all students, whether new or returning without prior notice, but significantly higher increases are usually applied to new students only. Updated fees are provided on the University Website: [www.sharjah.ac.ae](http://www.sharjah.ac.ae).

## Methods of Paying Fees

University fees must be paid in full before completing the registration process either in cash or by cheque made to the University due on the date of registration. However, for those unable to pay the full fees upon registration, the University has implemented the following options:

1. University fees must be paid in full before completing registration in any academic courses in any given academic semester.
2. Fees may be paid in cash, by crossed checks issued in the name of the University of Sharjah or by credit card.
3. Fees may be paid in two equal installments: the first is paid (in cash or by check) on the due date of registration and the second by a predated check due two months after the first payment.
4. Fees may be paid in three installments provided that the first installment is equivalent to 50% of the fees, in cash or by check, and the remaining two checks for the balance will become due one week prior to the mid-semester examinations and one week prior to the date of the final examinations respectively.

For a detailed breakdown of the University tuition fees per year, housing fees and other services at the University, kindly refer to the University's Catalog.

## Financial Assistance

1. Siblings registered at the University in the same semester will be granted a 10% discount each on the net fees payable by each of them separately. Further details are available in the Department of Finance.
2. The University grants a reduction on total tuition fees for distinguished students in accordance with the decisions of the University Administration. A student will be entitled to such a reduction if he registers for a minimum of fifteen credit hours during the semester, and such hours will include practical training. IEP students are not eligible for this assistance, which cannot be combined with any other financial assistance available in the University.
3. The University offers financial assistance to needy students studying on a regular basis. However, the University will have the right to withhold such assistance in some or all semesters. The student must have registered for a minimum of 15 credit hours in the previous semester and attained a G.P.A. of (3) or better. The University determines the period in which such an application may be submitted and the amount of assistance that

a student may receive. It should be noted that the University does not provide any assistance in cash, but only credit towards payment of fees.

4. The University will grant a 50% reduction of tuition fees for the first semester only to students obtaining 90% or more on the General Secondary School Examination. This reduction will not apply to students who obtain a full scholarship.

In addition, the University offers financial support to students with and outstanding academic performance of 3.6 GPA and above. For more information on the University financial policies, kindly refer to the Finance Department.

### **Fees Refund in case of Dropping Fall/Spring Credit Courses**

- (a) Students dropping courses within the first calendar week of the Fall/Spring semester will receive a 100% refund of the tuition fees,
- (b) Students dropping courses after the first week of the semester and before the end of the third week of the Fall/Spring semester will receive 100% refund of the tuition fees. In such cases a “Withdrawal without Penalty” (W) grade will be entered in their record,
- (c) Students dropping courses after the third week of the Fall/Spring semester will receive no refund, and will be awarded a W grade for that course,
- (d) If students do not withdraw from courses during these specified periods, they will be considered as being registered for the course, and held accountable,
- (e) A 100% refund of tuition fees will be given for courses canceled by UoS,
- (f) The University reserves the right to cancel any course/level where the number of students registered does not meet the minimum required number of students.
- (g) There are no fees required from students for the period to complete their thesis amendments.

## Vice Chancellor for Institutional Effectiveness and Accreditation

Professor Esam Agamy, Dean  
Main Administration Building, M11-237  
Tel: +971 6 5053026  
Fax: +971 6 5053020  
Email: [iru@sharjah.ac.ae](mailto:iru@sharjah.ac.ae)  
Website: <http://www.sharjah.ac.ae/en/Administration/QAIE/>

The Vice Chancellor Office for Institutional Effectiveness and Accreditation was established in May 2011 to cover areas of institutional research, institutional effectiveness and academic accreditation. The responsibilities of the Directorate are to:

- Coordinate and prepare for national and international accreditation and determine factors that are critical in obtaining institutional accreditation and assure that University of Sharjah implements effective plans to address those factors.
- Prepare and maintain the University portfolio of programs by developing and implementing an institutional database for University of Sharjah that will integrate data from all sources of information in all colleges of the University.
- Harmonize the institutional effectiveness activities to ensure that all academic and administrative units achieve their outcomes and ensure consistency in all campus locations.
- Identify gaps in data; establish procedures to maintain quality of data; ensure the proper use of knowledge and internal / external assessment data.
- Enhance the implementation of appropriate learning and teaching methodologies suitable for each program.
- Design and update the evaluation and assessment methods appropriate for each category of programs and verify all development plans.
- Ensure that all existing and planned curricula meet the required standards and have well defined outcomes.
- Prepare progress reports at all levels and periodically review and evaluate the implementation of the strategic plan and directions.
- Oversee the formulation, review, publication, and implementation of the UOS policies.
- Ensure that the policies and procedures are compliant with the accreditation standards and the UOS regulations.

### Location and Climate

The University campus is located within Sharjah University City, which also includes the American University of Sharjah, Sharjah Higher Colleges of Technology and Sharjah Police Academy. Located in the Muwaylih Suburb, about 12 Kilometers from the Sharjah City Center. The University is conveniently accessible via numerous roads and highways.

The main campus includes separate men's and women's facilities housed in new buildings with classrooms, laboratories and IT support units that are all well equipped with the latest instructional and educational technology. The Medical Colleges implement a co-educational system. The University fosters social, cultural and extra-curricular activities and sports. The University campus, which is spacious and beautifully landscaped, houses student dormitories,

sports facilities and medical clinics. Its architectural design is monumentally harmonious and inspires innovation, reflecting the peace emanating from the perennial surrounding desert environment. Many buildings are connected with each other, making it easier for faculty, staff and students to move between facilities in air-conditioned corridors.

### **Deanship of Academic Support Services**

Dr. Hussein M. Elmehti, Dean of Academic Support Services

Main Administration Building, M11-235

Tel: +971 6 5053016

Email: [ljandali@sharjah.ac.ae](mailto:ljandali@sharjah.ac.ae)

<http://www.sharjah.ac.ae/en/academics/a-services/>

The Deanship of Academic Support Services (DASS) is a very unique administrative entity that provides support services to students and academic staff in support of their academic endeavors at the University of Sharjah. In addition to the Deanship Office, there are five departments under DASS. These include:

- 1) Admissions Department (AD)
- 2) Registration Department (RD)
- 3) University of Sharjah Libraries (UOSL)
- 4) Directorate Central Laboratories (DCL)
- 5) Career Advising and Students Training Office (CASTO)

Each unit at DASS works diligently to provide high quality support services to academic staff, students, departments, colleges and university administration. Our services are designed to support students in their academic journey from the moment they enroll at the university till their graduation ceremonies. Our goal is to ensure student success at all levels. Among the main academic support services regularly provided by the five units of DASS are:

- 1) Prepare the strategic plans for each unit and align it with the UoS Strategic Plan.
- 2) Prepare the Policies and Procedures for all operation processes within the admissions, registration, libraries, central labs and career advising and internship training.
- 3) Provide needed information and files required by accreditation bodies and committees during their periodical and regular visits.
- 4) Select, test and implement IT solutions and systems including LMS and SIS.
- 5) Set up admission regulations and implement admission processes, which include admission criteria and selection and placement of students in various programs.
- 6) Coordinate with the colleges to set up the admission capacities.
- 7) Prepare, maintain and archive students' grades and records and issue official documents and certificates.
- 8) Work with the financial planning office to set up the fees, discounts and related fiscal financial plans.
- 9) Follow registration process that includes setting up class schedules and review the registration operations to make sure that students follow their study plans and graduate on time.
- 10) Define and maintain processes within the Student Information System (SIS) with Banner and Blackboard.

- 11) Provide students with study and research resources including textbooks, reference periodicals and online databases of huge collection of journals and periodicals.
- 12) Manage UoS libraries and study facilities including providing adequate quiet study areas within the UoS libraries equipped with adequate IT support and online resources.
- 13) Oversee the purchase and order of reference textbooks, online databases, periodicals & library software and applications.
- 14) Supervise, advise and support UoS libraries in their activities and events.
- 15) Manage Lab Space within the university.
- 16) Prepare purchase orders for any kind of equipment needed for labs including research labs and facilities
- 17) Prepare lab safety training programs, system and manuals.
- 18) Facilitate internship training for senior students.
- 19) Maintain and review the e-Portal used to facilitate internship training.
- 20) Coordinate with colleges and research institutes on international student exchange programs.
- 21) Organize regular workshop and training on career development and job readiness and employment advising.
- 22) Facilitate student employment within the university campus.

In addition, the Deanship Office is in charge of setting up and running the University of Sharjah Deans Council meetings and writing up the minutes of the council. DASS is also in charge of several key central committees such as the students' issues committee, special cases committee, academic calendar committee and several ad hoc committees.

### **Admission Department**

Ms. Aisha Bukhatir

Admission and Registration Building, M11A

Tel.: +9716 505 3738, +9716 505 3724

Emails: [abukhatir@sharjah.ac.ae](mailto:abukhatir@sharjah.ac.ae), [admission@sharjah.ac.ae](mailto:admission@sharjah.ac.ae)

Website: [www.sharjah.ac.ae/admission](http://www.sharjah.ac.ae/admission)

The Admissions Department was established during the academic year 2010/2011 upon a decision of his highness Sheikh Dr. Sultan Bin Mohammed Al-Qasimi, member of the supreme council and ruler of Sharjah, to be an independent and specialized department.

It's one of the five services and support entities of the Deanship of Academic Support Services at the University of Sharjah, and considered the gateway through which students pass to enter the academic life from the point of applying to join the University until receiving their academic degrees.

The Admissions Department interact greatly with the steady increase of the students, and the development of the university since its establishment. It works to develop itself in quantity and quality and activate its sections in the main branch, Medical Colleges as well as the branches in Khorfakkan, Kalba, Dhaid and Community College branch.

In addition, the "Online Admission" feature has been implemented to be in line with the era requirements, and facilitate the admission procedures for the international students.



The Admissions Department is the gateway through which students pass to enter their academic and university lives, from the point that they submit their applications to join the University until receiving their academic degrees. The Admissions Department processes online and manual applications for undergraduates' programs admission to all programs offered at all UoS campuses, coordinates with the academic units on admission-related issues, manages entrance examinations for new students, and notify the students of their decisions, and creates students file, also, it issues IDs to admitted and enrolled students, maintains and updates their personal records.

In order to provide the best service to students, parents, graduates, and governmental institutions, the Admission department exerts great efforts to communicate and coordinate with the University's colleges, departments, governmental and private institutions, and relevant universities both inside UAE and abroad. The Admission Department actively participates in conferences and workshops related to admission and archiving process such as ARAB ACRAO, and Arab Administrative Development Organization (Specialized Organization Affiliated with the League of Arab States). It organizes internal training workshops and participates in external training workshops for staff. In addition, it organizes international conferences related to Admission and periodical meetings with scholarship institutions to maintain their need upon the university's role.

The Admissions Department's administrative structure includes technical staff, specialists, and trainers who form a team committed to provide the best services through the Department's four main sections and Scholarship Office:

- Admissions Section (AS).
- Scholarship Office.
- Student Services Offices (SSO).
- System Management Section (SMS).

These sections perform basic functions that involve all groups of the university's community including applicants, students, graduates, visitors, parents, faculty and administrators, as each of these groups has its particular needs and requirements. The duties of each section include the following:

#### **Admission Section**

- 1) Process all undergraduate applications for admissions to the UoS and assist the College of Graduate Studies with their admission process.
- 2) Respond to all applicants and students' enquiries and provide the students with the required admissions information.
- 3) Prepare and update admissions materials and provide information about admissions policies for the various university programs that corresponds with the decisions of the Ministry of Education in UAE.
- 4) Manage on-line applications, ensure the fulfillment of the admissions rules and conditions, communicate with them to complete their application record, create students' files, enters students' applications to the Banner system, and announce the names of accepted students.
- 5) Organizing the entrance exams in coordination with the colleges and the concerned parties.
- 6) Coordinate with the colleges and the university admission committee on admission issues.
- 7) Participate in the enrollment campaigns and social media.



- 8) Participate in educational exhibitions locally and internationally to promote the various university programs and to raise the awareness of the admission conditions and regulations of the university.
- 9) Participate in the university open day for schools.
- 10) Attract outstanding students according to the guidance of the higher administration of the university, taking into consideration quality not quantity.
- 11) Develop, maintain and implement admission procedure in accordance with the general admission policy that is acknowledged by the university and complied with the decisions and instructions of the Ministry of Education in UAE.
- 12) Organize admission procedures for all academic levels and provide all electronic and technical facilities to improve and update admission procedures.
- 13) Open direct communication and coordinates with the University colleges and departments in addition to governmental and private institutions, relevant universities and sponsoring authorities both inside UAE and abroad in order to provide the best services for Institutions, students, applicants and graduates.
- 14) Updates enrolled students' personal information on the university Banner system.
- 15) Archives electronically all students' files.
- 16) Participate in the students' orientation programs.
- 17) Updates expected to graduate students' personal information on the Banner system and scans their documents to be uploaded on MOE website.
- 18) Maintains and updates students' personal records.

#### **Scholarship Office:**

- 1) Follow up scholarship applications for new students.
- 2) Provide acceptance letters to students and scholarship institutions.
- 3) Supervising the scholarships of the Sharjah government.
- 4) Coordinate with scholarship institutions regarding the following:
  - a) Provide the latest admission policy and procedures.
  - b) Follows-up candidate's admission status and required documentations.
  - c) Assist with in housing reservation.
  - d) Secure seats reservation.
  - e) Organize periodic meetings to discuss updates related to admission processes and procedures.
  - f) Provide statistics and reports of their admitted students.

#### **Student Services Offices**

1. Welcome students and their parents, and respond to their inquiries.
2. Maintain a high quality of services to all who come into contact with the Admission Department for New, Transfer, Readmit, and Graduate Students.
3. Help in directing parents and new students to the correct office and respond to queries.
4. Reply to the department's emails and phone calls.
5. Guide the students to apply for the required services electronically.

The Admission Department at the Admission and Registration Building (M11A) is divided into two separate sections to provide services to male and female students for various majors at the university except for the Medical and Fine Arts Colleges, as they have a separate branch in the

Medical and Health Sciences Colleges (M25-20) building and provide services to the students of Medicine, Dentistry, and Pharmacy, Health Sciences, Fine Arts and Design.

### System Management Section

1. Manage admission-related projects and integrations with other relevant systems.
2. Manage the Department Systems.
3. Design, implement and automate information management procedures and customize solutions that are compatible with the Banner System.
4. Develop, administrate, support and provide service management for the department's sections including: Student Information System (Banner), ID card system, graduation certificate system, smart card system and find creative solutions to improve them.
5. Compile, analyze and provide valid conclusions from information system data.
6. Manage student's personal information data and assist in auditing process through providing cleansing reports.
7. Generate different type of reports related to admission, scholarship, student's personal information, document control and graduates to various university divisions for planning and decision-making purposes.
8. Provide technical support and train staff on the proper use of information systems and data quality practices.
9. develop online admission application and the E- services, work flow and the reporting tools of the department.
10. Supervise the future technical plan such as: New archiving system (Document Management System), reporting tools, mobile application tools and other creative solutions that will add value to the services provided to our clients.
11. Supervise the Banner 9 upgrading process.

### Registration Department

Ms. Reem Al Sayed M. Al-Hashmi, Director of the Registration Department  
Admission and Registration Building, M11A  
Tel: +971 6 5053731  
Email: reemh@sharjah.ac.ae  
Website: [www.sharjah.ac.ae/registration](http://www.sharjah.ac.ae/registration)

The Registration Department is one of the integral administrative entities at the University of Sharjah that is responsible for administering academic processes and monitoring the academic progress of students. The Registration Department main functions includes:

- 1) **Student Registration:** Supervise and manage all administrative and operational functions related to registration for bachelors, postgraduate diplomas, masters and doctorate programs according to the University academic regulations, policies and by-laws. It takes into account all university branches in Khorfakkan, Kalba, and Al Dhaid, in addition to the main branch in Sharjah.
- 2) **Academic Records:** Ensure the reliability, accuracy, and security of student academic records. This includes the academic records of current students as well as graduated students.
- 3) **Students under Probation:** Review and apply decisions on students who are under probation and students who are subject to dismissal.

- 4) **Degrees, Curricula, and Study Planning:** Define new programs, maintain up-to-date study plans and ensure that all degree titles are in compliance with the Ministry of Education accreditation protocols.
- 5) **Class and Final Examination Scheduling:** Coordinate with colleges to offer the required courses and sections for newly admitted, continuous, and expected to graduate students and prepare final examination schedules to ensure proper utilization and efficient use of classrooms and resources.
- 6) **Graduation:** Nominate students for graduation after verifying their graduation requirements, provide internal and external parties with the lists of students expected to graduate, and apply graduation decisions and dates of completion on students' records.
- 7) **Transcripts, Verifications and Letters of Enrollment:** Issue official documents for current and prior students studying at the University of Sharjah. These documents include academic transcripts, verifications, To Whom It May Concern letters, and Graduation Completion letters.
- 8) **Scholarship Services:** Facilitate the procedures of sponsored students by coordinating among students and their sponsors, funding agencies, authorities and consulate attaché and ensure effective implementation of the rules and regulations provided by them. Provide them with students' academic transcripts, schedules, and academic progress periodically.
- 9) **Student Information System Management:** Provide clear, accurate and concise technical audit and review reports to support quality assurance processes at the Registration Department and ensure that Students Information System (SIS) Database is well defined, regularly and timely updated and properly secured including access policies and procedure, report extraction and definition of statistical parameters.
- 10) **Information and Statistics:** Provide routine as well as upon-request statistical reports to support management in decision-making. Provide reports to colleges on issues related to teaching and learning, academic advising, funding and scholarship, graduating students and alumni.
- 11) **Training and Staff Development:** Provide sufficient training for employees in the Registration Department, in colleges and in different branches to produce tangible results and support daily tasks and accelerate work. Conduct awareness and advising seminars to faculty staff, admin assistants and students on bylaws and registration instructions.
- 12) **Research and Development:** Participate in research related to teaching and learning, which is based on data available in SIS database and take part in conferences and workshops related to improving registration processes.

The Registration Department uses 'Banner' Students Information System to implement academic processes and maintain student records. Students and faculty members have Banner personal secured accounts to access relevant records, courses, schedules, grades, etc. The Registration Department provides an E-Service platform to receive requests submitted by faculty members and students.

The main office of the Registration Department is located in (M11A) behind the University's Main Administration Building. Registration operations for students in the Medical Colleges are handled by the department branch located in building (M25) within the Medical Campus, while postgraduates students' operations are managed by the Registration offices in the Graduates Studies building (M3A). Registration staff are also present at the University branches in Khorfakkan, Kalba and Al Dhaid.

For registration procedures, online services, deadlines and related issues please refer to the Registration section in this Catalog or visit: <http://www.sharjah.ac.ae/registration>

## UoS Libraries

Mrs. Nadia Masoud, Director of Libraries  
Main campus, Building M16 – First floor  
Tel: +971 6 5057188  
Email: [nadia@sharjah.ac.ae](mailto:nadia@sharjah.ac.ae)  
Website: <http://library.sharjah.ac.ae/libraries>

The University of Sharjah Libraries provide students and faculty with resources and services they need to succeed in their educational and research undertakings. Resources are housed in eight attractive, state-of-the-art library buildings occupying more than 30,000 square meters of space on the main campus and at satellite branches. The buildings offer users ample study and computing common areas; halls for meetings, seminars and conferences; classrooms; Postgraduate Hall, faculty development centers; prayer rooms; and executive meeting rooms. The Libraries provide knowledge based and up to date information resources to support academic programs and research activities.

With a diversified collection that includes 320,000 books, 160,000 E-books, 110 Online Databases, 62,000 Electronic Journals, 1,800,000 full text Theses and Dissertations, UoS libraries are considered one of the most comprehensive libraries in the region.

The Libraries Department is the repository for UOS Theses and Dissertations. Digitized copies are available for UOS community to access and view. Print theses are stored in the postgraduate hall for students to use.

To provide anytime / anywhere access to resources, the libraries emphasize electronic resources acquisition. The large majority of online resources available are the best worldwide, such as ScienceDirect, Scopus, IEEE, Emerald, Clinical Key, EBSCO, Proquest, JSTOR, SciFinder, Cochrane Library, UpToDate, and others.

UoS libraries continuously develop and improve library resources and services in response to changes and emergent needs; participate proactively in the enrichment of the educational experience; improve information technology and multimedia assets; repurpose available space to accommodate the changing library role; improve community outreach and branding; improve administrative structure and the commitment to due process.

### Organization of Materials

Library resources are organized in accordance with International standards and best practices. All print and electronic resources, except medical and health science materials, are cataloged according to the Library of Congress Classification. Medical resources are engendered according to the National Library of Medicine classification. Latest MARC21 formats and standards are used to build bibliographic records.

“The Library Homepage” is the main gateway to get information about UoS libraries and to access the electronic resources 24/7. To enhance the use of library resources and to ease the search process, a discovery tool was obtained that search all full text library resources along with the OPAC at once. Off-campus access to the electronic resources is offered to faculty and students through the RemoteX software. Research citations can be prepared by using “Refworks citation manager”. Electronic books and journals are retrievable through E-books and E-Journals Portals, in addition to many tools that help the researchers reach information on books and journals.

Librarians are found to provide a wide variety of services that fulfill faculty and students' needs. Services include reference services, book-iPad-laptop loans, library orientation and instruction sessions, research assistance, database and Internet searching, and much more.

Research papers and documents that are not available at the library will be ordered through the Document Delivery Service from the British Library. Current Awareness Service delivered to faculty and students, keeps them updated of the new library collection and services.

Various activities are conducted to introduce the libraries to the university community and to promote library resources and services such as the open days, book sales, workshops, product presentations, symposiums, and many other events.

#### UoS Libraries IT infrastructure, systems and facilities

An integrated library system (Sierra) is currently operating that embeds all library functions, services, and auxiliary tools. The libraries are fully automated and linked to all faculty and university offices through the university network. Multi-media rooms equipped with state-of-the-art tools, computers, video projectors, data shows, CD writers, etc. An Internet lab equipped with networked computers uploaded with the latest applications. Several networked public access computers are available for students' use, loaded with the latest applications to access research resources and connected to networked printers and scanners. Wireless Networking is enabled in all University of Sharjah libraries to allow library patrons use their own laptops and access the Internet as well as the library resources.

## The Central Laboratories

Eng. Mahmoud Abu Shammeh, Director of the Central Labs

Central Laboratories Buildings, W12

Tel: +971 6 5053450

Email: [abushammeh@sharjah.ac.ae](mailto:abushammeh@sharjah.ac.ae)

Website: [www.sharjah.ac.ae/centrallabs](http://www.sharjah.ac.ae/centrallabs)

Learning by doing is the learning mode that influences knowledge retention most, and experimental verification play a central role in understanding theories and their applications and in advancing knowledge through discovery. Complementing theoretical knowledge with applied skills and competencies also enhances students' potential to think critically, discover and practice innovation. Accrediting bodies in almost all fields have identified practical skills as an important element of curricular outcomes. For all these reasons, access to appropriate and quality lab facilities is viewed as a fundamental student right at the University of Sharjah.

UoS provides students applied learning experience through 147 modern laboratories that support learning and research activities in the Colleges and Research Institutes: Sciences, Engineering, Medicine, Dental Medicine, Pharmacy, Health Sciences, Research Institute of Science and Engineering(RISE) and Research Institute of Medical and Health Sciences (RIMHS) . The laboratories are distributed across various campuses as: 83 laboratories on the main campus are mainly housed in two buildings, W12 and M12, occupying an area of 21650 m<sup>2</sup>, 64 laboratories in the Medical Campus building in M32, M27, M28, M23 and M31.

The distribution of teaching and research labs in the University are shown below:

| Building Name                                    | Building # | Teaching  | Research  | Teaching/<br>Research | Total      |
|--|------------|-----------|-----------|-----------------------|------------|
| Women Central Laboratories                       | W12        | 34        | 8         | 6                     | <b>48</b>  |
| Men Central Laboratories                         | M12        | 25        | 1         | 7                     | <b>33</b>  |
| RIMHS  | M32        | 4         | 26        | -                     | <b>30</b>  |
| College of Medicine                              | M27        | 12        | -         | -                     | <b>12</b>  |
| College of Dentistry                             | M28        | 11        | -         | -                     | <b>11</b>  |
| College of Health Sciences                       | M23        | 7         | -         | -                     | <b>7</b>   |
| Clinical Training Center                         | M31        | 4         | -         | -                     | <b>4</b>   |
| College of Sciences                              | W8         | -         | 1         | -                     | <b>1</b>   |
| College of Arts, Humanities, and Social Sciences | M2         | -         | 1         | -                     | <b>1</b>   |
| <b>Total Labs</b>                                |            | <b>97</b> | <b>37</b> | <b>13</b>             | <b>147</b> |

The laboratories are managed by the Central Laboratories Directorate (CLD). The purpose of the Central Labs Directorate is to provide the learners and researchers the optimal space, tools and

support that enable them to transform ideas into meaningful innovations that advance the university's mission and drive community development.

#### **CLD Services**

- Creating supportive environment for the learners and researchers, assisting the academic units in the evaluation and procurement of all lab needs (Equipment, Consumables, Chemicals, safety items... etc.)
- Assuring safe lab environment by providing high standard online safety trainings for all lab users (Staff, Academics and Students), providing labs with all safety requirements.
- Managing lab space and assets to maximize the efficacy of available resources.
- Provide and support lab users with the tools to effectively manage all chemicals using the Online Chemical Management System.
- Maintenance for more than 12,000 state of the art lab equipment.
- Maintenance and updates for the inventory of lab equipment and necessary safety items for labs.
- Instituting sustainable practices responsive to environmental concerns.
- Engaging in planning to continuously improve the lab conditions and experience.
- Accommodating the testing needs of external entities in search for answers, instituting quality management practices in conformity with international standards.
- Facilitating knowledge sharing and transfer between the university and the outside community and offering training opportunities to faculty, lab staff and students.
- Support University management in developing the tools for online learning.



## **Career Advising and Student Training Office**

Ms. Rana Kabbani, Director  
Main Building, M11 – Ground Floor  
Tel: +971 65053058 or +971 6 5053018  
Email: [rana@sharjah.ac.ae](mailto:rana@sharjah.ac.ae)  
Website: [www.sharjah.ac.ae/](http://www.sharjah.ac.ae/)

The Career Advising and Student Training Office (CASTO) is one of the important students' services offices at the University of Sharjah. Its roles include securing internship training opportunities for senior students as well as providing them with the needed career advising to ensure that they are ready for the job market. Our main aim is to establish strong collaborative relationships among the university and government, private and authorities as well as various industries to explore and help students achieve their goals and align academic programs' outcomes to ensure students acquire the right set of skills needed to secure employment opportunities as soon as they graduate. The office is comprised of the following four sections:

### **Career Advising**

CASTO offers various workshops and seminars to prepare students for their internships and employment related to portfolio preparations, CV writing and enhancement, job interview skills as well as other soft skills. The office works to prepare students to proactively plan for their careers and future employment in ways that will have significant impact on finding appropriate employment opportunities. With seminars and workshops, CASTO ensures that UoS students are up to par with fellow graduates and increase their competitive edge in the job market. In lieu of the current outbreak, CASTO has directed different workshop ways to approach students, and it has worked effortlessly. Using MsTeams to approach students, we have organized many workshops with higher attendance from students as students can be there anywhere, and for those who are unable to join, a recording is left for them so they can view it at a later stage. A series of talks too have been lined up under the umbrella of "Let's Talk Employability" and "Meet the Team", a significant uptrend for students to understand the market scope.

### **Student Training**

CASTO gives students a unique opportunity to apply, implement and execute a variety of skills, theories and concepts learned in class in the real-world environment through the internship program. Students across the university are required to take the internship training course/program in order to complete their graduation requirements. CASTO works with colleges and departments to secure internship opportunities. In addition, CASTO manages the internship training by assisting to secure training opportunities and liaises between the training agencies, students and academic departments. CASTO also manages the e-portal (Taskstream) that is used to follow and assess the training program. Also, 2020 was a year with full of challenges, and with this we have launched the Internship Portal whereby companies can announce their opportunities with a pool of more than 16000 students enrolled.

### **Student Employment Program (SEP)**

Apart from enhancing students' career prospective, CASTO runs the Student Employment Program (SEP), which provides part-time employment opportunities to active UoS students in and out of campus, as well as build a workforce that is ready to be called upon to serve the needs of the university community.



### **International Student Exchange**

CASTO have been an active member of the International Association for the Exchange of Students for Technical Experience (IAESTE) since the year 2000 with a pool of more than 80-member countries enabling them to gain international experience and sequentially increase the ranking of our university internationally by providing the faculties and research groups with interns from abroad. IAESTE operates a high-quality research-based training exchange program between members in order to enhance technical and professional development, and to promote international understanding and goodwill amongst students, academic institutions, employers and the wider community.

## **Students Documents and Student File Archiving Office**

Ms. Haifa S. Al Tuniaji, Acting Director

Main Building, M11A – Ground Floor

Tel:

Email:

Website: [www.sharjah.ac.ae/](http://www.sharjah.ac.ae/)

The office is in charge of issuing IDs for admitted and enrolled students, maintains and updates their personal records, issues and certifies their graduation degrees after completing their studies.

### **Students files:**

- Archive new and enrolled students' files in a mechanized and fire-proof filing cabinet with electronic door, which contains more than 15000 Student files kept in box files labeled with names and ID numbers and sorted by ID.
- Organize and index students' files and maintain their documents during their enrollment.
- Monitor the movements of students' files between the branches and concerned departments.
- Archive students' academic and personal records, documents, and updates.
- Archive original grading sheets that are sent in stamped and sealed envelopes from the registration department.
- Save all graduates students' files in the admission store.

### **Students ID cards:**

- Design students' university ID cards for all levels: Diploma, Bachelor, Higher Diploma, Master and PhD.
- Scan photos and Issues IDs to all accepted and enrolled students.
- Issue international student ID discount cards (ISIC) for UoS students.

### **Graduation Certificates:**

- Approve the templets of the honorary and graduation certificates (attestations and transcripts) from the Dean of Academic Support Services and the Chancellor.
- Issue and print honorary and graduation certificates for each batch after completing their studies.
- Issue and print additional copies of graduation certificates (attestations and official transcripts) and submit them to the graduates.
- Apply security criteria for graduation certificates and upgrade the security features and standards periodically.
- Ensure the accuracy, integrity and the security of graduates' academic records.
- Scan all graduate's certificates and archive them electronically.
- Arrange all graduate's certificates in golden envelopes to be ready for submission.

- Develop, maintain and implement the procedures of printing graduation certificates in accordance with the general policy that is acknowledged by the university and complied with the decisions and instructions of the Ministry of Education in UAE.

#### Smart Chip:

- Upload graduate's information and their personal documents inside Smart Chips and attach them in the graduation certificate.
- Upload the graduate's information and their personal documents in the Ministry of Education website.

#### Online clearance for withdrawing and graduating students:

- Implement, follow up and complete the online withdrawal requests for students before submitting their files.
- Save electronic copies of the documents before submitting the files to the withdrawing students.

Follow up and complete the clearance processes for graduate students.

#### Academic Programs and Degrees

UoS offers 122 programs in 14 Colleges. A summary of the programs offered, degrees awarded, language of instruction and number of credits required to complete a degree is provided in the table below:

| Program  | Language of Instruction | Credits |
|--|-------------------------|---------|
| <b>College of Sharia and Islamic Studies</b>                 |                         |         |
| 1) Bachelor in Shari'a - Foundations of Religion             | Arabic                  | 126     |
| 2) Bachelor in Shari'a - Jurisprudence and its Foundations   | Arabic                  | 126     |
| 3) Bachelor in Shari'a and Law                               | Arabic                  | 132     |
| 4) Master in Jurisprudence and its Foundations               | Arabic                  | 33      |
| 5) Master in Exegesis and Hadith                             | Arabic                  | 33      |
| 6) Doctor of Philosophy in Hadith and its Sciences           | Arabic                  | 54      |
| 7) Doctor of Philosophy in Jurisprudence and its Foundations | Arabic                  | 54      |
| 8) Doctor of Philosophy in Exegesis and Quran Sciences       | Arabic                  | 54      |
| <b>College of Arts, Humanities and Social Sciences</b>       |                         |         |
| 9) Bachelor of Arts in French Language and Literature        | French                  | 123     |

|   |   |         |     |
|---|---|---------|-----|
| 10)                                       | Bachelor of Arts in Arabic Language and Literature                      | Arabic  | 123 |
| 11)                                       | Bachelor of Arts in English Language and Literature                     | English | 123 |
| 12)                                       | Bachelor of Arts in History and Islamic Civilization                    | Arabic  | 123 |
| 13)                                       | Bachelor of Arts in History and Islamic Civilization – Tourism Guidance | Arabic  | 123 |
| 14)                                       | Bachelor of Arts in Museum Studies and Art History                      | Arabic  | 123 |
| 15)                                       | Bachelor of Arts in Sociology   | Arabic  | 123 |
| 16)                                       | Bachelor of Arts in International Relations                             | English | 123 |
| 17)                                       | Bachelor of Education in Early Childhood                                | Arabic  | 123 |
| 18)                                       | Professional Diploma in Teaching  | Arabic  | 24  |
| 19)                                       | Master of Arts in Arabic Language and Literature                        | Arabic  | 33  |
| 20)                                       | Master of Arts in Translation   | English | 34  |
| 21)                                       | Master of Arts in History and Islamic Civilization                      | Arabic  | 33  |
| 22)                                       | Master of Arts in Applied Sociology                                     | Arabic  | 33  |
| 23)                                       | Doctor of Philosophy in Applied Sociology                               | Arabic  | 46  |
| 24)                                       | Doctor of Philosophy in Arabic Language and Literature                  | Arabic  | 48  |
| 25)                                       | Doctor of Philosophy in History and Islamic Civilization                | Arabic  | 54  |
| 26)                                       | Doctor of Philosophy in Linguistics and Translation                     | English | 54  |
| <b>College of Business Administration</b> |   |         |     |
| 27)                                       | Bachelor of Science in Accounting                                       | English | 123 |
| 28)                                       | Bachelor of Science in Finance  | English | 123 |
| 29)                                       | Bachelor of Science in Business Administration - Management             | English | 123 |
| 30)                                       | Bachelor of Science in Business Administration - Marketing              | English | 123 |
| 31)                                       | Bachelor of Science in Supply Chain Management                          | English | 123 |
| 32)                                       | Master of Science in Business Analytics                                 | English | 33  |
| 33)                                       | Executive Master in Business Administration                             | English | 33  |
| 34)                                       | Master in Business Administration                                       | English | 36  |

|                                 |  |         |     |
|---------------------------------|--|---------|-----|
| 35)                             | Doctor of Business Administration (DBA)                                | English | 54  |
| <b>College of Communication</b> |  |         |     |
| 36)                             | Bachelor of Arts in Communication – Electronic Journalism              | Arabic  | 123 |
| 37)                             | Bachelor of Arts in Communication - Radio and Television               | Arabic  | 123 |
| 38)                             | Bachelor of Arts in Communication – Digital Media Design               | Arabic  | 123 |
| 39)                             | Bachelor of Arts in Mass Communication                                 | English | 123 |
| 40)                             | Bachelor of Arts in Public Relations                                   | Arabic  | 123 |
| 41)                             | Master of Arts in Communication  | English | 33  |
| 42)                             | Doctor of Philosophy in Communication                                  | English | 54  |
| <b>College of Law</b>           |  |         |     |
| 43)                             | Bachelor in Law  | Arabic  | 126 |
| 44)                             | Master in Public Law   | Arabic  | 33  |
| 45)                             | Master in Private Law  | Arabic  | 33  |
| 46)                             | Master in Air and Space Law  | English | 33  |
| 47)                             | Doctor of Philosophy in Public Law                                     | Arabic  | 55  |
| 48)                             | Doctor of Philosophy in Private Law                                    | Arabic  | 55  |
| <b>College of Sciences</b>      |  |         |     |
| 49)                             | Bachelor of Science in Mathematics                                     | English | 123 |
| 50)                             | Bachelor of Science in Applied Physics                                 | English | 123 |
| 51)                             | Bachelor of Science in Chemistry                                       | English | 123 |
| 52)                             | Bachelor of Science in Biotechnology                                   | English | 124 |
| 53)                             | Bachelor of Science in Petroleum Geosciences and Remote Sensing        | English | 123 |
| 54)                             | Master of Science in Biotechnology                                     | English | 34  |
| 55)                             | Master of Science in Chemistry   | English | 34  |
| 56)                             | Master of Science in Astronomy and Space Sciences                      | English | 33  |
| 57)                             | Master of Science in Geographic Information Systems and Remote Sensing | English | 33  |

|  |  |         |     |
|--|--|---------|-----|
| 58)                                    | Master of Science in Physics   | English | 34  |
| <b>College of Engineering</b>          |  |         |     |
| 59)                                    | Bachelor of Science in Chemical and Water Desalination Engineering       | English | 131 |
| 60)                                    | Bachelor of Science in Civil Engineering                                 | English | 135 |
| 61)                                    | Bachelor of Science in Electrical and Electronics Engineering            | English | 132 |
| 62)                                    | Bachelor of Science in Architectural Engineering                         | English | 158 |
| 63)                                    | Bachelor of Science in Industrial Engineering and Engineering Management | English | 134 |
| 64)                                    | Bachelor of Science in Sustainable and Renewable Energy Engineering      | English | 133 |
| 65)                                    | Bachelor of Science in Nuclear Engineering                               | English | 131 |
| 66)                                    | Bachelor of Science in Mechanical Engineering                            | English | 132 |
| 67)                                    | Master of Science in Biomedical Engineering                              | English | 33  |
| 68)                                    | Master of Science in Environmental Science and Engineering               | English | 33  |
| 69)                                    | Master in Conservation Management of Cultural Heritage                   | Arabic  | 36  |
| 70)                                    | Master of Science in Engineering Management                              | English | 33  |
| 71)                                    | Master of Science in Civil Engineering                                   | English | 33  |
| 72)                                    | Master of Science in Electrical and Electronics Engineering              | English | 33  |
| 73)                                    | Master of Science in Mechanical Engineering                              | English | 33  |
| 74)                                    | Master of Science in Sustainable and Renewable Energy Engineering        | English | 33  |
| 75)                                    | Doctor of Philosophy in Engineering Management                           | English | 54  |
| 76)                                    | Doctor of Philosophy in Civil Engineering                                | English | 54  |
| 77)                                    | Doctor of Philosophy in Electrical and Computer Engineering              | English | 54  |
| <b>College of Fine Arts and Design</b> |  |         |     |
| 78)                                    | Bachelor in Fine Arts  | English | 129 |
| 79)                                    | Bachelor of Fine Arts in Interior Design                                 | English | 129 |

|                                   |   |         |        |
|-----------------------------------|---|---------|--------|
| 80)                               | Bachelor of Fine Arts in Fashion Design and Textiles    | English | 129    |
| 81)                               | Bachelor of Fine Arts in Visual Communication           | English | 129    |
| <b>College of Health Sciences</b> |   |         |        |
| 82)                               | Bachelor of Science in Medical Laboratory Sciences      | English | 134    |
| 83)                               | Bachelor of Science in Medical Diagnostic Imaging       | English | 137    |
| 84)                               | Bachelor of Science in Nursing                          | English | 137    |
| 85)                               | Bachelor of Science in Health Services Administration   | English | 134    |
| 86)                               | Bachelor of Science in Physiotherapy                    | English | 138    |
| 87)                               | Bachelor of Science in Environmental Health Sciences    | English | 134    |
| 88)                               | Bachelor of Science in Clinical Nutrition and Dietetics | English | 134    |
| 89)                               | Master of Science in Applied Nutrition                  | English | 34     |
| 90)                               | Master of Science in Environmental Health               | English | 33     |
| 91)                               | Master of Science in Adult Critical Care Nursing        | English | 36     |
| 92)                               | Master of Science in Physiotherapy                      | English | 42     |
| 93)                               | Master of Science in Medical Laboratory Sciences        | English | 36     |
| <b>College of Pharmacy</b>        |   |         |        |
| 94)                               | Bachelor of Pharmacy                                    | English | 170    |
| 95)                               | Master of Pharmaceutical Sciences                       | English | 36     |
| 96)                               | Doctor of Pharmacy (Pharm D) / (Master level)           | English | 72     |
| <b>College of Dental Medicine</b> |   |         |        |
| 97)                               | Bachelor of Dental Surgery (BDS)                        | English | Note 1 |
| 98)                               | Master of Science in Orthodontics                       | English | 90     |
| 99)                               | Master of Dental Surgery in Oral Surgery                | English | 65     |
| 100)                              | Master of Dental Surgery in Periodontology              | English | 65     |
| 101)                              | Master of Dental Surgery in Endodontics                 | English | 65     |
| 102)                              | Master of Dental Surgery in Prosthodontics              | English | 65     |

| College of Medicine  |         |        |
|--|---------|--------|
| 103) Bachelor of Medicine and Bachelor of Surgery (M.B.B.S)                | English | Note 1 |
| 104) Postgraduate Diploma in Ultrasound Technology Applications            | English | 24     |
| 105) Master of Science in Diabetes Management                              | English | 33     |
| 106) Master of Science in Molecular Medicine and Translational Research    | English | 48     |
| 107) Master of Science in Leadership in Health Professions Education       | English | 33     |
| 108) Doctor of Philosophy in Molecular Medicine and Translational Research | English | 54     |
| College of Computing and Informatics                                       |         |        |
| 109) Bachelor of Science in Biomedical Informatics                         | English | 124    |
| 110) Bachelor of Science in Cybersecurity Engineering                      | English | 132    |
| 111) Bachelor of Science in Computer Engineering                           | English | 132    |
| 112) Bachelor of Science in Computer Science                               | English | 123    |
| 113) Bachelor of Science in Information Technology - Multimedia            | English | 123    |
| 114) Bachelor of Science in Business Information Systems                   | English | 123    |
| 115) Master of Science in Artificial Intelligence                          | English | 33     |
| 116) Master of Science in Cybersecurity Engineering                        | English | 33     |
| 117) Master of Science in Computer Science                                 | English | 34     |
| 118) Master of Science in Computer Engineering                             | English | 33     |
| 119) Master of Science in Data Science                                     | English | 33     |
| 120) Doctor of Philosophy in Computer Science                              | English | 54     |

**Note 1: One foundation year plus five years.**

#### **Institute of Leadership in Higher Education**

|   |         |    |
|---|---------|----|
| 121) Master of Leadership in Higher Education               | English | 33 |
| 122) Postgraduate Diploma in Leadership in Higher Education | English | 24 |



## Admission

### General Information

The University of Sharjah admits academically qualified and morally sound students irrespective of their national origin, color, gender, religion or disability.

Applicants who submit completed application forms and all supporting materials to the Admission Department by the specified deadlines shall be notified on their decision through their email and SMS. Applications received after the announced deadlines are considered on a rolling basis and the students are usually notified of decisions within three working days after completing the application file. Early admission is granted to outstanding students as evidenced by their high school achievements.

Fulfilling the following admission requirements does not guarantee admission to a program. These requirements represent a threshold for including the application in the competition pool. Admission is competitive and subject to availability of spaces in the desired program.

The following stipulations pertain to admission to the undergraduate programs. Admission requirements to graduate studies are found in the Graduate Studies section of this Bulletin.

### General Admission Requirements:

All applicants must satisfy the following basic admission requirements:

1. Completion of secondary education or an equivalent level with the required average no earlier than three years prior to joining the University. Applicants to the College of Medicine and Dental Medicine need to have finished their secondary education no more than one year previously.
2. The applicant should not have been expelled from the UoS or any other institution for academic or disciplinary reasons.
3. The applicant should be medically, physically and mentally fit to be admitted to the university in accordance with the desired major.
4. Applicants should indicate their order of preference for majors on the application form.
5. Applicants are accepted in different majors according to the student's preference and her/his grade average and depending on the capacity of each college.
6. Applicants should complete and submit the application form and required documents to the Admissions Department by the stated deadlines and pay the application fee of AED 360.
7. Meeting the secondary education grade requirements as well as other admission requirements, and submitting the application, paying the application fees & receiving an ID number does not in any way mean that an applicant is admitted to the University. Students are required to pay a reservation fee after meeting specific criteria on a competitive basis, in accordance with University policy. Student reservation fees are nonrefundable if the student withdraws or does not enroll in the University, and are applied toward tuition fees if the student enrolls in his/her program.

8. Applicants to the Colleges of Medicine and Dental Medicine pay a 1500 AED fee for their applications to be considered as part of the admissions competitive process. This fee is non-refundable if the applicant is rejected or withdrew from the university.
9. The applicant who are still in their high school seats will receive conditional admission until the final results are submitted, and fulfill the requirements based on competitive criteria.
10. A student will not be issued an ID or allowed to register in courses unless the admission file is complete.

#### **Important General Notes:**

(1) Students fill out the application form personally, and be responsible for the accuracy of the information filled therein. Incomplete applications will not be considered.

(2) Students are responsible for completing all admission procedures by the specified deadlines, in accordance with the instructions of the Admissions Office as announced in the academic calendar. The university is not responsible for applications not completed by students on time. All students are required to visit the University's website ([www.sharjah.ac.ae](http://www.sharjah.ac.ae)) to learn about the dates and locations of the admission exams, English proficiency test, and personal interviews as well as to see their results.

(3) Reservation seat fees are nonrefundable if the student withdraws or does not enroll in the University, and are applied toward tuition fees if the student enrolls in his/her program.

(4) Admission is granted for the semester to which the student is applying. A student's admission will be cancelled if the student does not enroll in the same semester as when the application has been submitted.

(5) New students are permitted to postpone admission for a maximum of one semester for all programs with the exception of College of Fine Arts and Design for which they may postpone admission for one year after paying the required fees and submitting all required forms to the Admission Office.

(6) Paragraph (5) applies for all the university programs except for programs in the Colleges of Medicine and Dental Medicine, which do not allow postponement of admission.

(7) The university does not accept the submission of the original High School Certificate. Students are required to provide copies certified by the proper authorities.

(8) All documents submitted for admission to the university are considered the property of the university. Students are not permitted to request any documents from their personal file once submitted to a staff member.

(9) The university is not responsible for scholarship applications. Students are required to contact sponsors on their own.

(10) Applications received after the admission period will not be considered.

(11) The University reserves the right to increase the fees every year.

(12) Students shall abide by all other university requirements.

#### **Academic Qualifications:**

Before admitted, the student must have completed at least 12 years of schooling prior to joining the university. The applicant should have graduated from a school licensed and recognized by the Ministry of Education in the UAE, and must submit a certified copy of the secondary school certificates, with a grade script certified by the school and the Ministry of Education or the Education Zone in the UAE. An applicant who attended school outside the UAE should be a graduate of a school recognized by the official education authority in the country of study. Certificates submitted must be authenticated by the Education Authority in the country of study,

such as the Ministry of Education, Boards of Education, or the British Council, the Ministry of Foreign Affairs in the country, then the relevant Embassy of the United Arab Emirates or the Embassy of the Country in the UAE, and the Ministry of Foreign Affairs of the United Arab Emirates.

**Holders of Certificates of Secondary Education or its Equivalent:** Students who hold a diploma from a recognized secondary school may be admitted to a desired undergraduate program within the limits of its capacity and according to the requirements specified in the following table.

Secondary School Certificate or its equivalent

| College  | Study Track      | Average |
|--|------------------|---------|
| <b>Sharia and Islamic Studies</b>  | Advance, General | 70%     |
| <b>Arts Humanities and Social Sciences</b>   | Advance, General | 70%     |
| <b>Law</b>   | Advance, General | 70%     |
| <b>Business Administration</b>   | Advance, General | 70%     |
| <b>Communication</b>   | Advance, General | 70%     |
| <b>Fine Arts &amp; Design</b>  | Advance, General | 70%     |
| <b>Computing and informatics:<br/>Business Information System</b>                              | Advance, General | 70%     |
| <b>Computing and informatics:<br/>Computer Science, Information<br/>Technology- Multimedia</b> | Advance          | 70%     |
| <b>Computing and informatics:<br/>Computer Engineering</b>                                     | Advance          | 75%     |
| <b>Engineering</b>   | Advance          | 75%     |
| <b>Health Sciences</b>   | Advance          | 75%     |
| <b>Sciences</b>  | Advance          | 70%     |
| <b>Pharmacy</b>  | Advance          | 80 %    |
| <b>Dentistry</b>   | Advance          | 85 %    |
| <b>Medicine</b>  | Advance          | 90 %    |

**Holders of Secondary School Certificates from the schools that follows the educational system of Ministry of Education in UAE or Abu Dhabi Education Council:** Students holding a secondary School certificates in the UAE that follows the educational system of Ministry of Education or the Department of Education and Knowledge in Abu Dhabi are able to apply to the available programs in the university, as illustrated on the University website <http://www.sharjah.ac.ae/admission>

**Note:** Fulfilling the above minimum average requirements does not guarantee admission to a program. These requirements represent a threshold for including the application in the competition pool.

**Holders of Technical Secondary School Certificate or its Equivalent:** Students who hold a Technical Secondary School Certificate from a recognized school may be admitted to a desired undergraduate program according to the requirements specified in the following table.

Technical Secondary School Certificate or equivalent

| College   | Study Track                       | Average |
|---|-----------------------------------|---------|
| <b>Sharia and Islamic Studies</b>   | Sharia or its Equivalent          | 75%     |
| <b>Arts Humanities and Social Sciences (Except English language and Literature)</b> | Sharia or its Equivalent          | 75%     |
| <b>Law</b>  | Sharia or its Equivalent          | 75%     |
| <b>Business – Business Administration</b>   | Business or its Equivalent        | 80%     |
| <b>Engineering (According to their respective fields)</b>                           | Industrial                        | 85%     |
|   | Technical Institution certificate | 90%     |
| <b>Sciences (According to their respective fields)</b>                              | Industrial                        | 85%     |
|   | Technical Institution certificate | 90%     |

**Foreign high school:**

- a) **Holders of High School Diploma Certificate or its Equivalent:** Student who holds a High School Diploma (American system) or its equivalent may be admitted if the following conditions are met:
- (1) The students have completed 12 years of study.
  - (2) The certificate is recognized by the Ministry of Education in the UAE.
  - (3) The student must have studied 6 courses in the fields of Mathematics, Sciences, Social Studies, and Languages with English as the language of instruction.
  - (4) The diploma study track (Literature or Science) is determined on the basis of the courses studied in the 12th year (two Science and one Mathematic subject constitute a science track).
- Applicants to the Medical Colleges (Medicine, Dental Medicine, and Pharmacy):

(5) Must have completed two courses of Biology, two courses of Chemistry, and at least one course in Physics in the last three years (G10, G11, G12) and attained a grade of (B) or higher in the 12th year in Biology or Chemistry.

(6) For schools that follows the credit hours system, students must study chemistry, biology, and physics (full credit hour) distributed in high school levels at least once, and the student must attain a grade of at least (B) or above in Biology OR Chemistry in Gr12 certificate.

b) **Holders of British Certificate (IGCSE, GCSE, GCE):** An applicant who holds a British certificate of secondary education or its equivalent may be admitted upon meeting the following conditions:

(1) Has completed 12 years of study by the time she/he has finished secondary education and must provide proof thereof.

(2) The highest 7 grades obtained will be considered as follows: (a) A minimum grade of C in 5 O-Level subjects, and minimum grade of D in 2 AS-Level subjects or (b) A minimum grade of C in 6 O-Level subjects and a minimum grade of E in one A-Level subject (c) The courses should cover at least four areas of study: Mathematics, Sciences, Social Studies, Fine Arts & Design, and Languages.

(3) For an applicant to be considered as a graduate of the Science Track in secondary educations she/he must have successfully studied at least 2 Science and one Mathematics subjects at O-Level and AS-Level or A-Level.

(4) Applicants to the Colleges of Medicine, Dental Medicine, or Pharmacy must have taken Chemistry and Biology courses at the O-Level, AS-Level or A-Level and attained at least a minimum grade of B at the AS-Level or a C at the A-Level in one of these subjects.

(5) The UoS may award up to (12) credits for students who have successfully achieved a grade of (C) or better in specific A-Level subjects, and will be given substitute courses instead.

c) **Holders of International Baccalaureate Certificate (IB):** An applicant who holds International Baccalaureate Certificate may be admitted upon meeting the following conditions:

(1) the student has completed 12 years of study.

(2) IB Diploma must have been awarded according to the IB Board requirements.

(3) The diploma must be authenticated by the Ministry of Education in the UAE.

(4) The student must have studied six courses in the fields of Mathematics, Sciences, Social Studies, and Languages. Moreover, it should include at least three subjects at the higher level.

(5) The student should obtain no less than 24 points from 45 points.

(6) The Diploma study track (Literature or Science) is determined on the basis of the courses studied in International Baccalaureate certificate (two Science and one Mathematics subjects constitute a Science Track).

(7) Students applying for the Colleges of Medicine, Dental Medicine or Pharmacy) must have studied Chemistry and Biology, and must have achieved a minimum grade of (5) in Higher Level Biology or Chemistry in the IB Diploma.

(8) The university may award up to (12) credit hours for students who have successfully achieved a grade of (5) or higher in specific high - level (HL) subjects, provided that he/she takes substitute courses instead from the authorized elective courses according to the student study plan except for the Colleges of Medicine and Dental Medicine.

### **Special Admission Requirements:**

#### **Special Admissions Requirements for the College of Medicine and College of Dental Medicine:**

(A) The Criteria for entering the Competition of the Medicine and Dental Medicine Colleges:

(1) All students applying to the Medicine and Dentistry Colleges will be subject to further selection criteria based on academic competition amongst applicants depending on the regulations of the university.

(2) Students have to pay 1500 AED to enter the competition process. This amount is non-refundable in any case: (acceptance, non-acceptance, withdrawal, or non-attendance). In case of acceptance, the fee is considered a first installment of tuition fees. (B) Confirmation of Admission for Medicine and Dental Medicine Colleges: (1) all new students accepted in Medicine and Dental Medicine Colleges should pay the tuition fees within a maximum period of one week after announcement of their acceptance. (2) Students who do not enroll for the semester in which they were admitted will be denied admission to the university and will not receive a refund of any fees paid. (C) Minimum requirements for promotion to the First Year of the Bachelor of Medicine and Surgery or Bachelor of Dental Surgery: In order for a student of these programs to be promoted to Year One she/he must: (1) successfully complete the foundation Year. (2) Attain a minimum cumulative GPA of (2.5). (3) Attain a minimum cumulative GPA of (2.5) in Chemistry and Biology and their respective labs. (4) Students who successfully score the above GPA are subjected to competition for seats available in these colleges.

#### **Personal Interview for College of Communication:**

Applicants to the college of communication are required to sit in for a personal interview with college representatives before admission decision is made.

#### **Personal Interview and admission test for English Language and Literature program:**

Students who studied non-Arabic medium curricula and admitted to the Department of English Language and Literature in the College of Arts Humanities and Social Sciences are required to pass an Arabic language proficiency test and personal interview.

#### **Mathematics and Physics placement test for College of Engineering:**

- Students admitted to one of the Engineering programs must take a placement test for Mathematics and Physics.

- Students passing these tests are eligible to take Math and Physics courses, and it is not necessary for them to take remedial courses in these two subjects.

- A student failing in any of these tests is required to take a remedial course in that subject. A remedial course is treated as any other course. If a student fails the course he/she is required to repeat it.

- Students holding "General Stream" high school certificates will register in the "Qualification Program" course for Science subjects in the first semester, therefore they are not required to register or attend the Math and Physics placement test.

- Students who scored 1100 in EmSAT-Mathematics and 700 in EmSAT-Physics are exempted from taking the placement test in which they must submit a copy of the certificate to uos-Admission@sharjah.ac.ae for verification, and writing the student ID.

### **Admission to the Bridging Program:**

A student with a Diploma may seek to bridge toward a Bachelor degree in the same field. To qualify for admission, the student must meet the following requirements:

#### **a) General requirements:**

- The applicant must have obtained a secondary school certificate or its equivalent before getting a diploma. The applicant's grade average in the diploma will be calculated instead of her/his secondary school grades.
- The applicant must have completed an academic diploma accredited by the Ministry of Education in the UAE.
- The applicant has English Language competency equivalent to a score of 500 on the UoS TOEFL exam (see English Proficiency Requirement section).
- Once admitted to a bridging program the student cannot change the major, he/she was admitted to under any circumstances.

#### **b) Special requirements:**

Admission requirements that are specific to available bridging programs are summarized below:

#### **1. Medical Diagnostic Imaging Program (in the College of Health Sciences):**

- Applicants to the Bridging Program in MDI must have obtained two- or three-years diploma.
- Applicants must have an average GPA of at least 70% or a letter grade of (C).

#### **2. Nursing Program (in the College of Health Sciences):**

- Applicants to the Bridging Program in Nursing must have obtained three years diploma in Nursing.
- Applicants must have an average GPA of at least 70% or a letter grade of (C).

Note: If the diploma average is (D) (60 to 69 percent) but all other conditions are met, the student may be accepted on probation for one semester during which he/she must take a load of 6 to 12 credit hours (13 per the Dean's approval) and attain a semester GPA of 2.0 or higher to be allowed to continue in the program; otherwise they will be dismissed from the University.

#### **3. Bridging from a Diploma awarded by the Community College to a Bachelor's Program:**

Students who hold a diploma from the Community College are eligible to apply for admission into one of the bridging programs indicated in the following table.

|  |  |
|--|--|
|  |  |
|--|--|



| Diploma Program  | Bridging Programs Available According to the Certificate Type |  | Required GPA |
|--|---|--|--------------|
|  | College   | Major  |              |
| Information Technology   | College of Computing and Informatics                          | IT Multimedia  | 3.0          |
|  |   | Business Information System  | 3.0          |
| Administrative and Financial Sciences: (Business Administration or Accounting) | College of Business Administration                            | <ul style="list-style-type: none"> <li>· Management</li> <li>· Finance</li> <li>· Marketing</li> <li>· Accounting</li> </ul> | 3.0          |
| Food Safety  | College of Health Sciences                                    | Environmental Health Sciences  | 3.3          |
| Environmental Health and Safety  | College of Health Sciences                                    | Environmental Health Sciences  | 3.3          |
| Professional Diploma in Law  | College of Law  | Law  | 3.0          |

If the language of instruction of the diploma program is Arabic the applicant must study one semester and take 9 credit hours of prerequisite courses and attain a minimum of grade (C) in each and fulfill English language proficiency requirements & all other prerequisites before he/she can continue in the program.

- Students who has completed a three-year diploma program from an institution other than Community College no more than three years before applying are eligible to apply to the bridging program in the same specialization, provided that the diploma is certified by the UAE Ministry of Education.

#### Language of Instruction:

The language of instruction is Arabic in the following programs: all programs offered in the Colleges of: Shari'a and Islamic Studies, Law, Arts Humanities and Social Sciences (except the English Language & Literature, International Relations, and Museum Studies and art history programs), Public Relations and Mass communication Arabic track programs in the College of Communication.

However, the language of instruction is English in all programs offered in the Colleges of Engineering, Business Administration, Fine Arts and Design, Sciences, computing and informatics, Medicine, Dental Medicine, Pharmacy, Health Sciences, English Language and Literature Program, International Relations Program and Museum Studies and art history program in the College of Arts Humanities and Social Sciences, Mass Communication program English track in the Colleges of Communication.



### English Language Proficiency Test:

Upon admission to UoS and prior to course registration, all students admitted to UoS (new, transfer and bridging) must demonstrate a level of English proficiency consistent with the requirement of their college. Students can choose one of the alternative exams listed below for proof of proficiency.

| Test Type           | Minimum Required Score | Notes   |
|---------------------|------------------------|---|
| Paper-Based TOEFL   | 500                    | The exam offered by the University of Sharjah, AMIDEAST Dubai, and Abu Dhabi only.  |
| International TOEFL | 61                     | -   |
| IELTS (Academic)    | 5.0                    | <p>- Students who obtained a score less than "5.0" in one of the IELTS Academic skills will be registered in an Intensive English course relevant to that skill.</p> <p>- Students accepted in the College of Medicine, Dental Medicine, Pharmacy, or Health Sciences are not allowed to register for the program courses until they obtain a score of "5.0" in each IELTS skill or pass the relevant skill course in the Languages Institute at UoS.</p> |
| EmSAT               | * 1225                 | <p>Students who scored less than "1225" (1100-1200) will be registered in reading and writing skill courses at the University.</p> <p>* This score will be applied for the Academic Year 2020/2021 only.</p>  |
| PTE (Academic)      | 42                     | Students who scored less than "42" (36-41) will be registered in skills courses at the University.  |

### Second: Arabic Medium Majors

\* Mass Communication programs (Arabic tracks) in the College of Communication: Radio and Television, Journalism and Graphic Design and Multimedia.

\* Public Relations (the required score must be obtained during the first year).

\* Early Childhood Education (the required score must be obtained during the first year).

| Test Type | Minimum Required Score | Notes |
|-----------|------------------------|-------|
|-----------|------------------------|-------|

|                     |       |  |
|---------------------|-------|--|
| Paper-Based TOEFL   | 450   | The exam offered by the University of Sharjah, AMIDEAST Dubai, and Abu Dhabi only. |
| International TOEFL | 45    | -  |
| IELTS (Academic)    | 4.5   | -  |
| EmSAT               | * 950 | * This score will be applied for the Academic Year 2020/2021 only.                 |
| PTE (Academic)      | 30    | -  |

#### Important Notes:

- Certificates older than two years are not accepted.
- Students who couldn't obtain the required score in any of the above listed English Proficiency tests, will be enrolled in an "Intensive English Program" course, in which their English level will be determined by the Languages Institute at UoS.
- Students who obtained a score less than (5.0) in one of the IELTS Academic skills will be registered in an intensive English program relevant to that skill.
- Students accepted in the College of Medicine, Dental Medicine, Pharmacy or Health sciences are not allowed to register for the program courses until they obtain a score of (5.0) in each IELTS skill or pass the relevant skill course in the Languages Institute.
- Students must submit the original English language proficiency certificate to the Languages Institute at UoS for verification and approval and a copy must be saved inside student's admission file.
- The UoS reserves the right to require students to attend an interview in the Language Institute. Students may be required to take a further in-house test to ensure their scores are consistent with their English Language proficiency.

#### Intensive English Program:

Students who fail to attain the required score in any of the above listed English Proficiency tests must join the Intensive English program (IEP). The IEP consists of four levels: Level I (General English) – Level IV. IEP students receive 20-25 hours per week of instruction.

#### Transfer Students:

##### Requirement for Transfer for all programs except the Medicine and the Dentistry Colleges:

The UoS may admit students transferring from universities, colleges, and higher institutes or community college accredited by the UAE Ministry of Education, provided that the student fulfills the following conditions:

1. The applicant must have successfully completed at least two semesters or one whole year in an accredited university or college and must have achieved an average of no less than 'Good' (2.50 out of 4.00 points) or 'Very Good' (3.00 out of 4.00 points) from an accredited higher institute or community college.

2. He/she must meet the university admission criteria and the special requirements of the college to which he/she is transferring.
3. Students transferring from other universities, community colleges or institutes of higher education shall not benefit from their academic record if they have discontinued their studies for a period of four regular semesters or more.
4. There are available places in the college to which he/she is transferring according to the admission plan of the concerned college established within the general policy of admission at the university.
5. The maximum number of credit hours that can be transferred from another accredited university or college according to the study plan applicable to the student at the University of Sharjah shall not exceed (60) credit hours in all colleges except for the colleges of Engineering, Health Sciences, and Pharmacy where the maximum number of transferrable credit hours shall not exceed (70) the counted credit hours shall not exceed 50% of the student plan.
6. The maximum credit hours that may be accepted for transfer from a recognized higher institutes or community college and within the framework of the study plans at the university, is forty (40) credit hours in all Colleges, except the Colleges of Engineering and Health Sciences which may not exceed fifty (50) credit hours and shall not exceed 50% of the student plan.
7. The university from which the student is transferring must require full-time attendance and the transferring student must not have been expelled for academic or disciplinary reasons.
8. A department may accept the transfer of credits for all or some of the courses that the student has completed successfully in his previous university or college, on the condition that his/her final grade in any of them is no less than (C+).
9. A department may accept the transfer of credits for all or some of the courses that the student has completed successfully in his previous higher institutes or community college, on the conditions that his/her final grade in any of major course is no less than (B) and the final grade in any of the university or college requirement or elective course is no less than (C+).
10. Grades or averages that a student has received in the accepted courses for transfer will not be counted while calculating the student's CGPA at the university.
11. No credit for courses taken by a new student at the university shall count if he/she has already taken them at another university, community college, or institute of higher education from which he/she has obtained a certificate.

#### **Re-admission of Students**

1. A student whose registration has been cancelled due to withdrawal or discontinuation may request to be readmitted.
2. By a decision from the Council of Deans based on a recommendation from the concerned College Council, the student may retain the grades he/she had achieved prior to the cancellation of his/her registration, provided that the discontinuation period did not exceed six regular and continuous semesters; otherwise, previous courses taken at the University shall not be counted and the student shall be treated as a new student in term of course registration.
3. Students applying to be re-admitted as new students shall be admitted by a decision from the Council of Deans taking into consideration their previous record.
4. All students readmitted should continue with the same ID number.

### Visitor Students:

Students enrolled in other academic institutions and wish to take some courses in the Summer semester at the University of Sharjah as non-credit courses may do so as visiting students without being granted an academic degree as per the following regulations:

1. The student presents a letter from his/her university or college of origin consenting to him/her studying at the University of Sharjah and identifying the course the student wishes to study during the semester.
2. Once admitted, the visiting student may register for the agreed courses only after payment of the tuition fees which are non-refundable.
3. If during the semester the UoS chooses to cancel a course in which the student is enrolled, student's registration in that course will be automatically dropped and the visiting student receives a refund.
4. A visiting student may apply to rent a UoS housing unit pending availability.
5. Visiting students coming from abroad are requested to make their own visa and travel arrangements.
6. Students wishing to study as visiting students in the Fall or Spring semesters may submit their request to the Admission Department. However, their admission will be granted on a case by case basis subject to the approval of the Chancellor or Vice Chancellor for Academic Affairs or Dean of Academic support services or the delegates.
7. The visiting student shall not be granted any academic degree from the University of Sharjah.

Note: Students that are not enrolled in any academic institution may apply to take courses at UoS as visitor students without being granted an academic degree based on the approval of University's chancellor or the Vice-Chancellor for Academic Affairs.

### Exchange students

- Students from other institutions are allowed to take courses at UoS based on a cooperation agreement between the UoS and another academic institution within a period specified by the agreement without granting them any academic degree. Students of University of Sharjah are also allowed to apply to take courses at another academic institution as an exchange student based on the cooperation agreement.
- The tuition fees will be paid as per the agreement between the two universities.
- Note: Students of special studies system will not be granted an academic degree from UoS.

### Deferral of Admission and Confirmation of Admission

#### Deferral of Admission for all University program except Medicine and Dentistry:

1. Admitted students must enroll at the beginning of every semester during the registration period stated in the academic calendar, provided that the student indicates in the designated Advising Form, authorized by his/her advisor, his/her selection of the courses he/she is taking according to the study plan of the major he/she is admitted to.
2. Upon request and on approval from the Admission Department, new students may defer their admission after payment of the required fees for the semester he/she is admitted in for a maximum of one semester. The student must submit the deferment application before classes begin in the semester, he/she is admitted in. Once that is done, the

concerned college shall be duly notified. If the student, however, fails to register for the following semester, his/her admission shall be cancelled.

3. When a student does not register in the following semester, he/she may lodge an application for re-admission. However, the approval of such application shall depend on the availability of vacancies in the target program.
4. Admission postpone is not allowed in Colleges of Medicine and Dental Medicine.
5. In cases that are beyond a student's control; such as sudden illness, pregnancy, or giving birth; the Chancellor or his/her delegate may approve the deferment of admission in any of the programs offered by the University.
6. Students who do not enroll for the semester in which they were admitted or do not process a request for postponement of admission will be denied admission to the university and will not have the right to a refund of the seat reservation fees.

#### **Confirmation of admission to the colleges of Medicine and Dentistry:**

- Students admitted to either College must register during the registration period stated in the academic calendar at the beginning of each semester of the foundation year and at the beginning of the academic year for the remaining years of study in the undergraduate degree of medicine or dentistry, provided that they indicate in the designated Advising Form, authorized by their advisors, their selection of the courses they are taking during the foundation year or of the university requirements according to the study plan of the designated major.
- Students new to the College of Medicine or College of Dentistry must pay the due tuition fees for the semester they are admitted in within two weeks at the latest from the date the acceptance is announced and must commence study in the semester they are accepted in. Failure to do so will result in cancellation of admission to the university.

#### **Required Documents**

Applications are submitted to the concerned Admission Department accompanied by the following documents duly legalized:

##### **First: General Documents:**

- 1) A valid copy of student passport.
- 2) A copy of UAE National Family Registry for local students.
- 3) A valid copy of residence visa for non-local students.
- 4) Certified copy of Secondary School Certificate or its equivalent.
- 5) Four recent passport-size colored photographs.
- 6) Health Fitness certificate from Governmental authority in the UAE or University Hospital on the university's form, or university's clinic or any governmental authority in the UAE.
- 7) A valid copy of Good Conduct Certificate.
- 8) Copy of Birth Certificate.
- 9) A valid copy of UAE National Identity Card.
- 10) AED (360) cash application fee (non-refundable).
- 11) An English Language Proficiency Certificate (TOEFL, IELTS, PTE or EmsAT), (Student must hand the original English Language Proficiency Certificate for Majors that requires it before the course.

**Second: Additional Requirements for Students Obtaining Foreign Certificates:**

- 1) Document proving that the student completed 12 years of school.
- 2) Certified copy of grades 10, 11, and 12 certificates and Graduation certificate (Diploma).
- 3) Equivalent certificate from the Ministry of Education in the UAE.
- 4) Students who obtained certificates from outside the UAE must provide a document proving that the High School Certificate is accepted by government universities in the country from which the certificate was obtained, and equivalent certificate from the Ministry of Education in the UAE.

**Third: Additional Requirements for Bridging Programs Students:**

- 1) Certified copy of the Diploma certificate.
- 2) Certified copy of the transcript.
- 3) Students who had received the Diploma from outside the UAE must attain equivalent certificate for the Diploma from the Ministry of Education in the UAE.

**Fourth: Additional Requirements for Transfer Students:**

- 1) Certified copy of the official transcript after withdrawing from the previous institution.
- 2) Certified copy of detailed descriptions of the courses the student has taken.
- 3) Students transferring from an institution outside the UAE must also submit a letter of accreditation from the Ministry of Education in the UAE.
- 4) A letter clarifies the cumulative GPA and the academic status of the student at his/ her previous university.

**Fifth: Additional Requirements for Kuwaiti Students:**

No Objection Letter from the Consulate General of the State of Kuwait - Cultural Office in UAE specifying the program the student is allowed to take at the university.

**Sixth: Additional Requirements for visiting students:**

Approval letter from student's home university with a list of courses allowed to be taken at the university.

**Seventh: Additional Requirements for UAE local male students**

National service completion letter or no objection to complete the study from the Authority of National Service and Reserve.

**Student file and documents:**

- Admission applications are submitted to the Admission Department, accompanied by the required documents, duly certified, and within the period specified by the Admission Department.
- The Admission Department prepares an individual file for each student who has been accepted, and it contains all the documents related to it.
- • The applicant must not distort or falsify the documents, as this violation leads to rejection of the application and the fees paid will not be refunded.

- All documents submitted for admission to the university are considered the property of the university. Once delivered to the admission office, students or any other departments or centers are not allowed to access any document from the student's file, request, or take it, except with permission from the Admissions Director and follow the rules governing this process.
- All documents related to the student during his academic life must be saved in his file.
- Student files are archived electronically and on paper.
- Students are entitled to obtain their documents in case they withdraw from the university.
- Applicants whose admission application was rejected or students who did not enroll in the colleges in which they were accepted can recover their admission file within two months from the date of submitting the application, otherwise the file will be destroyed.
- The university has the right to destroy the files of students who were dismissed from the university after two years of dismissal. Electronic copies of their documents are archived before they are destroyed.
- The university has the right to destroy graduates' files seven years after their graduation, and electronic copies of their documents are archived before they are destroyed.
- It is not permissible to grant personal, academic, financial or behavioral information related to students; Whether orally, in writing, or otherwise; To any individual or party unless authorized personally by the student, or with the approval of the Dean of Academic Support Services, in which case this information is provided in accordance with the regulations that the university follows.

### Tuition Fees

The university tuition fees are determined by the Board of Trustees with the approval of the President of the university on an annual basis. Tuition and fees may be increased annually without prior notice. Currently applied tuition fees are posted on the university website: [www.sharjah.ac.ae](http://www.sharjah.ac.ae)

### Tuition Fees for Colleges and Majors for Bachelor Degree Programs Offered by University of Sharjah in the Academic Year 2022 / 2023

| Colleges                            | Majors & Tracks                    | Minimum Average% & Certificate Sections | Fees per Semester (AED) | Fees per Year (AED) | Fees per one credit hour (Fall / Spring) (AED) | Credit Hours |
|-------------------------------------|------------------------------------|---|-------------------------|---------------------|--|--------------|
| College of Sharia & Islamic Studies | Fundamentals of Religion           | 70 % (Scientific/ Literary)             | 19,500                  | 39,000              | 1,625  | 126 Cr.Hrs   |
|                                     | Jurisprudence and its Fundamentals |   |                         |                     |  | 126 Cr.Hrs   |
|                                     | Sharia and Law                     |   |                         |                     |  | 132 Cr.Hrs   |
|                                     | Arabic Language                    |   |                         |                     |  |              |

|   |   |                                |        |        |       |               |
|---|---|--------------------------------|--------|--------|-------|---------------|
| College of Arts, Humanities and Social Sciences | and Literature                                  | 70%<br>(Scientific / Literary) | 19,507 | 39,014 | 1,625 | 123<br>Cr.Hrs |
|   | English Language and Literature                 |                                |        |        |       |               |
|   | Sociology                                       |                                |        |        |       |               |
|   | History and Islamic Civilization                |                                |        |        |       |               |
|   | History and Islamic Civilization- Tourist Guide |                                |        |        |       |               |
|   | International Relations                         |                                |        |        |       |               |
|   | Museum Studies and Art History                  |                                |        |        |       |               |
|   | Early Childhood Education *New                  |                                |        |        |       |               |
| College of Sciences                             | Chemistry                                       | 70 %<br>(Scientific)           | 24,380 | 48,760 | 2,032 | 123<br>Cr.Hrs |
|   | Applied Physics                                 |                                |        |        |       | 123<br>Cr.Hrs |
|   | Mathematics                                     |                                |        |        |       | 123<br>Cr.Hrs |
|   | Biotechnology                                   |                                |        |        |       | 124<br>Cr.Hrs |
|   | Petroleum Geosciences and Remote Sensing        |                                | 25,000 | 50,000 | 2,083 | 123<br>Cr.Hrs |
| College of Business Administration              | Accounting                                      | 70%<br>(Scientific / Literary) | 26,278 | 52,556 | 2,190 | 123<br>Cr.Hrs |
|   | Business Administration - Management            |                                |        |        |       |               |
|   | Business Administration - Marketing             |                                |        |        |       |               |
|   | Supply Chain Management * New                   |                                |        |        |       |               |
|   | Finance   |                                |        |        |       |               |
|   | Civil Engineering                               | 75%                            | 26,278 | 52,556 | 2,190 | 135<br>Cr.Hrs |
|   | Electrical and Electronics Engineering          |                                |        |        |       | 132<br>Cr.Hrs |



|                                      |   |                           |        |        |       |            |
|--------------------------------------|---|---------------------------|--------|--------|-------|------------|
| College of Engineering               | Industrial Engineering and Engineering Management | (Scientific)              |        |        |       | 134 Cr.Hrs |
|                                      | Architectural Engineering                         |                           | 28,796 | 57,592 | 2,400 | 158 Cr.Hrs |
|                                      | Sustainable and Renewable Energy Engineering      |                           |        |        |       | 133 Cr.Hrs |
|                                      | Mechanical Engineering                            |                           |        |        |       | 132 Cr.Hrs |
|                                      | Nuclear Engineering                               |                           | 28,941 | 57,882 | 2,412 | 131 Cr.Hrs |
| College of Health Sciences           | Medical Laboratory Sciences                       | 75% (Scientific)          | 25,769 | 51,538 | 2,147 | 134 Cr.Hrs |
|                                      | Medical Diagnostic Imaging                        |                           |        |        |       | 137 Cr.Hrs |
|                                      | Nursing   |                           |        |        |       | 137 Cr.Hrs |
|                                      | Health Services Administration                    |                           |        |        |       | 134 Cr.Hrs |
|                                      | Physiotherapy                                     |                           |        |        |       | 137 Cr.Hrs |
|                                      | Environmental Health Sciences                     |                           |        |        |       | 134 Cr.Hrs |
|                                      | Clinical Nutrition and Dietetics                  |                           |        |        |       | 134 Cr.Hrs |
| College of Computing and Informatics | Computer Engineering                              | 75% (Scientific)          | 26,278 | 52,556 | 2,190 | 132 Cr.Hrs |
|                                      | Computer Science                                  | 70% (Scientific)          |        |        |       | 123 Cr.Hrs |
|                                      | Information Technology-Multimedia                 |                           |        |        |       | 123 Cr.Hrs |
|                                      | Business Information System                       | 70% (Scientific/Literary) |        |        |       | 123 Cr.Hrs |

|   |  |                                   |        |         |       |   |
|---|--|-----------------------------------|--------|---------|-------|---|
| College of Law                                  | Law  | 70%<br>(Scientific/<br>Literary)  | 21,023 | 42,046  | 1,752 | 126<br>Cr.Hrs   |
| College of Fine Arts<br>& Design                | Fine Arts  | 70%<br>(Scientific/<br>Literary)  | 24,616 | 49,232  | 2,051 | 122<br>Cr.Hrs   |
|   | Interior Design                                    |                                   |        |         |       |   |
|   | Fashion and Textiles<br>Design                     |                                   |        |         |       |   |
|   | Design in Visual<br>Communication                  |                                   |        |         |       |   |
| College of<br>Communication                     | Public Relations                                   | 70%<br>(Scientific /<br>Literary) | 26,985 | 53,970  | 2,249 | 123<br>Cr.Hrs   |
|   | Communication -<br>Journalism                      |                                   |        |         |       |   |
|   | Communication -<br>Graphics Design &<br>Multimedia |                                   |        |         |       |   |
|   | Communication -<br>Radio and Television            |                                   |        |         |       |   |
|   | Mass Communication<br>(English)                    |                                   |        |         |       |   |
| College of<br>Medicine                          | Medicine and Surgery<br>(M.B.B.S)                  | 90%<br>(Scientific)               | -      | 107,545 | -     | 1<br>Founda<br>tion yr.<br>+ 5 yrs.<br>+1 yr.<br>clinical<br>practic<br>e |
| College of<br>Dental<br>Medicine                | Dental Surgery (B.D.S)                             | 85%<br>(Scientific)               | -      | 104,521 | -     | 1<br>Founda<br>tion yr.<br>+ 5 yrs.<br>+1 yr.<br>clinical<br>practic<br>e |
| Foundation Year - College of<br>Medicine        |  |                                   | 40,330 | 80,659  | -     | One<br>Year   |
| Foundation Year - College of Dental<br>Medicine |  |                                   | 39,195 | 78,391  | -     | One<br>Year   |
| College of<br>Pharmacy                          | Pharmacy   | 80%<br>(Scientific)               | 27,899 | 55,799  | 2,325 | 17<br>0<br>Cr.<br>Hrs   |

|   |        |        |       |                      |
|---|--------|--------|-------|----------------------|
| Qualifying Program for General Stream Secondary School Certificates | 24,380 | 48,760 | 2,032 |                      |
| Intensive English Language Program (IEP)                            | 15,524 | 31,049 | -     | 20-25 Hours per-week |

The grade averages above represent the minimum required for admission to the University. Please note that students meeting the above average requirements are not guarantee admission but fall subject to competitive regulations and standards.

**Additional Fees (Subject to VAT):**

- Application fee: 360 AED (Non-refundable).
- Student ID card fees: 100 AED (Valid for 4 years).

**Other fees**

| Type of Service                                   | Fees in AED | Type of Service  | Fees in AED |
|---|-------------|--|-------------|
| Application fee (Non refundable)                  | 300         | Lost Study Plan Replacement                            | 5.25        |
| Application Fee-Master's Program (non refundable) | 200         | To Whom it May Concern Certificate                     | 21.00       |
| New Students - Change of Major/College Request    | 50          | Official Academic Transcript                           | 20          |
| Change of Major Request (Within the same College) | 35          | Unofficial Academic Transcript                         | 10          |
| College Transfer Request                          | 35          | Incomplete Application                                 | 35          |
| TOEFL Fees  | 525         | Mailing of University Performance Results              | 10          |
| IELTS Exam Fee                                    | 950         | Smart-Chip fees (certificate ratification in ministry) | 150         |
| Cheque Return request                             | 52.50       | University ID Card Fee (valid for 4 years)             | 105.00      |
| Course Final Exam Grade Review                    | 20          | University ID Renewal                                  | 15.75       |
| University Locker Spare Key Fee                   | 21.00       | University ID Replacement                              | 20          |
| Lost University Locker Key Replacement            | 31.50       | Lost University ID Replacement Fee                     | 52.50       |

|  |       |  |        |
|--|-------|--|--------|
| <b>University Locker Rental Fee (One Semester)</b> | 52.50 | <b>Penalty – Bounced Cheques</b>           | 525.00 |
| <b>Official Transcript for Graduated Student</b>   | 50    | <b>Graduation Certificate – Extra Copy</b> | 50     |
| <b>To whom It May Concern - Admission Dept.</b>    | 26.25 |  |        |

### Payment Methods

Students are required to pay their tuition balance by the announced deadlines to avoid late payment fees and at the risk of courses being dropped. Once the student registers for a course, he/she shall remain accountable for all applicable tuition fees and other fees until he/she drops the course formally by the drop/add deadline. Please refer to the academic calendar at [www.sharjah.ac.ae/calendar/](http://www.sharjah.ac.ae/calendar/) for applicable deadlines.

Payments must be made by the announced deadlines in one of the following forms: at one of the university cashiers in cash or using a check, online credit-card through the Self-Service Banner at one of the Sharjah Islamic Bank (SIB) branches or ATMs, or via bank transfer. Students must have the statement of fees in hand when payment is made to ensure proper crediting to the student's account.

Students who are unable to make full payments by the billing dates may benefit from the university installment payment plan. Students may visit the Finance Department and make the proper arrangements before the payment deadline.

### Tuition Refund

A student who has registered and paid the tuition fees for a course and then drops it during the drop/add period is entitled to a full refund after paying the applicable drop fees. Students who do not formally drop a course during the add/drop period will be responsible for payment of all tuition fees and other fees unless the student withdraws due to immediate and urgent circumstances. Refer to the withdrawal section of the Catalog for more information.

## Academic Advising

Each student is assigned an academic advisor from the first semester at UoS. The academic advisor is a faculty member in the student's academic department. The role of the advisor is to assist the student in preparing a course schedule during registration, support and guide him/her during his/her university studies, monitor his/her academic progress, and offer him/her counseling on any academic difficulties or problems he/she may experience.

## Advising Students at-risk Situation

Students can be considered as at-risk situation for different reasons such as:

- Facing any problems or obstacles while doing their activities during the study period.
- Wrong decision that affect negatively on their academic performance.
- Return to the study after long absence and suspended situation.
- Their academic ability below the average student level in the same college or program they are enrolled in it.
- Any physical limitation or brain disability that prevent them for completing their studies.
- Multi probation or warning letters for low academic performance or any inappropriate behaviors.
- Psychological problems that lead to harming themselves or people who are dealing with.
- Bad circumstances and financial Problem.
- Risky environment, facilities and campuses.

Steps and procedures for advising student at-risk situation:

- UoS provide free consultation and advising for any problem may face the students during the study period via different channels and persons. UoS assign direct supervisor for each student who can guide the student during the academic journey. In addition, UoS has professional academic advising program to support and monitoring the performance of the students.
- The academic supervisor can expect to support students in study skills, learning skills, time management for study plan and study workload, career advising and any difficulties in studies.
- Academic supervisor should stay calm during advising session, deal with students professionally, keep the situation in safe mode, give correct assistance and be clear in giving instructions.
- When the academic supervisors feel the situation need extra support and advising, they can transfer the case to the student counseling, student affairs committee, academic advising committee and social advisor or specialist based on the level of risk may the student face.
- UoS deal with each case in high level of privacy and confidentiality.
- Each case should be under monitoring and supervision until receiving full support and the student solve her/his problem and be in the safe situation.
- UoS encourage students to seek advising and asking for consultation for any type of challenges via different ways.
- UoS provide multi channels for advising such as face to face advising or distance advising throw Microsoft Teams apps, email, phones and messages. These channels play important role to stimulate student for advising and consultation without embarrassment.

### Orientation for New Students

Students admitted to the university are required to participate in the university orientation program organized at the beginning of the semester. Orientation dates are posted on the Academic Calendar.

### Registration

Students upon approval of his/her academic advisor, select the courses he/she will be studying, and which are part of the study plan of the specialization he/she has been admitted into. After consulting with their academic advisors, students are required to register for the courses they intend to take during the registration period noted in the academic calendar published in the university catalog and posted on the university website [www.sharjah.ac.ae/](http://www.sharjah.ac.ae/). During this period, the academic advisors assist students in preparing their course schedules to register online using the Self-Service Banner (SSB). Students under academic probation are requested to obtain their PIN Codes from their academic advisors before the online registration. Newly admitted students will register their courses through their college registrars.

The intended course schedule must comply with the following: The student has passed the prerequisite(s) of all courses, the courses are in the program's study plan, the courses are taken in the order noted in the study plan, failed courses are taken when first offered, and the maximum and minimum load requirements are met. After registration is complete, the student must proceed to pay all tuition and fees by the announced deadlines. Failure to meet financial commitments may result in dropping the class schedule.

### Course Coding System

The University of Sharjah has chosen a special coding system to identify its colleges and departments within the colleges. For example, the College of Arts, Humanities and Social Sciences is given the code 02; thus all the courses it offers begin with 02. A college may be composed of several departments each one of which is given another code number. For example, the Department of Arabic is given the code number 01, whereas the Department of English is given the code number 02. Any reference to the Department of Arabic in the College of Arts, Humanities and Social Sciences will be 0201 and to the Department of English will be 0202, and then is similarly applied to all colleges and departments in the university. We can define these four digits as a subject code of the course. This code is extended to identify all courses within the university. A code of seven digits has been chosen for the course: the first four numbers (the subject code) are used to identify the appropriate college and department; the fifth number digit designates the level of the course; the sixth stands for the specialization field and the seventh digit stands for the course within the specialization field.

| ab           | cd              | X               | y                         | z                    |
|--------------|-----------------|-----------------|---------------------------|----------------------|
| College Code | Department Code | Level/Year Code | Specialization Field Code | Course Sequence Code |

### College Code (ab)

- 01 College of Sharia and Islamic Studies
- 02 College of Arts, Humanities and Social Sciences
- 03 College of Business Administration
- 04 College of Engineering
- 05 College of Health Science
- 06 College of Law
- 07 College of Fine Arts and Design
- 08 College of Communication
- 09 College of Medicine
- 10 College of Dental Medicine
- 11 College of Pharmacy
- 12 Community College
- 14 College of Sciences
- 15 College of Computing and Informatics

### Symbolization of Credit Hours

The symbol (x-x:x), e.g. (3-0:3) located at the right-hand side of course description represents the credit hours composition of a course. The first digit stands for the number of lecture contact hours; the second for the number of lab contact hours; and the third the course credit hours. In the Arts, usually the course does not involve a practical part, and the total credit hours are usually three credit hours symbolized as (3-0:3). In Engineering, the course may involve 2 hours of theory and 3 hours of training work for a total of 3 credit hours and is symbolized as (2-3:3).

### General Education

To receive a Bachelor degree, the student has to successfully complete 24 credit hours of university requirements. These credits consist of 18 credit hours of mandatory courses and 6 credit hours of elective courses. The objective of the General Education Courses is to provide students a basic educational background in the areas of general knowledge, art and literature, social sciences, natural sciences and technology. Selection of the courses for a specific undergraduate program must take into account the contents of all other program courses to avoid duplication and redundancy. Thus, all university required courses should be taught according to well-planned curricula and clearly defined objectives will include important topics to provide students with broad knowledge and deep understanding of historical as well as contemporary social, economic and cultural issues. Consequently, the university will conduct detailed reviews in order to make the necessary adjustments in the contents of all courses available for the general university course requirements to ensure that such objectives are met. The 24 hours should be designated to cover eight domains in accordance with policies set by the Academic Accreditation Commission of the Ministry of Education as listed in the table below.

## General Education Program Goals and Outcomes

### General Education Program Goals

Goals of the General Education program are:

1. Build student basic knowledge in humanities, social sciences, Islamic studies, IT, mathematics and natural sciences.
2. Provide students with the basic communication, critical thinking and problems solving skills required to enrich their learning experience.
3. Foster the students' ethical values in research and presentation of materials.
4. Enhance the students' ability to work independently or in teams.

### General Education Program Learning Outcomes

By completing the General Education Program courses, students should be able to:

1. Identify the general principles and developments of humanities, social sciences, Islamic studies, IT, mathematics and natural sciences.
2. Communicate effectively using direct and indirect tools in both Arabic and English.
3. Apply the basic concepts essential to a critical thinking and evaluation of argumentative discourse.
4. Solve multiple-step problems through different (inductive, deductive and symbolic) modes of reasoning.
5. Apply ethical standards in research and presentation of materials, including proper verbal citations.
6. Apply cognitive and affective skills necessary for life-long learning through engagement in behaviors conducive to individual well-being and development.
7. Work independently and in collaboration with others in seeking and sharing knowledge.
8. Discuss how ethics and social responsibility promote sustainable growth for present and future generations.

### Courses in the General Education Program

- All students in all programs offered by the university have to study 24 credit hours.
- The Compulsory and Electives courses are specified as follows:

### General Education Requirements

The program requires students to take 24 credit hours, 18 of which are compulsory and the 6 are electives. Eight domains are covered:

- A. English Language
- B. Arabic Language
- C. Islamic Studies
- D. UAE Studies
- E. Innovation and Entrepreneurship
- F. Information Technology
- G. Humanities, Social and Arts
- H. Sciences and Technology



## 1.1 Compulsory Requirements (18 credit hours); Domains A-F:

### Domain A: English Language

| General Education & Course Domain | Course Titles                 | Courses Number | Cr.Hrs |
|-----------------------------------|-------------------------------|----------------|--------|
| English Language                  | Basic English                 | 0202111        | 3      |
|                                   | English for Academic Purposes | 0202112        |        |
|                                   | English for Medical Sciences  | 0202121        |        |

### Domain B: Arabic Language

| General Education & Course Domain | Course Titles                           | Courses Number | Cr.Hrs |
|-----------------------------------|---|----------------|--------|
| Arabic Language                   | Arabic Language                         | 0201102        | 3      |
|                                   | Arabic Language for Non Arabic Speakers | 0201105        |        |

### Domain C: Islamic Studies

| General Education Course Domain | Course Title    | Course Number | Cr.Hrs |
|---------------------------------|-----------------|---------------|--------|
| Islamic Studies                 | Islamic Culture | 0104100       | 3      |

### Domain D: UAE Studies

| General Education & Course Domain | Course Titles | Courses Number | Cr.Hrs |
|-----------------------------------|---------------|----------------|--------|
| UAE Studies                       | UAE Society   | 0204102        | 3      |

### Domain E: Innovation & Entrepreneurship

| General Education & Course Domain | Course Titles                                 | Courses Number | Cr.Hrs |
|-----------------------------------|---|----------------|--------|
| Innovation & Entrepreneurship     | Fundamentals of Innovation & Entrepreneurship | 0302200        | 3      |

### Domain F: Information Technology

| General Education Course Domain | Course Title                           | Courses Number | Cr.Hrs. |
|---------------------------------|--|----------------|---------|
| Information Technology          | Introduction to Information Technology | 1411100        | 3       |

## 1.2 Elective Requirements (6 credit hours); Domains G-H:

### Domain G: Humanities and Arts

| General Education & Course Domain | Courses Title  | Courses Number | Cr.Hrs |
|-----------------------------------|--|----------------|--------|
| Humanities, Social and Arts       | Islamic Civilization                                 | 0203100        | 3      |
|                                   | Human Rights in Islam and International Declarations | 0602246        |        |
|                                   | Introduction to Arabic Literature                    | 0201140        |        |
|                                   | History of the Sciences among Muslims                | 0203200        |        |
|                                   | History of the Arabian Gulf                          | 0203102        |        |
|                                   | History of Medical & Health Sciences                 | 0900107        |        |
|                                   | Introduction to Islamic Art and Design               | 0700310        |        |
|                                   | French Language                                      | 0202130        |        |
|                                   | Fundamentals of Islamic Education                    | 0206102        |        |
|                                   | Introduction to Psychology                           | 0206103        |        |
|                                   | Introduction to Economics*                           | 0308150        |        |
|                                   | Introduction to Business Administration*             | 0302150        |        |
|                                   | Media in Modern Societies**                          | 0800107        |        |
|                                   | Personal Finance                                     | 0308131        |        |
|                                   | Analytical Biography of the Prophet                  | 0104130        |        |
|                                   | Islamic System***                                    | 0103103        |        |

\* Not for students of the College of Business Administration

\*\* Not for students of the College of Communication

\*\*\* Not for students of the College of Sharia

### Domain H: Sciences and Technology

| General Education & Course Domain | Courses Titles                   | Courses Number | Cr.Hrs. |
|-----------------------------------|----------------------------------|----------------|---------|
| Sciences and Technology           | Astronomy and Space Sciences     | 1430101        | 3       |
|                                   | Man and the Environment*         | 0401142        |         |
|                                   | Health and Safety*               | 0503101        |         |
|                                   | Health Awareness and Nutrition** | 0507101        |         |
|                                   | Fitness and Wellness***          | 0505101        |         |
|                                   | Biology and Society              | 1450100        |         |
|                                   | Artificial Intelligence ****     | 1502233        |         |

\* Not for Civil Engineering Students and Environmental Health Students

\*\* Not for Clinical Nutrition Students

\*\*\*Not for Physiotherapy Students

\*\*\*\*Not for Computer Science, Information Technology (Multi-Media) and Computer Engineering Students

Note: Every student should take all courses in domains A to F and one course from each of domain G and H.

## Course Description

### **0103103 Islamic System (3-0:3)**

#### **Prerequisite: None (Not for Sharia's students)**

The course aims at introducing Islamic system to the students through studying sources of Islamic system, its historical background and development, concept, philosophy and features. The course also sheds light on Islamic social system by means of elaborating reality of the family system, and social cooperation and solidarity, in addition to the economic system in Islam, Islamic political system, crime and punishment philosophy and judicial system. The course is also made to highlight principles of international relations, as well as wisdom and philosophy behind Islamic system as whole, and many other related issues.

### **0104100 Islamic Culture (3-0:3)**

#### **Prerequisite: None**

Introduction to Islamic Culture: (The concept of culture, and its characteristics). Multiple sources of Islamic culture, various fields of Islamic culture: (belief, worship, and morals).

### **0104130 Analytical Biography of the Prophet (3-0:3)**

#### **Prerequisite: None**

This course deals with the definition of Al-Sira al-Nabawiyyah (i.e., the biography of the Prophet), its characteristics and sources. It also provides an analytical study of the Prophet's biography from the birth to death and it covers the era of the Caliph Abu Bakr. Further, it concentrates and analyses the main events of the Prophet's biography in an attempt to infer lessons from them, justifying the suspicions aroused by the prophet's opponents and how to benefit from the prophet's biography in both life and dawah.

### **0201102 Arabic Language (3-0:3)**

#### **Prerequisite: None**

The aim of this course is to enable students to express their ideas and to communicate in a spoken and Written Arabic language, to positively interact in conversations using a fluent Arabic language that reflects its comprehension. It also enables students to determine the errors in an audible or written speech and correct them.

### **0201140 Introduction to Arabic Literature (3-0:3)**

#### **Prerequisite: None**

This course covers topics, genres, features and figures of Modern Arabic poetry and prose to improve the literary appreciation skills.

### **0202111 Basic English (3-0:3)**

#### **Prerequisite: None**

Basic English is a 3-credit hour course with no prerequisites. It aims at helping learners to achieve an overall proficiency in English Language. The course uses a multi-skill approach that helps students to grasp the Basics of English language, with a special focus on reading and writing. It also lays emphasis on oral communication skills and writing using authentic material, relevant situations, and different language functions.

**0202112                      English for Academic Purposes                      (3-0:3)**

**Prerequisite: None**

This course focuses on academic reading and writing skills, including extensive work in reading comprehension and retention. Students will practice identifying topics, determining the main idea of a text, recognizing the supporting details of a paragraph, recognizing authors' writing patterns, and understanding new vocabulary through context clues. Emphasis is given to the rhetorical structures of the argumentative essay.

**0202121                      English for Medical Sciences                      (3-0:3)**

**Prerequisite: None**

This competency based course aims to enable students of Medicine, Dentistry, Pharmacy, and Health Sciences to communicate effectively in English, orally and in writing, using the medical terms in their respective fields. The competences include patient and population care, knowledge, evidence-based practice, life-long learning and interpersonal communication skills. Students will be familiarized with the structure of medical terms and the principles of constructing, analyzing and pronouncing them. They will also be trained to read medical articles and reports, summarize/outline them and rephrase medical statements in their own words. Students will also be trained to infer the meaning of medical terms from the context. They are also expected to write coherent and cohesive paragraphs and medical reports on topics related to their majors. Special attention will be given to oral presentations and patient-doctor dialogues. This course also aims to develop students' general academic skills, critical thinking capacities, and independent learning skills. Academic vocabulary and relevant grammatical structures will be highlighted and practiced. Students are also expected to apply this knowledge to understanding texts in their fields of study.

**0202130                      French Language                      (3-0:3)**

**Prerequisite: None**

The course is designed for students with no prior knowledge of the French language. It targets the fundamental language needs of students and gives them the necessary tools for immediate communication in French. The students will learn to listen, speak, read and write French at beginner level. They will be familiarized with a variety of topics related to everyday life in French through a communicative based language use and activities.

**0203100                      Islamic Civilization                      (3-0:3)**

**Prerequisite: None**

The course introduces the various periods of the history of Arab-Islamic civilization (from the "Jahiliyya" or pre-Islamic to the late Abbasid period). Besides, it introduces the intellectual, scientific, artistic, and architectural contributions of the Arab scholars to world modern civilization. The course enlightens the students about the Islamic law (Sharieaa) and discuss the humans' and animal's rights in Islam.

**0203102 History of the Arabian Gulf (3-0:3)**

**Prerequisite: None**

The course acquaints students with Pre-historic periods of the Gulf until the rise of Islam. It also focuses on the significance of the Islamic history of the area until the beginning of European domination early in the 16th century. It provides an analysis of the causes and effects of the conflict of interests in the region, until the emergence of modern Gulf states.

**0203200 History of the Sciences among the Muslims (3-0:3)**

**Prerequisite: None**

This course focuses on the importance of the sciences and their emergence in Islam, it deals with the sciences of the Arabic language, lexicography, biography and history, it also deals with the development of theoretical sciences like medicine, geometry, Arithmetic, Astronomy, Mechanics and Botany and the influence of the Muslim scientific achievements on Western civilization.

**0204102 UAE Society (3-0:3)**

**Prerequisite: None**

The course deals with the UAE society: its social foundation, formation, and traits. In addition, it deals with the nature of contemporary social organizations (family, education, health and economy), human development, social change and social problems and its relationships with issues of globalization and modern technology.

**0206102 Fundamentals of Islamic Education (3-0:3)**

**Prerequisite: None**

This course aims to enable students to learn about the concept, objectives, principles and characteristics of Islamic education. It also explores the theoretical perspectives and methods of teaching in Islamic Education along with some ideological concepts, and the application of values learned through Islamic Education to social issues.

**0206103 Introduction to Psychology (3-0:3)**

**Prerequisite: None**

This is an introductory course providing an overview of the current body of knowledge on psychology. The topics included are the historical foundations of psychology, cognition, emotions, learning, human development, biological bases of behavior, personality, psychological disorders, psychotherapy, and behavior change. Applications and examples will be given of psychology to diverse.

**0302150 Introduction to Business Administration (3-0:3)**

**Prerequisite: None (Non-Business students)**

The Introduction to Business for non-business students' course is designed to introduce non-business students to the different internal and external elements of a business and help them to understand the context in which a business operates. This course will expose students from different majors to business terminology, concepts, and current business issues, with the intent of helping them develop basic knowledge about the complexity of establishing and operating contemporary private business in a changing world.

**0302200                      Fundamentals of Innovation and Entrepreneurship                      (3-0:3)**

**Prerequisite: None (Year 2)**

A non-conventional highly interactive course designed to provide UOS students with a unique experience into identifying the concepts of innovation, entrepreneurship, growth and leadership. At a practical level, this course equips students with the necessary design thinking and entrepreneurial skills and tools to enhance their personal development, business-oriented mindset and future professional career.

**0308131                      Personal Finance                      (3-0:3)**

**Prerequisite: None**

This course provides a comprehensive examination of individual financial planning concepts and techniques. It covers personal income, expenditures; saving, consumption, and sources of finance. The course delivers lessons on how to develop short and long run financial goals and formulate plans to achieve the goals.

**0308150                      Introduction to Economics                      (3-0:3)**

**Prerequisite: None (Non-Business students)**

Introduction to Economics for NBS is a study of basic economic principles, of both Microeconomics and Macroeconomics. This course is stressing how consumers, producers, and policy makers make rational economic decisions under varying economic conditions.

**0401142                      Man and the Environment                      (3-0:3)**

**Prerequisite: None (Not for Civil Engineering or Environmental Health students)**

This course is designed to raise students' environmental awareness and introduce them to basic principles of environmental science and engineering and the contemporary local and global environmental challenges. The course addresses man's role, particularly from an Islamic perspective, in terms of protecting, conserving and managing the environment. The course material covers general principles of environmental science and engineering, environmental balance and recovery systems, environmental pollution and control, consumption of nonrenewable resources, waste production and management, and the concept of sustainable development. Students in the course are involved in voluntary activities that contribute to spreading environmental awareness and knowledge or otherwise serve the community.

**0505101                      Fitness and Wellness                      (3-0:3)**

**Prerequisite: None (Not for Physiotherapy students)**

This course applies physiological, psychological and social principles to achieving fitness and wellness in everyday life. Students will learn how to assess physical fitness and implement a program based on those results that will enhance their fitness levels. Students will be introduced to the seven dimensions of wellness and taught strategies to enhance their wellness in each domain to improve overall quality of life.

**0507101 Health Awareness & Nutrition (3-0:3)**

**Prerequisite: None (Not for Nutrition students)**

This course is designed to increase the awareness of students regarding the basic nutrition and its relationship with health. The course will orient them to determine the nutritional status of the individuals through simple, objective methods. The students shall learn about the different nutrients important for health and dietary guidelines towards good health. It will also give them an insight into the common nutritional problems of public health importance; their prevention and strategies to tackle them. The course will enable the students to understand the concept of healthy and active lifestyle for health promotion.

**0602246 Human Rights in Islam and International Declarations (3-0:3)**

**Prerequisite: None**

Discusses the essential notions involved in the concept of human rights, giving account of their historical development, the role of religions in proclaiming them and the international declarations and constitutions upholding them; concentrates on the meaning of civil, social and cultural rights and their characteristics in Islamic Law, with emphasis on the constitution of the U.A.E.

**0700310 Introduction to Islamic Art and Design (3-0:3)**

**Prerequisite: None**

Islamic Art and Design is an integral part of our local and regional culture. The course is an introduction to Islamic arts and design focusing on the main characteristics that define each era and location. The course covers the Umayyad and Abbasid, Andalusian and Ottoman periods through various building types (such as mosques, palaces, madrassahs, forts, etc.). Special design elements, such as calligraphy and geometry shall be discussed.

**0800107 Media in Modern Societies (3-0:3)**

**Prerequisite: None (Not for Communication students)**

Media in Modern Society is designed to help students develop an informed and critical understanding of how media shape and influence society. The course will develop a critical understanding of ideas around media effects, audience and reception analysis, and theories of cultivation, agenda setting, framing, and uses & gratifications. The course will look at the evolution of communication and media industries over time to explore how models for information distribution and reception have facilitated communication in modern society. Finally, the course will explore the future of media systems in a digital age, with a look at the future of marketing communication through the lens of convergence culture and participatory technology.

**0900107 History of Medical & Health Sciences (3-0:3)**

**Prerequisite: None**

The course covers the history of sciences and progress of scientific mentality as well as its leading ideas will enable understanding the factors for prosperity and collapse across the different historical periods. It also focuses on understanding the cultural, intellectual and scientific aspects are among the learning outcomes of the university requirements that aim to build the integrated personality of students.

**1501100 & 1501101 Int. to Information Technology (3-0:3)**

**Prerequisite: None**

This course is designed to provide students with a working knowledge of computer concepts that includes exploring various topics in computing hardware and software. Moreover, it covers evolving trends in information technology fields such as multimedia, networking & cloud computing, security, data science and artificial intelligence. In addition, this course will equip the students with a hands-on training and understanding of necessary tools to succeed and be productive in their personal and professional careers.

**1430101 Astronomy and Space Sciences (3-0:3)**

**Prerequisite: None**

The course covers fundamental astronomical concepts about light, matter, and energy, the various types of ground and space telescopes, the formation of the Solar System and its occupants. The course discusses aspects of stars and their distances from Sun, types, brightness, motions and life cycles. The course covers the Milky Way, the evolution of galaxies and analysis of recent findings and current theories regarding the evidence for an accelerating expansion of the Universe.

**0503101 Health and Safety (3-0:3)**

**Prerequisite: None**

This course aims to provide students with information on first aid safety, and main health issues that affect health and safety of individuals, families and communities in the UAE.

**1450100 Biology and Society (3-0:3)**

**Prerequisite: None**

This course introduces students to the basics of the scientific process and covers some of biology's most compelling topics surrounding the history and diversity of life. The goals of the course are to build understanding of core biological principles and to apply this knowledge to real world situations and modern issues. Topics covered include scientific inquiry; chemistry of life; cell structure and function; genetics; ecology; human systems; and an overview of the diversity of life.

**1502233 Artificial Intelligence (3-0:3)**

**Prerequisite: None**

The objective of this course is to immerse students in Artificial Intelligence technologies. Applications on Artificial intelligence models from different disciplines will be introduced. Students will have hands-on experience on how to build and test Artificial Intelligence and regression models.



## Academic Regulations

The following section presents the academic regulations applied to Bachelor degree programs. These regulations are meant to assist students, academic advisors, administrators and staff in taking appropriate decisions. The Chancellor, Vice Chancellors, Deans, and the Registration Department shall be responsible for their implementation. The Council of Deans is authorized to rule on cases that are not covered in these regulations and to mitigate problems arising from their application.

Pleading ignorance of these regulations or of related publications and announcements that are published via e-mail and on the university's website shall not exonerate students from the responsibility to abide by them.

Any student petition related to the academic rules must be initiated at the Registration Department to verify the authenticity of the information before it is forwarded to the responsible entity for further action.

## Academic Terminology

**Academic Degree:** The award of successfully completing the requirements of an academic program.

**Academic Dismissal:** Status that can apply to students at the university as the result of poor academic achievement.

**Academic Level:** The student standing within a program. The following four academic levels are adopted:

- Freshman: 0-30 credit hours
- Sophomore: 31-64 credit hours
- Junior: 65-98 credit hours
- Senior: 99 credit hours and up

Remedial courses do not count toward student standing

**Academic Load:** The number of credit hours a student is undertaking.

**Academic Period:** An academic term is a portion of an academic year, the time during which an educational institution holds classes.

**Academic Program:** An academic program is a course of study of courses and/or requirements leading to a degree or certificate, or to a major, co-major, minor or academic track and/or concentration.

**Academic Year:** The period composed of fall and spring semesters. Summer session may include.

**Active Students:** Students who are enrolled in courses in a particular semester or year.

**Alumni:** Former students who have graduated from University.

**Appeal:** A procedure which allows a student to ask for a review of a decision relating to his/her academic progress or award.

**Bachelor's degree:** Completion of all University and major graduation requirements as certified by the University.

**Credit hour:** A unit of measure representing an hour (50 minutes) of instruction over a 16-week period in a semester. It is applied toward the total number of hours needed for completing the requirements of a degree, diploma, certificate, or other formal award. An equivalent amount of work for other academic activities as established by the institution including laboratory work, internships, practice, studio work, and other academic work leading to the award of credit hours.

**Class:** A group of students studying the same course.

**Class Section:** Specific designation of each course offering that distinguishes room location, meeting time, and instructor.

**Course:** A course is the basic component of an academic program. A course is identified by a course name and an 'area and catalogue number'.

**Area of Concentration:** A subset of requirements within a program of study leading to a degree.

**Course Level:** A classification of courses that, at UoS, includes Developmental, College 100 and College 200. Level of a course based on the catalog number. Lower division = courses numbered 000 to 299, Upper division = courses numbered 300 to 499, Graduate = courses numbered 500 and above.

**Disciplinary Dismissal:** A compulsory drop of a program of study.

**Earned Hours:** Successfully completed credit hours of study.

**Electives Course:** A number of credit hours a student has to select from a group of credit hours as part of an academic program.

**Exchange Programs:** Academic programs in which students can complete part of their study plan in another institution.

**Foundation Year:** The first year of study within a program where students are not eligible to apply to a specific program.

**General Education Program:** A list of required courses taken by all students of the institution.

**Internship:** Practical work or training experience that allows students to apply what they have learned in class.

**Major:** A primary field of specialized study.

**Minor :** A secondary field of specialized study that does not lead to a degree.

**office Hours:** A time that is set aside by an instructor to meet with students.

**Placement Test:** A test a student takes to determine the level of his/her knowledge in a subject

**Prerequisites:** A course or requirement that must be met prior to enrolling in a course.

**Practicum:** Involves supervised activities emphasizing practical application of theory, especially one in which a student gains exposure to a field of study; generally required as part of the program curriculum

**Unit:** The credit value associated with a course. Unit weights are used in the calculation of averages for academic standing.

**Remedial Course :** Course designed to assist students in developing basic skills that are essential to successful university achievement. Units and grades earned will not count in the student's grade point average nor towards meeting graduation requirements

**Semester:** Period of study lasting approximately 15 to 16 weeks or one-half the academic year.

**Syllabus:** A course outline provided by the instructor that delineates course requirements, grading criteria, course content, faculty expectations, deadlines, examination dates, grading policies, class attendance requirements, and other relevant course information.

**Student ID:** A student identification number.

**Term:** A particular four-month period within which sessions are defined and fees are arranged.

**Textbook:** A book that contains material that is central to the understanding of a course

**Transcript:** An official document that displays the courses registered and the grades obtained since joining the University until last semester studied in the university.

**Transfer Credit Hours:** Credit hours granted to a student for courses undertaken at another institution.

**Transfer Student:** A student who moves from one educational institution to another at the same level.

**Tuition:** The money an institution charges for instruction and training (does not include the cost of books).

**Withdrawal:** The administrative procedure of dropping a course, a semester or leaving the university.

**Registration Load:** The allowed number of credit hours to be registered by a student in a semester based on his/her academic standing.

## Duration of Study

### Minimum Period

To earn a Bachelor degree, a student is required to study a minimum period as a matriculated student at UoS. The minimum period shall be: six regular semesters for a Bachelor degree from the Colleges of Sharia and Islamic Studies, Law, Arts, Humanities and Social Sciences, Sciences, Business Administration Fine Arts and Design, Communication, and Computing and Informatics, and eight regular semesters for a Bachelor degree from the Colleges of Engineering, Health Sciences and Pharmacy. A student in a bridging program must study at least three regular semesters before earning a bachelor degree. A transfer student is required to study at least four regular semesters at UoS to earn a Bachelor degree. A regular semester refers to a fall or spring semester.

The minimum duration of study to achieve a Bachelor Degree of Medicine and Surgery or a Bachelor Degree of Dental Surgery is six years including the foundation year.

### Maximum Duration of Study

The maximum study period to earn a Bachelor degree, excluding semesters of approved deferment of study, is 13 regular semesters for the Colleges of Sharia and Islamic Studies, Law, Arts, Humanities and Social Sciences, Sciences, Business Administration Fine Arts and Design, Communication, and Computing and Informatics, and 15 regular semesters for the Colleges of Engineering, Health Sciences and Pharmacy. No student shall exceed a study period of nine years in either the College of Medicine or the College of Dental Medicine to obtain their bachelor's degree.

If, for compelling reasons, a student cannot complete the Bachelor or Diploma degree within the apportioned period, a request for an extension may be submitted through the College Council for approval by the Council of Deans.

### Course Load

#### Minimum Load

The minimum semester load shall be 12 credits unless the student needs less than that to graduate. In certain cases, the Dean may approve a 9 credits minimum upon the recommendation of the Academic Advisor.

#### Maximum Load

The maximum load in a regular semester shall be 19 credits. A student may be allowed to take a maximum of 21 credit hours if he/she:

- (1) has a CGPA of no less than 3.60 or
- (2) needs 21 credits to graduate.

The maximum load in a summer session shall not exceed 7 credits. A 10-credit load may be allowed if the student:

- (1) has a CGPA of no less than 3.60 or
- (2) needs 10 credits to graduate.

Students in the colleges of Medicine and Dental Medicine shall be allowed to enroll in a maximum of nine (9) credit hours.

### **IEP Students**

Students in the IEP level 3 and 4 may take either an Arabic Language or Islamic Culture course in addition to the IEP required courses.

### **Dropping courses**

Students who do not plan to continue in a course must drop it during the first week of the fall and spring semesters or the second day of the summer session otherwise the student remains financially accountable for the course. A course dropped during the official drop and add period will be deleted from the student's schedule and the student will be relieved from the financial liability associated with the deleted course. If a refund is due, the provisions of the refund policy will apply.

### **Repeating Courses**

The student must repeat all failed courses when first offered. The student may repeat a failed elective course or take a substitute listed in the study plan in force. The substitute course shall be considered as a repeat of the failed course in calculating semester and cumulative GPA. The student may also repeat a course in which he/she passed with a grade of "C+" or lower only once to improve his/her CGPA. While all repeats shall remain on the student's record, the credits of a repeated course shall count only once, and the highest grade is used in computing GPA. No course may be repeated more than once if a student has obtained a passing grade in it.

### **Substituting Courses**

A student may be allowed upon the approval of the College Dean to take a substitute for a required major course in the following cases:

- The required course is not offered or is in conflict with another required course in the semester a student is expected to graduate.
- The student has failed the course three times.

The substitute and required course shall meet the following equivalency criteria: the number of credits and level of the substitute course must be the same or higher; and the course is in the same language of instruction.

### **Student Class Level**

The student class level is defined in accordance with the following criteria:

|              |                     |
|--------------|---------------------|
| First year:  | 00-30 credit hours  |
| Second year: | 31-64 credit hours  |
| Third year:  | 65-98 credit hours  |
| Fourth year: | 99-130 credit hours |
| Fifth year:  | 131+ credit hours   |

### **Attendance**

Students are required to attend all class meetings and course-related activities. The instructor shall issue the first warning if the number of student absences exceeds 10 percent and a final warning upon the approval of the Dean if the student misses more than 15 percent of the total semester sessions. If the absences reach the 20 percent, the student shall be barred from taking

the final exam. Students who represent the country or the university in official activities shall be allowed up to 25% absences. If the absence is due ill health or other exigent circumstances, the Dean may recommend that the students is assigned a grade of W to the course. All absences, excused or otherwise, shall be counted and the student is accountable for the missed work. All related decisions shall be reported to the Registration Department for action. The Instructor must state the attendance policy in the course syllabus. A student may not be withdrawn from a course(s) if the semester load would fall below 9 credits.

### **Course Syllabus**

Instructors are required to give students in each course a detailed syllabus at the beginning of the first-class meeting. The syllabus is a way to inform the students of the course's salient features and rules to help them plan accordingly. The syllabus should at the very least include the following components: Information about the instructor – Name, contact information, office location and hours, and the manner and medium of communicating with the students; information about the course - title, brief description, pre-requisites, topics covered, learning outcomes; course resources - textbook, web links, references, technology tools and instructional materials; course activities and related deadlines - homework, quizzes, projects, research papers, presentations, group work; etc.; assessment criteria and grade distribution; statement to inspire engagement, communication, motivation, and self-expression; and class policy on attendance, exam make-up, etc.

### **Assessment and Examinations**

The College Council shall establish and continuously review and update course evaluation and examination policies and procedures applied in the courses offered by the college. A brief outline of the current policies and procedures is given below.

#### **Performance Assessment**

The student has the right to have his academic performance assessed and to receive continuous feedback in accordance with university guidelines. Assessment of Student performance shall be based on the level of attainment of the course outcomes stated in the course syllabus. Assessment instruments include, but not limited to, homework, exams, research papers, projects, practical work, research, etc. The instructor must complete a midterm performance assessment and report the results before the withdrawal deadline to give unsatisfactorily performing students a chance to withdraw and to help faculty advisors better advice students during the registration period.

#### **Examinations**

The course syllabus must state the number and dates of exams to be given during the semester. In the case that only one exam is planned, the exam should be given during the seventh and the ninth week or a regular semester or in the fourth week of a summer term. If two exams are planned, the exams should be given on the sixth and twelfth weeks of a regular semester or on the third and fifth week of a summer term. The instructor is responsible for preparing clearly written and properly weighted exam questions in line with the course content, language of instruction, learning outcomes, and allotted exam time period stipulated in the course syllabus. An appropriate exam should be given to the students with clear instructions on exam rules. The instructor shall correct the exam within a week after the exam and report the grades in letter form and percentage to the Department Chair a week later. Final examinations are given during the period approved by the University and noted in the academic calendar. A student shall not be

allowed to take his/her final examinations without having settled all his/her financial obligations to the University.

### **Absence from the Final Exam**

If a student fails to attend a final examination without a valid excuse, the student shall receive an “F” grade for the course. If missing the exam is due to exigent circumstances beyond the student’s control, the student may submit a petition to the Dean of the concerned college and if the Dean concludes that the stated reasons are justifiable, he/she will inform the Registration Department to record an incomplete ‘I’ grade to the course. The student in coordination with concerned department and course instructor must take a make-up exam to replace the “I” before the end of the add/drop period of the following semester. If the exigent circumstances persist, the Dean may recommend that the “I” grade be changed to “W”. Otherwise, a grade of “F” will be automatically assigned to the course.

- Credit for incomplete grade will be assigned to the semester in which the courses were taken.
- Graduation requirements shall be considered complete and the student is cleared for graduation in the semester his/her all Incompletes are resolved.

### **Make-up examination**

The instructor will indicate in the course syllabus the policy that he/she intends to follow in the matter of missed examinations and quizzes, so that the students are fully aware of this policy and its consequences. Normally, a student shall receive a grade of zero for the exam or quiz he/she misses. If the absence is due to a legitimate excuse for which a verifiable evidence is presented, the course instructor may then give the student a make-up exam.

### **Appeal of Final Exam Grade**

If a student feels that the grade he/she has attained on an exam was unfair, should promptly discuss the matter with the instructor of the course. If the student and the instructor are unable to arrive at a solution, the student may then request for an “Exam Review” to the concerned Dean through the Registration Department within two weeks after the grade is posted. If the student’s concern is legitimate, the Dean shall form a committee consisting of the Department’s Chair, course instructor and one other faculty member from the same department to investigate the request and adjust the grade in accordance with standard procedures.

### **Course Grades**

#### **Course Grade Distribution**

The course components, topics, associated assessment criteria and course grade distribution must be clearly stated in the course syllabus. The course grade is distributed in accordance with the following guidelines:

**Lecture-only courses:** 45 to 55 percent of the total course grade should be assigned to the final examination and 45 to 55 percent should be given allotted for the other course activities including exams as approved by the department council. Any grading scenario that does not meet this policy should be approved by the College Council early in the semester.

**Practical-oriented courses:** Depending on the nature of the course, the College Council shall articulate the corresponding grading policy.

**Special courses:** The department and college councils shall develop the rules to grade students' work in courses that have a special nature and do not fall under the above categories.

### Submission of Final Grades

The instructor shall prepare the final course grade report according to the established format and submit it to the Department Chair within 48 of the final exam time. The Department Chair forwards course grades reports to the College Council for certification. The certified grades reports are forwarded to the registration department within 72 hours after the final exam to roll them into students' records. All semester grades must be entered by the instructor on the Self-Service Banner system.

### Change of Grade

A course grade cannot be changed after it has been submitted. If extreme circumstances warrant a grade change, the course instructor explains the reasons on a "Change of Grade Form" and submits it to the dean of the concerned college through the department chairperson for action before the beginning of the following semester. Grade cannot be changed after the Bachelor Degree is awarded.

### Grade Point Average (GPA)

#### Semester GPA

The Semester GPA is computed as follows:

- 1) Determine the course quality points by multiplying the number of the course credit hours by the value of the letter grade (see the "Grading" section below)
- 2) Add the total quality points and the total number of corresponding credit hours.
- 3) Divide the total quality points by the total number credit hours. The higher grade of a repeated course is used in the computations. A "W" grade is not included in the GPA computations.

#### Cumulative GPA (CGPA)

The cumulative GPA is computed as follows:

- 1) Determine quality points of all courses taken
- 2) Add the total quality points and the total number of corresponding credit hours.
- 3) Divide the total quality points by the total number credit hours. The higher grade of a repeated course is used in the computations. A "W" grade is not included in the CGPA computations.

### Grading System

Letter grades are used to represent student performance in a course. The letter grades are calculated according to the scheme outlined below. The minimum passing letter grade is D.

| %                             | Letter Grade | Grade Value |
|-------------------------------|--------------|-------------|
| More than 90                  | A            | 4           |
| More than 85 and less than 90 | B+           | 3.5         |
| More than 80 and less than 84 | B            | 3           |
| More than 75 and less than 79 | C+           | 2.5         |



| %                             | Letter Grade | Grade Value |
|-------------------------------|--------------|-------------|
| More than 70 and less than 74 | C            | 2           |
| More than 65 and less than 69 | D+           | 1.5         |
| More than 60 and less than 64 | D            | 1.0         |
| Less than 60                  | F            | zero        |

Students performance is designated according to his/her GPA as follows:

| GPA            | Designation  |
|----------------|--------------|
| 3.6+           | Excellent    |
| 3.00 – 3.59    | Very Good    |
| 2.5 – 2.99     | Good         |
| 2.00 – 2.49    | Satisfactory |
| Less than 2.00 | Fail         |

#### Not Counted Grades in Averages in All Degrees

|    |             |
|----|-------------|
| I  | Incomplete  |
| EX | Exempted    |
| GR | Granted     |
| P  | Pass        |
| F* | Fail        |
| NP | No Pass     |
| U  | Continue    |
| TR | Transferred |
| W  | Withdrew    |

#### Special Codes

|   |  |
|---|--|
| I | Included in GPA and counted toward degree. |
| E | Excluded from GPA and degree.              |
| A | Included in GPA and not counted toward     |

### **Honors and Distinction**

A Bachelor degree student graduating with a CGPA of 3.60-3.79 shall be awarded the designation of “Honors” and those graduating with a CGPA of 3.80 and above shall be granted a designation of “Highest Honors”.

### **Withdrawal**

#### **Withdrawal from Courses**

A student may, upon approval of the academic advisor, withdraw from one or more courses during the first week of classes of a regular semester or two days after the commencement of the summer session. No record of the dropped course(s) shall appear on the student’s record. The student is responsible to settle the financial matters due to the change.

A student, upon approval the academic advisor, may withdraw from one or more courses between the second and the tenth week of classes of a regular semester, or during the third and fourth weeks of a summer term, provided that the student’s load (excluding summer) does not fall below 9 credits. A grade of “W” shall be recorded on the student’s transcripts for each withdrawn course. Approval of the College Dean is required if the withdrawal results in a load less than 12 credits.

Students who withdraw from classes after the drop period are responsible for all related tuition and applicable fees.

#### **Withdrawal from a Semester**

A student may, for verifiably exigent circumstances, petition to withdraw from all semester’s courses at any time after the drop/add period and before the final exams begin. A grade of “W” shall appear on the transcripts for each withdrawn course. A student returning in the following semester may register by following the normal registration procedures.

#### **Withdrawal from the university**

Students who wish to withdraw from the university are required to complete established clearance procedures.

#### **Registration Suspension**

The Registrar Office may, upon the request of a student who has been a regular student for at least one semester, suspend his/her registration and keep his/her grades obtained before suspension if there is a compelling reason for doing so.

If a student temporarily discontinues his/her studies at the university without requesting suspension of registration within four-week period, his/her registration shall be suspended as a matter of course by the Registrar Office.

Suspension of registration shall not exceed four continuous or discontinuous semesters throughout the student’s candidacy for the bachelor’s degree. Semesters in which the student is given a withdrawal without failure by the College Council shall constitute part of this period of four semesters provided that the semesters of withdrawal shall not exceed two semesters after

taking the four-semester limit of suspension; thus the total semesters of suspension shall be six ordinary semesters.

If the period of suspension above exceeds the four-semester limit, the student's registration shall be canceled, and this cancellation shall be duly recorded in the student's academic record. The period of suspension of registration shall constitute part of the maximum period of study at the university.

Suspension of registration shall not exceed two continuous or discontinuous semesters throughout the student's candidacy for the diploma's degree. Semesters in which the student is given a withdrawal without failure by the College Council shall constitute part of this period of two semesters. If the period of suspension exceeds the two-semester limit, the student's registration shall be canceled, and this cancellation shall be duly recorded in the student's academic record. A student whose registration has been suspended shall have forfeited the right to have credit for courses studied at another university, community college, or other institution of higher education transferred.

The suspension period shall be counted as part of the maximum period of study at the university.

### **Change Major**

A student who has completed at least 15 credit hours in a major may request a Change of Major in a regular semester (fall or spring). The dean of the new college, in consultation with the department chairperson of the aspired program, decides on the request before the start of the following semester based on the following conditions: the request meets college rules and requirements; a seat in the desired major is available; the student has not changed major before within the same college; the number of earned credits in the prior major is less than 64 credits unless the student was forced out of the major due to academic warnings.

The Registrar Office shall transfer credits earned in the program transferred from, which are compulsory in the new program, and to include grades obtained therein in the semester averages and the CGPA.

The Registrar Office shall transfer credits earned in the elective courses studied in the program transferred from if the student so wishes and if these courses are required in the new program. Grades earned therein shall be included in the semester average and the CGPA.

No student shall be transferred from one program to another from which the student has been transferred due to an academic warning.

Intensive English Program students may request a reassignment of major. Reassignment of majors shall not be considered a transfer or a change of major.

### **Academic Warning and Dismissal Academic Probation**

A bachelor student receives an academic probation if his/her CGPA falls below 2.00 at the end of the second or any subsequent matriculated semester, excluding summer session. A student receives a second probation if he/ she fails to remove the first probation by the end of the following semester. Students with two consecutive probations may choose one of the following options:

a) Continue in the same major with the approval of the College Council and risk academic dismissal if the probation is not removed by the end of the following semester; i.e. the student receives three consecutive probations in the same major.

b) Change their major: if accepted, the transferred courses and CGPA will be determined according to the requirements of the new major. If the CGPA of the first semester after the change of major is 2:00 or higher, the probation status is removed, and if not it shall remain in effect. The Registration Department shall generate a report of probation students at the end of every semester and inform the student and the concerned department of the probation status. A student may remove probation in a summer term but the results shall not cause a probation.

### **Course Load**

Normally the maximum study load for a student on probation is 12 credits (6 in a summer term). The load may be increased to 13 credits (7 in a summer term) if one of the courses is a 4 credit-hour course or a 1-credit required lab course. The load may also be increased to 15 credit hours (9 in a summer term) if the student is expected to graduate at the end of the semester subject to the approval of the concerned dean.

### **Forced Change of Major**

A student whose CGPA falls below 1.0 point at the end of any semester must transfer to another program and shall not be allowed to return to the old program in the future.

### **Academic Dismissal**

A student shall be dismissed from the university in the following cases:

- 1) If the student receives three consecutive academic probations while studying in the same Major;
- 2) If the number of probations reaches 5 during the entire period of the students' study;
- 3) If a student receives 2 academic probations in a study program and transfers to another program and then receives 2 consecutive probations on the new program. In such a case, transfer to any other program will not be permitted.
- 4) If the CGPA drops below 1.0 more than once during their period of study.

Summer sessions will not count in terms of academic probations.

A student after having completed more than 90 credits with a CGPA of 1.95 or higher and receives academic dismissal due to attaining a probation shall be allowed to study one more semester to clear probation. The Registration Department shall inform the student and the concerned department of the dismissal decision.

### **Student Records and Transcripts**

The university is committed to protecting the rights of its students to privacy and confidentiality of their personal and academic records. Only authorized personnel are entitled to access secured student records. Professors are required to post exam results by student ID numbers and not by student names. Official transcripts may be issued to a third party only if a signed authorization from the student is presented. Official transcripts are signed by the Director of the Registration

Department. Students may access their unofficial copy of the transcript or a record of their grades any time they are in need of it through their Banner Self-service.

### **Names on Diplomas and Degrees**

Names on diplomas and degrees are spelled exactly as they appear on passports as required by the Ministry of Education (MOE), and in special circumstances, reference can be made to other official documents such as, identity card, secondary school certificate, ... etc.

If after admission the name on the passport changes the student must update his/her records by submitting a certified evidence of the change to the Registration Department before graduation. Otherwise the old name will appear on the diploma which cannot be changed thereafter.

### **Graduation**

A Bachelor Degree is awarded to students after fulfilling the following requirements:

- a. That all courses required in the Study Plan are passed;
- b. That the student has a Cumulative Grade Point Average (CGPA) of 2.00 or higher; and that any other requirements detailed in the Study Plan are completed and/or met;
- d. That the student has completed the award taking at least the minimum period stipulated; and that the student has completed the award within the maximum period stipulated.

### **Academic Integrity**

The University of Sharjah comprises a community of students, faculty, administrators, and staff who share a commitment to learning of the highest quality. Since the practice of academic integrity is essential to learning, the university fosters a culture of honesty and respect. Adhering to aspects of integrity is a shared responsibility in any community. Students at the University of Sharjah are expected to honor scholarly values and assume academic, cultural, and social responsibility throughout their learning experience. The free exchange of ideas depends on the participants' trust that they will be given credit for their work. Therefore, everyone in an academic community must be responsible for acknowledging their use of others' words, research results, and ideas, using the methods accepted by the appropriate academic disciplines. Since intellectual workers' words and ideas constitute a kind of property, plagiarism is like theft. Any violation of academic integrity codes either in or out of the classroom will be handled with the appropriate disciplinary measures by the University administration. In addition, a primary responsibility of an instructor is to certify that a specific academic assignment has been mastered sufficiently to merit college credit. An integral part of this responsibility is to take all possible precautions to ensure that the credit has not been attained by fraud. Instructors at the University of Sharjah should and would rigorously enforce honesty concerning all academic work submitted by his/her students for evaluation.

### **Intellectual property Ownership Rights**

Unless otherwise stated in this policy, UOS shall own all Intellectual Property Rights of inventions or creative works carried out by faculty, staff and students at or under the auspices of UOS making substantial use of its resources.

### 1- Intellectual Property Created by Faculty and Staff

- a. Except as stated in paragraphs e and f of this section, UOS shall own all Intellectual Property invented, created or designed by faculty or staff members (post-docs, assistants, trainees, or students who are hired as employees) for the purpose of research, teaching and administration during their Employment at the university.
- b. Intellectual Property developed by faculty or staff as result of significant support from the UOS, including funds, facilities, resources and space is assigned to the university and considered university-owned.
- c. A faculty or staff member shall be required to sign any documents or formalities required to facilitate the protection of the invention and the filing of patent applications and the related procedures, including assigning his/her intellectual property rights to UOS
- d. By signing these documents, the inventor agrees to assign the intellectual property s/he has developed to UOS to be managed by the Technology Transfer Office.
- e. UOS does not claim ownership of copyright in any written work written by faculty for the purpose of scholarly research, such as: journal articles, conference proceedings and scientific books.
- f. UOS does not claim ownership of copyright material in artistic, musical, or imaginative works created or composed by faculty, except where such a work is considered as a potentially valuable IP asset - upon recommendation by the TTO - or has been specially made on request by the university.

### 2- Intellectual Property Created by Students

- a. Students who create intellectual property as a result of their participation in study programs at UOS, such as PhD dissertations, research reports or graduation projects shall retain ownership rights to that property unless:
  1. It makes considerable use of UOS property, personnel or facilities.
  2. It is supported by a direct allocation of funds through the University (grant, contract, fellowship, scholarship, etc.)
  3. It is commissioned by the University.
  4. It is subjected to contractual obligations such as a sponsored research agreement.
- b. b- If any of the above conditions are met, students shall be treated in the same way as any UOS employee. Students must disclose to the Technology Transfer Office any intellectual property they have developed in which UOS may have ownership rights.
- c. c- A faculty member who supervises students should have them sign an Assignment of Ownership Agreement Form and a non-disclosure form.
- d. d- Any student engaging in research or development of intellectual property under the supervision a faculty in connection with any program or activity subject to this Intellectual Property Policy shall claim no ownership rights, unless s/he has significantly contributed to the IP creation, and will be eligible to share the income and/or equity distribution determined by the Technology Transfer Office proportionally to his/her contribution as per the signed IP disclosure form.
- e. e- If a student independently creates and owns intellectual property that s/he believes to have a commercialization potential, the student may ask the TTO support to involve the university

in the commercial exploitation of that property and shall assign the IP rights to UOS. In this case all the other procedures of IP policies - including revenue distribution - shall be applied.

### **Students Rights and Responsibilities**

Governed by the University bylaws and defined policies and procedures, the following students' rights and responsibilities are defined:

#### **Student Rights:**

- Pursue academic education as long as the student is satisfying the eligibility criteria and adhering to the academic standards.
- Receive education in professional, supportive, equal and safe academic environment
- Be clearly informed of study plans and related bylaws, policies and procedures
- Have access to University facilities, services and learning resources
- Have access to related personal and academic records and have protection against unauthorized disclosure of confidential data
- Enjoy the benefits of student services
- Form and participate in student activity associations and clubs as described in the by-laws
- Membership and nomination in Student Union as indicated in the bylaws
- File a grievance when feeling treated unjustly by the disciplinary committee
- Submit an appeal to review grading of an examination as governed by the bylaws

#### **Student Responsibilities:**

- Adhere to all applicable University bylaws and laws of the Emirate of Sharjah and United Arab Emirates
- Respect Islamic ethics and cultural values of the UAE
- Uphold and maintain academic honesty and integrity
- Perform all academic obligations and be an active participant in the learning environment and the welfare of the university community
- Use university property and facilities in a manner that is responsible and mindful of the rights of others
- Respect the right and dignity of faculty members, university staff, students and others within and outside of the university community
- Provide the University with correct personal data and authentic documentation and update it whenever applicable.
- The terms and conditions in this manual and other UoS catalogs are considered as a part of contract between students and University of Sharjah.

To help students and faculty learn what constitutes scholastic dishonesty and how to maintain academic integrity, all students of the University have access to the following:

1. Students rights and submitting a grievance.
2. By Law of discipline.
3. By law of scientific associations.
4. By law of activity associations and clubs
5. Financial aid program
6. By law of Residence
7. UoS Catalogs
8. UoS policies and procedures manual.



### Classroom Expectations

A professor will normally provide at the beginning of each semester, an outline of the lectures, activities, assignments, and grading system appropriate to the course. The primary responsibility for managing the classroom environment rests with the faculty. Students who engage in any prohibited or unlawful acts may be directed by the faculty member to leave the class. Behavior that a reasonable person would view as substantially or repeatedly interfering with the conduct of a class or conduct that is disruptive, disrespectful or threatening will not be tolerated. In addition to academic measures that may be taken, behavioral infractions may be resolved through the Code of Student Conduct.

### Attendance

- Students shall attend all theoretical lectures, laboratory hours, and training sessions. They shall also participate in research sessions and sit for all examinations required in the courses in which they are enrolled.
- If a student's absences exceed 10% of total hours designated for one or more courses without an acceptable excuse, the instructor of the course shall issue a warning. If the absences reach 15% without an excuse acceptable to the College, the instructor shall issue a final warning with the Dean's approval.
- If absences reach 20%, the student shall be barred from sitting for the final examination(s). If the absence is caused by ill health or some other cause acceptable to the Dean, the student shall be given a withdrawal mark (W) in his/her transcript. All such cases shall be reported to the Registrar's Office. However, students who represent the country or the University in official activities shall be allowed up to 25% absences.
- All absences, whether with or without an excuse, are calculated as part of allowable absences.

For more information about the attendance policies see the UoS policies and procedures manual.

### Remedial Course

Academic knowledge and background is crucial part in the education process. The UoS offers remedial courses to develop students' background in such a field and major which may help student entering the program smoothly. Moreover, the remedial courses will help student apply to the higher level of education with solid educational foundation without any challenges or problems. The remedial course not offers toward a degree or to be in the study plan structure. It is (zero) credit hour and the grade not affects the GPA of the students.

- Remedial course may offer for graduate or undergraduate students.
- Remedial courses should have a clear course syllabus which contain of a measurable student course learning outcomes (CLOs).
- Faculty teaching remedial course should have an experience in a field related to the subject and appropriate qualification in related field.
- Students who are admitted conditionally and required to complete some remedial courses in UOS in order to fulfil the admission requirements, shall register the remedial courses that are specified by UoS.



- The Student should pass the minimum grade assigned for this course. The student GPA will not include the grade of remedial course.
- The maximum period to pass the remedial course(s) is specified to the student before register the remedial course.
- In case students do not pass the remedial course in their first attempt, they have the chance to repeat it the following semester if UoS and ministry of education by-laws allow that.
- In case the student fails, his/her record may be terminated and leave the institution based on the UoS by-laws and CAA standard.
- The graduate students can register for credit-bearing course after they have successfully completed remedial course if required.
- Remediation usually takes place during the first Year (Foundation Year) and it is preferable to be in the first semester to make the program study plan for the student more effective and practical.
- Each remedial course has E-file for archiving and assessment purposes.

### Students Appeals

UoS gives the students chance and right to apply for any doubts in the academic results or any academic complaints. Students appeals is a formal request from a student asking for review a decision relating to any exam results, assessment, progression or any academic issue.

- Students have the right to apply for appeals and petitions for any issue in receiving academic results and decisions.
- UoS is committed to the equitable dealing and fair treatment in students' appeals.
- Submission appeal should be via registration department by online system.
- For more integrity and credibility, the students can follow their appeals electronically until received the final result.
- Any Appeal should be applied and dealt with within same academic year and should not be delay it to the next academic year.
- An Appeal must be raised within two weeks after receiving written result.
- Student should be aware of all terms, condition and fees before applying for such appeal. Most of the Appeals is free of charge except the review of final exam it is charge 21 Dhs and all the fees should be published in the UoS Website:  
<https://www.sharjah.ac.ae/en/Admissions/fees-scholar/Pages/sf.aspx>
- Student cannot raise new issue during the triage and review stages.
- UoS deal with appeals with all respect, handle students' information confidentially and provide students all support information, evidence and resources.
- Students are responsible for engaging in the appeal process in a respectful manner.
- UoS is responsible to form a committee for students' affairs and petitions. This Committee shall study each student's petition in detailed.

## Type of Appeals

The students have the right to appeal university decisions made in respect of:

- Examination Outcome.
- Academic Progress.
- Student Grievances and Complaints.
- Academic Misconduct.
- Fitness to Practice.
- General Misconduct.
- Fitness to Study.
- Suspension Order.
- Incorrect Information.
- Selection into a Course.
- Student Transfer Decision.
- Academic Probation.
- Exclusion for a Notifiable Disease.
- Admission Denial.
- Course or program registration Denial.
- Class Rooms Denial.
- Exam Denial.
- Certificate and Graduated Denial.

## Appeals Process

- Students fill and apply the electronic form of the appeals.
- Student will submit the appeal within the submission deadline and academic calendar.
- The Committee should meet periodically during the semester according to the cases submitted.
- All the appeals and its documentations will be carefully reviewed by the Committee.
- The decisions of the Committee are final after approval from chancellor and Dean.
- The final result will be informed to the student via the electronic system.

## Guide for Submission

- A student may submit a written petition to the Dean of the College which offers the course within two weeks after the grades have been posted to have his/her final examination answer sheets or booklet reviewed.
- The petition shall be submitted through the Registrar's Office after payment of a fixed fee.
- If the petition is granted, the review shall be conducted by a committee formed by the Department's Chair consisting of himself/herself and two other members of the Department, one of whom shall be the instructor of the course.

- The review shall ascertain whether or not there is a material error in adding up the grades allocated to each question, copying the components of the grade, or forgetting to correct a question partially or wholly.
- If such an error exists, the instructor of the course shall correct it, and the corrected result shall be approved in accordance with standard procedures.
- The student may apply through the E-Services portal to fill the Student Issues form explaining the request.
- The Office of the Registrar reviews the case of the student and writes a brief explanation of the issue and the academic status of the student.
- The case is reviewed by the academic advisor, the head of department, the dean, and the student Issues representative at the college.
- Once the request is approved by the college, it is forwarded to the representative of the Student Affairs in the Office of the Registrar.
- All cases are presented in the Student Affairs Committee for decision.
- The secretary of the committee will consolidate the cases and their decisions in one form to be forwarded to the Chancellor for approval.
- Once approved, the committee's secretary will distribute the decisions among college registrars to implement and inform students.

### Transferred Students Process

Transferred students must meet the transfer student conditions in order to look into their credit transfer. Credits that comply to this policy might be transferred towards the student's degree in UOS.

- The student affairs committee shall be formed annually in UoS. This committee shall review petitions of an academic nature, put forward by students, including courses they plan to register or withdraw from the evaluation, transfer student or credit, adjustment, or equating of academic record or any other matters related to academic issues. The committee shall study each student petition and then presents its recommendation to the chancellor for approval.
- The students who would like to transfer into UoS should have study records from licensed institution approved by CAA or any recognized institutions of higher learning located outside the UAE.
- Any transferred student should present in advance valid language certification such as EmSAT, TOFEL or IELTS.
- Any students who are not in good academic standing can transfer only to a program in a field distinctly different from the one from which the student is transferring.
- UoS allows the credits for clinical training to be transferred only when done in the UAE under review and approval from CAA.

### **Undergraduate and Diploma Students Transferring from another University**

Students who are admitted as transferred students:

1. The maximum number of credit hours that can be transferred from another recognized university within the framework of the study plan applicable to the student at University of Sharjah shall not exceed 50%.
2. The Department Council may transfer credit for all or some of the courses taken in the university transferred from, provided that the grade in each is no less than C+ (2.5 out of 4.0) or equivalent.
3. Students transferred from a recognized institute of higher education to one of the University's colleges may transfer credit for all or some of the courses taken there provided that the grade in each is no less than B (3.0 out of 4.0) or equivalent.
4. Students transferring from other universities or institutes of higher education shall not benefit from their academic record if they have discontinued their studies for a period of four regular semesters or more.
5. Grades or averages transferred from another university shall not be included in the student's CGPA at UOS.
6. No transferred credits allowed in the foundation year in Medicine and Dental Medicine as courses grades must be counted for the promotion purposes.
7. No courses taken by a newly transferred student will count for credit if he/she has already gained a degree.
8. UoS does not allow credit for graduation project to be transferred.

### **Procedure and Process for Transferred Students**

1. After the student is accepted as a transferred student by satisfying the minimum admission conditions, the student prior transcript, course syllabus, and transcript verifications are forwarded from the Admissions Department to the College for course evaluation.
2. The college forms a committee to evaluate the course syllabus.
3. The result of the evaluation is sent to the Office of the Registrar, where the following conditions should apply in order for the registrar to include the transferred credits in the student's transcript:
  - a. The student had completed a minimum of one year or two semesters in his previous institution (for diploma and undergraduate programs).
  - b. The CGPA in his previous institution is not below 2.5 out of 4.0 (for diploma and undergraduate programs).
  - c. The previous institution is accredited by the Ministry of Education and the transcript is verified to be authentic.
  - d. The grades of the transferred credits comply to the policy above.
  - e. The number of total transferred credits comply to the policy above.

- f. The number of credits of each transferred course should be equal or higher than the equivalent course in UOS.
4. All transferred credits are inserted in the transcript of the student, however only those that comply to his study plan are included in the earned hours.
5. The registrar informs the student of the courses that have been accepted from his previous institution and updates the student study plan accordingly.
6. Transferred courses are indicated in the transcript by the grade 'TR'.
7. The name of the previous institution and UOS equivalent courses shall be displayed on the transcript.
8. In case a student repeats a course that was accepted as a transferred course, the transferred course will be excluded from the transcript and the grade of the course taken in UOS will be counted if it was passed

## Information Technology Center

Mr. Robert Irving, Director  
Main building, M11-216  
Tel: +971 6 5050070  
Email: [rirving@sharjah.ac.ae](mailto:rirving@sharjah.ac.ae)  
Website: <http://www.sharjah.ac.ae/itc>

The Information Technology Center (ITC) provides optimal IT solutions to support university faculty, students and staff in their quest to achieve excellence in teaching, learning, research and service. The ITC actively engages in the teaching and learning processes by introducing enabling multimedia solutions and mobile technologies, creating a smart classroom environment, and supporting the effective utilization of the learning management system. The ITC also supports administrative divisions in adopting technologies that improve user productivity in executing university functions. The ITC provides integrated online services through the UoS portal and most up-to-date communication technology and manages all university information systems. Additionally, the ITC is responsible for procuring, maintaining, and upgrading all hardware, software and applications dedicated to running university academic and administrative functions. The ITC also engages in infrastructure planning and maintenance and in supervising ongoing projects in terms of Fiber Optics and internal cabling.

### Operation and Network Services

The ITC runs a state-of-the-art data center that houses the computers and related telecommunications and storage systems, including Blade Server technologies, Virtual Desktop Infrastructure, Storage Area Networking, Virtualization, Video Conferencing and Intrusion Prevention. The Center includes redundant power sources, redundant data communications connections, and environmental controls and security devices.

The Center also includes a large number of servers that provide all students, faculty, and staff the storage space and privileged access to network-based data, software resources, and Internet and e-mail services.

The network serves all faculty members, administrative staff, and students. It covers over 50 buildings with classrooms, offices, student dorms and faculty housing villas on all University campuses. The Gigabit Ethernet fiber-optic backbone network is connected to the Internet through a 500 Mb/s line to provide the necessary bandwidth for quality services. The network consists of over 27,000 voice/data points of which 18,000 are active and includes more than 1,100 Wireless Access points covering all University buildings, including heavily occupied outdoors areas. At present, nearly 7,000 computers are connected to the University network.

The university PABX supports Analog telephone lines and IP Telephony with a call accounting system, call forwarding, and telephone to mobile forwarding services. More than 4,000 lines are available to all university faculty and staff members and to students in the dormitories.

### **Management Information System (MIS)**

The Management Information Systems (MIS) Section includes a highly competent team that manages the University Information Systems. The MIS Section is responsible for developing, administrating, supporting and providing service management for the University ERPs, including the: Student Information System (Banner), ID card system, student accounting, finance, payroll, human resources systems, library and archiving systems, and staff work log system. Furthermore, the MIS Section manages information and generates reports to various university divisions for planning and decision-making purposes.

### **University Website and Portal**

Web content is managed through the latest release of Microsoft Office Share Point Server 2010. The system hosts the university's public website and an internal "Collaboration Portal" that provides university users with all available online services including the Learning Management System, Library Catalog, Training portal, (CBTs) the Human Resource System, Student Information System and much more.

### **Instructional and Classroom Technologies**

A team of dedicated specialists ensures that the technology-aided teaching and learning needs of faculty and students are met. The team maintains the multimedia assets of more than 400 classrooms, supports four video conferencing facilities in four different locations and manages a network of plasma screens located throughout the campus to broadcast information and announcements to students. The team manages the Blackboard - Learning Management System (LMS), which provides the platform through which faculty and students actively engage with course material to improve the students' potential of attaining expected learning outcomes. New tools are being introduced to simplify the creation of online course and enable conversion of documents to dynamic objects with flash cards, quizzes, video/audio, navigation and images.

### **IT Support and Services**

The IT support and services team provides innovative technologies and learning resources linked through the UoS portal to support the faculty, students and staff and ensure that their IT needs are met. Support channels include self-service procedures, FAQ's, IT knowledge-based material, online requests, service desk and personalized special support. Training services offer a wide variety of IT learning modules and workshops that help the UoS Community (Faculty, Staff and Students) to make efficient and effective use of Information Technology in their daily work. The training program is available to all members of the UoS community. Issues that cannot be handled through these services are outsourced to external related IT services providers

## **The Marketing and Student Recruitment Department (MSR)**

Dr. Nadia Farhat, Director  
Main Building M11 – Ground Floor  
Tel: +971 6 50503871  
Fax: +971 6 5053872  
Email: [msr@sharjah.ac.ae](mailto:msr@sharjah.ac.ae)  
Website: [www.sharjah.ac.ae](http://www.sharjah.ac.ae)

The Marketing and Student Recruitment Department (MSR) develops and continuously improves recruitment plans in accordance with the university's mission, goals and strategic plans. MSR has a twofold objective; the first is about student recruitment be it graduate or undergraduate and the other is about Marketing and Brand Management for the UOS that would eventually cascade to the recruitment process and repositioning the university of Sharjah in the local and global education Markets.

Student recruitment at the undergraduate level is all about making sure that schools, counselors and students are well informed about existing majors and student life at the UOS. This is accomplished through rigorous outreach programs, including onsite school visits and UOS campus 'Open Days' with one-on-one or group sessions; and using our online interactive facilities, and through the UOS Academic Advising program (APP).

Due to the current pandemic most of our advising methods have been converted to an online advising service where school students are invited to participate and get the proper academic advice.

We participate in virtual education exhibition locally and internationally. Also we contact many virtual webinars that explains to prospective students what each academic program is and their future career options in the aforementioned programs,

Student recruitment at the graduate level is about reaching the prospective applicant locally and internationally through rigorous outreach programs that satisfies the market need.

The UOS offers exciting learning opportunities, state-of-the-art facilities, numerous programs and specializations delivered by highly-qualified faculty members and an administrative support network that ensures that you make the most of their university education. At UOS, students are our number one priority and we help them reach their highest potential. We assist students in choosing a major to match their interests and skills and encourage them to engage in the University's collective global education, made possible through its international collaborations, internships and training opportunities.



## Student Affairs

Professor Eid Kanaan  
Dean of Student Affairs - Men  
Building M21 – First Floor  
Tel: +971 6 5050700  
Email: [ekanaan@sharjah.ac.ae](mailto:ekanaan@sharjah.ac.ae)  
Website:  
<http://www.sharjah.ac.ae/>

Dr. Salama Al Rahoomi  
Dean of Student Affairs - Women  
Building W21–108, First Floor  
Tel: +971 6 5050702  
Email: [salrahoomi@sharjah.ac.ae](mailto:salahoomi@sharjah.ac.ae)  
Website:  
<http://www.sharjah.ac.ae/>

The Office of the Dean of Student Affairs is responsible for many functions that serve to support the nonacademic aspects of university life in order to improve students' potential for academic success and help them attain a meaningful holistic experience. The Office manages students' clubs and societies, promotes athletic and creative activities, organizes cultural events, oversees housing facilities, provides counselling services, supports training and career placement, organizes commencement ceremonies, and participates in student orientation programs. A brief overview of the various functions is presented in the following:

### Cultural, Social and Artistic Activities

The Office of the Dean of Student Affairs organizes and supervises a wide spectrum of cultural, social, artistic and theatrical activities and events in addition to encouraging students' clubs and councils.

To accomplish such an important ingredient of a university education, a team of professional works with male and female students arrange such activities especially those that are physically, psychologically and socially constructive. Within these eventful encounters, talents are discovered and refined.

Both male and female students take part in those activities and participate in clubs and student councils. Students are encouraged to express themselves and follow their passion to discover more about the areas in which they excel.

To participate, please contact the student activity department at 06-5053761 or 065053707 (women) and 065050770 or 065050756 (men).

### Psychological Counselling

The Office of the Psychological Counselling is concerned with building student awareness to achieve social and psychological adaptation, which can positively influence academic achievement and wellbeing. The Office of the Psychological Counselling aspires to find solutions for all sorts of obstacles that students may encounter during their university experience. The Center works on making students settled and secured through interventional individual and group sessions, seminars and workshops, for the purpose of preventing and guiding students on dealing with every kind of difficulty whether on the social, psychological and emotional level. Such workshops and interventions help students deal with their personal problems and various personality challenges, in addition to giving students confidence, developing their communication and social skills, and helping them to deal with their anxieties, take decisions, and overcome family, personal and psychological challenges. For more information, please contact us at 06-5050702, 06-5056905 (women) or 065050759 (men).

### **Dormitories**

There are two separate dormitories at University of Sharjah: The women's dormitory on the women's campus and the men's dormitory on the men's campus.

The employees working in the students' dormitory desire to offer an excellent housing experience to international students and local residents who study away from home. These professionals do their best to secure comfort and the most suitable environment for studying. In addition to that, there are great efforts exerted to strengthen ties and build friendships among different nationalities; thus, bringing different students together and creating one warm family. The student housing experience also engages students in different sports, cultural and social events exclusively organized for students living on campus. For more information on female housing, please contact: 065051401, 065051443, or 065051410 and on male housing 065052774.

### **Athletics and Recreation**

The University of Sharjah includes two sports centers for females and males and another one on the Khorfakkan campus, in addition to a number of tennis and basketball courts, football fields and indoor and outdoor sports facilities. A team of specialists organizes activities and tournaments. For the latter purpose, they enroll students in teams in order to develop their sports hobbies and engage them. Some tournaments are internal; others are external on the national level, and the university teams participate in championships on an international level. The Sports Center also engages the faculty members, administrative staff and their families in different training and sports activities. Furthermore, students who excel at sport can be provided with full scholarship from the university. For more information on female sports, please contact 065053784, 065053773; male sports 065050454; and Khorfakkan Campus 092085784.

### **The Rover Scouts**

The Rover Scouts at the University of Sharjah encourage students to participate in volunteer activities and community service programs to achieve the primary mission of making students more serious and more faithful individuals within their own communities; thus, preparing them to become constructive members within their own societies. Registration is always open. For inquiries, please call us at 065050770( Male) 0650503707 (Female).

### **The Ushers**

This program involves and trains students to help in organizing the events and conferences that take place at the university. They are also trained to participate in formal events as ushers who receive special guests and guide them accordingly. For information, contact us at 065053705 (Females) and 065050756 (Males).

### **The Art Studios**

Because the University of Sharjah believes in the significant role that art plays in our life, the Deanship of Student Affairs has allocated two different studios on the women's and men's campuses where students can visit and practice different forms of art supervised and guided by different artists. The art studios offer students space and tools with the presence of art advisors all year long. For more information, please contact us at the women's center 065053711 and men's center 065050769.

### **Expected Attire and General Conduct**

Students are expected to respect the environment of the University of Sharjah and the Islamic community they are part of; thus, they need to abide by wearing clothing that suit such expectations and the academic environment. Transparent and tight clothes, extravagant shoes, overly funky and colorful hairstyles are not the most suitable for the university environment.

As for students on the medical campus, they are obliged to wear the white coat in the laboratories, clinics and hospital but not on the other premises of the university.

### **Students are also expected to abide by the following:**

- Smoking is not allowed on all premises of the University of Sharjah.
- Observing the cleanliness and hygiene of premises, in addition to protecting the facilities built for its students' own benefit.
- Cheating is not allowed, and students involved in cheating or attempting to cheat will be punished according to the by-laws of the University.
- Respecting the guidelines of proper attire.
- Respecting all by-laws and policies stated in the University Manual.

### **Student Centers**

To provide all sorts of services to students living in the dormitory, the university has two student centers, one on the women's campus and one the men's campus. The Student Centers house several facilities including a grocery store, bank, bookstore, shops, TV room, lounge and a lobby for receiving visitors, in addition to an activity room. In each of these buildings, students have access to the Deanship of Student Affairs offices.

### **Health Care**

The university provides medical clinics for both male and female students on a 24-hour basis, plus ambulance services for emergency help whenever needed.

### **Student Rights and Responsibilities**

#### **The University of Sharjah (UoS) pledges to students:**

- The Right to be challenged to enrich the capacity for critical judgment.
- The Right to receive support in pursuit of answers and meanings.
- The Right to an inspiring and supportive learning environment.
- The Right to receive proper academic advising and mentoring.
- The Right to be treated with dignity and respect by all.
- The Right to receive a clear and informative course outline at the start of the semester and to be informed of any modifications thereafter.
- The Right to receive constructive feedback on course work within a reasonable timeframe.
- The Right to be assessed on the merits of academic performance without prejudice or other discrimination.
- The Right to the confidentiality of academic and personal information.
- The Right to access all information and documents to which students are entitled.
- The Right to express an opinion and convey grievances without fear of retribution.
- The Right to protest the violation of rights, appeal judgment deemed unfair, receive, and understand related decisions.

**And expects students to accept:**

- The Responsibility to understand, comply and safeguard the university by-laws and student code of conduct.
- The Responsibility to set a purpose and have the drive to achieve it.
- The Responsibility to study hard to learn the contents of each course and commit to learning on a continuous basis.
- The Responsibility to know program study plans and graduation requirements.
- The Responsibility to follow course outlines, attend all classes, and accomplish course requirements in a timely and honorable manner.
- The Responsibility to respect and adhere to established university deadlines.
- The Responsibility to be courteous, respectful of diversity, and tolerant to others' beliefs and concerns.
- The Responsibility to express concerns and grievances within the confines of civility.
- The Responsibility to follow due processes and react with reason in the face of conflict.
- The Responsibility to protect university property and preserve campus beauty.
- The Responsibility to embrace sustainable practices and to use natural resources wisely.
- The Responsibility to represent the university with honor and professionalism.

### **Center for Continuing Education and Professional Development**

Professor Radhi Al Zubaidi, Director

Building M25 - First Floor

Tel: +971 6 5057081

Email: [yinshasi@sharjah.ac.ae](mailto:yinshasi@sharjah.ac.ae)

Website: <https://www.sharjah.ac.ae/en/cce/Pages/default.aspx>

The Center for Continuing Education and Professional Development (CCEPD) reinforces the university's bond with the community and strengthens its engagement with real issues. Simply, CCEPD serves as the bridge to transfer the knowledge base, expertise and resources available at the university to private and public institutions, organizations and enterprises in the UAE to help them develop professional skills and overcome challenges in a meaningful way. In so doing, the university aims to contribute to the social and economic development of the community.

The Center strives to develop mutually beneficial collaborative partnerships with willing private and public entities. Before embarking on a project, CCEPD conducts careful assessment and analysis of customer needs and then provide the best services that meet those needs by applying best-in-class practices in the corresponding field. CCEPD can deliver a wide spectrum of services: provide consultancy services in areas partners have no expertise of; conduct comprehensive studies of possible ventures or undertakings; organize and deliver training courses to employees to advance their knowledge and skills in emergent technologies and work practices and improve organizational performance and productivity; deliver training programs all areas that benefit employees and individuals to improve their personal and professional lives; accommodate testing needs utilizing state-of-the art laboratory resources; design campaigns to improve awareness on contemporary issues of concern. CCEPD also works closely with clients to tailor make a service that best confronts emergent shifts in the market place and meet the challenges before them. In addition to tapping to the university resources, CCEPD collaborates with international universities and institutions associated with the cooperation agreements to deliver the best possible service to its customers. The CCEPD delivered a vast accredited training programs recognized internationally.

Over the years, CCEPD has established strong working relationships with a significant number of government and private sector organizations and managed to successfully provide a wide range of services in the form of: Technical and administrative consulting services, feasibility studies; laboratory and technical examinations; institutional assessment, special arbitration, rehabilitation programs, onsite training programs, customized training programs and workshops, special lectures series, and Language training programs in Arabic Language for non-native speakers, French Language in collaboration with the Alliance Française, and English and Urdu Languages courses. CCEPD is also licensed to award the following International certificates: International Computer Driving License (ICDL), Cisco Certified Network Administrator (CCNA), English Language Tests (IELTS) and (IESOL), and CMA for Accounting.

Among the services offered by the CCEPD are the customized professional diploma programs that are organized to meet the clients' needs. Upon successful completion of a program, participants

receive a University of Sharjah Certificate. The CCEPD conducted a number of professional Diploma to different organizations, some of them are listed below:

- Professional Diploma in Leadership
- Professional Diploma in Accounting and Finance Management
- Professional Diploma in Human Resources Management
- Professional Diploma in Graphic design and Multimedia
- Professional Diploma in Public Relations & Organizational Communication
- Professional Diploma in Electronic Media
- Professional Diploma in Leadership in Humanitarian Foundation
- Professional Diploma in Food Safety
- Professional Diploma in Health and Occupational Safety
- Professional Diploma Inspector in Construction Projects
- Professional Diploma in Labor Inspection
- Professional Diploma in Real Estate
- Professional Diploma in Scientific Research & Future Studies
- Professional Diploma In SPSS
- Professional Diploma in Ecotourism
- Professional Diploma in Inspection
- Professional Diploma - Family Counselor
- Professional Diploma in Environmental Inspection
- Professional Diploma in Secretarial and Office Management
- Professional Diploma for Inspectors
- Professional Diploma in Cognitive Behavioral Therapy
- Professional Diploma in Interior Design
- Professional Diploma in Preparing Government Leaders
- Professional Diploma in Advanced Information Technology
- Professional Diploma in Commercial Arbitration
- Professional Diploma in Legal and Administrative Affairs
- Professional Diploma - Nursery Supervisors
- Professional Diploma in Tourism Guidance
- Professional Diploma in Urban Planning
- Professional Diploma in Social Work
- Professional Diploma in Government Communication and Social Media
- Professional Diploma in Banking Services
- Professional Diploma in Quality Management and Corporate Excellence
- Professional Diploma for Preparing Fitness Trainers
- Professional Diploma in Value Added Tax Law
- Professional Diploma in Designing Mobile Applications
- Professional Diploma in Training of Trainers
- Professional Diploma in Government Communication & eMedia
- Professional Diploma in Learning Difficulties
- Professional Diploma in Data Management, Statistical Analysis and Synthesis of Results
- Professional Diploma in Parliamentary Work
- Professional Diploma in Digital Media and Social Media

The CCEPD also offered consultancy services in all the disciplines of all colleges of University of Sharjah, like Engineering, Medicine, Law, Communication, Business and others.

For more information, please visit:

<https://www.sharjah.ac.ae/en/cce/Pages/default.aspx>

### **The Institute of Leadership in Higher Education (ILHE)**

Professor Maher Omar, Director

Building: M25-125

Tel: +971 6 5057061

Email: [malzarouni@sharjah.ac.ae](mailto:malzarouni@sharjah.ac.ae)

Website: <http://www.sharjah.ac.ae/en/Research/ILHE/Pages/default.aspx>

The Institute of Leadership in Higher Education (ILHE) is an excellence and innovation institute within the University of Sharjah that promotes quality in professional developments at the University, including pedagogical and leadership practices. In doing this, the Institute will be working with the stakeholders and colleagues within and outside the University to uphold the University of Sharjah's leadership position in the UAE and the region.

Since its establishment in 2013, the ILHE has been promoting state-of-the-art teaching and learning methods and encouraging the appropriate deployment of the latest technology and social computing software in course delivery. The primary goal of the ILHE is to assist faculty and staff members in keeping up with the ever-changing means of teaching and enhancing students' learning experiences and wellbeing.

Moreover, the ILHE provides world-class training courses that help UoS faculty members to be up-to-date and capable of integrating the latest technology within the teaching process. Besides, the ILHE aims to stimulate and encourage faculty members to conduct scholarly research that focuses on the latest methods and technologies in teaching and student assessments.

In addition to running professional development-oriented programs, the Institute has two initiatives supporting the leadership skills development for aspiring higher education leaders and Emirati students. In this light, a Master's degree of Leadership in Higher Education and the Emirati Future Leadership Initiatives (EFLI) are proposed and will soon be launched. The master's program is developed in response to the growing need for more highly skilled higher education leaders. The EFLI complements the University of Sharjah's strategic goal related to promoting the Emiratisation agenda of the United Arab Emirates.

The Institute is open to collaborative endeavors focusing on professional developments, including workshops for enhancing teaching and learning, and research to improve pedagogical and leadership practices. Please reach out to us if you would like to work with us on any of our priority areas, as shown on our website.

For more information about the ILHE and its upcoming activities, please visit:

<http://www.sharjah.ac.ae/en/Research/ILHE/Pages/default.aspx>



## Language Institute

Professor Shehdeh Fareh, Director

Building: W2/M2 Ground Floor

Tel: +971 6 5050(428)/(269)

Email: [babu@sharjah.ac.ae](mailto:babu@sharjah.ac.ae) / [maleem@sharjah.ac.ae](mailto:maleem@sharjah.ac.ae)

Website: <http://www.sharjah.ac.ae/en/Administration/li/Pages/ppl.aspx>

The Language Institute at the University of Sharjah, UAE is a leading institute in the area of foreign language education at the local and regional levels. It contributes to the realization of the University's mission and goals. The Institute consists of five centers:

- 1) **English Language Center:** The ELC is tasked with enabling students to meet the university's minimal English language admission requirements for English-medium specializations.
- 2) **The Center for Teaching Arabic to Non-Arabic Speakers** is a leading center in teaching Arabic to **non-Arabic Speakers** at the national and regional levels.
- 3) **Foreign Language Center:** The Foreign Language Center serves the community and meets its needs, to strengthen the UAE's relations with other countries through preparing qualified professionals who can communicate in different languages and work towards activating cultural, scientific and technological exchanges.
- 4) **Writing Center:** The Writing Center at the University of Sharjah serves all students taking courses in which English is the medium of instruction, and helps them become more confident and skillful writers.
- 5) **Translation Center:** The Translation Center offers simultaneous and consecutive translation, interpretation, editing and proofreading training and consultation services to the University of Sharjah community, and to the public at the local and regional levels.

## Welcome to the Language Institute

Welcome to the Language Institute (LI). As one of the largest academic units at the University of Sharjah, the LI comprises five centers that offer their services to the University of Sharjah students and staff as well as the local and regional communities.

### I. English Language Center (ELC)

The ELC is tasked with enabling students to meet the University's minimum English language admission requirements for English-medium specializations.

### ELC Mission

- To raise the English-language proficiency of our students for their academic and professional success.
- To enable students to meet the University's minimum entrance requirements for English-medium degree programs.

### Our Strategic Objectives

- To provide high-quality instruction and programs
- To create friendly, meaningful and practical learning experiences
- To foster the development of effective strategies for life-long learning



## Admission Requirements

<https://www.sharjah.ac.ae/en/Administration/Admission/ug/Pages/at.aspx>

No student will be placed in an ELC program without a recognized language qualification.

### English Medium Major

- 1) The University requires students wishing to enroll in English-medium specializations to submit one of the following certificates as proof of their English language proficiency:
  - IELTS
    - IELTS Academic with a minimum overall score of Band 5 (for most colleges).
    - Medical Colleges: IELTS Academic with a minimum score of Band 5 (and a minimum of 5.0 in each skill area).
  - TOEFL iBT with a minimum score of 61.
  - Paper Based TOEFL (PBT)- accepted from University of Sharjah or main branches of AmidEast in Dubai and Abu Dhabi with a minimum score of 500
  - EmSat with a minimum score of 1225
  - PTE with a minimum score of 42
- 2) Students who fail to meet the University's minimum language admission requirements for entry into English-medium programs may study English in one of the programs offered by the ELC at the University of Sharjah.
- 3) Students who attain an overall IELTS score of Band 5.0 but fail to do so in one or more of the skill components are required to enroll in the Special Skills course/s corresponding to any skill area in which they have received a score below Band 5.0. Students with an EmSat score of 1100 to 1200 are required to take 2 special skills courses (reading and writing). Students enrolled in Special Skills courses may also take University required courses. Once students have successfully completed their special skills course/s, they are considered to have fully satisfied the University's minimum entrance requirements.

### Arabic Medium Majors

<https://www.sharjah.ac.ae/en/Administration/Admission/ug/Pages/at.aspx>

No student will be placed in an ELC program without a recognized language qualification.

- Mass Communication programs (Arabic tracks) in the College of Communication: Radio and Television, Journalism and Graphic Design and Multimedia.
  - Public Relations (the required score must be obtained during the first year).
  - Early Childhood Education (the required score must be obtained during the first year).
- 
- |   |     |
|---|-----|
| • IELTS Academic  | 4.5 |
| • TOEFL iBT   | 45  |
| • Paper Based TOEFL (PBT)   | 450 |
| - accepted from University of Sharjah or main branches of AmidEast in Dubai and Abu Dhabi |     |
| • EmSat   | 950 |
| • PTE   | 30  |

**Please note:**

- Students who take the IELTS, TOEFL or PTE outside the University are required to submit a copy of the certificate to the Language Institute to be verified and maybe subject to interview if required.
- English language proficiency certificates are only valid for two years from the date of issue.

**Graduate Programs:**

For detailed information on the graduate program please visit their website:

<https://www.sharjah.ac.ae/en/Research/gs/Pages/gsa.aspx>

**Overview of English Language Center Programs:**

The English Language Center offers the following programs, for the duration of one semester each:

- **Foundation (1 & 2):** 25 hours per week of instruction in listening, speaking, reading, writing and exam preparation.
- **Preparatory (3 & 4):** 20 hours per week of instruction in listening, speaking, reading, writing, and exam preparation. Students in this program are permitted to take one general required course, which counts towards their major's study requirements.
- **Special Skills Program:** This program comprises courses in listening, speaking, reading, and writing, which meet three (3) hours per week. They are mandatory courses for students who have been admitted into their majors but have not successfully achieved an IELTS score of Band 5 in one or more of the IELTS skill components. Special Skills Reading and Special Skills Writing are mandatory for students who joined their majors with an EmSAT score of 1100-1200.

**Summer Courses:**

The ELC offers special skills courses (see above) during the summer. These courses allow registered students to fulfill their English language admission requirements for their majors. In addition, the ELC also offers an exam preparation course in the summer, which is open to the public.

**In-House IELTS, TOEFL and EmSAT Exams:**

The ELC offers in-house IELTS, TOEFL exams and EmSAT exams throughout the year. Registration takes place on campus and students are provided with relevant information and instruction in a timely manner.

**ESP Courses:**

In addition to other facilities, the ELC offers English for Specific Purposes courses (ESP) to the public. These courses include English for business, banking, public relations, law, administrative staff, human resources, journalism, transportation, police, security, media, tourism, insurance, aviation, and Islamic studies.

### ELC Contact Information:

The ELC has offices on all University of Sharjah campuses with its two main offices located on the main campuses (men's and women's) in Sharjah University City.

Contact information

Email:

[shfareh@sharjah.ac.ae](mailto:shfareh@sharjah.ac.ae)

[aawad@sharjah.ac.ae](mailto:aawad@sharjah.ac.ae)

[atraish@sharjah.ac.ae](mailto:atraish@sharjah.ac.ae)

[babu@sharjah.ac.ae](mailto:babu@sharjah.ac.ae)

[maleem@sharjah.ac.ae](mailto:maleem@sharjah.ac.ae)

phone:

060-505-0428

060-505-0269

Fax:

971-06-505-0669

## II. Center for Teaching Arabic to Non-Arabic Speakers

### Mission

The Center for Teaching Arabic to **non-Arabic Speakers** is a leading center in teaching Arabic to **non-Arabic Speakers** at the national and regional levels. Learners will receive a unique education that focuses on enabling students to communicate in Arabic. This reflects the University's aspiration to engage with the community and to meet the public's needs by promoting the Arabic language as a tool of knowledge transfer and a means of communication among Arabs.

### Objectives

The center aims to:

- 1) Teach Arabic to **non-Arabic Speakers** and train them to master the Arabic language over a period of time.
- 2) Organize specially-designed sessions to teach Arabic to diplomats and other employees in the public and private sectors
- 3) Develop programs and textbooks for teaching Arabic to **non-Arabic Speakers** that utilize modern language teaching methodologies
- 4) Contact regional and international counterparts for the purpose of cooperation and exchange
- 5) Hold training courses for Arabic teachers who wish to work in this field in the UAE.

### Beneficiaries

The center offers its services to those with minimal or non-existent mastery of the Arabic language among the following groups:

- 1) University of Sharjah students
- 2) staff, administrators and managers
- 3) Members of the international diplomatic corps
- 4) Media professionals
- 5) Researchers
- 6) Expatriates in the UAE who wish to learn Arabic

### III. Foreign Language Center

#### Mission

The University of Sharjah is constantly seeking to strengthen its connections with the local and international community through the introduction of programs required in the local and regional labor market. The Foreign Language Center aims to achieve the University's objectives of excellence in serving the community and meeting its needs, and to strengthen the UAE's relations with other countries through preparing qualified professionals who can communicate in different languages and work towards activating cultural, scientific and technological exchanges. The Center also seeks to promote foreign language learning for academic, professional and personal purposes.

#### Objectives

The Center aims to:

- 1) Provide an excellent level of foreign language education for different target groups, such as university students, employees and interested local and regional community members
- 2) Provide courses in some foreign languages to meet the needs of specific departments and colleges at the University
- 3) Offer diploma programs in foreign languages
- 4) Raise the students' awareness of the culture of the people who speak these languages, so as to benefit from their cultural, scientific and technological heritage, and to introduce them to the Arab culture in return
- 5) Offer courses and modules in foreign languages such as, French, Spanish, Chinese, Japanese, Urdu, Turkish, German and other important foreign languages

#### Beneficiaries

- 1) University of Sharjah students who wish to learn a foreign language or further develop their proficiency,
- 2) Students of majors that require learning a foreign language
- 3) Postgraduate students whose studies require knowledge of a foreign language for research purposes
- 4) University of Sharjah staff
- 5) Employees of the Ministry of Foreign Affairs, embassies, and the diplomatic corps in general
- 6) Employees of private and public sector institutions
- 7) Media professionals
- 8) Translators
- 9) Hospitality and tourism staff in the country,

### IV. Writing Center

#### Mission

The Writing Center at the University of Sharjah aims to serve all students taking courses in which English is the medium of instruction, and help them become more confident and skillful writers. The Center works with the students to enhance their capabilities in various modes and contexts of written English and prepare them to be not just successful students at the University of Sharjah but also more efficient communicators in English and more effective participants in the workplace.

### Objectives

The Writing Center aims to:

- 1) Provide feedback to students on various writing assignments and improve their written work in accordance with the assignment's requirements
- 2) Offer tutorials and workshops on writing in English
- 3) Offer editing services to faculty members interested in publishing their research
- 4) Offer editing services to Masters students to improve the quality of their theses and dissertations
- 5) Offer editing services to the administration of the University of Sharjah, and to the community outside the university
- 6) Training students to write C. V's, resumes, and cover letters.

### Beneficiaries

- 1) University of Sharjah undergraduate and graduate students
- 2) University of Sharjah faculty members
- 3) Individuals interested in editing and improving the quality of their written work

### V. Translation Center (Editing)

### Mission

The Translation Center aims to offer translation, interpretation, training and consultation services to the University of Sharjah community, and to the public at the local and regional levels. It also aims at making Arab and Islamic scientific and intellectual achievements available to different nations in their own languages.

### Objectives

The Translation Center aims to:

- 1) Translate research papers produced by University of Sharjah faculty into English
- 2) Offer translation, interpretation, training and consultation services to the local community
- 3) Translate selected works of Arab scholars into other languages in order to make the Arab and Islamic civilization and heritage available to other nations
- 4) Translate quality publications into Arabic
- 5) Translate publications that enrich cross-cultural communication
- 6) Establish cooperative relations with other centers overseas to exchange expertise and skills
- 7) Support departments and units in the University of Sharjah in order to achieve the common goal of promoting the University as a center of excellence in scientific research and education
- 8) Provide the students of the Department of English at the University of Sharjah with training opportunities in translation
- 9) Provides editing and proofreading services

### Beneficiaries

- 1) University of Sharjah faculty, especially those seeking to translate their research papers and other publications into English
- 2) International research centers, departments of Middle Eastern studies, and academicians interested in the Arab Muslim civilization
- 3) National and regional government institutions and agencies
- 4) Private sector institutions, including marketing and advertising agencies, banks, insurance companies, accounting firms, hospitals and legal firms
- 5) International and regional organizations
- 6) Individuals who need to translate their work into other languages
- 7) Individuals interested in acquiring and improving their translation and interpretation skills

## Disability Resource Center

Professor Ahmad Alomosh, Director

Building: M11-Ground Floor

Tel: +971 6 5053028

Email: [drc@sharjah.ac.ae](mailto:drc@sharjah.ac.ae)

Website: <http://www.sharjah.ac.ae/en/Administration/DRC/Pages/default.aspx>

Upon directives of His Highness Sheikh Dr. Sultan bin Mohammad Al Qasimi, Member of the Supreme Council, Ruler of Sharjah and President of the University of Sharjah, the Disability Resource Center was established by virtue of the decision no.(299)of 2013-2014 as an independent center concerned with people with disabilities' affairs. The Center is intended to be a source of support for people with disabilities, which assumes the responsibility of inclusion, integration and empowerment. To achieve this goal, the Center employs a comprehensive and an integrated work system that takes care of people with disabilities from the time of their enrolment in the university and continues well beyond their graduation.

To create an attractive, Inclusive, sustainable and accessible environment that provides full outreach to people with disabilities at the university whereupon disability are viewed as an aspect of diversity within the university community and beyond in the community-at-large. And to promote the education quality for people with disabilities at the University of Sharjah and providing them with opportunities of community engagement and self-development.

Creating a suitable environment to guarantee that people with disabilities enjoy all of their rights as stipulated in relevant federal laws and the laws of Sharjah. Facilitating the chances for people with disabilities to obtain a university education and paving the way towards achieving the highest levels of university education. Diagnosing methods of teaching and presenting the curriculum in a simplified manner to achieve learning objectives. Creating activities and learning opportunities to improve the university environment at the personal, educational and professional levels for people with disabilities. Promoting respect of the dignity of people with disabilities who join the university. Protecting people with disabilities from all forms of discrimination, abuse, negligence or exploitation. Integrating people with disabilities in the university community, helping them adapt with university life and providing them with support to become active members. And reaching the highest levels of competence in objective evaluation and professional integration in all aspects in accordance with privacy, confidentiality and evaluation regulations.

There are different Types of Disability such as Hearing, Vision, Physical, Acquired Brain Injury, Learning Difficulties, Autism Spectrum Disorders, Communication Disorders, Multiple Disabilities, and the Recognized Types of Disabilities by the Centre. There are different Branches in Sharjah, Kalba and Khorfakkan with new technologies.

### **Sharjah Academy for Astronomy, Space Sciences and Technology**

The Sharjah Academy for Astronomy, Space Sciences and Technology (SAASST) was established with the aim of developing and disseminating astronomy culture and sciences in the United Arab Emirates and Middle East. It is considered a heritage, tourist and educational center for visitors of all ages as well as an educational and research center for professionals. The Academy includes:

#### **Scientific Laboratories:**

Research is one of the main components of the Sharjah Academy for Astronomy, Space Sciences and Technology (SAASST). In cooperation with the University of Sharjah, the Academy operates five major research laboratories, including the: (1) GIS and Remote Sensing Center; (2) Meteorology Research Center; (3) Radio Astronomy Laboratory; (4) Ionosphere Laboratory; and (5) CubeSat Laboratory. The laboratories provide a research platform for researchers and university students work on various projects.

One project is to build a "CubeSat" satellite, which will perform space experiments within the atmosphere and study celestial bodies emitting X-rays. CubeSat is a small satellite,  $10 \times 10 \times 10$  cm in dimension. It can be sent to space at a much lower cost than larger satellites. This exciting project is being undertaken by the College of Engineering and College of Sciences at the University of Sharjah.

There is also a plan to contribute extensively to the United Arab Emirates Space Agency (UAESA) program by building a 40-meter radio dish for radio astronomy research and to operate the Deep Space Observatory with the aim of connecting to the Emirates probe project for the Mars discovery mission, "Hope Mars Mission." Radio astronomy is important to the study of the Universe, especially with regard to the study of objects emitting much of their illumination in the form of radio waves.

#### **Planetarium:**

This is a gigantic hall topped by a white aluminum screen in the form of golden dome 18.5-meters in diameter. The hall sits at a 10-degree angle to allow 200 visitors the best view of outer space and its celestial objects. The display supports two systems, one of which is digital consisting of seven high-quality display channels, which together make up a complete picture encompassing the entire dome screen. The display also utilizes a unique device, the Megastar Optical Electromechanical Projector, which is one of the world's most advanced planetarium technological devices. The device has the capability to display 10 million celestial bodies at the same time with amazing accuracy. Also featured in the cosmic display is the Uniview program, in addition to a series of modern instruments, which display the planets moving between the stars in simulation, taking the visitor on an exciting journey into space far away from the city lights, where they may contemplate the creation of our miraculous Universe.

The planetarium offers fascinating programs, Saturday through Wednesday, to visitors, families, students and tourists, who will enjoy the shows in Arabic and English. More information is available on the Academy's website at: [www.scass.ac.ae](http://www.scass.ac.ae)

#### **Sharjah Observatory**

The Observatory houses a modern telescopic system, consisting of two telescopes (a 450 mm reflector telescope connected to a 200 mm diameter refractor telescope) installed together on a single level base. The importance of this system is unique because of its high-quality lenses and



mirrors and advanced technology. The system is connected to an electronic control network, which ensures the transmission of data monitored over the Internet and can be used from anywhere in the world. The observatory has a high-quality professional spectrometer, enabling research teams to study unique phenomena, such as variable and binary stars, and prepare mathematical models. At the academic level, this advanced observatory plays an important role in the teaching of astronomy and astrophysics to university students, who are rapidly increasing in number each semester. Space amateurs and the general public may visit the observatory on certain nights allocated for the public each month, where Academy astronomers will assist them in witnessing special events, such as solar and lunar eclipses.

### **Astronomy Exhibitions**

These consist of a number of unique scientific stations, which together offer the visitor the opportunity to learn about the Universe using simple historic astronomical instruments. Such instruments include the Astrolabe, used by Arabs in the Middle Ages, and the early telescopes invented and developed by the great scientists and inventors, such as Galileo, Kepler, Newton and Casgrain, in addition to astronomical, terrestrial and space observatories, which provide amazing knowledge, data and images of the Universe. Through touring the various exhibits, students and visitors will learn about the efforts of astronomers in recent centuries. They will further understand objects in space by analyzing their spectra and colors and detecting their spectral fingerprints with spectroscopy devices. The exhibits also offer tactile and targeted learning experiences, such as the black hole game and the Moon landing challenge as well as that of docking at the international space station (ISS), while engaging in many other interesting and exciting space adventures.

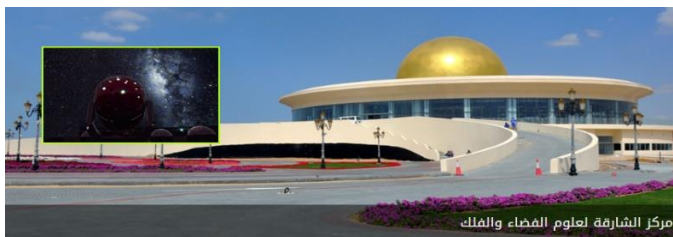
### **Exhibition of the Universe in the Quran:**

“We will show them Our signs in the horizons and within themselves until it becomes clear to them that it is the truth,” Allah’s great truth.

Our Universe is full of scientific and engineering miracles, which have puzzled philosophers and scientists for thousands of years. The Holy Quran is replete with verses revealing the power of Allah, the Almighty, and the miracles of His great creation. This exhibit encompasses the story of the creation of the Universe, starting with the Big Bang and the formation of the galaxies, stars and solar systems, and concluding with the end of the Universe as hypothesized by scientists today and consistent with revelations in the Holy Quran revealed at least 14 centuries ago.

### **The Cosmic Park:**

This is the first cosmic park in the region, where visitors may explore Earth’s solar system up close. Here, they get a sense of the giant size of Jupiter in relation to Saturn with its marvelous rings and the other planets of our solar system. The planets are aligned as if in orbit around the great golden dome of the planetarium, which is notable for its size and luster and represents the star closest to Earth in the center of our solar system, the Sun..





## Graduate Studies

Professor Raafat El-Awady, Dean

Building M3A, Second Floor

Tel: +971 6 5050301

Email: [Ssaleem@sharjah.ac.ae](mailto:Ssaleem@sharjah.ac.ae)

Website: <http://www.sharjah.ac.ae/>

## Introduction

The College of Graduate Studies (CGS) endeavors to achieve the University's mission to attain excellence in its graduate studies programs. To this end, the College of Graduate Studies oversees all graduate studies programs at the university and coordinates between them, and recommends approval, evaluation, and permanent review for graduate studies. The Graduate Studies Council is formed to consider all matters related to graduate studies and authorized to take the necessary decisions regarding them within the limits of its specializations in accordance with the provisions of the university's regulations such as:

- 1) Propose and amend the general graduate studies policy as well as coordinating it with all colleges and centers, and follow-up its implementation upon approval.
- 2) Propose internal by-laws in coordination with the concerned academic departments and colleges regarding the organization of graduate studies.
- 3) Propose, implement, and oversee admission criteria.
- 4) Recommend the approval of new programs after considering the programs and coordinate between them and existing programs.
- 5) Recommend the approval on the graduate studies courses and programs, as well as any amendments or changes therein.
- 6) Recommend graduate degree titles in both Arabic and English based on the recommendations of the college councils.
- 7) Recommend awarding academic degrees.
- 8) Decide on all students' affairs related to the University's graduate studies students.
- 9) Approve the assigning of theses supervisors and the formation of theses defense committee.
- 10) Set a general framework for research proposals, rules governing how to write, print and output and submit thesis, thesis-format guidelines, and defense committee forms.
- 11) Conduct periodic evaluations of graduate studies programs in consultation with internal and external specialized committees or bodies.
- 12) Review the annual reports on graduate studies submitted by the academic departments in the university and Review referred matters from the Dean's Council, the Chancellor, or the College of Graduate Studies Dean to be reviewed and discussed.

For more details, please refer to the CGSR catalog or visit:

[www.sharjah.ac.ae/en/academics/colleges/gsr/Pages/default.aspx](http://www.sharjah.ac.ae/en/academics/colleges/gsr/Pages/default.aspx)

## Admissions Requirements for Master Programs

- 1) The student must hold a bachelor's degree or its equivalent from a recognized university with a CGPA no less than 3.00 out of 4.00. Students with CGPA between 2.5 and 2.99 may be admitted conditionally.
- 2) The bachelor's degree must be in a major that qualifies the student to study the desired master program.
- 3) Students in programs taught in English must obtain 550 in TOFEL (PBT) (Should be taken inside the university), 79 or above in TOFEL (IBT) (outside the university) or 6 in IELTS (Academic). For Applied Sociology and Law programs, the student must obtain 450 in TOFEL (PBT)

(Should be taken inside the university), (46-45) and above in TOFEL (IBT) (outside the university), or 4.5 in IELTS.

- 4) In master programs taught in Arabic (except Applied Sociology and Law), the student is required to take and pass an English course as a prerequisite. However, the student shall be exempted from the course, if he/she obtain 400 in TOFEL (PBT) (Should be taken inside the university), (32) and above in TOFEL (IBT) (outside the university), or 4.0 on IELTS.

#### **Program Duration and Tuition Fees (Master)**

1. For full-time master students, the time limit set for obtaining the master's degree shall be no less than three academic semesters and shall not exceed eight academic semesters.
2. For part-time master students, the time limit set for obtaining the master's degree shall be no less than six academic semesters and shall not exceed ten academic semesters.
3. For information regarding credit hours tuition fees, please refer to the University financial Department (or visit their website).

#### **Admissions Requirements for PhD Programs**

- 1) The student must hold a master's degree or its equivalent from a university, college, or institution recognized by the University of Sharjah and accredited by the United Arab Emirates Ministry of Education, with a CGPA no less than 3.00 out of 4.00, and above.
- 2) Students in programs taught in English must score 550 in TOFEL (PBT) (Should be taken inside the University), 79 and above in TOFEL (IBT) (outside the University) or 6.0 in IELTS (Academic). To apply for Doctor of Philosophy in Applied Sociology and Doctor of Philosophy in Private Law programs, students should obtain 500 in TOFEL (PBT) (Should be taken inside the University), 61 and above in TOFEL (IBT) (outside the University), or 5.0 in IELTS. For programs taught in Arabic, the student must obtain 450 in TOFEL (PBT) (Should be taken inside the University), (46-45) and above in TOFEL (IBT) (outside the university), or 4.5 in IELTS.
- 3) Passing the PhD interview.

#### **Program Duration and Tuition Fees (PhD)**

The time limit set for obtaining the doctoral degree shall be no less than six academic semesters and shall not exceed ten academic semesters. For information regarding credit hours tuition fees, please refer to the University financial Department (or visit their website).

#### **Required Documents**

- 1) Equivalency Certificate from the Ministry of Education for certificates issued from outside the UAE. The student may submit a receipt indicating that he applied for equivalency until obtaining the certificate.
- 2) A Certified Copy of the University Transcript.
- 3) A Certified Copy of the University Degree.
- 4) A Copy of Emirates ID
- 5) A Copy of the Passport + (Family book for UAE nationals/ Residence Visa).
- 6) Two Letters of Recommendation (if any).
- 7) Curriculum Vitae
- 8) Two recent photos
- 9) A copy of TOEFL or IELTS certificate or their equivalents (if required and according to the program).
- 10) Payment of AED 420 for application Fees (Non-Refundable) or a bank transfer to address/account: (beneficiary name: University of Sharjah, account number: 002-9200147-001, bank name: Sharjah Islamic Bank, Sharjah Islamic Bank main branch- Sharjah-United Arab Emirates)

# College of Shari'a and Islamic Studies

## College of Shari'a and Islamic Studies

### Officers of the College

|                        |   |
|------------------------|---|
| Prof. Kotb Rissouni    | Acting Dean   |
| Prof. Mohamed Sumeran  | Vice Dean   |
| Prof. Mohmmad Alemoush | Head of Jurisprudence and its Foundation Department |
| Dr. Ahmed Al-Kubise    | Head of Foundations of Religion Department          |

### Personnel

#### Foundations of Religion

|           |  |
|-----------|--|
| Professor | Nayel Mamduh Abu Zaid, Kassem Ali Saad, Abdal Samee Al- Aniess |
|-----------|--|

|                     |  |
|---------------------|--|
| Associate Professor | Ahmed Al-Kubise, Mahdi Kais, Hasan Salem Habshan, Fatima Zohra Aouati, |
|---------------------|--|

|                     |  |
|---------------------|--|
| Assistant Professor | Kabiru Goje, Qais Salem, Mahmoud Batal, Zia ul Haq, Reda Ibrahim |
|---------------------|--|

|          |                            |
|----------|----------------------------|
| Lecturer | Fatima Hafiz Irshad Ul-Haq |
|----------|----------------------------|

#### Jurisprudence and Its Foundations

|           |  |
|-----------|--|
| Professor | Mohammad Sumeran, Hassan AL Rifai, Kotb Rissouni, Mohamed Suliman Elnor, Kathafi Izzat ALGHananeem, Mohmmad Alemoush |
|-----------|--|

**Associate Professor**

Mohamed Semai, Dalila Berraf

**Assistant Professor**

Ibrahim Al Mansoori, Samya Elfatih Elhag, Alhammadi, Arif  
Aljanaahi, Madou Gaye Sylla, Saeed Alnaqbi, Shaikha  
Altaffaq

**Administrative Staff**

Dr. Abdelbaagi Mohamed El Faki  
Saad Zafarul Hasan  
Fatima Ali Hattawi  
Zainab Ahmed Suliman  
Asma Ahmed Hassan  
Shaimaa Ramadan  
Moza Ahmed Alhmoudi

Mariam Salim Alqaydi

Sr. Administrative Officer  
Administrative Assistant  
Student Services Officer  
Administrative Assistant  
Laboratory Officer-Computer  
Administrative Assistant  
Secretary – Foundations of Religion  
Department  
Secretary –Jurisprudence and its Foundations  
Department

**Contact Information**

College of Sharia and Islamic Studies Building, M1-230- W1-228, University City, Sharjah,  
UAE

Tel: 00971-6-5050181- 5053160

Website: [www.sharjah.ac.ae](http://www.sharjah.ac.ae)

**Accreditation**

All programs offered in the College of Sharia and Islamic Studies are accredited by the Ministry of Education (MOE).

**Vision**

The College aspires to assume a leading role in teaching, research and training in the fields of Shari'a and Islamic studies in the United Arab Emirates. Built upon originality, modernity and moderation, the academic programs of the College of Shari'a are designed to provide students with specialized knowledge, skills and ethical values qualifying them to effectively contribute to the development of Islamic institutions and companies. The college aims at playing a significant role in realizing the University's goals including serving the local Arab and Islamic community and equipping it with academically qualified people who can successfully lead and carry out their roles and bring about progress at the human and professional levels.

**Mission**

The College of Shari'a constantly endeavors to create and develop academic programs in the field of Shari'a and Islamic Studies. The College is keen on backing its programs against a solid background of specialized knowledge and acquired skills and having programs of quality that are supported by the latest technologies. The College has its programs evaluated regularly in order to

ensure quality and verify their effective roles in meeting the needs of the community and shaping the Islamic personality. The College adheres to the principle of diversity in teaching in order to encourage free thought, exploration, innovation, constructive criticism and excellent research by teachers and students.

## Goals

The College of Shari'a and Islamic Studies strives to:

- 1) Create a Muslim personality characterized by deep understanding of Islamic Shari'a, based on the Holy Qur'an and the Sunnah.
- 2) Prepare specialists in the different branches of Shari'a such as Qur'an, Sunnah, Islamic Jurisprudence, Creed, and Islamic Call.
- 3) Provide graduates with good academic qualifications to meet the needs of the UAE, the Emirate of Sharjah, and contemporary Islamic society in the fields of teaching, propagation of faith, and academic research.
- 4) Prepare students to pursue careers in courts as judges, in Ministries of Endowments and Islamic Affairs, Khatibs and teachers in Mosques.
- 5) Prepare students for graduate studies in various specializations in the field of Shari'a
- 6) Cooperate with other universities and educational institutions locally and internationally.

## Academic Programs

The College of Shari'a and Islamic Studies offers the following Academic Programs:

- 1) Bachelor in Shari'a - Foundations of Religion.
- 2) Bachelor in Shari'a - Jurisprudence and its Foundations.
- 3) Bachelor in Shari'a and Law.
- 4) Master in Exegesis and Hadith.
- 5) Master in Jurisprudence and its Foundations.
- 6) Doctor of Philosophy in Exegesis and Quran Sciences.
- 7) Doctor of Philosophy in Hadith and its Sciences.
- 8) Doctor of Philosophy in Jurisprudence and its Foundations.

All programs offered by the College of Shari'a and Islamic Studies are taught in Arabic. The Bachelor programs are described in details in the Arabic version of the University Undergraduate bulletin. The Master and Ph.D. programs are described in the University Graduate bulletin.

## Admission Requirements

Admission to the College of Shari'a and Islamic Studies is subject to satisfying the requirements described in the Admission section in the University part of this bulletin. Please refer to that section for details.

## Graduation Requirements

Each Bachelor degree program comprises three categories: University requirements (UR), college requirements (CR), and program requirements (PR). The university and college requirements are common to all departments in the college of Shari'a and Islamic Studies. Each program has its own required and elective courses. The credit hours allocations for each program are shown in the following tables:

### Bachelor of Shari'a (126 Credits Hours)

#### (Foundations of Religion and Jurisprudence and its Foundations)

|                   | UR | CR | PR-<br>Core | PR(others) | Total |
|-------------------|----|----|-------------|------------|-------|
| Mandatory Credits | 15 | 18 | 63          | 9          | 105   |
| Elective Credits  | 9  | -  | 12          | -          | 21    |
| Total             | 24 | 18 | 75          | 9          | 126   |

### Bachelor of Shari'a (132 Credits Hours)

#### (Shari'a and Law)

|                          | UR        | CR        | PR-<br>Core | PR(others) | Total      |
|--------------------------|-----------|-----------|-------------|------------|------------|
| <b>Mandatory Credits</b> | 15        | 18        | 81          | -          | <b>114</b> |
| <b>Elective Credits</b>  | 9         | -         | 9           | -          | <b>18</b>  |
| <b>Total</b>             | <b>24</b> | <b>18</b> | <b>90</b>   | -          | <b>132</b> |

### Foundations of Religion Department

Requirements for Obtaining the B.A. Degree in Shari'a (Foundations of Religion)

First: University Requirements: (15 Credit Hours Compulsory)  
(9 Credit Hours Elective)

Second: College Requirements: (18 Credit Hours)

| No | Course No | Course title  | Cr.<br>hrs. | Prerequisite | remarks     |
|----|-----------|---|-------------|--------------|-------------|
| 1  | 0103105   | Introduction to Islamic Jurisprudence               | 3           | -            | -           |
| 2  | 0103206   | Research Methodology and Sources of Islamic Studies | 3           | -            | -           |
| 3  | 0104111   | Islamic Creed (1)                                   | 3           | -            | -           |
| 4  | 0104122   | Sciences of the Qur'an                              | 3           | -            | -           |
| 5  | 0104132   | Sciences of Hadith                                  | 3           | -            | -           |
| 6  | 0104221   | Recitation Memorization and Tajweed (1)             | 1           | -            | 3 Practical |
| 7  | 0104321   | Recitation Memorization and Tajweed (2)             | 1           | 0104221      | 3 Practical |
| 8  | 0104421   | Recitation Memorization and Tajweed (3)             | 1           | 0104321      | 3 Practical |

Third: Specialization Requirements (84 Credit Hours) divided into the following:

a- Compulsory requirement (63 Credit hours)

| No | Course No | Course title                                    | Cr. hrs. | Prerequisite | remarks           |
|----|-----------|---|----------|--------------|-------------------|
| 1  | 0104212   | Islamic Creed (2)                               | 3        | 0104111      | -                 |
| 2  | 0104130   | Analytical Biography of the Prophet             | 3        | -            | -                 |
| 3  | 0104220   | Eloquence Styles in the Qur'an                  | 3        | 0104122      | -                 |
| 4  | 0104222   | Analytical Exegesis of the Qur'an (1)           | 3        | 0104122      | -                 |
| 5  | 0104223   | Exegesis of Legal Verses                        | 3        | 0104122      | -                 |
| 6  | 0104231   | Regulations of Hadith (1)                       | 3        | 0104132      | -                 |
| 7  | 0104232   | Analytical Hadith (1)                           | 3        | 0104132      | -                 |
| 8  | 0104318   | Islamic Sects                                   | 3        | 0104111      | -                 |
| 9  | 0104322   | Analytical Exegesis of the Qur'an (2)           | 3        | 0104222      | -                 |
| 10 | 0104325   | Topical Exegesis                                | 3        | 0104122      | -                 |
| 11 | 0104332   | Analytical Hadith (2)                           | 3        | 0104232      | -                 |
| 12 | 0104414   | Comparative Religion                            | 3        | 0104111      | -                 |
| 13 | 0104419   | Preaching and Oratory                           | 1        | -            | 3 Practical hours |
| 14 | 0104433   | Hadith Authentication & the Study of Chains     | 3        | 0104132      | -                 |
| 15 | 0103110   | Foundations of Islamic Jurisprudence            | 3        | -            | -                 |
| 16 | 0103221   | Jurisprudence of Worship (Prayer and Fasting)   | 3        | 0103105      | -                 |
| 17 | 0103222   | Jurisprudence of Transactions (1)               | 3        | 0103105      | -                 |
| 18 | 0103223   | Jurisprudence of Marriage and Divorce           | 3        | 0103105      | -                 |
| 19 | 0103322   | Jurisprudence of Worship (Alms giving and Hajj) | 3        | 0103105      | -                 |
| 20 | 0103324   | Jurisprudence of Worship (Oaths and Vows)       | 3        | 0103105      | -                 |
| 21 | 0103401   | Islamic Studies in English                      | 2        | 0202111      | -                 |
| 22 | 0104415   | Logic in Religious Studies                      | 3        | -            | -                 |

B- Elective requirements (12 Credit hours): The Student Chooses (6) credit hours from the first group and (6) credit hours from the second group as follows:

First Group: (6 Credit Hours)

| No | Course No | Course title                        | Cr. hrs. | Prerequisite | remarks |
|----|-----------|-------------------------------------|----------|--------------|---------|
| 1  | 0104310   | Islamic Ethics                      | 3        | -            | -       |
| 2  | 0104316   | The Status of the Islamic World     | 3        | -            | -       |
| 3  | 0104317   | Islamic Call and its Methods        | 3        | -            | -       |
| 4  | 0104331   | Regulations of Hadith (2)           | 3        | 0104231      | -       |
| 5  | 0104334   | Methods of the Hadith Transmitters  | 3        | 0104132      | -       |
| 6  | 0104417   | Contemporary Intellectual Doctrines | 3        | 0104111      | -       |
| 7  | 0104418   | Orientalism                         | 3        | 0104111      | -       |
| 8  | 0104426   | Methods of Exegetes                 | 3        | -            | -       |
| 9  | 0104427   | The Inimitability of the Qur'an     | 3        | -            | -       |



Second Group: (6 Credit Hours)

| No | Course No | Course title                           | Cr. hrs. | Prerequisite | remarks |
|----|-----------|--|----------|--------------|---------|
| 1  | 0103224   | Islamic Criminal Law                   | 3        | 0103105      | -       |
| 2  | 0103325   | Jurisprudence of Wills and Inheritance | 3        | 0103105      | -       |
| 3  | 0103326   | Political system in Islam              | 3        | -            | -       |
| 4  | 0103327   | Jurs.of inter Relt.. in Islam          | 3        | 0103105      | -       |
| 5  | 0103420   | Juridical Rules                        | 3        | 0103105      | -       |
| 6  | 0104262   | Current Islamic Issues                 | 3        | -            | -       |

C- Support major requirements (9 Credit hours)

| No | Course No | Course title                      | Cr. hrs. | Prerequisite | remarks         |
|----|-----------|-----------------------------------|----------|--------------|-----------------|
| 1  | 0201112   | Syntax and Morphology Studies (1) | 3        | -            | College of Arts |
| 2  | 0201212   | Syntax and Morphology Studies (2) | 3        | 0201112      | College of Arts |
| 3  | 0601111   | Introduction of Law               | 3        | -            | College of Law  |

**Study Plan for the B.A. Degree in Shari'a (Foundation of Religion)**

| First Level   |                                       |              |           |                 |   |              |           |
|---------------|---------------------------------------|--------------|-----------|-----------------|---|--------------|-----------|
| Fall Semester |                                       |              |           | Spring Semester |   |              |           |
| Cr. No.       | Course Title                          | Prerequisite | Cr. Hrs   | Cr. No.         | Course Title                                  | Prerequisite | Cr. Hrs   |
| 0104111       | Islamic Creed (1)                     | -            | 3         | 0104132         | Sciences of Hadith                            | -            | 3         |
| 0103105       | Introduction to Islamic Jurisprudence | -            | 3         | 0103221         | Jurisprudence of Worship (Prayer and Fasting) | 0103105      | 3         |
| 0104122       | Sciences of the Qur'an                | -            | 3         | 0104100         | Islamic culture                               | -            | 3         |
| 0201102       | Arabic Language                       | -            | 3         | 0103110         | Foundations of Islamic Jurisprudence          | -            | 3         |
| 0202111       | Basic English                         | -            | 3         | 1411101         | Introduction to IT(Arabic)                    | -            | 3         |
| <b>Total</b>  |                                       |              | <b>15</b> | <b>Total</b>    |   |              | <b>15</b> |

| Second Level  |   |              |           |                 |   |              |           |
|---------------|---|--------------|-----------|-----------------|---|--------------|-----------|
| Fall Semester |   |              |           | Spring Semester |   |              |           |
| Cr. No.       | Course Title  | Prerequisite | Cr. Hrs   | Cr. No.         | Course Title                            | Prerequisite | Cr. Hrs   |
| 0104221       | Recitation Memorization, & Tajweed (1)              | -            | 1         | 0104212         | Islamic Creed (2)                       | 0104111      | 3         |
| 0103206       | Research Methodology and Sources of Islamic Studies | -            | 3         | 0104130         | Analytical Biography of the Prophet     | -            | 3         |
| 0104231       | Regulations of Hadith (1)                           | 0104132      | 3         | 0104223         | Exegesis of Legal Verses                | 0104122      | 3         |
| 0103222       | Jurisprudence of Transaction (1)                    | 0103105      | 3         | 0104321         | Recitation Memorization and Tajweed (2) | 0104221      | 1         |
| 0104222       | Analytical Exegesis of the Qur'an (1)               | 0104122      | 3         | XXXXX           | University Requirement (Elective)       | -            | 3         |
| 0104232       | Analytical Hadith (1)                               | 0104132      | 3         | XXXXX           | University Requirement (Elective)       | -            | 3         |
| <b>Total</b>  |   |              | <b>16</b> | <b>Total</b>    |   |              | <b>16</b> |

| Third Level   |   |              |         |                 |                                      |              |         |
|---------------|---|--------------|---------|-----------------|--------------------------------------|--------------|---------|
| Fall Semester |   |              |         | Spring Semester |                                      |              |         |
| Cr. No.       | Course Title                                    | Prerequisite | Cr. Hrs | Cr. No.         | Course Title                         | Prerequisite | Cr. Hrs |
| 0104421       | Recitation Memorization and Tajweed (3)         | 0104321      | 1       | 0104318         | Islamic Sects                        | 0104111      | 3       |
| 0201112       | Syntax and Morphology Studies (1)               | -            | 3       | 0104325         | Topical Exegesis                     | 0104122      | 3       |
| 0103223       | Jurisprudence of Marriage and Divorce           | 0103105      | 3       | 0201212         | Syntax and Morphology Studies (2)    | 0201112      | 3       |
| 0103322       | Jurisprudence of Worship (Alms giving and Hajj) | 0103105      | 3       | 0104322         | Analytical Exegesis of the Quran (2) | 0104222      | 3       |
| XXXXX         | Department Requirement: (Elective)              | -            | 3       | XXXXX           | Department Requirement (Elective)    | -            | 3       |
| XXXXX         | University Requirement (Elective)               | -            | 3       |                 |                                      |              |         |
| Total         |   |              | 16      | Total           |                                      |              | 15      |

| Fourth Level  |   |              |           |                 |                                   |              |           |
|---------------|---|--------------|-----------|-----------------|-----------------------------------|--------------|-----------|
| Fall Semester |   |              |           | Spring Semester |                                   |              |           |
| Cr. No.       | Course Title                                | Prerequisite | Cr. Hrs   | Cr. No.         | Course Title                      | Prerequisite | Cr. Hrs   |
| 0104220       | Eloquence Styles in the Qur'an              | 0104122      | 3         | 0601111         | Introduction of Law               | -            | 3         |
| 0104414       | Comparative Religion                        | 0104111      | 3         | 0103401         | Islamic Studies in English        | 0202111      | 2         |
| 0104433       | Hadith Authentication & the Study of Chains | 0104132      | 3         | 0104419         | Preaching and Oratory             | -            | 1         |
| 0103324       | Jurisprudence of Worship (Oaths and Vows)   | 0103105      | 3         | 0104332         | Analytical Hadith (2)             | 0104232      | 3         |
| XXXXX         | Department Requirement (Elective)           | -            | 3         | 0104415         | Logic in Islamic Studies          | -            | 3         |
| 0302200       | Fund. of Innovation & Entrep.               | -            | 3         | XXXXX           | Department Requirement (Elective) | -            | 3         |
| <b>Total</b>  |   |              | <b>18</b> | <b>Total</b>    |                                   |              | <b>15</b> |

### Jurisprudence and its Foundations Department

Requirements for Obtaining the B.A. Degree in Shari'a (Jurisprudence and its Foundations)

First: University Requirements: (15 Credit Hours Compulsory)  
(9 Credit Hours Elective)

Second: College Requirements: (18 Credit Hours)

| No | Course No | Course title  | Cr. hrs. | Prerequisite | remarks     |
|----|-----------|---|----------|--------------|-------------|
| 1  | 0103105   | Introduction to Islamic Jurisprudence               | 3        | -            | -           |
| 2  | 0103206   | Research Methodology and Sources of Islamic Studies | 3        | -            | -           |
| 3  | 0104111   | Islamic Creed (1)                                   | 3        | -            | -           |
| 4  | 0104122   | Sciences of the Qur'an                              | 3        | -            | -           |
| 5  | 0104132   | Sciences of Hadith                                  | 3        | -            | -           |
| 6  | 0104221   | Recitation Memorization and Tajweed (1)             | 1        | -            | 3 Practical |
| 7  | 0104321   | Recitation Memorization and Tajweed (2)             | 1        | 0104221      | 3 Practical |
| 8  | 0104421   | Recitation Memorization and Tajweed (3)             | 1        | 0104321      | 3 Practical |

Third: Specialization Requirements (84 Credit Hours) divided into the following:

a- Compulsory requirement (63 Credit hours)

| No | Course No | Course title                                    | Cr. hrs. | Prerequisite | remarks           |
|----|-----------|---|----------|--------------|-------------------|
| 1  | 0104223   | Exegesis of Legal Verses                        | 3        | 0104122      | -                 |
| 2  | 0104231   | Regulations of Hadith (1)                       | 3        | 0104132      | -                 |
| 3  | 0104419   | Preaching and Oratory                           | 3        | -            | 3 practical hours |
| 4  | 0104433   | Hadith Authentication & the Study of Chains     | 3        | 0104132      | -                 |
| 5  | 0103211   | Sources of Islamic Law                          | 3        | -            | -                 |
| 6  | 0103221   | Jurisprudence of Worship (Prayer and Fasting)   | 3        | 0103105      | -                 |
| 7  | 0103222   | Jurisprudence of Transaction (1)                | 3        | 0103105      | -                 |
| 8  | 0103223   | Jurisprudence of Marriage and Divorce           | 3        | 0103105      | -                 |
| 9  | 0103224   | Islamic Criminal Law                            | 3        | 0103105      | -                 |
| 10 | 0103312   | Topics of Legal Rules and Conceptions           | 3        | -            | -                 |
| 11 | 0103322   | Jurisprudence of Worship (Alms giving and Hajj) | 3        | 0103105      | -                 |
| 12 | 0103323   | Jurisprudence of Transaction (2)                | 3        | 0103222      | -                 |
| 13 | 0103324   | Jurisprudence of Worship (Oaths and Vows)       | 3        | 0103105      | -                 |
| 14 | 0103325   | Jurisprudence of Wills and Inheritance          | 3        | 0103105      | -                 |
| 15 | 0103326   | Political System in Islam                       | 3        | -            | -                 |
| 16 | 0103338   | Jurisprudence of Justice and Ways of Evidence   | 3        | 0103105      | -                 |
| 17 | 0103401   | Islamic Studies in English                      | 2        | 0202111      | -                 |
| 18 | 0103413   | Studies in Independent Thinking and Preference  | 3        | 0103312      | -                 |
| 19 | 0103422   | Comparative Jurisprudence                       | 3        | 0103105      | -                 |
| 20 | 0103420   | Juridical Rules                                 | 3        | 0103105      | -                 |
| 21 | 0103225   | Financial and Economic System in Islam          | 3        | -            | -                 |
| 22 | 0104415   | Logic in Islamic Studies                        | 3        | -            | -                 |

B- Elective requirements (12 Credit hours): The Student Chooses (6) credit hours from the first group and (6) credit hours from the second group as follows:

First Group: (6 Credit Hours)

| No | Course No | Course title                             | Cr. hrs. | Prerequisite | remarks                  |
|----|-----------|--|----------|--------------|--------------------------|
| 1  | 0104212   | Islamic Creed (2)                        | 3        | 0104111      | -                        |
| 2  | 0103327   | Jurs.of inter Relt.. in Islam            | 3        | 0103105      | -                        |
| 3  | 0103430   | Fundamentals of Shari'a and Civil Trials | 3        | 0103338      | -                        |
| 4  | 0103431   | Juridical Applications                   | 3        | 0103338      | Perquisite or Concurrent |

Second Group: (6 Credit Hours)

| No | Course No | Course title                    | Cr. hrs. | Prerequisite | remarks |
|----|-----------|---------------------------------|----------|--------------|---------|
| 1  | 0104220   | Eloquence Styles in the Qur'an  | 3        | 0104122      | -       |
| 2  | 0104316   | The Status of the Islamic World | 3        | -            | -       |
| 3  | 0104317   | Islamic Call and its Methods    | 3        | -            | -       |
| 4  | 0104318   | Islamic Sects                   | 3        | 0104111      | -       |
| 5  | 0104334   | Methods of Hadith Transmitters  | 3        | 0104132      | -       |
| 6  | 0104414   | Comparative Religion            | 3        | 0104111      | -       |
| 7  | 0104418   | Orientalism                     | 3        | 0104111      | -       |
| 8  | 0104427   | The Inimitability of the Qur'an | 3        | -            | -       |

C- Support major requirements (9 Credit hours)

| No | Course No | Course title                      | Cr. hrs. | Prerequisite | remarks         |
|----|-----------|-----------------------------------|----------|--------------|-----------------|
| 1  | 0201112   | Syntax and Morphology Studies (1) | 3        | -            | College of Arts |
| 2  | 0201212   | Syntax and Morphology Studies (2) | 3        | 0201112      | College of Arts |
| 3  | 0601111   | Introduction of Law               | 3        | -            | College of Law  |

**Study Plan for the B.A. Degree in Shari'a (Jurisprudence and its Foundations)**

| First Level   |                                       |              |           |                 |   |              |           |
|---------------|---------------------------------------|--------------|-----------|-----------------|---|--------------|-----------|
| Fall Semester |                                       |              |           | Spring Semester |   |              |           |
| Cr. No.       | Course Title                          | Prerequisite | Cr. Hrs   | Cr. No.         | Course Title                                  | Prerequisite | Cr. Hrs   |
| 0104111       | Islamic Creed (1)                     | -            | 3         | 0104132         | Sciences of Hadith                            | -            | 3         |
| 0103105       | Introduction to Islamic Jurisprudence | -            | 3         | 0103221         | Jurisprudence of Worship (Prayer and Fasting) | 0103105      | 3         |
| 0104122       | Sciences of the Qur'an                | -            | 3         | 0104100         | Islamic culture                               | -            | 3         |
| 0201102       | Arabic Language                       | -            | 3         | 0103211         | Sources of Islamic Law                        | -            | 3         |
| 0202111       | Basic English                         | -            | 3         | 1411101         | Introduction to IT(Arabic)                    | -            | 3         |
| <b>Total</b>  |                                       |              | <b>15</b> | <b>Total</b>    |   |              | <b>15</b> |

| Second Level  |   |              |           |                 |   |              |           |
|---------------|---|--------------|-----------|-----------------|---|--------------|-----------|
| Fall Semester |   |              |           | Spring Semester |   |              |           |
| Cr. No.       | Course Title  | Prerequisite | Cr. Hrs   | Cr. No.         | Course Title                            | Prerequisite | Cr. Hrs   |
| 0104221       | Recitation Memorization, & Tajweed (1)              | -            | 1         | 0103225         | Islamic Finance & Economic System       | -            | 3         |
| 0103206       | Research Methodology and Sources of Islamic Studies | -            | 3         | 0201212         | Syntax and Morphology Studies (2)       | 0201112      | 3         |
| 0104231       | Regulations of Hadith (1)                           | 0104132      | 3         | 0104223         | Exegesis of Legal Verses                | 0104122      | 3         |
| 0103222       | Jurisprudence of Transaction (1)                    | 0103105      | 3         | 0104321         | Recitation Memorization and Tajweed (2) | 0104221      | 1         |
| 0103322       | Jurisprudence of Worship (Alms giving and Hajj)     | 0103105      | 3         | XXXXX           | Department Requirement (Elective)       | -            | 3         |
| 0201112       | Syntax and Morphology Studies (1)                   | -            | 3         | XXXXX           | University Requirement (Elective)       | -            | 3         |
| <b>Total</b>  |   |              | <b>16</b> | <b>Total</b>    |   |              | <b>16</b> |

| Third Level   |   |              |           |                 |   |              |           |
|---------------|---|--------------|-----------|-----------------|---|--------------|-----------|
| Fall Semester |   |              |           | Spring Semester |   |              |           |
| Cr. No.       | Course Title                              | Prerequisite | Cr. Hrs   | Cr. No.         | Course Title                                  | Prerequisite | Cr. Hrs   |
| 0104421       | Recitation Memorization and Tajweed (3)   | 0104321      | 1         | 0103323         | Jurisprudence of Transaction (2)              | 0103222      | 3         |
| 0601111       | Introduction of Law                       | -            | 3         | 0103420         | Juridical Rules                               | 0103105      | 3         |
| 0103223       | Jurisprudence of Marriage and Divorce     | 0103105      | 3         | 0103224         | Islamic Criminal Law                          | 0103105      | 3         |
| 0103326       | Political System in Islam                 | -            | 3         | 0103338         | Jurisprudence of Justice and Ways of Evidence | 0103105      | 3         |
| 0103312       | Topics of legal Rules and Conceptions     | -            | 3         | 0302200         | Fund. of Innovation & Entrep.                 | -            | 3         |
| 0103324       | Jurisprudence of Worship (Oaths and Vows) | 0103105      | 3         | XXXXX           | Department Requirement (Elective)             | -            | 3         |
| <b>Total</b>  |   |              | <b>16</b> | <b>Total</b>    |   |              | <b>18</b> |

| Fourth Level  |   |              |         |                 |  |              |         |
|---------------|---|--------------|---------|-----------------|--|--------------|---------|
| Fall Semester |   |              |         | Spring Semester |  |              |         |
| Cr. No.       | Course Title                                | Prerequisite | Cr. Hrs | Cr. No.         | Course Title                                   | Prerequisite | Cr. Hrs |
| 0103422       | Comparative Jurisprudence                   | 0103105      | 3       | 0103413         | Studies in Independent Thinking and Preference | 0103312      | 3       |
| 0103325       | Jurisprudence of Wills and Inheritance      | 0103105      | 3       | 0103401         | Islamic Studies in English                     | 0202111      | 2       |
| 0104433       | Hadith Authentication & the Study of Chains | 0104132      | 3       | 0104419         | Preaching and Oratory                          | -            | 1       |
| XXXXX         | Department Requirement (Elective)           | -            | 3       | 0104415         | Logic in Islamic Studies                       | -            | 3       |
| XXXXX         | University Requirement (Elective)           | -            | 3       | XXXXX           | University Requirement (Elective)              | -            | 3       |
|               |   |              |         | XXXXX           | Department Requirement (Elective)              | -            | 3       |
| Total         |   |              | 15      | Total           |  |              | 15      |

## **Shari'a and Law**

Requirements for Obtaining the B.A. Degree in Shari'a (Shari'a and Law)

First: University Requirements: (15 Credit Hours Compulsory)  
(9 Credit Hours Elective)

Second: College Requirements: (18 Credit Hours)

| No | Course No | Course title  | Cr. hrs. | Prerequisite | remarks     |
|----|-----------|---|----------|--------------|-------------|
| 1  | 0103105   | Introduction to Islamic Jurisprudence               | 3        | -            | -           |
| 2  | 0103206   | Research Methodology and Sources of Islamic Studies | 3        | -            | -           |
| 3  | 0104111   | Islamic Creed (1)                                   | 3        | -            | -           |
| 4  | 0104122   | Sciences of the Qur'an                              | 3        | -            | -           |
| 5  | 0104132   | Sciences of Hadith                                  | 3        | -            | -           |
| 6  | 0104221   | Recitation Memorization and Tajweed (1)             | 1        | -            | 3 Practical |
| 7  | 0104321   | Recitation Memorization and Tajweed (2)             | 1        | 0104221      | 3 Practical |
| 8  | 0104421   | Recitation Memorization and Tajweed (3)             | 1        | 0104321      | 3 Practical |

Third: Specialization Requirements (90 Credit Hours) divided into the following:

a- Compulsory requirement (81 Credit hours)

| No | Course No | Course title                   | Cr. hrs. | Prerequisite       | remarks |
|----|-----------|--------------------------------|----------|--------------------|---------|
| 1  | 0103221   | Juri. of Worship Prayer&Fasti. | 3        | 0103105            |         |
| 2  | 0103223   | Juri. of Marriage and Divorce  | 3        | 0103105            |         |
| 3  | 0103224   | Islamic Criminal Law           | 3        | 0103105            |         |
| 4  | 0602247   | Legal Studies In English(S&L)  | 1        | 0601111            |         |
| 5  | 0602248   | Public International Law (S&L) | 3        | 0601111            |         |
| 6  | 0103344   | Legitimate & Legal stud.(E)    | 2        | 0602241            |         |
| 7  | 0103312   | Topics of Legal Rules and Con. | 3        | -                  |         |
| 8  | 0103325   | Jur. of Wills & Inheritance    | 3        | 0103105            |         |
| 9  | 0103445   | Prov. of evid. aga. isl. jur.  | 3        | 0601214            |         |
| 10 | 0601345   | Law of Civil Procedures(S&L)   | 3        | 0601214            |         |
| 11 | 0103422   | Comparative Jurisprudence      | 3        | 0103105            |         |
| 12 | 0103446   | Training Courses 2             | 0        | 0601345<br>0602454 |         |
| 13 | 0103490   | Graduation Project             | 3        | 0103206<br>0601345 |         |
| 14 | 0601111   | Introduction to Law            | 3        | -                  |         |
| 15 | 0601113   | Sources of Obligations         | 3        | 0601111            |         |



|    |         |                               |   |         |  |
|----|---------|-------------------------------|---|---------|--|
| 16 | 0601214 | Rules of Obligations          | 3 | 0601113 |  |
| 17 | 0103242 | Named contra. comp. with doc. | 3 | 0601214 |  |
| 18 | 0103343 | Rights in rem ag. Islm. Jurs. | 3 | 0103242 |  |
| 19 | 0601422 | Enforcement Procedures        | 3 | 0601214 |  |
| 20 | 0601423 | Private International Law     | 3 | 0601214 |  |
| 21 | 0601134 | Princ. of Commercial Law(S&L) | 3 | 0601113 |  |
| 22 | 0601332 | Banking Transactions(S&L)     | 3 | 0601134 |  |
| 23 | 0602141 | Constit. Law and Politic Syts | 3 | -       |  |
| 24 | 0602142 | Administrative Law(S&L)       | 3 | 0601111 |  |
| 25 | 0301150 | Intro to Economics (Non-B)    | 3 | -       |  |
| 26 | 0602253 | Penal/ General Section        | 3 | 0601111 |  |
| 27 | 0602353 | Private Penal Law (1)         | 3 | 0602253 |  |
| 28 | 0602454 | Law of Criminal Procedures    | 3 | 0602353 |  |
| 29 | 0103211 | Sources of Islamic Law        | 3 | -       |  |
| 30 | 0103447 | Courses Training 1            | 0 | 0601345 |  |

B- Elective requirements (9 Credit hours): The Student Chooses (3) credit hours from the first group, (3) credit hours from the second group and (3) credit hours from the third group as follows:

First Group: (3 Credit Hours)

| No | Course No | Course title                      | Cr. hrs. | Prerequisite | remarks |
|----|-----------|-----------------------------------|----------|--------------|---------|
| 1  | 0103241   | Personal status of non. Mus.      | 3        | 0103105      |         |
| 2  | 0103322   | Jur. of Worship (Alms giv. & Hajj | 3        | 0103105      |         |
| 3  | 0103423   | Current Juridical Issues          | 3        | 0103105      |         |
| 4  | 0103420   | Juridical Rules                   | 3        | 0103105      |         |
| 5  | 0103413   | Studies in Independent Thinkin    | 3        | 0103312      |         |

Second Group: (3 Credit Hours)

| No | Course No | Course title             | Cr. hrs. | Prerequisite | remarks |
|----|-----------|--------------------------|----------|--------------|---------|
| 1  | 0602256   | Criminology              | 3        | -            |         |
| 2  | 0601318   | Intellectual Property    | 3        | 0601113      |         |
| 3  | 0602355   | Private Penal Law (2)    | 3        | 0602253      |         |
| 4  | 0601434   | Maritime Law             | 3        | 0601134      |         |
| 5  | 0601310   | Consumer Protection Laws | 3        | 0601214      |         |

Third Group: (3 Credit Hours)

| No | Course No | Course title                 | Cr. hrs. | Prerequisite | remarks |
|----|-----------|------------------------------|----------|--------------|---------|
| 1  | 0103241   | Personal status of non. Mus. | 3        | 0103105      |         |

|    |         |                                |   |         |  |
|----|---------|--------------------------------|---|---------|--|
| 2  | 0103322 | Jur. of Worship(Alms giv.&Hajj | 3 | 0103105 |  |
| 3  | 0103423 | Current Juridical Issues       | 3 | 0103105 |  |
| 4  | 0103420 | Juridical Rules                | 3 | 0103105 |  |
| 5  | 0103413 | Studies in Independent Thinkin | 3 | 0103312 |  |
| 6  | 0602256 | Criminology                    | 3 | -       |  |
| 7  | 0601318 | Intellectual Property          | 3 | 0601113 |  |
| 8  | 0602355 | Private Penal Law (2)          | 3 | 0602253 |  |
| 9  | 0601434 | Maritime Law                   | 3 | 0601134 |  |
| 10 | 0601310 | Consumer Protection Laws       | 3 | 0601214 |  |

### Study Plan for the B.A. Degree in Shari'a (Shari'a and Law)

| First Level   |                                       |              |           |                 |   |              |           |
|---------------|---------------------------------------|--------------|-----------|-----------------|---|--------------|-----------|
| Fall Semester |                                       |              |           | Spring Semester |   |              |           |
| Cr. No.       | Course Title                          | Prerequisite | Cr. Hrs   | Cr. No.         | Course Title                                  | Prerequisite | Cr. Hrs   |
| 0104111       | Islamic Creed (1)                     | -            | 3         | 0104132         | Sciences of Hadith                            | -            | 3         |
| 0103105       | Introduction to Islamic Jurisprudence | -            | 3         | 0103221         | Jurisprudence of Worship (Prayer and Fasting) | 0103105      | 3         |
| 0104122       | Sciences of the Qur'an                | -            | 3         | 0601113         | Sources of Obligations                        | 0601111      | 3         |
| 0201102       | Arabic Language                       | -            | 3         | 0103211         | Sources of Islamic Law                        | -            | 3         |
| 0601111       | Introduction of Law                   | -            | 3         | 0602141         | Constit. Law and Politic Sytsem               | -            | 3         |
| 0104100       | Islamic culture                       | -            | 3         | 0602253         | Penal/ General Section                        | 0601111      | 3         |
| <b>Total</b>  |                                       |              | <b>18</b> | <b>Total</b>    |   |              | <b>18</b> |

| Second Level  |   |              |         |                 |                                |              |         |
|---------------|---|--------------|---------|-----------------|--------------------------------|--------------|---------|
| Fall Semester |   |              |         | Spring Semester |                                |              |         |
| Cr. No.       | Course Title                                | Prerequisite | Cr. Hrs | Cr. No.         | Course Title                   | Prerequisite | Cr. Hrs |
| 0104221       | Recitation Memorization, & Tajweed (1)      | -            | 1       | 0602247         | Legal Studies In English (S&L) | 0601111      | 1       |
| 0103206       | Research Methodology and Sources of Islamic | -            | 3       | 0302200         | Fund. of Innovation & Entrep.  | -            | 3       |

|              | Studies                               |         |           |              |                            |         |           |
|--------------|---------------------------------------|---------|-----------|--------------|----------------------------|---------|-----------|
| 0103223      | Jurisprudence of Marriage and Divorce | 0103105 | 3         | 0103224      | Islamic Criminal Law       | 0103105 | 3         |
| 0602248      | Public International Law (S&L)        | 0601111 | 3         | 0601214      | Rules of Obligations       | 0601113 | 3         |
| 0602142      | Administrative Law (S&L)              | 0601111 | 3         | 0301150      | Intro to Economics (Non-B) | -       | 3         |
| 0202111      | Basic English                         | -       | 3         | 0602353      | Private Penal Law (1)      | 0602253 | 3         |
| <b>Total</b> |                                       |         | <b>16</b> | <b>Total</b> |                            |         | <b>16</b> |

| Third Level   |                                   |              |           |                 |   |              |           |
|---------------|-----------------------------------|--------------|-----------|-----------------|---|--------------|-----------|
| Fall Semester |                                   |              |           | Spring Semester |   |              |           |
| Cr. No.       | Course Title                      | Prerequisite | Cr. Hrs   | Cr. No.         | Course Title                            | Prerequisite | Cr. Hrs   |
| 0103242       | Named contra. comp. with doc.     | 0601214      | 3         | 0104321         | Recitation Memorization and Tajweed (2) | 0104221      | 1         |
| 0103344       | Legitimate & Legal stud.(E)       | 0602247      | 2         | 0103325         | Jur. of Wills & Inheritance             | 0103105      | 3         |
| 0103312       | Topics of Legal Rules and Con.    | -            | 3         | XXXXX           | University Requirement (Elective)       | -            | 3         |
| XXXXX         | Department Requirement (Elective) | -            | 3         | 0601332         | Banking Transactions (S&L)              | 0601134      | 3         |
| 0601134       | Princ. of Commercial Law(S&L)     | 0601113      | 3         | 0103343         | Rights in rem ag. Islm. Jurs.           | 0103242      | 3         |
| 0601345       | Law of Civil Procedures (S&L)     | 0601214      | 3         | 0602454         | Law of Criminal Procedures              | 0602353      | 3         |
| <b>Total</b>  |                                   |              | <b>17</b> | <b>Total</b>    |   |              | <b>16</b> |

| Fourth Level  |   |                    |         |                 |                                   |              |         |
|---------------|---|--------------------|---------|-----------------|-----------------------------------|--------------|---------|
| Fall Semester |   |                    |         | Spring Semester |                                   |              |         |
| Cr. No.       | Course Title                            | Prerequisite       | Cr. Hrs | Cr. No.         | Course Title                      | Prerequisite | Cr. Hrs |
| 0103422       | Comparative Jurisprudence               | 0103105            | 3       | 0103445         | Prov. of evid. aga. isl. jur.     | 0601214      | 3       |
| 0104421       | Recitation Memorization and Tajweed (3) | 0104321            | 1       | 0601423         | Private International Law         | 0601214      | 3       |
| 0601422       | Enforcement Procedures                  | 0601214            | 3       | 1411101         | Introduction to IT(Arabic)        | -            | 3       |
| XXXXX         | Department Requirement (Elective)       | -                  | 3       | XXXXX           | University Requirement (Elective) | -            | 3       |
| XXXXX         | University Requirement (Elective)       | -                  | 3       | XXXXX           | Department Requirement (Elective) | -            | 3       |
| 0103490       | Graduation Project                      | 0103206<br>0601345 | 3       |                 |                                   |              |         |
| Total         |   |                    | 16      | Total           |                                   |              | 15      |

# College of Arts, Humanities and Social Sciences

### Academic Officers of the College

|                          |  |
|--------------------------|--|
| Prof. Nader El-Bizri     | <b>Dean</b>                                |
| Dr. Mohammed Abdel Karim | <b>Vice Dean</b>                           |
| Dr. Abdel Rahman Ahmed   | <b>Assistant Dean for Graduate Studies</b> |

### Personnel

#### Arabic Language & Literature Department

|                                      |  |
|--------------------------------------|--|
| <b>Chairperson:</b>                  | Dr. Mariam Saeed Balejaid  |
| <b>Professors</b>                    | Abdulrahman Abouali, Salah Jarrar, Abdulkader Asaad, Benissa Bettaher            |
| <b>Associate Professors</b>          | Muhammad Fadil Al-Samarraie  |
| <b>Assistant Professors</b>          | Leila Labidi, Mariam Saeed Balejaid, Fikry El-Naggar, Badeeah Khaleel Al-Hashemi |
| <b>Visiting Assistant Professors</b> | Dr. Fikry El-Naggar  |
| <b>Lecturer</b>                      | Anas Aydan, Dame Toure, Shaikha Alzaabi, Amna Alkaydi                            |

#### Department of Foreign Languages

|                             |  |
|-----------------------------|--|
| <b>Chairperson</b>          | Ghaleb Al Rababeh  |
| <b>Professors</b>           | Adnan Khalid Abdullah, Shehdeh<br>Ismail Fareh, Sane Mo. Yagi, Ghaleb Al Rababeh   |
| <b>Associate Professors</b> | Ghanim Samarrai, Najib Jarad, Ahmad Al Haraheha  |
| <b>Assistant Professors</b> | Samer Jarbou, Andrew Joseph Power, Sanna Bin Masood, Chiraz Anan   |
| <b>Lecturers</b>            | Inaam Hamadi, Ghaida Kaziha, Muhieddin Al-Qaddour, Adnan Al-Bustanji, Stephen Palubiski, Dana Aziz Khalil, Mutwakil Ibrahim Ismail, Abdellatif Messikh, Suhair Abu Hantash, Nada Mohamed Al-Hammadi, Messan Stouhi, Reem Abdulla Al Hajji, Lahcan Damiri |
| <b>Administrative Staff</b> | Aisha Rashid Al-Shamsi Administrative Assistant  |

## Department of History and Islamic Civilization

|                             |   |
|-----------------------------|---|
| <b>Professors</b>           | Mesut Idriz, Mohamed M. Awad  |
| <b>Associate Professors</b> | Nadjib Benkheira, Chatra<br>Khiereddine, As'ad Hammad Aburumman,<br>Issam Mustafa Okleh, Mohamed Ahmed Aboushouk, Modar Adnan Telfah,<br>Fawzi Khalid Ali Al Twahya, Thabet Ghazi Alomari |
| <b>Assistant Professors</b> | Mariam Taha, Maher Al Shamaileh, Abdallah<br>al Mughanni, Saleh Muhammad Al-leheabi, Emad<br>Eddin Abu El-Enain, Issam Mustafa Okleh, Ali Hassan<br>Khamis, Badreyya Mohammed Alshamsi,   |
| <b>Lecturers</b>            | Ameena Abdullah Al Khatri   |
| <b>Administrative Staff</b> |   |
| Aisha Mohammed Al Awadhi    | Internship Officer  |
| Jamila Ali Alhosnai         | Administrative Assistant  |

## Department of Sociology

|                             |   |
|-----------------------------|---|
| <b>Professors</b>           | Nayef AL Banawi, Ahmed Alomosh, Layachi Anser,<br>Brahim Touhami, Hussain Al Othman Fakir AL Gharaibeh  |
| <b>Associate Professors</b> | Khalil Medani, Ahmed Khettabi,<br>Zezit Mostafa, Saleh Nassar, Omaima Mohamed<br>Makia Gomaa, Mohammed Hourani, Ouassila Yaiche,<br>Alaa AL-Taii, Khalil Al-Halalat |
| <b>Assistant Professors</b> | Wafa Barhoumi, Salama Mohamed AL Rahooomi, Huda Alnaqbi, Mohamed<br>Bayoumy, Raouf Kaouache   |

## Department of International Relations

|                             |   |
|-----------------------------|---|
| <b>Chairperson</b>          | Stephen John Louw   |
| <b>Associate Professor</b>  | Abdel Rahman Ahmed Abdel Rahman<br>Stephen John Louw<br>Muhamed Ali     |
| <b>Assistant Professors</b> | Shyamal Kataria<br>Shaojin Chai<br>Sherko Kirmanj ,Kazi Fahmida Farzana |

### Administrative Support Staff

Faheema Abdalla Al Ali  
Shaikha Mohamed Ali AlKetbi  
Shaikha Mubarak Khamis  
Huda Ahmed Al Ameri  
for Graduate Studies Office

Administrative Officer  
Administrative Assistant-Dean Office  
Administrative Assistant-Vice Dean Office  
Administrative Assistant- Assistant, Dean

### Contact Information

College of Arts, Humanities and Social Sciences Building, W2 University City  
Sharjah, UAE +971-6-5053201  
[www.sharjah.ac.ae](http://www.sharjah.ac.ae)

### Accreditation

All programs offered in the College of Arts, Humanities and Social Sciences are accredited by the UAE's Ministry of Education (MOE).

### Overview

The College of Arts, Humanities and Social Sciences has six departments:  
Department of Arabic Language and Literature,  
Department of Foreign Languages and Literature,  
Department of History and Islamic Civilization,  
Department of Sociology  
Department of International Relations  
Department of Education

### Vision Statement

The University of Sharjah (UoS) promotes national identity and consolidates awareness of Arab and Islamic culture. It offers applied knowledge according to international standards in the field of arts, humanities and social sciences to meet the needs of the local community. UoS Seeks excellence in producing knowledge in the fields of humanities and social sciences at the national and regional levels.

### Mission Statement

The College of Arts, Humanities and Social Sciences provides comprehensive, high quality education to help students acquire knowledge, analytical skills and critical thinking skills. It sensitizes students to the ever-increasing needs of their society and prepares them for the challenges of a rapidly-changing world. As the largest and most diverse academic unit in the University, the College serves all undergraduate students through general education courses and offers a wide variety of graduate and undergraduate programs in the Arts, Humanities and Social Sciences. The College promotes ethical development based on Arabic and Islamic values, and seeks to instill in students the habits of learning, creative thinking, self-confidence, effective collaboration and community service.

### Objectives

The College of Arts, Humanities and Social Sciences strives to achieve the following goals:  
Provide excellent education at the graduate and undergraduate levels in the fields of History, Arabic, English, Sociology and Education.  
Provide service and support courses to other colleges in the University.  
Build and maintain excellence in departments and programs across the Arts, Humanities and Social



Sciences.

Enrich the community of scholarship and learning through diversity.

Improve the ability of students and faculty to conduct research, produce creative work and integrate scholarship with teaching.

Expand and diversify the resources available to the College in order to achieve its goals.

Provide training and consultancies in a variety of fields to the community at large.

Foster stronger relations with other colleges, the community and institutions of similar interests locally and internationally.

### Academic Programs

The College of Arts, Humanities and Social Sciences is organized in six departments that offer undergraduate and graduate programs. Those programs and the corresponding language of instruction are:

- 1) Bachelor of Arts in Arabic Language and Literature (Arabic)
- 2) Bachelor of Arts in English Language and Literature (English)
- 3) Bachelor of Arts in History and Islamic Civilization (Arabic)
- 4) Bachelor of Arts in History and Islamic Civilization – Tourist Guide (Arabic)
- 5) Bachelor of Arts in Sociology (Arabic)
- 6) Bachelor of Arts in International Relations (English)
- 7) Master of Arts in Arabic Language and Literature (Arabic)
- 8) Master of Arts in Translation (English)
- 9) Master of Arts in History and Islamic Civilization (Arabic)
- 10) Master of Arts in Applied Sociology (Arabic)
- 11) PhD in Applied Sociology (Arabic)
- 12) PhD in Arabic Language and Literature (Arabic)
- 13) PhD in History & Islamic Civilization

Full details on the mainly Arabic programs are presented in the Arabic version of the University bulletin. Graduate programs are described in the University Graduate bulletin.

### Admission Requirements

Admission to the English based programs in the College of Arts, Humanities and Social Sciences is subject to satisfying the English proficiency requirement and the necessary academic preparation as described in the University section on Admission in this bulletin. Applicants should refer to that section for details on the admission requirements.

### Graduation Requirements

Each Bachelor of Arts (BA) degree program requires the completion of 123 credit hours distributed in three categories: University requirements (UR), college requirements (CR), and program requirements (PR). The university and college requirements are common to all departments in the college of Arts, Humanities and Social Sciences. Each program has its own required and elective courses. The credit hours allocations for each program are shown in the following table:

| BA in Arabic Language and Literature – Arabic (123 Credits) |           |           |           |            |
|---|-----------|-----------|-----------|------------|
|   | UR        | CR        | PR        | Total      |
| Mandatory Credits   | 15        | 15        | 63        | 90         |
| Elective Credits  | 09        | -         | 21        | 24         |
| <b>Total</b>  | <b>24</b> | <b>15</b> | <b>84</b> | <b>123</b> |

| B.A. in English Language and Literature (123 Credits) |           |           |             |            |
|---|-----------|-----------|-------------|------------|
|   | UR        | CR        | PR          | Total      |
| Mandatory Credits                                     | 12        | 15        | 54 (CC), 15 | 96         |
| Electives Credits                                     | 12        | -         | 15          | 27         |
| <b>Total</b>  | <b>24</b> | <b>15</b> | <b>84</b>   | <b>123</b> |

| BA in History and Islamic Civilization - Arabic (123 Credits) |           |           |           |            |
|---|-----------|-----------|-----------|------------|
|   | UR        | CR        | PR        | Total      |
| Mandatory Credits   | 15        | 15        | 57        | 84         |
| Elective Credits  | 09        | -         | 27        | 39         |
| <b>Total</b>  | <b>24</b> | <b>15</b> | <b>84</b> | <b>123</b> |

| BA in History and Islamic Civilization, Tourist Guide – Arabic (123) |           |           |           |            |
|--|-----------|-----------|-----------|------------|
|  | UR        | CR        | PR        | Total      |
| Mandatory Credits  | 15        | 15        | 63        | 90         |
| Elective Credits   | 09        | -         | 21        | 33         |
| <b>Total</b>   | <b>24</b> | <b>15</b> | <b>84</b> | <b>123</b> |

| BA in Sociology – Arabic (123 Credits) |           |           |           |            |
|--|-----------|-----------|-----------|------------|
|  | UR        | CR        | PR        | Total      |
| Mandatory Credits                      | 15        | 15        | 54        | 84         |
| Elective Credits                       | 9         | -         | 30        | 39         |
| <b>Total</b>                           | <b>24</b> | <b>15</b> | <b>84</b> | <b>123</b> |

| BA in International Relations – English (123 Credits) |           |           |           |            |
|---|-----------|-----------|-----------|------------|
|   | UR        | CR        | PR        | Total      |
| Mandatory Credits                                     | 15        | 15        | 33        | 60         |
| Elective Credits                                      | 09        | -         | 51        | 63         |
| <b>Total</b>  | <b>24</b> | <b>15</b> | <b>84</b> | <b>123</b> |

| General Diploma in Education – Arabic (24 Credits) |    |    |    |       |
|--|----|----|----|-------|
|  | UR | CR | PR | Total |
| Mandatory Credits                                  | 0  | 0  | 24 | 24    |

### College Requirements

Each department will select 15 credits in a manner appropriate to the department concerned from the following list.

| Course # | Course Title                | CrHrs | Prerequisite |
|----------|-----------------------------|-------|--------------|
| 0201203  | Art of writing Arabic       | 3     | 0201100      |
| 0202113  | English for Humanities      | 3     |              |
| 0203103  | Islamic History             | 3     |              |
| 0203114  | History of the Islamic City | 3     |              |
| 0204111  | Arab Society                | 3     |              |
| 0204372  | Woman and Development       | 3     |              |
| 0206101  | Introduction to Education   | 3     |              |

Descriptions of the required College requirements are given below.

**0201203                      Art of writing                      (3-0:3)**

**Prerequisite: 0201102.**

The course deals with sentence formation, its patterns and styles. It introduces students to paragraph writing, the proper use of conjunctions, text writing, with emphasis on functional writing such as letters, reports, articles and research projects.

**0202113                      English for Humanities                      (3-0:3)**

**Prerequisite: 0202111.**

English for Humanities is a higher intermediate course that follows an integrated multi-skills approach. It aims at helping students build their communicative competence, develop their critical thinking skills, and improve the structure of their written expression. It also lays emphasis on enabling students to write a range of short response paragraphs.

**0203103                      Islamic History                      (3-0:3)**

This course introduces students to the History of the Arabs before Islam, the main characteristics of the period of the Prophet's mission, the Islamic city and its organization, the spread of Islam, the characteristics of the Rashidun period, the Umayyads' and the Abbasids Caliphates until the Mogul's attack, the Crusades and the role of the Ayyubids and Mamluks in opposing them, and the Muslim petty states until the Ottoman conquest.

**0203114                      History of the Islamic City                      (3-0:3)**

This course study The importance of the subject and its sources, Arabs and the city, the emergence of Islamic cities and their characteristics, the planning of Islamic cities, city administration and plans, the emirate and employment on the city, and its impact on the city, the jurisprudence of construction in Islam . It also deals with a historical study of selected Islamic cities. And sheds light on the Islamic city in the battle of modernity and renewal.

**0204111                      Arab Society                      (3-0:3)**

**Prerequisite: 0204111.**

Analysis of social systems and values and their role in forming Arab identity. Extent to which such systems and values are able to meet challenges of contemporary developments.

**0204372                      Woman and Development                      (3-0:3)**

**Prerequisite: 0204372.**

Women and the system of division of labor in society, the role of women within the family and outside, the relationship between the status of women and the distribution of wealth and power, the impact of social, educational, religious, economic and political institutions on the role of women in the development process.

**0206101                      Introduction to Education                      (3-0:3)**

This course aims to present a general introduction to education. It discusses the notion of education, its types and institutions as well as its development and impact on various societies. Factors, at both local and international levels, that have impacted education are further discussed. The course also aims to enhance the students' understanding of the relationship between educational systems and social, cultural,

economic and administrative institutions. Besides, the course familiarizes students with projects of training qualified teachers in order to contribute actively in the country's comprehensive social development.

#### Program Requirements

Requirements for the Bachelor of Arts degree are program-specific. They encompass three categories: major specific core courses, major specific elective courses, and courses chosen from outside the major. The program requirements for the bachelor degrees in English Language and Literature, which are Museum Studies and Art History, and International Relations are given hereafter. Details and titles of relevant courses are included in the Student's Study Plan (SSP).

#### Course Coding

Courses offered in the College of Arts, Humanities and Social Sciences are designated by number codes in the form 020XABC where:

|     |   |
|-----|---|
| 02  | 01: Department of Arabic Language and Literature<br>02: Department of English Language and Literature<br>03: Department of History and Islamic Civilization<br>04: Department of Sociology<br>05: Department of International Relations<br>06 Department of Education |
| ABC | Program specific course number described in the respective program sections   |

The designation used to represent credit hours components (t-p: c) of a course is as follows: "t" stands for theoretical component of the course; "p" practical or laboratory component; and "c" the total credit hours. For example, (3-0:3) represents a 3 credit hour course with three contact lecture hours and zero laboratory hours.

## Department of Arabic Language and Literature

|                             |   |
|-----------------------------|---|
| <b>Chairperson:</b>         | Ben Issa Bettaher   |
| <b>Professors</b>           | Mahmoud Mohamed Hasssan Drabsa, Abdulrahman Abouali, Salah Jarrar, Abdulkader Asaad, Benissa Bettaher |
| <b>Associate Professors</b> | Muhammad Fadil Al-Samarraie   |
| <b>Assistant Professors</b> | Leila Labidi, Mariam Saeed Balejaïd, Fikry El-Naggar, Badeeah Khaleel Al-Hashemi                      |
| <b>Lecturer</b>             | Anas Aydan, Dame Toure, Shaikha Alzaabi, Amna Alkaydi   |

### Department Vision

The Arabic Language and Literature program seeks to deepen love of and loyalty to Arabic language, the language of the Holy Quran, and its genuine heritage. It also aims to academically prepare a generation of graduates who are proud of their Arabic and Islamic identity, able to meet today's challenges, and able to read, write, listen and speak Arabic language well. It further aims to prepare graduates who are strongly tied to their society, and who are qualified to serve it in accordance with the vision, mission, and goals of the university, the college and the department.

### Department Goals

1. Providing students with the linguistic, syntactic, and morphological knowledge, and developing their basic Arabic language skills (Reading, Writing, Listening and Speaking) to achieve their life and career goals.
2. Enabling students to think logically, analyze critically, develop creative linguistic and literary skills, and conserve their cultural heritage.
3. Providing students with the rhetorical, literary and critical knowledge, and methods of writing and evaluating Arabic texts.
4. Enriching students' skills to appreciate the modern linguistic and literary theories and to understand the strong relationship between the various branches of Arabic language.
5. Promoting students' spirit of belonging to religion and country through instilling the love of Arabic language in their hearts and urging them to defend it, and to adhere to the ethics of their profession, team work and community service.

### Academic Programs

- Bachelor of Arts in Arabic Language and Literature
- Master of Arts in Arabic Language and Literature
- Doctor of Philosophy in Arabic Language and Literature

### Career Opportunities

- A. Job openings available in both government and private sectors.
- B. Graduate studies.
- C. Opportunities in media outlets.
- D. Teaching careers.
- E. Arabic language editors
- F. Libraries

## Department of Foreign Languages

**Chairperson** Adana Khalid Abdulla

### Professors

Adnan Khalid Abdullah, Shehdeh  
Ismail Fareh, Sane Mo. Yagi, Ghaleb Al Rababeh

**Associate Professors** Ghanim Samarrai, Najib Jarad , Ahmad Al Harahesha

**Assistant Professors** Samer Jarbou, Andrew Joseph Power, Sanna Bin Masood, Chiraz Anan

### Lecturers

Inaam Hamadi, Ghaida Kaziha, Muhieddin Al-Qaddour, Adnan Al-Bustanji,  
Stephen Palubiski, Dana Aziz Khalil, Mutwakil Ibrahim Ismail, Abdellatif Messikh, Suhair Abu Hantash,  
Nada Mohamed Al-Hammadi, Messan Stouhi, Reem Abdulla Al Hajji, Lahcan Damiri

### Administrative Staff

Aisha Rashid Al-Shamsi Administrative Assistant

### Vision Statement

The Department of Foreign Languages aspires to be an internationally recognized center of excellence in teaching and research in language, literature, linguistics and translation. The Department strives to prepare graduates who are not just successful and confident learners, but are also creative thinkers and producers of knowledge with a passion for life-long learning. Our ambition is to see that our students attain high levels of academic excellence and professionalism in order to ensure that they have excellent job prospects and a prosperous future.

The current MA program in Translation is widely acknowledged to be one of the most successful programs in the region. Encouraged by this success, the Department has successfully launched its Ph.D. program in Linguistics and Translation Studies. The Department is in the process of getting initial accreditation for a B.A. in French Language and Literature and a B.A. in Chinese.

### Mission Statement

The mission of the Department of Foreign Languages is to provide students with cutting-edge knowledge of language, its literary canon, writers, and cultures and to help students develop proficiency in critical thinking, teaching, translation and academic, professional, and creative writing. The three study tracks, Linguistics and Translation and Literature and Translation, and English Language and Literature are geared towards preparing students for employment as language teachers, translators and interpreters, and for pursuing their studies at the master's or doctoral levels.

### Objectives

The objectives of the Department of Foreign Languages are:

To develop students' competency level in the four skills of listening, speaking, reading and writing, to equip them with all necessary tools for the appreciation of various kinds of imaginative writing in literature, and to train their critical taste and judgment.

To raise students' awareness of the principles and strategies that underline effective academic and professional communication.

To provide opportunities and resources for faculty and students to engage in research.

To familiarize students with the major theories and trends in linguistics, and the applications of linguistic principles and findings to such areas as language learning and teaching, inter-language studies, contrastive analysis, etc.

To create in the students an awareness of the principles and techniques of translation and to give them practical training in the translation of a variety of text categories.

### **Program Outcomes**

Upon the successful completion of the B.A degree program, students are expected to be able to:

Describe the sounds of the language they are studying and to pronounce words clearly and legibly in terms of segmental and supra-segmental features.

Analyze words into their respective constituents and differentiate sense relations between lexical units.

Analyze sentences into their basic constituents and produce well-formed sentences of various levels of complexity.

Analyze language at the semantic, sociolinguistic, and discourse levels.

Write with clarity and precision, in a variety of forms and for a variety of audiences, well-organized paragraphs, essays (narrative, descriptive, comparative, etc.), reports or research papers.

Differentiate between the major teaching methods and techniques and apply the appropriate teaching method and its techniques in teaching specific language skills, taking into consideration language learning principles and styles.

Prepare valid tests of different types to assess the various language skills.

Read a variety of literary genres critically and proficiently to demonstrate in writing or speech the comprehension, analysis, and interpretation of those genres.

Translate and interpret a variety of text types from their language and specialization into Arabic and vice versa, using proper terminology and appropriate style.

Use research skills and procedures to conduct research and deliver written and oral presentations.

### **Career Opportunities**

Graduates of the Department of Foreign Languages will be able to pursue careers in language teaching, translation services agencies and, the travel, transportation and tourism industry, radio and television broadcast stations (as translators or newsreaders), and online translation.

### **Admission Requirements for B.A. in English Language and Literature**

In addition to satisfying the admission criteria stipulated in the University section on Admissions in this bulletin, the following additional conditions apply to students who wish to study at the Department of Foreign Language:

Department majors are required to successfully complete the following two courses in the first semester of their official enrollment in the Department of Foreign Languages. These two courses are prerequisites to most linguistics, literature and translation courses.

0202108 - Extensive Reading

0202109 - Advanced Language Skills

Non-Arabic Speaking Students must pass the Arabic proficiency test administered by the Arabic Department.

### **Program Overview**

A student undertaking this program must complete a total of 123 credits covering University Requirements (UR), College Requirements (CR), and Program Requirements (PR). The PR consists of 45 credits of core courses (CC), 15 credits of structured studies track courses (TC) courses, and 15 credit hours of DR/E

Department Elective The following table outlines credit allocation for each degree requirement.

| <b>B.A. in English Language and Literature (123 Credits)</b> |           |           |             |              |
|--|-----------|-----------|-------------|--------------|
|  | <b>UR</b> | <b>CR</b> | <b>PR</b>   | <b>Total</b> |
| Mandatory Credits  | 15        | 15        | 45 (CC), 24 | 99           |
| Electives Credits  | 9         | -         | 15 (DR/E)   | 24           |
| <b>Total</b>   | <b>24</b> | <b>15</b> | <b>84</b>   | <b>123</b>   |

### University Requirements

Every student is required to take 24 credit hours of general education courses distributed over ~~seven~~ three domains. Fifteen (15) mandatory credit hours are selected from domains 1, 2, 3 and (9) elective credit hours selected from 4 as indicated in the University section (General Education).

### College Requirements

The list of the 15 credits of College required courses and their descriptions are presented in the introductory pages of this bulletin.

### Program Requirements

The program requirements consist of 99 credit hours of courses divided into three sets of tracks as described below.

Track (1) Linguistics and Translation

Track (2) Literature and Translation

Track (3) English Language and Literature

**NOTE: This new plan is to be followed by students enrolled starting from Fall 2016/2017 . Students prior to the year of 2016 will follow the previous plan.**



**College of Arts, Humanities and Social Sciences**

**Department of Foreign Languages**

**BA Study Plan**

**Level: Undergraduate**

**Total Credits : 123**

**Concentration : Linguistics and Translation**

**Total Courses: 41**

| Course #  | Course Title                         | Credits                |
|---|--------------------------------------|------------------------|
| <b>Area : UG-English-University</b>                             | <b>24 Credits</b>                    | <b>8 Courses</b>       |
| <b>(select one course from each of the three baskets below)</b> |                                      |                        |
| <b>1- Group: UG-University-Arts- (Elective) Select</b>          | <b>3 Credits</b>                     | <b>Select 1 Course</b> |
| 0203100   | Islamic Civilization                 | 3                      |
| 0203102   | History of the Arabian Gulf          | 3                      |
| 0203200   | History of Sciences among Muslims    | 3                      |
| 0602246   | Human Rights in Islam                | 3                      |
| 0900107   | History of Medical & Health Sciences | 3                      |
| 0201140   | Introduction to Arabic Literature    | 3                      |
| 0710109   | Arts & Medicine                      | 3                      |
| 0202130   | French Language                      | 3                      |
| <b>2- Group: UG-University-Arts- (Elective) Select</b>          | <b>3 Credits</b>                     | <b>Select 1 Course</b> |
| 0401142   | Man and the Environment              | 3                      |
| 1430101   | Astronomy and Space Sciences         | 3                      |
| 0507101   | Health Awareness and Nutrition       | 3                      |
| 0505101   | Fitness and Wellness                 | 3                      |
| 0503101   | Health and Safety                    | 3                      |
| 1450100   | Biology & Society                    | 3                      |
| <b>3- Group: UG-University-Arts- (Elective) Select</b>          | <b>3 Credits</b>                     | <b>Select 1 Course</b> |
| 0206102   | Fundamentals/Islamic Education       | 3                      |
| 0800107   | Media in Modern Societies            | 3                      |
| 0301150   | Intro to Economics (Non-Business)    | 3                      |

|  |  |                  |
|--|--|------------------|
| 0302150  | Introduction to Business for Non-Business. | 3                |
| 0104130  | Analytical Biography of the Prophet        | 3                |
| 0204102  | UAE Society                                | 3                |
| 0206103  | Introduction to Psychology                 | 3                |
| 0301131  | Personal Finance                           | 3                |
| 0103103  | Islamic System                             | 3                |
| <b>Group: UG-UNIVERSITY02ENGL-(Compulsory)</b> | <b>15 Credits</b>                          | <b>5 Courses</b> |
| 0104100  | Islamic Culture                            | 3                |
| 0201102  | Arabic Language                            | 3                |
| 0202112  | English for Academic Purposes              | 3                |
| 1411100  | Introduction to IT(English)                | 3                |
| 0302200  | Fundamentals of Innovation & Entrep.       | 3                |

|  |                             |                                   |
|--|-----------------------------|-----------------------------------|
| <b>Area: UG-ENGLISH-COLLEGE</b>                    | <b>15 Credits</b>           | <b>5 Courses</b>                  |
| <b>Group: UG-ENGLISH-(COLLEGE-ELECTIVE) Select</b> | <b>15 Credits</b>           | <b>5 Courses</b>                  |
| 0201203  | Art of Writing in Arabic    | 3                                 |
| 0206101  | Introduction to Education   | 3                                 |
| 0203103  | Islamic History             | 3                                 |
| 0203114  | History of the Islamic City | 3                                 |
| 0204372  | Women and Development       | 3                                 |
| 0204111  | Arab Society                | 3                                 |
| <b>Area: UG-ENGLISH-MAJOR</b>                      | <b>60 Credits</b>           | <b>20 Courses</b>                 |
| <b>Group: UG-ENGLISH-(MAJOR-COMPULSORY)</b>        | <b>45 Credits</b>           | <b>15 Courses (Pre-requisite)</b> |
| 0202108  | Extensive Reading           | 3                                 |
| 0202109  | Advanced Language Skills    | 3                                 |
| 0202110  | Speech Communication        | 3                                 |
| 0202212  | Research Paper Writing      | 3 (0202109)                       |
| 0202213  | Short Fiction               | 3 (0202108)                       |
| 0202218  | Drama                       | 3 (0202108)                       |
| 0202226  | Poetry                      | 3 (0202108)                       |

|  |                                   |  |
|--|-----------------------------------|--|
| 0202230  | Introduction to Language          | 3 (0202109)                                      |
| 0202231  | Syntax 1                          | 3 (0202230)                                      |
| 0202310  | Advanced Writing                  | 3 (0202109)                                      |
| 0202311  | Debating                          | 3 (0202110 or [0202108 and 0202109] )            |
| 0202331  | Syntax 2                          | 3 (0202231)                                      |
| 0202333  | Second Language Learning          | 3 (0202230)                                      |
| 0202431  | Methods of Teaching English       | 3  |
| 0202490  | Graduation Project                | 3 (0202212)                                      |
| <b>Group: UG-ENGLISH-LIT-(MAJOR-ELECTIVE)<br/>Select</b> | <b>15 Credits</b>                 | <b>Select 5 Courses</b>                          |
| 0202421  | The Modern Novel                  | 3 (0202213)                                      |
| 0202422  | Early American Literature         | 3 (0202226)                                      |
| 0202221  | Middle Eastern Literature         | 3 (0202213)                                      |
| 0202222  | 20th Century American Literature. | 3 (0202226)                                      |
| 0202320  | World Literature in English       | 3 (0202213)                                      |
| 0202323  | Literature of Antiquity           | 3 (0202218)                                      |
| 0202334  | Error Analysis                    | 3  |
| 0202424  | Shakespeare                       | 3 (0202218)                                      |
| 0202425  | Literary Criticism                | 3 (0202226)                                      |
| 0202430  | Contrastive Linguistics           | 3 (0202230)                                      |
| 0202432  | Language Testing                  | 3 (0202230)                                      |
| 0202332  | Socio-Linguistics                 | 3 (0202230)                                      |
| 0202223  | 20th Century British Literature.  | 3 (0202226)                                      |
| 0202322  | 19th Century British Literature.  | 3 (0202226)                                      |
| 0202448  | Semantics                         | 3 (0202230)                                      |
| 0202450  | Consecutive Interpreting          | 3 (0202340)                                      |
| 0202441  | Literary Translation              | 3 (0202340)                                      |
| 0202449  | Practicum in TEFL Skills          | 3 (0202431)                                      |
| <b>Area: UG-ENG-LIT-CONCENTRATION</b>                    | <b>24 Credits</b>                 | <b>8 Courses</b>                                 |
| <b>Group: UG-ENGLISH-LIT-CONS-(Compulsory)</b>           | <b>24 Credits</b>                 | <b>8 Courses</b>                                 |
| 0202232  | Phonetics and Phonology           | 3 (0202230 or [0202108 and 0202109 and 0202110]) |

|         |                              |  |
|---------|------------------------------|--|
| 0202233 | Morphology & Lexical Studies | 3  |
| 0202434 | Discourse Analysis           | 3 (0202230)  |
| 0202446 | Business Translation         | 3 (0202340)  |
| 0202340 | Translation Principles       | 3 (0202231 <b>or</b> [0202108 <b>and</b> 0202109]) |
| 0202341 | Media Translation            | 3 (0202340)  |
| 0202447 | Legal Translation            | 3 (0202340)  |
| 0202445 | Practicum in Translation     | 3 (0202431)  |

**STUDY PLAN FOR THE B.A. DEGREE -- LINGUISTICS & TRANSLATION**

### Freshman Year

#### Fall Semester

| Crs.No.      | Course Title                  | Type  | Cr        | Pre-req. |
|--------------|-------------------------------|-------|-----------|----------|
| 0104100      | Islamic Culture               | UR\CC | 3         |          |
| 0201102      | Arabic Language               | UR\CC | 3         |          |
| 0202112      | English for Academic Purposes | UR\CC | 3         |          |
| 0202108      | Extensive Reading             | DR\CC | 3         |          |
| 0202109      | Adv. Language Skills          | DR\CC | 3         |          |
| <b>Total</b> |                               |       | <b>15</b> |          |

#### Spring Semester

| Crs. No.     | Course                 | Type  | Cr        | Pre-req. |
|--------------|------------------------|-------|-----------|----------|
| xxx          | Universit              |       | 3         |          |
| 1411100      | Introduct<br>ion to IT | UR\CC | 3         |          |
| 0202230      | Intro. to Language     | DR\CC | 3         | 0202109  |
| xxx          | College Elective       |       | <b>3</b>  |          |
| 0202110      | Speech com.            | DR\CC | 3         |          |
| <b>Total</b> |                        |       | <b>15</b> |          |

### Sophomore Year

#### Fall Semester

| Crs. No.     | Course Title            | Type  | Cr        | Pre-                 |
|--------------|-------------------------|-------|-----------|----------------------|
| XXX          | College Elective 2      | CR\E  | 3         |                      |
| 0202231      | Syntax 1                | DR\CC | 3         | 020223               |
| 0202232      | Phonetics and Phonology | DR\TC | 3         | 0202230 or (0202108) |
| 0202213      | Short Fiction           | DR\CC | 3         | 0202108              |
| xxx          | College Elective 3      | CR\C  | 3         |                      |
| <b>Total</b> |                         |       | <b>15</b> |                      |

#### Spring Semester

| Crs. No.     | Course                  | Type  | Cr        | Pre-req. |
|--------------|-------------------------|-------|-----------|----------|
| 020231       | Advanced                |       | 3         | 0202109  |
| 020222       | Poetry                  | DR\   | 3         | 0202108  |
| xxx          | University Elective (2) |       | <b>3</b>  |          |
| 0202218      | Drama                   | DR\CC | 3         | 0202108  |
| 020223       | Morpholog               | DR\T  | 3         |          |
| <b>Total</b> |                         |       | <b>15</b> |          |

### Junior Year

#### Fall Semester

| Crs. No. | Course Title                   | Type  | Cr        | Pre-req.                         |
|----------|--------------------------------|-------|-----------|----------------------------------|
| 0202212  | Research Paper Writing         | DR\CC | 3         | 0202109                          |
| 0202333  | 2 <sup>nd</sup> Lang. Learning | DR\CC | 3         | 0202230                          |
| 0202xxx  | Department Elective 1          | DR\E  | 3         |                                  |
| 0202331  | Syntax 2                       | DR\CC | 3         | 0202231                          |
| 0202340  | Translation Principles         | DR\TC | 3         | 0202231<br>or<br>(0202108<br>and |
| 0302200  | Fund. Of Innovation & Enterp.  | UR\CC | 3         |                                  |
|          | <b>Total</b>                   |       | <b>18</b> |                                  |

#### Spring Semester

| Crs. No. | Course Title            | Type  | Cr        | Pre-req.                         |
|----------|-------------------------|-------|-----------|----------------------------------|
| 0202311  | Debating                | DR\CC | 3         | 0202110<br>or<br>(0202108<br>and |
| 0202431  | Methods of Teaching Eng | DR\CC | 3         |                                  |
| 0202xxx  | Department Elective 2   | DR\E  | 3         |                                  |
| 0202434  | Discourse               | DR\T  | 3         | 0202230                          |
| 0202341  | Media Translation       | DR\TC | 3         | 0202340                          |
|          |                         |       |           |                                  |
|          | <b>Total</b>            |       | <b>15</b> |                                  |

### Senior Year

#### Fall Semester

| Crs. No. | Course Title             | Type  | Cr        | Pre-req. |
|----------|--------------------------|-------|-----------|----------|
| 0202xxx  | Department Elective 3    | DR\E  | 3         |          |
| xxx      | College Elective 4       | CR\E  | 3         |          |
| 0202445  | Practicum in Translation | DR/TC | 3         | 0202341  |
| 0202446  | Business Translation     | DR\TC | 3         | 0202340  |
| 0202xxx  | Department Elective 4    | DR\E  | 3         |          |
|          | <b>Total</b>             |       | <b>15</b> |          |

#### Spring Semester

| Crs. No. | Course Title          | Type  | Cr        | Pre-req. |
|----------|-----------------------|-------|-----------|----------|
| 0202xxx  | Department Elective 5 | DR\E  | 3         |          |
| 0202447  | Legal Translation     | DR\TC | 3         | 0202340  |
| 0202490  | Graduation Project    | DR\CC | 3         | 0202212  |
| xxx      | University Elective 3 | UR\E  | 3         |          |
| xxx      | College Elective 5    |       | 3         |          |
|          | <b>Total</b>          |       | <b>15</b> |          |

**NOTE: This new plan is to be followed by students enrolled starting from Fall 2016/2017 . Students prior to the year of 2016 will follow the previous plan.**

**College of Arts, Humanities and Social Sciences**

**Department of Foreign languages**

**BA Study Plan**

**Level: Undergraduate**

**Total Credits : 123**

**Concentration : Literature and Translation**

**Total Courses: 41**

| Course #  | Course Title                         | Credits                |
|---|--------------------------------------|------------------------|
| <b>Area : UG-English-University</b>                                 |                                      |                        |
| <b>24 Credits</b>   |                                      | <b>8 Courses</b>       |
| <b>(select one course from each of the four baskets below UR/E)</b> |                                      |                        |
| <b>1- Group: UG-University-Arts-(Elective) Select</b>               | <b>3 Credits (UR/E)</b>              | <b>Select 1 Course</b> |
| 0203100   | Islamic Civilization                 | 3                      |
| 0203102   | History of the Arabian Gulf          | 3                      |
| 0203200   | History of Sciences among Muslims    | 3                      |
| 0602246   | Human Rights in Islam                | 3                      |
| 0900107   | History of Medical & Health Sciences | 3                      |
| 0201140   | Introduction to Arabic Literature    | 3                      |
| 0710109   | Arts & Medicine                      | 3                      |
| 0202130   | French Language                      | 3                      |
| <b>2- Group: UG-University-Arts-(Elective) Select</b>               | <b>3 Credits (UR/E)</b>              | <b>Select 1 Course</b> |
| 0401142   | Man and The Environment              | 3                      |
| 1430101   | Astronomy and Space Sciences         | 3                      |
| 0507101   | Health Awareness and Nutrition       | 3                      |
| 0505101   | Fitness and Wellness                 | 3                      |
| 0503101   | Health and Safety                    | 3                      |
| 1450100   | Biology & Society                    | 3                      |
| <b>3- Group: UG-University-Arts-(Elective) Select</b>               | <b>3 Credits ((UR/E)</b>             | <b>Select 1 Course</b> |
| 0206102   | Fundamentals/Islamic Education       | 3                      |
| 0800107   | Media in Modern Societies            | 3                      |

|  |  |                  |
|--|--|------------------|
| 0301150  | Introduction to Economics(Non-Business)    | 3                |
| 0302150  | Introduction to Business for Non-Business. | 3                |
| 0104130  | Analytical Biography of the Prophet        | 3                |
| 0204102  | UAE Society                                | 3                |
| 0206103  | Introduction to Psychology                 | 3                |
| 0301131  | Personal Finance                           | 3                |
| 0103103  | Islamic System                             | 3                |
| <b>Group: UG-UNIVERSITY02ENGL-(Compulsory)</b> | <b>15 Credits ( UR\CC)</b>                 | <b>5 Courses</b> |
| 0104100  | Islamic Culture                            | 3                |
| 0201102  | Arabic Language                            | 3                |
| 0202112  | English for Academic Purposes              | 3                |
| 1411100  | Introduction to IT (English)               | 3                |
| 0302200  | Fundamentals of Innovation & Entrep.       | 3                |

|  |                             |                                       |
|--|-----------------------------|---------------------------------------|
| <b>Area: UG-ENGLISH-COLLEGE</b>                    | <b>15 Credits (CR/E)</b>    | <b>5 Courses</b>                      |
| <b>Group: UG-ENGLISH-(COLLEGE-ELECTIVE) Select</b> | <b>15 Credits</b>           | <b>5 Courses</b>                      |
| 0201203  | Art of Writing in Arabic    | 3                                     |
| 0206101  | Introduction to Education   | 3                                     |
| 0203103  | Islamic History             | 3                                     |
| 0203114  | History of the Islamic City | 3                                     |
| 0204372  | Women and Development       | 3                                     |
| 0204111  | Arab Society                | 3                                     |
| <b>Area: UG-ENGLISH-MAJOR</b>                      | <b>60 Credits</b>           | <b>20 Courses</b>                     |
| <b>Group: UG-ENGLISH-(MAJOR-COMPULSORY)</b>        | <b>45 Credits (DR/CC)</b>   | <b>15 Courses (Pre-requisite)</b>     |
| 0202108  | Extensive Reading           | 3                                     |
| 0202109  | Advanced Language Skills    | 3                                     |
| 0202110  | Speech Communication        | 3                                     |
| 0202212  | Research Paper Writing      | 3 (0202109)                           |
| 0202213  | Short Fiction               | 3 (0202108)                           |
| 0202218  | Drama                       | 3 (0202108)                           |
| 0202226  | Poetry                      | 3 (0202108)                           |
| 0202230  | Introduction to Language    | 3 (0202109)                           |
| 0202231  | Syntax 1                    | 3 (0202230)                           |
| 0202310  | Advanced Writing            | 3 (0202109)                           |
| 0202311  | Debating                    | 3 (0202110 or [0202108 and 0202109] ) |
| 0202331  | Syntax 2                    | 3 (0202231)                           |
| 0202333  | Second Language Learning    | 3 (0202230)                           |



|   |                                     |  |
|---|-------------------------------------|--|
| 0202431   | Methods of Teaching English         | 3  |
| 0202490   | Graduation Project                  | 3 (0202212)  |
| <b>Group: UG-ENGLISH-LIT-<br/>(MAJOR-ELECTIVE) Select</b> | <b>15 Credits (DR/E)</b>            | <b>Select 5 Courses</b>                              |
| 0202421   | The Modern Novel                    | 3 (0202213)  |
| 0202422   | Early American Literature           | 3 (0202226)  |
| 0202232   | Phonetics and Phonology             | 3 (0202230 or [0202108 and<br>0202109 and 0202110] ) |
| 0202233   | Morphology & Lexical Studies        | 3  |
| 0202320   | World Literature in English         | 3 (0202213)  |
| 0202323   | Literature of Antiquity             | 3 (0202218)  |
| 0202334   | Error Analysis                      | 3  |
| 0202424   | Shakespeare                         | 3 (0202218)  |
| 0202425   | Literary Criticism                  | 3 (0202226)  |
| 0202430   | Contrastive Linguistics             | 3 (0202230)  |
| 0202432   | Language Testing                    | 3 (0202230)  |
| 0202434   | Discourse Analysis                  | 3 (0202230)  |
| 0202332   | Socio-Linguistics                   | 3 (0202230)  |
| 0202322   | 19th Century British Literature     | 3 (0202226)  |
| 0202448   | Semantics                           | 3 (0202230)  |
| 0202450   | Consecutive Interpreting            | 3 (0202340)  |
| 0202441   | Literary Translation                | 3 (0202340)  |
| 0202449   | Practicum in TEFL Skills            | 3 (0202431)  |
| <b>Area: UG-ENG-LIT-<br/>CONCENTRATION</b>                | <b>24 Credits (DR/TC)</b>           | <b>8 Courses</b>                                     |
| <b>Group: UG-ENGLISH-LIT-CONS-<br/>(Compulsory)</b>       | <b>24 Credits</b>                   | <b>8 Courses</b>                                     |
| 0202221   | Middle Eastern Literature           | 3 (0202213)  |
| 0202222   | 20th Century American<br>Literature | 3 (0202226)  |
| 0202223   | 20th Century British Literature     | 3 (0202226)  |
| 0202446   | Business Translation                | 3 (0202340)  |
| 0202447   | Legal Translation                   | 3 (0202340)  |
| 0202340   | Translation Principles              | 3 (0202231 or [0202108 and<br>0202109])              |
| 0202341   | Media Translation                   | 3 (0202340)  |
| 0202445   | Practicum in Translation            | 3 (0202341)  |

## Study Plan for the B.A. Degree -- Literature & Translation

### Freshman Year

#### Fall Semester

| Crs.No.      | Course Title         | Type  | Cr        | Pre-req. |
|--------------|----------------------|-------|-----------|----------|
| 0104100      | Islamic Culture      | UR\CC | 3         |          |
| 0201102      | Arabic Language      | UR\CC | 3         |          |
| 0202112      | English for Academic | UR\CC | 3         |          |
| 0202108      | Extensive Reading    | DR\CC | 3         |          |
| 0202109      | Adv. Language Skills | DR\CC | 3         |          |
| <b>Total</b> |                      |       | <b>15</b> |          |

#### Spring Semester

| Crs. No.     | Course Title                 | Type  | Cr        | Pre-req. |
|--------------|------------------------------|-------|-----------|----------|
| xxx          | University Elective 1        | UR/E  | 3         |          |
| 1411100      | Introduction to IT (English) | UR\CC | 3         |          |
| 0202230      | Intro. to Language           | DR\CC | 3         | 0202109  |
| xxx          | College Elective 1           | CR/E  | <b>3</b>  |          |
| 0202110      | Speech com.                  | DR\CC | 3         |          |
| <b>Total</b> |                              |       | <b>15</b> |          |

### Sophomore Year

#### Fall Semester

| Crs. No.     | Course Title       | Type  | Cr        | Pre-req. |
|--------------|--------------------|-------|-----------|----------|
| XXX          | College Elective 2 | CR/E  | 3         |          |
| 0202231      | Syntax 1           | DR\CC | 3         | 0202230  |
| 0202226      | Poetry             | DR\CC | 3         | 0202108  |
| 0202213      | Short Fiction      | DR\CC | 3         | 0202108  |
| xxx          | College Elective 3 | CR/E  | 3         |          |
| <b>Total</b> |                    |       | <b>15</b> |          |

#### Spring Semester

| Crs. No.     | Course Title                          | Type  | Cr        | Pre-req. |
|--------------|---------------------------------------|-------|-----------|----------|
| 0202310      | Advanced Writing                      | DR\CC | 3         | 0202109  |
| 0202221      | Middle Eastern Literature             | DR\TC | 3         | 0202213  |
| xxx          | University Elective (2)               | UR/E  | <b>3</b>  |          |
| 0202218      | Drama                                 | DR\   | 3         | 0202108  |
| 0202222      | 20 <sup>th</sup> Century American Lit | DR\TC | 3         | 0202226  |
| <b>Total</b> |                                       |       | <b>15</b> |          |

### Junior Year

#### Fall Semester

| Crs. No. | Course Title                   | Type      | Cr        | Pre-req.                 |
|----------|--------------------------------|-----------|-----------|--------------------------|
| 0202212  | Research Paper Writing         | DR\C<br>C | 3         | 0202109                  |
| 0202333  | 2 <sup>nd</sup> Lang. Learning | DR\C<br>C | 3         | 0202230                  |
| 0202xxx  | Department Elective 1          | DR\E      | 3         |                          |
| 0202331  | Syntax 2                       | DR\C<br>C | 3         | 0202231                  |
| 0202340  | Translation Principles         | DR\T<br>C | 3         | 0202231<br>or<br>(020210 |
| 0302200  | Fund. Of Innovation & Enterp.  | UR\C<br>C | 3         |                          |
|          | <b>Total</b>                   |           | <b>18</b> |                          |

#### Spring Semester

| Crs. No. | Course Title                          | Type      | Cr        | Pre-req.                 |
|----------|---------------------------------------|-----------|-----------|--------------------------|
| 0202311  | Debating                              | DR\C<br>C | 3         | 0202110<br>or<br>(020210 |
| 0202431  | Methods of Teaching Eng.              | DR\C<br>C | 3         |                          |
| 0202xxx  | Department Elective 2                 | DR\E      | 3         |                          |
| 0202223  | 20 <sup>th</sup> Century British Lit. | DR\T<br>C | 3         | 0202226                  |
| 0202341  | Media Translation                     | DR\T<br>C | 3         | 0202340                  |
|          |                                       |           |           |                          |
|          | <b>Total</b>                          |           | <b>15</b> |                          |

### Senior Year

#### Fall Semester

| Crs. No. | Course Title             | Type      | Cr        | Pre-req. |
|----------|--------------------------|-----------|-----------|----------|
| 0202xxx  | Department Elective 3    | DR\E      | 3         |          |
| xxx      | College Elective 4       | CR\E      | 3         |          |
| 0202445  | Practicum in Translation | DR/T<br>C | 3         | 0202341  |
| 0202446  | Business Translation     | DR/T<br>C | 3         | 0202340  |
| 0202xxx  | Department Elective 4    | DR\E      | 3         |          |
|          | <b>Total</b>             |           | <b>15</b> |          |

#### Spring Semester

| Crs. No. | Course Title          | Type      | Cr        | Pre-req. |
|----------|-----------------------|-----------|-----------|----------|
| 0202xxx  | Department Elective 5 | DR\E      | 3         |          |
| 0202447  | Legal Translation     | DR\T<br>C | 3         | 0202340  |
| 0202490  | Graduation Project    | DR\C<br>C | 3         | 0202212  |
| xxx      | University Elective 3 | UR\E      | 3         |          |
| xxx      | College Elective 5    | CR/E      | 3         |          |
|          | <b>Total</b>          |           | <b>15</b> |          |

**NOTE: This new plan is to be followed by students enrolled starting from Fall 2016/2017 . Students prior to the year of 2016 will follow the previous plan.**

**College of Arts, Humanities and Social Sciences**

**Department of Foreign Languages**

**BA Study Plan**

**Level: Undergraduate**

**Total Credits : 123**

**Concentration : English Language and Literature**

**Total Courses: 41**

| Course #   | Course Title                         | Credits                |
|--|--------------------------------------|------------------------|
| <b>Area : UG-English-University</b>                                  | <b>24 Credits</b>                    | <b>8 Courses</b>       |
| <b>(select one course from each of the three baskets below UR/E)</b> |                                      |                        |
| <b>1- Group: UG-University-Arts-(Elective) Select</b>                | <b>3 Credits (UR/E)</b>              | <b>Select 1 Course</b> |
| 0203100  | Islamic Civilization                 | 3                      |
| 0203102  | History of the Arabian Gulf          | 3                      |
| 0203200  | History of Sciences among Muslims    | 3                      |
| 0602246  | Human Rights in Islam                | 3                      |
| 0900107  | History of Medical & Health Sciences | 3                      |
| 0201140  | Introduction to Arabic Literature    | 3                      |
| 0710109  | Arts & Medicine                      | 3                      |
| 0202130  | French Language                      | 3                      |
| <b>2- Group: UG-University-Arts-(Elective) Select</b>                | <b>3 Credits (UR/E)</b>              | <b>Select 1 Course</b> |
| 0401142  | Man and The Environment              | 3                      |
| 1430101  | Astronomy and Space Sciences         | 3                      |

|   |  |                        |
|---|--|------------------------|
| 0507101   | Health Awareness and Nutrition             | 3                      |
| 0505101   | Fitness and Wellness                       | 3                      |
| 0503101   | Health and Safety                          | 3                      |
| 1450100   | Biology & Society                          | 3                      |
| <b>3- Group: UG-University-Arts-(Elective) Select</b> | <b>3 Credits (UR/E)</b>                    | <b>Select 1 Course</b> |
| 0206102   | Fundamentals/Islamic Education             | 3                      |
| 0800107   | Media in Modern Societies                  | 3                      |
| 0301150   | Introduction to Economics(Non-Business)    | 3                      |
| 0302150   | Introduction to Business for Non-Business. | 3                      |
| 0104130   | Analytical Biography of the Prophet        | 3                      |
| 0204102   | UAE Society                                | 3                      |
| 0206103   | Introduction to Psychology                 | 3                      |
| 0301131   | Personal Finance                           | 3                      |
| 0103103   | Islamic System                             | 3                      |
| <b>Group: UG-UNIVERSITY02ENGL-(Compulsory)</b>        | <b>15 Credits (UR/CC)</b>                  | <b>5 Courses</b>       |
| 0104100   | Islamic Culture                            | 3                      |
| 0201102   | Arabic Language                            | 3                      |
| 0202112   | English for Academic Purposes              | 3                      |
| 1411100   | Introduction to IT (English)               | 3                      |
| 0302200   | Fundamentals of Innovation & Entrep.       | 3                      |

|  |                          |                  |
|--|--------------------------|------------------|
| <b>Area: UG-ENGLISH-COLLEGE</b>                    | <b>15 Credits (CR/E)</b> | <b>5 Courses</b> |
| <b>Group: UG-ENGLISH-(COLLEGE-ELECTIVE) Select</b> | <b>15 Credits</b>        | <b>5 Courses</b> |
| 0201203  | Art of Writing in Arabic | 3                |

|  |                                  |                                       |
|--|----------------------------------|---------------------------------------|
| 0206101  | Introduction to Education        | 3                                     |
| 0203103  | Islamic History                  | 3                                     |
| 0203114  | History of the Islamic City      | 3                                     |
| 0204372  | Women and Development            | 3                                     |
| 0204111  | Arab Society                     | 3                                     |
| <b>Area: UG-ENGLISH-MAJOR</b>                        | <b>60 Credits</b>                | <b>20 Courses</b>                     |
| <b>Group: UG-ENGLISH-(MAJOR-COMPULSORY)</b>          | <b>45 Credits (DR/CC)</b>        | <b>15 Courses (Pre-requisite)</b>     |
| 0202108  | Extensive Reading                | 3                                     |
| 0202109  | Advanced Language Skills         | 3                                     |
| 0202110  | Speech Communication             | 3                                     |
| 0202212  | Research Paper Writing           | 3 (0202109)                           |
| 0202213  | Short Fiction                    | 3 (0202108)                           |
| 0202218  | Drama                            | 3 (0202108)                           |
| 0202226  | Poetry                           | 3 (0202108)                           |
| 0202230  | Introduction to Language         | 3 (0202109)                           |
| 0202231  | Syntax 1                         | 3 (0202230)                           |
| 0202310  | Advanced Writing                 | 3 (0202109)                           |
| 0202311  | Debating                         | 3 (0202110 or [0202108 and 0202109] ) |
| 0202331  | Syntax 2                         | 3 (0202231)                           |
| 0202333  | Second Language Learning         | 3 (0202230)                           |
| 0202431  | Methods of Teaching English      | 3                                     |
| 0202490  | Graduation Project               | 3 (0202212)                           |
| <b>Group: UG-ENGLISH-LIT-(MAJOR-ELECTIVE) Select</b> | <b>15 Credits (DR/E)</b>         | <b>Select 5 Courses</b>               |
| 0202421  | The Modern Novel                 | 3 (0202213)                           |
| 0202222  | 20th Century American Literature | 3 (0202226)                           |
| 0202221  | Middle Eastern Literature        | 3 (0202213)                           |
| 0202223  | 20th Century British Literature  | 3 (0202226)                           |
| 0202446  | Business Translation             | 3 (0202340)                           |
| 0202323  | Literature of Antiquity          | 3 (0202218)                           |
| 0202334  | Error Analysis                   | 3                                     |

|   |                                 |   |
|---|---------------------------------|---|
| 0202424   | Shakespeare                     | 3 (0202218)                                       |
| 0202425   | Literary Criticism              | 3 (0202226)                                       |
| 0202430   | Contrastive Linguistics         | 3 (0202230)                                       |
| 0202432   | Language Testing                | 3 (0202230)                                       |
| 0202340   | Translation Principles          | 3 (0202231 or [0202108 and 0202109] )             |
| 0202447   | Legal Translation               | 3 (0202340)                                       |
| 0202322   | 19th Century British Literature | 3 (0202226)                                       |
| 0202341   | Media Translation               | 3 (0202340)                                       |
| 0202450   | Consecutive Interpreting        | 3 (0202340)                                       |
| 0202441   | Literary Translation            | 3 (0202340)                                       |
| 0202445   | Practicum in Translation        | 3 (0202341)                                       |
| <b>Area: UG-ENG-LIT-CONCENTRATION</b>           | <b>24 Credits (DR/TC)</b>       | <b>8 Courses</b>                                  |
| <b>Group: UG-ENGLISH-LIT-CONS- (Compulsory)</b> | <b>24 Credits</b>               | <b>8 Courses</b>                                  |
| 0202232   | Phonetics and Phonology         | 3 (0202230 or [0202108 and 0202109 and 0202110] ) |
| 0202233   | Morphology & Lexical Studies    | 3   |
| 0202422   | Early American Literature       | 3 (0202226)                                       |
| 0202320   | World Literature in English     | 3 (0202213)                                       |
| 0202332   | Socio-Linguistics               | 3 (0202230)                                       |
| 0202448   | Semantics                       | 3 (0202230)                                       |
| 0202434   | Discourse Analysis              | 3 (0202230)                                       |
| 0202449   | Practicum in TEFL Skills        | 3 (0202431)                                       |

### Freshman Year Fall Semester

| Crs. No.     | Course Title                  | Type | Cr        | Pre-req. |
|--------------|-------------------------------|------|-----------|----------|
| 0104100      | Islamic Culture               | UR\C | 3         |          |
| 0201102      | Arabic Language               | UR\C | 3         |          |
| 0202112      | English for Academic Purposes | UR\C | 3         |          |
| 0202108      | Extensive Reading             | DR\C | 3         |          |
| 0202109      | Adv. Language Skills          | DR\C | 3         |          |
| <b>Total</b> |                               |      | <b>15</b> |          |

### Freshman Year Spring Semester

| Crs. No.     | Course Title                 | Type | Cr        | Pre-req. |
|--------------|------------------------------|------|-----------|----------|
| xxx          | University Elective 1        | UR/E | 3         |          |
| 1411100      | Introduction to IT (English) | UR\C | 3         |          |
| 0202230      | Intro. to Language           | DR\C | 3         | 0202109  |
| xxx          | College Elective 1           | CR/E | 3         |          |
| 0202110      | Speech com.                  | DR\C | 3         |          |
| <b>Total</b> |                              |      | <b>15</b> |          |

### Sophomore Year

#### Fall Semester

| Crs. No.     | Course Title       | Type | Cr        | Pre-req. |
|--------------|--------------------|------|-----------|----------|
| XXX          | College Elective 2 | CR\E | 3         |          |
| 0202231      | Syntax 1           | DR\C | 3         | 0202230  |
| 0202226      | Poetry             | DR\C | 3         | 0202108  |
| 0202213      | Short Fiction      | DR\C | 3         | 0202108  |
| xxx          | College Elective 3 | CR\E | 3         |          |
| <b>Total</b> |                    |      | <b>15</b> |          |

#### Spring Semester

| Crs. No.     | Course                  | Type | Cr        | Pre-req.  |
|--------------|-------------------------|------|-----------|---|
| 0202310      | Advanced Writing        | DR\C | 3         | 0202109   |
| 0202232      | Phonetics & Phonology   | DR\T | 3         | (0202230 or [0202108 and 0202109 and 0202110] ) |
| xxx          | University Elective (2) | UR/E | 3         |   |
| 0202218      | Drama                   | DR\C | 3         | 0202108   |
| 0202233      | Morphology              | DR\T | 3         |   |
| <b>Total</b> |                         |      | <b>15</b> |   |



### Junior Year

#### Fall Semester

#### Spring Semester

| Crs. No. | Course Title                   | Type  | Cr        | Pre-req.  |
|----------|--------------------------------|-------|-----------|-----------|
| 0202212  | Research Paper                 | DR\CC | 3         | 0202109   |
| 0202333  | 2 <sup>nd</sup> Lang. Learning | DR\CC | 3         | 0202230   |
| 0202xxx  | Department Elective 1          | DR\E  | 3         |           |
| 0202331  | Syntax 2                       | DR\CC | 3         | 0202231   |
| 0202332  | Sociolinguistics               | DR\TC | 3         | (0202230) |
| 0302200  | Fund. Of Innovation & Entrep.  | UR\CC | 3         |           |
|          | <b>Total</b>                   |       | <b>18</b> |           |

| Crs. No.    | Course Title                | Type      | Cr        | Pre-req.                               |
|-------------|-----------------------------|-----------|-----------|--|
| 0202311     | Debating                    | DR\C<br>C | 3         | 0202110 or<br>(0202108 and<br>0202109) |
| 0202431     | Methods of Teaching Eng.    | DR\C<br>C | 3         |  |
| 0202xx<br>x | Department Elective 2       | DR\E      | 3         |  |
| 0202xx<br>x | Department Elective 3       | DR\E      | 3         |  |
| 0202320     | World Literature in English | DR\T<br>C | 3         | 0202213                                |
|             |                             |           |           |  |
|             | <b>Total</b>                |           | <b>15</b> |  |

## Courses Descriptions

Courses offered by the Department of Foreign Languages are designated by the code (0202ABC) where 02 indicates the College and 02 the programs.

Descriptions of the core and elective core courses are given below.

### 0202108 Extensive Reading (3-0:3)

**Prerequisite: None**

A CALL-based course that focuses on extensive reading with the purpose of enabling students to understand works of a literary nature. It aims to enrich the student's stock of vocabulary and to improve reading and comprehension through carefully selected interactive software and directed classroom discussion.

### 0202109 Advanced Language Skills (3-0:3)

**Prerequisite: None**

A CALL-based exam-preparation course that teaches advanced level grammatical structures and critical reading; cultivates written expression; trains in public speaking; gives standardized exam preparation and develops a specialized stock of vocabulary.

### 0202110 Speech Communication (3-0:3)

#### Senior Year

#### Fall Semester

| Crs. No. | Course Title          | Type      | Cr | Pre-req.  |
|----------|-----------------------|-----------|----|-----------|
| 0202xxx  | Department Elective 4 | DR\E      | 3  |           |
| xxx      | College Elective 4    | CR\E      | 3  |           |
| 0202445  | Practicum in TEFL     | DR/T<br>C | 3  | 0202341   |
| 0202448  | Semantics             | DR\T<br>C | 3  | (0202230) |
| 0202xxx  | Department Elective 5 | DR\E      | 3  |           |
|          | Total                 |           | 15 |           |

#### Spring Semester

| Crs. No. | Course Title          | Type      | Cr | Pre-req. |
|----------|-----------------------|-----------|----|----------|
| 0202434  | Discourse Analysis    | DR\T<br>C | 3  | 0202230  |
| 0202422  | Early American Lit.   | DR\T<br>C | 3  | 0202226  |
| 0202490  | Graduation Project    | DR\CC     | 3  | 0202212  |
| xxx      | University Elective 3 | UR\E      | 3  |          |
| xxx      | College Elective 5    | CR/E      | 3  |          |
|          | Total                 |           | 15 |          |

**Prerequisite: None**

Aims to develop students' to speak in public; focuses on accuracy, clarity and fluency in formal and informal contexts and fosters listening skills in academic settings as well as in social contexts.

**0202212                      Research Paper Writing                      (3-0:3)**

**Prerequisite: 0202109 or 0202210.**

Introduces students to the tools and techniques of collecting and interpreting information. Students learn how to narrow down a topic, assemble a bibliography, create a working plan for a research paper, organize material, and integrate information from primary and secondary sources into a coherent academic paper.

**0202221                      Middle Eastern Literature                      (3-0:3)**

**Prerequisite: 0202213**

Introduces students to the literary achievements of major Arab and Middle Eastern writers, both classical and modern; explores the major themes and recurrent motifs that give this literature its distinctive quality. A variety of literary genres are studied.

**0202222                      20th Century American Literature                      (3-0:3)**

**Prerequisite: 0202226**

Introduces students to the 20th century development of literature in America, from naturalism through modernism and postmodernism; focuses on distinctly American strains of modernism and on understanding their relation to British and European modernism; and concentrates on concepts such as modernization, modernity and postmodernism.

**0202230                      Introduction to Language                      (3-0:3)**

**Prerequisites: 0202109**

Introduces language as a concept and as a phenomenon; examines the development of human language, the development of writing, the acquisition of mother tongue and language change and studies the nature of language: sounds, words, sentences and meaning.

**0202231                      Syntax 1                      (3-0:3)**

**Prerequisite: 0202230.**

An introduction to the descriptive analysis of sentence constituents which covers word classes, phrases and sentence patterns.

**0202232                      Phonetics and Phonology                      (3-0:3)**

**Prerequisite: 0202230 or (0202108 and 0202109 and 0202110).**

A basic introduction to speech and sound mechanisms. Concentrates on principles of articulatory phonetics, IPA transcription, ear- training, distinctive feature theory, segmental phonological analysis and the writing of phonological rules. Special emphasis is given to the sounds and sound patterns of English.

**0202233                      Morphology and Lexical Studies                      (3-0:3)**

**Prerequisite: None.**

Introduces major types of morphological phenomena, their analysis, and current theoretical approaches to handling them; focuses on inflection and derivation, the mechanisms for English word formation and their implications for the lexicon. Meaning change across time and across dialects is also studied.

**0202310                      Advanced Writing                      (3-0:3)**

**Prerequisite: 0202109 or 0202210.**

Seeks to consolidate and develop writing skills acquired in the less advanced courses in the study plan. Topics include sophisticated issues that require careful planning. The course will also include writing an extended original essay on a topic acceptable to the instructor. This essay is in lieu of a final examination.

**0202311                      Debating                      (3-0:3)**

**Prerequisites: 0202110 or (0202108 and 0202109.)**

Students are engaged in debating various issues suggested by the instructor or by other students. The course aims to train students to speak with greater command of spoken English on topics requiring the expression and defense of opinion. Speakers are selected on two sides of an issue, each side defending its position while attempting to refute the other side's arguments.

**0202320                      World Literature in English                      (3-0:3)**

**Prerequisite: 0202213**

Introduces majors to literature written in English by authors from places other than Britain and the United States; and focuses on the political and literary-historical context of these works and on themes common to the work of authors writing within a postcolonial framework, such as exile, psychic and linguistic displacement and cosmopolitanism.

**0202322                      19th Century British Literature                      (3-0:3)**

**Prerequisite: 0202226**

Deepens students' with central authors, works and issues; introduces them to the nineteenth century novel; and focuses in particular on the development of the novel over the course of the century and on the different responses made by novelists, poets and writers of prose to the pressures of the period.

**0202323                      Literature of Antiquity                      (3-0:3)**

**Prerequisite: 0202218**

Introduces students to the classics of antiquity; Greek and Roman civilizations are studied through representative texts that highlight the degree to which the Western literary tradition draws upon its ancient sources. Literary techniques, genres, themes and topics help elucidate the connection between the Age of Antiquity and later periods.

**0202331                      Syntax 2                      (3-0:3)**

**Prerequisite: 0202231**

Extends students' knowledge from Syntax 1 and examines syntactic processes such as coordination and subordination complexity and related logical connectors and ambiguity.

**0202332                      Sociolinguistics                      (3-0:3)**

**Prerequisite: 0202230**

An introduction to major topics in sociolinguistics: sociolinguistic goals, techniques and levels of analysis; implications of the recognition of language as a social phenomenon and its importance in social interaction; and functions of different speech varieties in human communities.

**0202333                      Second Language Learning                      (3-0:3)**

**Prerequisite: 0202230**

Designed to provide prospective teachers with a theoretical base for understanding how a second language is learned; and offers psychological, social and linguistic concepts and an overview of the major theories in the field of second language learning and teaching.

**0202334                      Error Analysis                      (3-0:3)**

**Prerequisite: None**

Introduces the concept of error in language learning; and covers topics such as error vs. mistake, significance of errors, attitudes towards errors, sources of errors, the process of analyzing errors, inter-language and types of errors (inter-lingual, intra-lingual, development and teacher-induced errors).

**0202340                      Translation Principles                      (3-0:3)**

**Prerequisite: 0202231 or (0202108 and 0202109)**

Contrastive analysis, stylistics, and lexical problems within the context of translating from English to Arabic and vice versa and types of translation are discussed. Basic techniques in translation are used to produce supervised translations of various types of texts.

**0202341                      Media Translation                      (3-0:3)**

**Prerequisite: 0202340**

Applies the principles of translation learned in the pre-requisite to a variety of newspaper, radio, television, and public relations texts. Attention is paid to the formats of hard news stories, feature articles, editorials, spoken and written language.

**0202421                      The Modern Novel                      (3-0:3)**

**Prerequisite: 0202213**

Provides an introduction to, and a historical overview of, the development of the novel in the 20th century. Representative works by major British and American novelists are studied, with emphasis on recurring themes and evolving narrative techniques. Different types of novels, including the Bildungsroman, will be the object of close analysis.

**0202422                      Early American Literature                      (3-0:3)**

**Prerequisite: 0202226**

Introduces students to representative authors, texts, and issues in American literature both before and after independence and covers the Puritan world view, reinterpretations of the Puritan legacy, the American Enlightenment, Manifest Destiny, the frontier, race and slavery.

**0202424                      Shakespeare                      (3-0:3)**

**Prerequisite: 0202218**

Introduces students to the world of William Shakespeare; studies at least three plays by Shakespeare and several of his sonnets. Plays vary from one semester to another, but they represent the major categories of his output: tragedies, comedies, and histories.

**0202425 Literary Criticism (3-0:3)**

**Prerequisite: 0202226**

Probes the history of literary criticism. Approaches such as structuralism, post-structuralism, reception theory, sociology of literature and speech act theory are studied then applied to selected texts.

**0202430 Contrastive Linguistics (3-0:3)**

**Prerequisite: 0202230.**

Introduces the hypothesis and methods of contrastive analysis and investigates differences between English and Arabic and focuses on selected areas of the sound system, word formation and grammatical and syntactic structures found in both languages.

**0202431 Methods of Teaching English (3-0:3)**

**Prerequisite: None.**

Designed for students preparing for a career in teaching; focuses on classroom techniques, instructional procedures, and teacher/learner behaviors that emerge when a variety of second language methodologies are used; and covers a wide range of skill areas.

**0202432 Language Testing (3-0:3)**

**Prerequisite: 0202230**

Aims at acquainting the students with the purposes and methods of language testing, construction and administration of different types of tests as well as interpretation of their results, techniques used in evaluating listening, speaking, reading and writing. The characteristics of good language tests will also be highlighted.

**0202434 Discourse Analysis (3-0:3)**

**Prerequisite: 0202230**

The features of written and spoken discourse are discussed. The course provides an exploration of the continuum as well as the dichotomy of spoken and written discourse. Students learn to identify concepts like grounding, coherence and cohesion, topic and reference, and they learn how sentences can be manipulated to achieve these notions.

**0202447 Legal Translation**

**Prerequisite: 0202340.**

The course applies the principles of translation learned in the pre-requisite and in other related courses to a wide variety of legal texts, focusing on specialized terminology as well as stylistic features of these texts.

**0202446 Business Translation**

**Prerequisite: 0202340**

The course aims to familiarize students with different types of English business texts, business terminology and stylistic features of these texts. It seeks to train students to tap resources, including online material such as glossaries, the Web, parallel corpora and comparable corpora to find Arabic equivalents. Additionally, it capitalizes on skills acquired in other translation courses to further develop students' skills in translating business texts from English into Arabic.

**0202441 Literary Translation (3-0:3)**

**Prerequisite: 0202340.**

Applies the principles of translation learned in the prerequisite to a variety of literary genres, with special emphasis on figurative language, styles and aspects of creativity.

**0202490 Graduation Project (0-6:3)**

**Prerequisite: 0202212.**

Intended to consolidate research skills and methodologies acquired in previous courses. Students are expected to produce academically sophisticated research papers. Topics to be discussed will normally be in essays of three to four thousand words in length and should be related to the three main areas of specialization covered by the study program: literature, linguistics, and translation.

**Service Courses**

The following courses are offered for other majors as service courses:

| Course # | Title                         | Purpose   |
|----------|-------------------------------|---|
| 0202111  | Basic English                 | UR for Arabic-medium                            |
| 0202112  | English for Academic Purposes | UR for Science majors                           |
| 0202113  | English for Humanities        | CR for Arabic-medium students in the College of |
| 0202114  | English for Media             | CR for Arabic-medium students in the College of |
| 0202121  | English for Medical Sciences  | UR for Medical students                         |
| 0202207  | Technical Writing             | CR for Engineering majors                       |
| 0202227  | Critical Reading and Writing  | CR for Science majors                           |

**Description of the service courses is given below.**

**0202113 English for Humanities (3-0:3)**

**Prerequisite: None**

English for Humanities is a higher intermediate course that follows an integrated multi-skills approach. It aims at helping students build their communicative competence, develop their critical thinking skills, and improve the structure of their written expression. It also lays emphasis on enabling students to write a range of short response paragraphs.

**0202114 English for Media (3-0:3)**

**Prerequisite: 0202113.**

This is an English for specific purposes course that develops the communication skills and specialist English language knowledge of media students. It provides students with job-specific skills such as writing headlines and advertisements in order to prepare them to work more confidently and effectively in their relevant fields.

**0202112 English for Academic Purposes (3-0:3)**

**Prerequisite: TOEFL.**

This course focuses on academic reading and writing skills, including extensive work in reading comprehension and retention. Students will practice identifying topics, determining the main idea of a text, recognizing the supporting details of a paragraph, recognizing authors' writing patterns, and understanding

new vocabulary through context clues. Emphasis is given to the rhetorical structures of cause and effect.

**0202207                      Technical Writing                      (3-0:3)**

**Prerequisite: 0202112**

An ESP task-based course intended for engineering students. It aims at increasing their proficiency in managing technical data and writing for the work-place, namely memoranda, letters, reports, proposals and research papers.

**0202330                      Basic English                      (3-0:3)**

**Prerequisite: None.**

It follows an integrated multi-skills approach that encourages students to develop their communicative competence in the language. This course also lays special emphasis on aural/ oral and writing skills using authentic material, relevant situations, and different language functions.

**0202121                      English for Medical sciences                      (3-0:3)**

**Prerequisite: None.**

This competency based course aims to enable students of Medicine, Dentistry, Pharmacy, and Health Sciences to communicate effectively in English, orally and in writing, using the medical terms in their respective fields. The competences include patient and population care, knowledge, evidence-based practice, life-long learning and interpersonal communication skills. Students will be familiarized with the structure of medical terms and the principles of constructing, analyzing and pronouncing them. They will also be trained to read medical articles and reports, summarize/outline them and rephrase medical statements in their own words. Students will also be trained to infer the meaning of medical terms from the context. They are also expected to write coherent and cohesive paragraphs and medical reports on topics related to their majors. Special attention will be given to oral presentations and patient-doctor dialogues. This course also aims to develop students' general academic skills, critical thinking capacities, and independent learning skills. Academic vocabulary and relevant grammatical structures will be highlighted and practiced. Students are also expected to apply this knowledge to understanding texts in their fields of study.

**0202213                      Critical Reading and Writing                      (3-0:3)**

**Prerequisite: None.**

Critical Reading and Writing introduces students to the critical, systematic processes through which they can develop and support their own ideas as well as evaluate the strength of ideas put forward by others. This course includes practice in inductive and deductive reasoning, presentation of arguments in oral and written form, critical analysis of arguments in written form, and analysis of the use of language to influence thought. The course also applies the critical reasoning process to other fields of study that students are involved in.

**Department of Foreign Languages**

**Introduction**

As an institution of higher education, the University of Sharjah seeks to provide continuous and specialized education which aims at training human resources that are both capable of contributing to the sustained development of the country and enhancing its links with an ever-changing world. The Department of Foreign Languages, being keenly aware of these objectives, realizes that, in a world undergoing an



irreversible process of globalization, there is a growing need for people who are in full command of the language that this process requires. Such people will need to be abreast of the latest developments in the world arena, to transfer the knowledge the country needs in the various fields of human endeavor, and to convey an accurate picture of the progress the country is undergoing in its own attempt to be in the forefront of developing nations.

### Program objectives

- 1- Provide students with the basic theoretical principles of the major approaches to translation.
- 2- To acquaint students with the characteristic discourse features of various Arabic and English text types, and to give them intensive training in translating these texts.
- 3- To promote students' awareness of (a) the relationship between culture and translation, (b) cross-cultural differences and similarities between English and trends characteristic of the two languages.
- 4- To promote the transfer of Arab and Islamic culture to English-speaking countries.
- 5- To prepare qualified graduates to serve the needs of both the private and public sectors.
- 6- To acquaint students with the principles of consecutive interpretation of political speeches and interviews from and into Arabic.
- 7- To develop students' research skills in the areas of translation, machine translation, contrastive linguistics, and lexicography.
- 8- To prepare students for further research in translation.

### Program Learning Outcomes:

By the end of successful completion of the program, students should be able to:

1. Demonstrate ability to analyze and translate a variety of texts into and out of English and Arabic, in a variety of situations.
2. Analyze the multifaceted role of translation in intercultural communication.
3. Apply relevant theories and approaches to reflection on translation practices and the role of translators in society.
4. Create solutions for translation problems by drawing on knowledge of translation theory and linguistics.
5. Utilize computer-assisted translation tools in translation activities.
6. Apply relevant research methodologies to the investigation of key issues in translation.

### Alignment of Program Goals to Program Learning Outcomes

| No. | Program Goals  | Related Program Learning Outcomes   |
|-----|--|---|
| 1   | Provide students with the basic theoretical principles of the major approaches to translation. | - Apply relevant theories and approaches to reflection on translation practices and the role of translators in society. |

|   |   |   |
|---|---|---|
|   |   | <ul style="list-style-type: none"> <li>- Create solutions for translation problems by drawing on knowledge of translation theory and linguistics.</li> <li>- Apply relevant research methodologies to the investigation of key issues in translation.</li> </ul>  |
| 2 | To acquaint students with the characteristic discourse features of various Arabic and English text types, and to give them intensive training in translating these texts.                               | <ul style="list-style-type: none"> <li>- Demonstrate ability to analyze and translate a variety of texts into and out of English and Arabic, in a variety of situations.</li> </ul>   |
| 3 | To promote students' awareness of (a) the relationship between culture and translation, (b) cross-cultural differences and similarities between English and trends characteristic of the two languages. | <ul style="list-style-type: none"> <li>- Analyze the multifaceted role of translation in intercultural communication.</li> </ul>  |
| 4 | To promote the transfer of Arab and Islamic culture to English-speaking countries.  | <ul style="list-style-type: none"> <li>- Analyze the multifaceted role of translation in intercultural communication.</li> </ul>  |
| 5 | To prepare qualified graduates to serve the needs of both the private and public sectors.   | <ul style="list-style-type: none"> <li>- Demonstrate ability to analyze and translate a variety of texts into and out of English and Arabic, in a variety of situations.</li> <li>- Create solutions for translation problems by drawing on knowledge of translation theory and linguistics.</li> <li>- Utilize computer-assisted translation tools in translation activities.</li> </ul>         |
| 6 | To acquaint students with the principles of consecutive interpretation of political speeches and interviews from and into Arabic.   | <ul style="list-style-type: none"> <li>- Demonstrate ability to analyze and translate a variety of texts into and out of English and Arabic, in a variety of situations.</li> </ul>   |
| 7 | To develop students' research skills in the areas of translation, machine translation, contrastive linguistics, and lexicography.   | <ul style="list-style-type: none"> <li>- Apply relevant theories and approaches to reflection on translation practices and the role of translators in society.</li> <li>- Create solutions for translation problems by drawing on knowledge of translation theory and linguistics.</li> <li>- Apply relevant research methodologies to the investigation of key issues in translation.</li> </ul> |
| 8 | To prepare students for further research in translation.  | <ul style="list-style-type: none"> <li>- Apply relevant research methodologies to the investigation of key issues in translation.</li> </ul>  |

### Alignment of Program Learning Outcomes to QF Emirates

| NQF Emirates Strand                | Program Learning Outcomes  |
|------------------------------------|--|
| <b>Knowledge</b>                   | <ul style="list-style-type: none"> <li>- Apply relevant theories and approaches to reflection on translation practices and the role of translators in society.</li> <li>- Create solutions for translation problems by drawing on knowledge of translation theory and linguistics.</li> <li>- Apply relevant research methodologies to the investigation of key issues in translation.</li> </ul>  |
| <b>Skill</b>                       | <ul style="list-style-type: none"> <li>- Demonstrate ability to analyze and translate a variety of texts into and out of English and Arabic, in a variety of situations.</li> <li>- Create solutions for translation problems by drawing on knowledge of translation theory and linguistics.</li> <li>- Utilize computer-assisted translation tools in translation.</li> </ul>   |
| <b>Autonomy and responsibility</b> | <ul style="list-style-type: none"> <li>- Demonstrate ability to analyze and translate a variety of texts into and out of English and Arabic, in a variety of situations.</li> <li>- Create solutions for translation problems by drawing on knowledge of translation theory and linguistics.</li> </ul>  |
| <b>Role in context</b>             | <ul style="list-style-type: none"> <li>- Demonstrate ability to analyze and translate a variety of texts into and out of English and Arabic, in a variety of situations.</li> <li>- Apply relevant theories and approaches to reflection on translation practices and the role of translators in society.</li> <li>- Create solutions for translation problems by drawing on knowledge of translation theory and linguistics.</li> </ul>   |
| <b>Self-development</b>            | <ul style="list-style-type: none"> <li>- Demonstrate ability to analyze and translate a variety of texts into and out of English and Arabic, in a variety of situations.</li> <li>- Apply relevant theories and approaches to reflection on translation practices and the role of translators in society.</li> <li>- Create solutions for translation problems by drawing on knowledge of translation theory and linguistics.</li> <li>- Utilize computer-assisted translation tools in translation activities.</li> <li>- Apply relevant research methodologies to the investigation of key issues in translation.</li> </ul> |

### Program Structure

The MA Program in Translation consists of 34 credit hours distributed as follows:

| Program Structure  | Cr. Hrs.          |
|--------------------|-------------------|
| Compulsory courses | 13 credits        |
| Electives          | 12 credits        |
| Dissertation       | 9 credits         |
| <b>Total</b>       | <b>34 credits</b> |

## Study Plan: Course List

### Compulsory Courses (13 credit hours):

| No. | Course No. | Course Title                              | Credit hours | Type       |
|-----|------------|---|--------------|------------|
| 1.  | 0202540    | Translation Theory                        | 3            | Compulsory |
| 2.  | 0202541    | Contrastive Linguistics                   | 3            | Compulsory |
| 3.  | 0202542    | Research Methodology                      | 1            | Compulsory |
| 4.  | 0202543    | Translation of Arabic and English Texts 1 | 3            | Compulsory |
| 5.  | 0202544    | Linguistics and Translation               | 3            | Compulsory |

### Elective Courses (12 credit hours):

| No. | Course No. | Course Title                                | Credit hours | Type     |
|-----|------------|---|--------------|----------|
| 1.  | 0202545    | Legal Translation                           | 3            | Elective |
| 2.  | 0202546    | Mass Media Translation                      | 3            | Elective |
| 3.  | 0202547    | The Cultural Trend in Translation Studies   | 3            | Elective |
| 4.  | 0202548    | Scientific and Technical Translation        | 3            | Elective |
| 5.  | 0202640    | Translation Criticism                       | 3            | Elective |
| 6.  | 0202641    | Translation of Religious Text               | 3            | Elective |
| 7.  | 0202642    | Literary Translation                        | 3            | Elective |
| 8.  | 0202643    | Machine-Aided Translation                   | 3            | Elective |
| 9.  | 0202644    | Lexicology and Lexicography                 | 3            | Elective |
| 10. | 0202645    | Principles of Consecutive Interpreting      | 3            | Elective |
| 11. | 0202646    | Translation of Arabic and English Texts II  | 3            | Elective |
| 12. | 0202647    | Business Translation                        | 3            | Elective |
| 13. | 0202648    | Translation of Political Speeches and Texts | 3            | Elective |

### Dissertation (9 credit hours):

|    |         |              |   |
|----|---------|--------------|---|
| 1. | 0202690 | Dissertation | 9 |
|----|---------|--------------|---|

## Study Plan: Course Distribution

| Year 1                         |   |          |            |
|--------------------------------|---|----------|------------|
| Year I, Semester 1 (9 Credits) |   |          |            |
| Course No.                     | Course Title                              | Cr. Hrs. | Status     |
| 0202540                        | Translation Theory                        | 3        | Compulsory |
| 0202543                        | Translation of Arabic and English texts 1 | 3        | Compulsory |
| 0202xxx                        | Elective 1                                | 3        | Elective   |
| Year I, Semester 2 (7 Credits) |   |          |            |
| Course No.                     | Course Title                              | Cr. Hrs. | Status     |
| 0202541                        | Contrastive Linguistics                   | 3        | Compulsory |
| 0202542                        | Research Methodology                      | 1        | Compulsory |

| Year 1  |            |   |          |
|---------|------------|---|----------|
| 0202xxx | Elective 2 | 3 | Elective |

| Year 2                         |                             |          |            |
|--------------------------------|-----------------------------|----------|------------|
| Year 2, Semester 1 (9 Credits) |                             |          |            |
| Course No.                     | Course Title                | Cr. Hrs. | Status     |
| 0202544                        | Linguistics and Translation | 3        | Compulsory |
| 0202xxx                        | Elective 3                  | 3        | Elective   |
| 0202xxx                        | Elective 4                  | 3        | Elective   |
| Year 2, Semester 2 (9 Credits) |                             |          |            |
| Course No.                     | Course Title                | Cr. Hrs. | Status     |
| 0202690                        | Dissertation                | 3        | Compulsory |

### Admission Requirements

In accordance with the university requirements for graduate degrees ([Appendix 4](#)), regular enrollment is granted for applicants to the MA program who satisfy the following academic qualifications and criteria:

1. The applicant must hold a bachelor degree from a recognized university with a minimum grade of Good and a CGPA of 3 on a 4 point scale.
2. Applicants with a CGPA of 2.5 to 2.99 may be admitted conditionally provided that they register for 6-9 credit hours in the first semester of their study and obtain a (B) average. Otherwise, a student will be expelled from the program.
3. Applicants must obtain 550 points on the TOEFL test or 6 on IELTS. An applicant may be admitted conditionally if he obtains 530 points or better on the TOEFL provided that the applicant enrolls in an English language course and receives a TOEFL score of 550 at the end of his first semester of study. Otherwise, the applicant will be expelled from the program.
4. The applicant must pass an entrance test in Arabic to ensure that the candidate has attained a native speaker or near-native speaker competence in the language.
5. The applicant must pass an interview.

**PhD in Linguistics and Translation**  
**University of Sharjah**

General Information

| Program’s Name     | Doctor of Philosophy in Linguistics and Translation |              |                              |                              |
|--------------------|---|--------------|------------------------------|------------------------------|
| College            | Arts, Humanities & Social Sciences                  | Department   | Foreign Languages            |                              |
| Specializations    | Linguistics & Translation                           |              |                              |                              |
| Adoption Date      | Fall 2020/2021                                      | Location     | University Main Campus       |                              |
| Level              | Ph.D.   | Study System | Thesis and Coursework        |                              |
| Total Credit Hours | 48  | Total Amount | **Insert** XXXX AED per CrHr | Total of **Insert** XXXX AED |
| Duration           | 3 – 4 Years (Full-time only)                        | Language     | English                      |                              |
| Intake             | Fall - Spring                                       | Study Mode   | Full Time                    |                              |

Introduction

The Doctor of Philosophy in Linguistics and Translation program develops a candidate's understanding of fundamental and advanced issues in linguistics and translation, enables him or her to communicate their knowledge with excellent oral and written skills, and motivates them to take the lead in research and development in their field of expertise. The candidates would demonstrate ability to engage independently in research and provide an original and significant contribution in their area of specialization. The main goal of this program is to provide advanced knowledge in linguistics and translation topics with in-depth research experience. Graduates of this program may work in academic institutions to teach linguistics and translation courses, at translation agencies, or in research centers.

Program Objectives

1. Conduct original research in linguistics and translation,
2. Successfully apply newly gained theoretical knowledge within an academic environment.
3. Provide expert knowledge and guidance in linguistics and translation-related decisions in projects of local and regional interests.
4. Disseminate research findings to academia and the community at large.

Admission Requirements

- M.A. in English Language and Literature, M.A. in Linguistics, M.A. in Translation
- IELTS 7.5, TOEF (paper) 620, TOEFL iBT 105, or CEFR C1
- Translation Exam

## Program Structure

This PhD program consists of 48 credit hours as detailed below:

|  | Course Number | Course Title                          | Credits           |
|--|---------------|---------------------------------------|-------------------|
| <b>Compulsory Courses (12 credits)</b> | 0202710       | Contrastive Textology                 | 3                 |
|  | 0202711       | Critical Discourse Analysis           | 3                 |
|  | 0202720       | Current Trends in Translation Studies | 3                 |
|  | 0202722       | Translation & Technology              | 3                 |
| <b>Electives (12 credits)</b>          | 0202713       | Semantics and Pragmatics              | 3                 |
|  | 0202714       | Advanced English Syntax               | 3                 |
|  | 0202715       | Corpus Linguistics                    | 3                 |
|  | 0202725       | Seminar in Linguistics/Translation    | 3                 |
|  | 0202726       | Stylistics and Translation            | 3                 |
|  | 0202716       | Special Topic 1                       | 3                 |
|  | 0202721       | Special Topic 2                       | 3                 |
| <b>Dissertation (24 credits)</b>       | 0202727       | PhD Dissertation                      | 24                |
| <b>Total</b>                           |               |                                       | <b>48 Credits</b> |

## Study Plan

| <b>Year I, Semester 1 (6 Credits) Term 1</b> |                               |       |            |
|--|-------------------------------|-------|------------|
| Course                                       | Title                         | CrHrs | Status     |
| 0202710                                      | Contrastive Textology         | 3     | Compulsory |
| 0202722                                      | Translation & Technology      | 3     | Compulsory |
|  |                               |       |            |
| <b>Year I, Semester 2 (6 Credits) Term 2</b> |                               |       |            |
| Course                                       | Title                         | CrHrs | Status     |
| 0202711                                      | Critical Discourse Analysis   | 3     | Compulsory |
| 0202xxx                                      | Elective 1                    | 3     | Elective   |
| <b>Year 2, Semester 1 (6 Credits) Term 3</b> |                               |       |            |
| Course                                       | Title                         | CrHrs | Status     |
| 0202720                                      | Current Trends in Translation | 3     | Compulsory |
| 0202xxx                                      | Elective 2                    | 3     | Elective   |

**Qualifying Examination in the 3<sup>rd</sup> and 4<sup>th</sup> weeks of January covering four areas: Contrastive Textology, Critical Discourse Analysis, Current Trends in Translation Studies, and one Elective area of study.**

| <b>Year 2, Semester 2 (6 Credits) Term 4</b>                                |              |       |            |
|---|--------------|-------|------------|
| Course  | Title        | CrHrs | Status     |
| 0202xxx   | Elective 3   | 3     | Elective   |
| 0202727   | Dissertation | 3     | Compulsory |
| <b>Defense of Dissertation Proposal in the 4<sup>th</sup> week of April</b> |              |       |            |
| <b>Year 3, Semester 1 (9 Credits) Term 5</b>                                |              |       |            |
| Course  | Title        | CrHrs | Status     |
| 0202xxx   | Elective 4   | 3     | Elective   |
| 0202727   | Dissertation | 3     | Compulsory |
| <b>Year 3, Semester 2 (6 Credits) Term 6</b>                                |              |       |            |
| Course  | Title        | CrHrs | Status     |
| 0202727   | Dissertation | 6     | Compulsory |
| <b>Year 4, Semester 1 (6 Credits) Term 7</b>                                |              |       |            |
| Course  | Title        | CrHrs | Status     |
| 0202727   | Dissertation | 6     | Compulsory |
| <b>Year 4, Semester 2 (6 Credits) Term 8</b>                                |              |       |            |
| Course  | Title        | CrHrs | Status     |
| 0202727   | Dissertation | 6     | Compulsory |

## Course Descriptions

### 0202710 Contrastive Textology 3.0

This course builds on the MA course titled Contrastive Linguistics (0202541) and moves students beyond the contents of that course. It basically focuses on topics such as genre analysis (which is determined by three categories: field, tenor and mode), relevance of genre analysis to translation studies, text categorizations according to Werlich (1976/1983), de Beaugrande and Dressler (1981) and Hatim (1984), text structure and texture, managing and monitoring in translation, Speech Act theory and its relevance to translation studies, standards of textuality, types of parallel corpora, and their applications into translation studies.

### 0202711 Critical Discourse Analysis 3.0

Critical discourse analysis is a compulsory course that aims at enabling students to examine how writers produce texts and how these texts may be received and interpreted by a wider audience. CDA views translation as a social act that aims at answering questions such as: who is translating for whom? What is being translated and when? What are the effects on the receiving culture or audience? The selection of grammatical structures, lexical items, verbs, pronouns as well as nouns in producing a text plays an important role in analyzing the text and uncovering the hidden beliefs and ideologies of the text producer. This course includes topics such as: discourse organization, pragmatic functions of linguistic elements, systemic functional linguistics, thematic organization, power and dominance and how these concepts are



represented in texts and speeches. Students will also be acquainted with how to critically analyze speeches and texts, especially political texts, in order to identify the producer's underlying ideologies, attitudes, emotions and feelings, which are not always explicitly stated, towards an event, a group of people, or any phenomenon. Identifying such notions is essential for properly rendering them from a source language into a target one.

**0202713      Semantics and Pragmatics      3.0**

This course discusses, on the one hand, advanced topics in word and sentence meaning (i.e., lexical relations; derivational relations; entailment; presupposition; tense; aspect; modality; evidentially; thematic roles; deixis; context; reference; inference; and speech acts); and, on the other, theoretical approaches to semantics such as componential analysis; generative semantics; formal semantics; cognitive semantics; and computational semantics, and to pragmatics such as Austin's; Searle's; Grice's; and Leech's.

**0202714      Advanced English Syntax      3.0**

This course explores in depth the structures of Arabic and English clauses and sentences in order to address a range of currently open theoretical questions and to introduce the main schools of contemporary syntactic theorizing, including derivational theories such as minimalism, and lexicalist models such as functional grammar. The course focuses on syntactic description and argumentation, and students will be introduced to a variety of syntactic structures onto which they will apply theory.

**0202715      Corpus Linguistics      3.0**

Corpus Linguistics is a methodology used to investigate linguistic phenomena. It involves use of computational tools over large, electronic, annotated text collections or corpora. This course provides a general introduction to corpus-based language study. Students will be introduced to: (i) some basic techniques in corpus analysis; (ii) principles in the design, categorization, and coding of corpora; (iii) and some applications of Corpus Linguistics. The course requires use of computers on a weekly basis.

**0202716      Special Topic 1      3.0**

This is a directed reading course on a special topic that culminates in a publishable research article. It involves specialized research by qualified students under the direction of a faculty member who shares the same research interest. Permission of the professor who will supervise the student's work is required. Prerequisite to the course is the successful completion of 12 credit hours of PhD courses.

**0202720      Current Trends in Translation Studies      3.0**

The objective of this course is to encourage and promote research and scholarship in translation; it introduces students to a wide range of topics and issues related to translation including: history of translation theory; translation strategies; cognitive scientific approaches to translation and interpreting; translation and technology; bilingual (English-Arabic) reference corpora for translators and translation studies; cross-linguistic and cross-cultural impact of translation; translation and taboo; ideology in translation; text analysis and translation; translation quality assessment; genre translation; multimedia translation; translator training; translation ethics; the translation profession.

**0202721      Special Topic 2      3.0**

This is an advanced directed reading course on a special topic that culminates in a publishable research article. It involves specialized research by qualified students under the direction of a faculty member who shares the same research interest. Permission of the professor who will supervise the student's work is required. Prerequisite to the course is the successful completion of 0202716.

**0202722      Translation and Technology      3.0**

The focus of this course is on critical appreciation of Machine Translation, Computer-Assisted Translation, Software Localization, and the workflow of translation project management. It studies a sample of machine translation systems, translation memory, terminology extraction, and project management. Students shall be trained on the process of translation with technology, the use of cloud computing, editors, termbases, interactive translation, corpus construction, and on such technologies as Google Translate, Tarjem, Google as a Corpus, Trados Translator's Workbench, and Sketchengine parallel corpora.

**0202725      Seminar in Translation/ Linguistics      3.0**

This is a seminar that addresses a topic of a general interest to students. The topic can be related to translation or linguistics. It could cover topics as diverse as the new developments in linguistics and their impact on translation, challenges of translation teaching in Arab universities, central texts in Arabic translation, Arabization of linguistic terminology, translation ethics, ideology, loss and gain in translation and sociocultural issues in community translation. The topics of the special seminar change frequently to reflect the interests of the participants and course instructors. Students will be allowed to take this course more than once, depending on their needs and/ or interest.

**0202726      Stylistics and Translation      3.0**

This course aims to integrate concepts in stylistics and to explore their applicability to translation criticism and practice. It focuses on differing features and aspects of style in a range of texts, both literary and non-literary, and aims to equip students to cope better with such problems in translation and construct new strategies for dealing with such problems, as well as generating translations in light of stylistics.

**0202727      Dissertation      24.0**

The student must complete an independent scientific research under the supervision of a faculty member. The thesis work should provide the student with in-depth understanding of a research problem in his/her chosen field of Linguistics or Translation. The student should apply scientific research methodology in identifying problems, performing extensive literature review, designing and implementing an original solution that contributes to current research in the area, conducting experiments and/or providing theoretical proofs, writing reports, and presenting the solution.

## Department of History and Islamic Civilization

**Professors** Mesut Idriz, Mohamed M. Awad

**Associate Professors** Nadjib Benkheira, Chatra  
Khiereddine, As'ad Hammad Aburumman,  
Issam Mustafa Okleh, Mohamed Ahmed Aboushouk, Modar Adnan Telfah, Fawzi  
Khalid Ali Al Twahya, Thabet Ghazi Alomari

**Assistant Professors** Mariam Taha, Maher Al Shamaileh, Abdallah  
al Mughanni, Saleh Muhammad Al-leheabi, Emad  
Eddin Abu El-Enain, Issam Mustafa Okleh, Ali Hassan  
Khamis, Badreyya Mohammed Alshamsi,

**Lecturers** Ameena Abdullah Al Khatri

### Administrative Staff

Aisha Mohammed Al Awadhi  
Jamila Ali Alhosnai

Internship Officer  
Administrative Assistant

### Mission:

The Department of History and Islamic Civilization serves all three cycles: BA, MA and PhD. The primary mission and vision of the department is to train undergraduate as well as postgraduate students in scientific research, analysis, deduction, and the delivery of accurate information on temporal change using the historical method. The duties and responsibilities of the department reflect this mission and vision by providing and teaching courses at the university, college and department levels, and major and minor specialization courses, as well as courses within the integrated specializations that lead to enriching students' knowledge and experiences during their university studies. As for postgraduate students, the department focuses to guide and graduate researchers in all fields of history, especially in Islamic History and the History of the Arab Gulf, which are of central importance in the events of world history. It also prepares students for teaching and conduct scientific research, and enriches their knowledge and skills so that they contribute to the current social needs and being creative in enriching significant experiences for the society.

### Objectives

- 1) Enabling the student to understand historical and cultural issues.
- 2) Developing the student's modern technical skills.
- 3) Training the student to access various sources of knowledge.
- 4) Developing student's ability to debate.
- 5) Developing the skills of the department's graduates to qualify them to meet the needs of local institutions such as museums and archaeological sites in the country.

- 6) Preparing specialists in the history and civilization of the region who are able to work in public and private organizations with the high level of competence.
- 7) Enriching the scientific research process for historical studies.

### **Program Outcomes**

The Department of History and Islamic Civilization Program aims to produce:

#### Critical Thinking

- 1) The student describes historical events from multiple dimensional perspectives.
- 2) Students demonstrate the historical arguments using original ideas.
- 3) The student supports the arguments with historical evidence drawn from primary and secondary sources.
- 4) The student analyzes the main sources and is interested in including them within the historical context.

#### Informational Awareness in Historical Research

- 1) The student frames the research question.
- 2) The student accesses primary and secondary sources.
- 3) The student examines the objectivity of the resources based on their content.
- 4) The student uses the sources to place historical events in the texts and describe the temporal change.
- 5) The student produces qualitative and quantitative research in the fields of history and civilization.

#### Professional Competence

- 1) The students apply their research skills in various fields and study periods.
- 2) The students use the necessary vocabulary of political, social, economic and intellectual history.
- 3) The students would be able to pursue higher studies in history, social sciences, or teaching according to his abilities.

### **Career Opportunities**

Teaching in the schools and higher learning institutions. Museums. Libraries. The media. Culture departments. Heritage, cultural and historical research centers. Tourist guides. Archives. Ministry of Foreign Affairs. Armed forces.

## Department of Sociology

**Department Head:** Dr. Ayat Jebril Jaber Nashwan

### Department Vision:

The Department of Sociology at the University of Sharjah aims to provide high quality education, publish original social science research, and provide excellent university and community services.

### Department Goals

- Prepare qualified professionals and equip them with knowledge, skills, values and self-confidence to enable them to work in various fields of social work. The department also aims to provide family counselling, social planning, social research, and draw up the social policies at local and regional levels.
- Prepare, design and conduct specialized scientific research on social and family problems, social policies, social work, and applied sociological science in order for the department to have a distinguished role in the advancement of the community.
- Strengthen the relationship with the community of Sharjah and other emirates, and effectively participate in the university service to achieve its clear and efficient role in maintaining and preserving national unity.
- Maintain communication with the community to meet all needs for a forward-looking perspective.
- Guarantee distinguished quality training to equip students with the skills and capabilities needed to qualify them to practice effectively in the applied sociological science related fields.
- Open new departments or branches of sociology to meet the national and regional needs.
- Develop the study plans by introducing and creating courses that are in compliance with the spirit of this time, and accommodate global and international changes and their local and regional impacts.

### Academic Programs

- Bachelor of Arts in Sociology
- Master of Arts in Applied Sociology
- Doctor of Philosophy in Applied Sociology

### Job Opportunities

The graduates of the Department of Sociology are expected to work in one of the following institutions:

- Ministry of Social Affairs
- Ministry of Culture and Youth
- Ministry of Education
- Ministry of Interior
- Ministry of Health
- Quasi-governmental and non-governmental organizations concerned with family, development, women, childhood and the elderly.

## Department of International Relations

### Personnel

|                             |   |
|-----------------------------|---|
| <b>Chairperson</b>          | Sherko Kirmanj  |
| <b>Associate Professor</b>  | Abdel Rahman Ahmed Abdel Rahman<br>Stephen John Louw<br>Muhammed Ali      |
| <b>Assistant Professors</b> | Shyamal Kataria<br>Shaojin Chai<br>Sherko Kirmanj<br>Kazi Fahmida Farzana |

### Administrative Staff

|                     |                          |
|---------------------|--------------------------|
| Hala Yahia Maher    | Administrative Assistant |
| Asma Mohammed Qasem | Internship Officer       |

### History

The International Relations Program received initial accreditation from the Ministry of Education in the United Arab Emirates in 2012 and was launched in Fall 2012/2013.

### Vision Statement

The Department of International Relations strives to be leading, locally and regionally, in providing quality teaching and learning, research, quality services, and academic programs that contribute to meeting the needs of the local, national, and regional communities.

### Mission

Providing our students and practitioners in the field of International Relations with the knowledge, skills, and expertise that enable them to understand the questions of conflict and cooperation in the field of International Relations.

- Providing our students with a milieu to practice acquired skills that prepare them for future workplace roles in International Relations.
- Developing in our students the capacity to come up with innovative ways to deal with issues that they may encounter in their future roles as practitioners and/or academicians in the field of International Relations.

The International Relations Program aims to accomplish the following goals:

- 1) Provide students with a sound understanding of the history, theories, and practice of International Relations by exposing them to a wide range of courses in the field.
- 2) Develop students' understanding of the factors of cooperation, competition, and conflict among nations in the international system.
- 3) Provide students with expertise or specialized knowledge of particular relevance or significance to the United Arab Emirates and the Arab Gulf region.
- 4) Develop students' critical and analytical abilities to help them pursue graduate studies in International Relations.

- 5) Contribute to preparing students for future careers in areas related to national and regional security, diplomacy, foreign policy, and other areas relevant to the practice of International Relations.
- 6) Provide students with opportunities to gain practical experience through international travel and/or internships that are relevant to International Relations.

### Program Learning Outcomes

By the end of successful completion of the program, students should be able to:

1. Identify the principal theoretical approaches to the study of international relations, and the relationships between them.
2. Compare and contrast alternative systems of governance throughout the Arab Gulf region and other parts of the world that are of particular significance to the United Arab Emirates and the Arab Gulf region.
3. Analyze international affairs by using theoretical concepts and ideas from more than one international relations-related discipline.
4. Apply qualitative and quantitative methods and problem-solving skills to analyze studies dealing with some aspect(s) of international relations.
5. Evaluate and apply diverse perspectives to complex subjects within natural and human systems in the face of multiple and even conflicting positions.
6. Adapt existing arguments, hypotheses, models, etc. or propose alternative ones to describe, explain, or predict instances of cooperation and conflict in regional and/or international relations.
7. Develop scenarios of the possible outcomes of the interactions between socioeconomic and political realities in specific national context(s) and regional and international actors and institutions.

### Career Opportunities

- Diplomatic missions
- Regional and international organizations
- Political analysts in the media (the press, radio and television)
- Non-Governmental Organizations (NGOs)
- Governmental institutions

### Program Structure

The International Relations Program encompasses three course categories: university, college, and department courses. Those courses include both compulsory and elective. The structure of the Program is presented in Table 13.

| Mandatory/Elective Credits | University Requirements | College Requirements | Departmental Requirements | Total |
|----------------------------|-------------------------|----------------------|---------------------------|-------|
| <b>Mandatory Credits</b>   | 15                      | 15                   | 33                        | 63    |
| <b>Electives Credits</b>   | 09                      | 0                    | 51                        | 60    |
| <b>Total</b>               | 24                      | 15                   | 84                        | 123   |

A student undertaking this program must complete a total of 123 credits covering University Requirements (UR), College Requirements (CR), and Program Requirements (PR). The courses subsuming under each one of these category requirements are listed below.

#### a) University Requirements

Every student working for the B.A. in International Relations is required to take 24 credit hours of general education courses distributed over four domains. Nine elective credit hours are selected from Domains 1, 2, and 3. Fifteen mandatory credit hours are selected from domains 4 as indicated below.

##### Domain 1: 3 Credits (1 course)

|         |  |   |
|---------|--|---|
| 0203100 | Islamic Civilization                                 | 3 |
| 0602246 | Human Rights in Islam and International Declarations | 3 |
| 0201140 | Introduction to Arabic Language                      | 3 |
| 0203200 | History of the Sciences among Muslims                | 3 |
| 0710109 | Arts and Medicine                                    | 3 |
| 0203102 | History of the Arabian Gulf                          | 3 |
| 0202130 | French Language                                      | 3 |
| 0900107 | History of Medical and Health Sciences               | 3 |

##### Domain 2: 3 Credits (1 course)

|         |                                |   |
|---------|--------------------------------|---|
| 1430101 | Astronomy and Space Sciences   | 3 |
| 0401142 | Man and the Environment        | 3 |
| 0500210 | Health Awareness and Nutrition | 3 |
| 0505101 | Fitness and Wellness           | 3 |

##### Domain 3: 3 Credits (1 course)

|         |  |   |
|---------|--|---|
| 0206102 | Fundamentals of Islamic Education      | 3 |
| 0204102 | UAE society                            | 3 |
| 0206103 | Introduction to Psychology             | 3 |
| 0305110 | Introduction to Economics ( for non B) | 3 |
| 0302120 | Introduction to Business               | 3 |
| 0800107 | Media in Modern Societies              | 3 |
| 0302327 | Personal Finance                       | 3 |
| 0104130 | Analytical Biography of the Prophet    | 3 |



**Domain 4: 15 Credits (5 courses)**

|         |   |   |
|---------|---|---|
| 0104100 | Islamic Culture                           | 3 |
| 0201102 | Arabic Language (For Arabic Speakers)     | 3 |
| 0201105 | Arabic Language (For Non-Arabic Speakers) | 3 |
| 0202112 | English for Academic Purposes             | 3 |
| 1411100 | Introduction to IT                        | 3 |
| 0302200 | Fund of Innovation                        | 3 |

**b) College Requirements**

Students must complete a total of 15 credits from the following list:

| Course Number | Course Title                | Credit Hours | Prerequisites |
|---------------|-----------------------------|--------------|---------------|
| 0201203       | Art of writing Arabic       | 3            | 0201100       |
| 0203103       | Islamic History             | 3            |               |
| 0203114       | History of the Islamic City | 3            |               |
| 0204111       | Arab Society                | 3            |               |
| 0206101       | Introduction to Education   | 3            |               |
| 0202113       | English for Humanities      | 3            |               |
| 0206101       | Woman and Development       | 3            |               |

**c) Department Requirements**

Program requirements consist of 84 credit hours of courses divided into four sets as shown below.

**Mandatory Core Courses**

This set consists of the following 33 credit hours:

| Course Number | Course Title                            | Credit Hours | Prerequisites |
|---------------|---|--------------|---------------|
| 0205101       | Introduction to International Relations | 3            |               |
| 0205111       | Introduction to Political Science       | 3            |               |
| 0205160       | Introduction to Comparative Politics    | 3            |               |
| 0205204       | Introduction to Political Philosophy    | 3            |               |
| 0205300       | International Law                       | 3            |               |
| 0205320       | International Security                  | 3            |               |
| 0205200       | Research Methods                        | 3            |               |
| 0205280       | Theory of International Relations       | 3            |               |
| 0205345       | International Political Economy         | 3            |               |

| Course Number | Course Title   | Credit Hours | Prerequisites |
|---------------|----------------|--------------|---------------|
| 0205390       | Foreign Policy | 3            |               |
| 0205340       | Diplomacy      | 3            |               |

### Department Electives

Students are required to take 51 credits of elective courses: 24 credits chosen from Group 1, 24 credits from Group 2, and 3 credits from Group3, as indicated below.

| Course Number  | Course Title                               | Credit Hours | Prerequisites                   |
|--|--|--------------|---------------------------------|
| <b>Group I: Choose 24 credits (8 courses)</b>                          |  |              |                                 |
| 0205220  | World Perspective                          | 3            |                                 |
| 0205281  | Globalization                              | 3            |                                 |
| 0205301  | Conflict in the World                      | 3            |                                 |
| 0205310  | International Organization                 | 3            |                                 |
| 0205330  | International Human Rights                 | 3            |                                 |
| 0205370  | International Terrorism                    | 3            |                                 |
| 0205311  | Environment and Sustainable Development    | 3            |                                 |
| 0205270  | Refugees and Displacement                  | 3            |                                 |
| 0205440  | Selected Topics in International Relations | 3            |                                 |
| 0205499  | Independent Study                          | 3            | 0205200                         |
| <b>Group II: 24 credits (8 courses) must be chosen from this list.</b> |  |              |                                 |
| 0205100  | Governance in the UAE                      | 3            |                                 |
| 0205201  | Homeland Security                          | 3            |                                 |
| 0205240  | Comparative Governments of the GCC         | 3            |                                 |
| 0205250  | Islamic Political Systems                  | 3            |                                 |
| 0205255  | Islamic World in International Relations   | 3            |                                 |
| 0205287  | American National Government               | 3            |                                 |
| 0205333  | Great Powers Foreign Policy                | 3            |                                 |
| 0205204  | Introduction to Political Philosophy       | 3            |                                 |
| 0205225  | Middle East in International Relations     | 3            |                                 |
| 0205309  | Political Economy of the Middle East       | 3            | 0205225;<br>0205111;<br>0205345 |
| 0205377  | EU's International Relations               | 3            | 0205101;<br>0205111;<br>0205160 |
| 0205379  | China in International Relations           | 3            | 0205101;<br>0205111;<br>0205160 |

| Course Number   | Course Title                            | Credit Hours | Prerequisites                   |
|---|---|--------------|---------------------------------|
| 0205382   | Africa in International Relations       | 3            | 0205101;<br>0205111;<br>0205160 |
| 0205383   | Russia in International Relations       | 3            | 0205101;<br>0205111;<br>0205160 |
| 0205384   | Central Asia in International Relations | 3            | 0205101;<br>0205111;<br>0205160 |
| 0205387   | Turkey in International Relations       | 3            | 0205101;<br>0205111;<br>0205160 |
| 0205388   | The Palestinian Question                | 3            |                                 |
| <b>Group III: One of these courses must be taken.</b> |   |              |                                 |
| 0205350   | National Internships                    | 3            |                                 |
| 0205351   | International Internships               | 3            |                                 |
| 0205352   | International Programs                  | 3            |                                 |

#### Study Plan: Course Distribution

The International Relations Program encompasses 123 credit hours distributed over four years or 8 semesters of study. The following study plan serves as a roadmap for a smooth progression toward graduation. The International Relations Program encompasses 123 credit hours distributed over four years or 8 semesters of study. The following study plan serves as a roadmap for a smooth progression toward graduation.

#### Year 1 - Freshman, Semester 1 (12 Credits)

| Course Number | Title                                   | Credit Hours | Prerequisites |
|---------------|---|--------------|---------------|
| 0101100       | University Requirement – Domain 4       | 3            |               |
| 0201102       | University Requirement – Domain 4       | 3            |               |
| 0205101       | Introduction to International Relations | 3            |               |
| 0202105       | University Requirement – Domain 4       | 3            |               |

#### Year 1 - Freshman, Semester 2 (15 Credits)

| Course Number | Title | Credit Hours | Prerequisites |
|---------------|-------|--------------|---------------|
|---------------|-------|--------------|---------------|

|  | University Requirement - Domain 1    | 3            |               |
|--|--------------------------------------|--------------|---------------|
| 01411101   | University Requirement – Domain 4    | 3            |               |
| 0205110  | Introduction to Political Science    | 3            |               |
| 0205160  | Introduction to Comparative Politics | 3            |               |
| 02xxxxx  | College Requirement -1               | 3            |               |
| <b>Year 2 - Sophomore, Semester 3 (18 Credits)</b> |                                      |              |               |
| Course Number                                      | Title                                | Credit Hours | Prerequisites |
| 0205204  | Introduction to Political Philosophy | 3            |               |
| 0205200  | Research Methods                     | 3            |               |
| 02xxxxx  | College Requirement -2               | 3            |               |
| 02xxxxx  | College Requirement -3               | 3            |               |
|  | University Requirement - Domain 2    | 3            |               |
| 0205xxx  | Department Elective- Group I         | 3            |               |
| <b>Year 2 - Sophomore, Semester 4 (15 Credits)</b> |                                      |              |               |
| Course Number                                      | Title                                | Credit Hours | Prerequisites |
| 0205280  | Theory of International Relations    | 3            |               |
| 0205xxx  | Department Elective-Group I          | 3            |               |
| 0205xxx  | Department Elective -Group II        | 3            |               |
| 0205xxx  | Department Elective –Group II        | 3            |               |
| 0201203  | College Requirement -4               | 3            |               |
| <b>Year 3 - Junior, Semester 5 (18 Credits)</b>    |                                      |              |               |
| Course Number                                      | Title                                | Credit Hours | Prerequisites |
| 0205300  | International Law                    | 3            |               |

| 0205320  | International Security   | 3            |               |
|--|--|--------------|---------------|
| 0205xxx  | Department Elective –Group II                                    | 3            |               |
| 0205xxx  | Department Elective Group II                                     | 3            |               |
| 0205xxx  | Department Elective –Group I                                     | 3            |               |
|  | University Requirement – Domain 3                                | 3            |               |
| <b>Year 3 - Junior, Semester 6 (15 Credits)</b>    |  |              |               |
| Course Number                                      | Title  | Credit Hours | Prerequisites |
| 0205345  | International Political Economy                                  | 3            |               |
| 02xxxxx  | College Requirement-5  | 3            |               |
| 0205390  | Foreign Policy   | 3            |               |
|  | University Requirement – 1 more course from Domains, 1, 2, or 3. | 3            |               |
| 0205xxx  | Department Elective –Group I                                     | 3            |               |
| <b>Year 3 - Junior, Summer session (3 Credits)</b> |  |              |               |
| Course Number                                      | Title  | Credit Hours | Prerequisites |
| 0205xxx  | Department Elective –Group III                                   | 3            |               |
| <b>Year 4 - Senior, Semester 7I (15 Credits)</b>   |  |              |               |
| Course Number                                      | Title  | Credit Hours | Prerequisites |
| 0205340  | Diplomacy  | 3            |               |
| 0205xxx  | Department Elective - Group II                                   | 3            |               |
| 0205xxx  | Department Elective - Group II                                   | 3            |               |
| 0205xxx  | Department Elective Group I                                      | 3            |               |
| 0205xxx  | Department Elective –Group I                                     | 3            |               |
| <b>Year 4 - Senior, Semester 8 (12 Credits)</b>    |  |              |               |

| Course Number | Title                          | Credit Hours | Prerequisites |
|---------------|--------------------------------|--------------|---------------|
| 0205xxx       | Department Elective - Group II | 3            |               |
| 0205xxx       | Department Elective - Group II | 3            |               |
| 0205xxx       | Department Elective –Group I   | 3            |               |
| 0205xxx       | Department Elective –Group I   | 3            |               |

### Completion Requirements

To become eligible for a Bachelor of Arts in International Relations, a student must fulfill the following requirements:

- Passing all the courses required for graduation in the study plan.
- Accumulating an average of 2.00 or more and completing all the other requirements of the study plan.
- Spending the minimum period stipulated for the award of the bachelor's degree and not exceeding the maximum.
- Issuing the graduation decision by the relevant councils.
  - Graduates with CGPA of 3.60-3.79 shall be granted a designation of "Honors".
  - Graduates with CGPA of 3.80 and above shall be granted a designation of "Highest Honors"

### Courses Descriptions

#### Mandatory Courses

Description of the 33 credit hours, 11 mandatory core courses are given below.

#### 0205101 Introduction to International Relations (3-0:3)

The Introduction to International Relations is aiming to provide students with basic concepts and knowledge in the field of International Relations. The course will address the following questions – what is international relations? When international relations began? What is the state? What is sovereignty? What theoretical tools can we use to analyse relations between states?

The first part of the course will focus on the development of the state system. It will address such questions as when the states emerge; what is Westphalian concept of sovereignty and how the sovereignty has evolved and spread across the world since Westphalia. In the second part of the course we shall look at the impact of two world wars on the state system, emergence of the UN, decolonization and Cold War. Finally we shall study some of the major theoretical schools of IR – Realism, Liberalism and Marxism.

**0205111                      Introduction to Political Science                      (3-0:3)**

This course introduces students to the basic concepts, institutions, processes, and theories of political science. Concepts such as state, society, government, the political system, political behavior, power, and authority will be discussed thoroughly to provide students with a solid foundation necessary for preparing them for future course work in the field.

**0205160                      Introduction to Comparative Politics                      (3-0:3)**

This course compares national governments in terms of their political system, institutions, structures, and processes of development, modernization, democratization, political culture, nationalism, and state-society relations.

**0205200                      Research Methods                      (3-0:3)**

The goal of this course is to introduce students to the relevant concepts, theories, and practices that together comprise political science research methods, including epistemology, ontology, qualitative and quantitative methods, and statistics. They will be required to design a small-scale research project, including literature review and proposal, and write a research report on the topic of their choice. Throughout this process, students will work in pairs or groups to provide peer advising and feedback. At the end of the course, groups of students will present their research in panels according to theme and topic, much like the panels at political science conferences.

**0205204                      Introduction to Political Philosophy                      (3-0:3)**

This course introduces students to the major contributions of political philosophers spanning from ancient Greece, through the middle ages to the Enlightenment Age. Major works of Plato, Aristotle, Al Farabi, Machiavelli, Thomas Hobbes and Karl Marx, etc. will be surveyed.

**0205280                      Theory of International Relations                      (3-0:3)**

This course designed to introduce the ways that different theories conceive, analyze and explain the character of international relations. The key objective of the course is to provide a thorough interrogation of these theories, exploring debates both within and between them. Theoretical approaches to be considered include: classical and neo-realism; liberal institutionalism, democratic peace, interdependence liberalism and neoliberalism; Marxism; constructivism; English School theory; critical theory; post-structuralism; green politics; and feminism.

**0205300 International Law (3-0:3)**

This course introduces students to International Law in terms of its theoretical foundations, development, institutions, and enforcement.

**0205320 International Security (3-0:3)**

This course is a survey of the main theoretical foundations of International Security as a sub-field in International Relations. It also addresses the main issues of debate in the fields of defense, offense, peace, peacemaking, peacekeeping, strategies, tactics, weapons of mass destruction, and arms reduction. The class culminates in a class conference that simulates a summit of an international security organization, in which students will debate pressing issues based on the theory and intellectual framework discussed throughout the course.

**0205345 International Political Economy (IPE) (3-0:3)**

This course provides students with in-depth understanding of the politics of international economic relations. It introduces students to the main theoretical approaches in the field. It also deals with trade relations, international finance, economic assistance, and international economic organization.

**0205390 Foreign Policy (3-0:3)**

This course deals with the analysis of foreign policy. It provides students with an in-depth understanding of the dynamics of foreign policy making processes. It covers theoretical discussions as well as empirical analysis of how a country formulates its foreign policy and conducts it in international affairs. Its main goal is to equip students with analytical capabilities in assessing foreign policy and anticipating future developments in a country's external behavior.

**0205340 Diplomacy (3-0:3)**

This course studies diplomacy in theory and practice. It deals with the essential ingredients and key debates about the concepts and practice of diplomacy. It starts by an overview about what actors, sites and goals are traditionally understood to be the focal point of diplomatic study and practice. It will then analyze how these conceptions can be contested, both within and without the state system. It concludes with some case studies that demonstrate the span and intensity of diplomacy in international affairs.

**Elective Courses**

**Group – I: Description of Group I - electives follows.**

**0205319 Environment and Sustainable Development (3-0:3)**

This course introduces students to environmental problems and national and global policy interventions to deal with those problems. The course also examines various theoretical and political-ideology-based perspectives on environmental problems and related approaches to dealing with them.



**0205220****World Perspective****(3-0:3)**

The major IR theories of Realism and Liberalism agree that the state is the main actor of International Relations. However, in recent decades the world saw the proliferation of failed states – starting from Somalia, Afghanistan and most recently Libya and South Sudan. This brings us to the question what holds states together? Why some states do not turn into failed states even if they are economically underdeveloped (for example Albania and Moldova are poorest European states) while others are unable to function like a state even if they have vast natural resources such as Libya?

To answer these questions we need to turn to the idea of a nation-state and the “glue” that holds it together – national identity. This course will therefore look at the idea of nationalism and national identity as a part of state-centric International Relations. We shall study several major theoretical works that explain the rise of nationalism in the last few centuries, the role and place it plays in the modern nation-state and the means by which a strong national identity is being formed.

While the course is largely theoretical it is advisable that students take it before signing up for IR Theories course. It is expected that after completing this course students will be familiar with the fundamental texts on national identity, can apply their knowledge to analyze international affairs and if necessary formulate state policies based on their knowledge.

**0205270****Refugees and Displacement****(3-0:3)**

The course provides a stimulating interdisciplinary environment in which we explore contemporary issues in refugee and forced migration studies. Relevant international instruments, research, case studies, agency policies, and reports will be examined in order to develop students’ skills necessary for understanding the current status of the field. The course will critically assess international humanitarian assistance and protection frameworks and discuss how refugees’ experiences of assistance and protection are gendered and racialized. Specific emphasis will be placed on recent developments in refugee terminology, refugee status determination, durable solutions, and extremely vulnerable refugees. The voices of refugees are emphasized throughout the course.

**0205281****Globalization****(3-0:3)**

The main goal of this course is to introduce students to the concept and institution of globalization. It will focus mainly on the three aspects of globalization: economic, political, and cultural globalization.

**0205301****Conflict in the World****(3-0:3)**

This course examines the topic of World Conflict in terms of the root causes of war, its destructive impacts on humans and society, and the mechanisms of war prevention and peacemaking.

**0205310****International Organization****(3-0:3)**

This course introduces students to the international organization in terms of its structure, processes, and its impact on international relations. It deals with both governmental and non-governmental institutions and their impact on international affairs. Special attention will be devoted to the United Nations and its role in world affairs.

**0205330 International Human Rights (3-0:3)**

This course provides students with an in-depth understanding of human rights in terms of origins, types, development, institutions, obstacles, etc. It also deals with major international agreements and covenants that govern human rights worldwide, such as the United Nations Declaration of Human Rights and the Geneva Conventions. Students will participate in a class conference to debate and discuss current issues in International Human Rights based on course material and independent research.

**0205370 International Terrorism (3-0:3)**

This course introduces students to political violence and terrorism in terms of theories, forms, causal factors, goals, and consequences. Terrorism and political violence have been a part of human condition since the beginning of recorded history. Terror and mass killings have become recurring realities throughout the world, and it is essential to understand their root causes and patterns.

**0205440 Selected Topics in International Relations (3-0:3)**

This course introduces students to an in-depth understanding of a selected group of topics. The issue to be focused upon will be ethnic conflict in the field of political science.

**0205499 Independent Study (3-0:3)**

This course is designed to provide individual students with the opportunity to study in detail certain issues in international relations. In coordination with a faculty member, students sign up for the class, and coordinate with their supervisors on a list of readings and evaluation mechanisms.

**Group – II: Description of Group II - electives follows**

**0205100 Governance in the UAE (3-0:3)**

This course introduces students to the government, governance, and economy of the United Arab Emirates. Topics covered include foreign policy, policy making, economic diversification, Emiratization, woman empowerment, government-driven innovation, and socioeconomic development of the United Arab Emirates.

**0205201 Homeland Security (3-0:3)**

This course deals with homeland security, and identifies threats that undermine stability and social peace. It also deals with nation's efforts to combat threats that target the homeland, and the efforts of national, regional, and local authorities to confront such threats.

**0205225 Middle East in International Relations (3-0:3)**

This course examines the governments and politics of the Middle East. In doing so, it combines the subject and methods of history, geography, political science, religion, and political philosophy. The primary goal of this course is to develop the analytical skills, conceptual tools, and historical foundations necessary to understand Middle East politics. Moreover, the course invites and emphasizes students' role in engaging in discussions and debates about the topics covered in the course with reference to broad academic literature on the topics.

**0205240 Comparative Governments of the GCC (3-0:3)**

This course is devoted to the study of the political systems of the Gulf Cooperation Council's member states, as well as to the understanding of the GCC's structure and role in regional stability and development. The class will compare and contrast the political systems in the United Arab Emirates, Oman, Saudi Arabia, Kuwait, Bahrain, and Qatar.

**0205250 Islamic Political Systems (3-0:3)**

This course is devoted to the study of Islam, the Islamic state, governance in Islam, authority, and state-society relations. Major texts, historical perspectives, and schools of thought will be examined in the study of Islam and its politics such as the Holy Quran, the Prophet's Sunna, and the practice of the Islamic Caliphate throughout history.

**0205255 Islamic World in International Relations (3-0:3)**

This course introduces students to the Islamic world in the context of International Relations. It examines cooperation among Muslim countries and conflicts in those countries. The status of Muslim minorities in non-Muslim majority countries is analyzed, as are the regional and international implications of the treatment of those minorities in those countries. The course also includes discussions on issues, including case studies on failed states in the Islamic World, Islamophobia, and non-state actors in the Islamic World outside the Middle East.

**0205287 American National Government (3-0:3)**

This course is designed to introduce students to the foundation, structure, organization and functioning of [North] American National Government. It will examine the three major branches of the government: executive, legislative, and judicial, as well as [North] American foreign and defense policy. The ultimate goal is to develop the analytical skills, conceptual tools, and historical foundations necessary to understand [North] American politics.

**0205333**

**Great Powers Foreign Policy**

**(3-0:3)**

The course will address the foreign policy of great powers. In the first part of the it will introduce students to the theoretical approaches to the great power politics by studying two fundamental texts of International Relations – Paul Kennedy’s “The Rise and Fall of Great Powers” and John J. Mearsheimer’s “The Tragedy of Great Power Politics”. These works will provide students with analytical perspective to study the great power foreign policy. In the second part of the course we shall focus on practical aspects of several Great Powers foreign policies (USA, China, Russia, Great Britain, France, India).

**0205377**

**EU’s International Relations**

**(3-0:3)**

The European Union (EU), previously the European Community, is considered to be the most successful integration experience in international relations; it has had significant impact on world affairs since the end of WWII. The principal objective of this course is to provide students with an informed understanding of the EU’s role in international relations. In order to achieve this, it will explore the nature of EU’s external action in various issues and its interaction with major powers, emerging powers, multilateral organizations, and Islamism as well as its relations with the developing world paying attention to issues such as association and cooperation agreements, control of external migration, trade, sanctions, democracy and human rights promotion, humanitarian aid, and the links between development and security.

**0205379**

**China in International Relations**

**(3-0:3)**

This course provides in-depth understanding of the Chinese political system in terms of its modern history, regime-type, institutions, authorities, the rise of China, and its foreign policy. It also examines China’s global engagement with special attention to Chinese-Arab Gulf and Middle Eastern relations. . Readings, lectures, and discussion will focus on the sources of China’s domestic and international conduct, interactions with major powers, relations with neighboring countries, “going global” into different regions of the world, participation in global governance and international regimes, and its national security environment and coercive capabilities.

**0205382**

**Africa in International Relations**

**(3-0:3)**

The purpose of this course is to provide students with an intensive introduction to the broad structures and processes of international relations and foreign policy in Africa. The course provides an overview of major linkages and relationships between today’s sub-Saharan Africa and the rest of the world, focusing on selected case studies. Thus, it covers the continent’s relations with major external powers as well as non-state actors, such as the International Criminal Court, the International Monetary Fund and the World Bank. Furthermore, the course emphasizes many of the major themes and patterns that have characterized the continent’s international relations since the end of the Cold War. Today, Africa’s international relations are defined with its oil and mineral reserves, the world’s ever-increasing interest in its expanding markets, and the increasing economic and political reach of new emerging powers like China and India. At the same time, African states are undergoing internal changes that are affecting their international relations: unprecedented economic growth, a young and growing population demanding change, a rising middle class and sings of new international assertiveness on the global arena. The course is addressing the following

questions: Are new patterns of political transformation and economic development, assisted by countries like China, transforming not only Africa but reshaping the established conventions which have framed the continent's relationship with the rest of the world? How are African interests aligned with old and emerging global actors? What are the areas of divergence? What are the implications of this global power transformation for African development and security on the continent?

**0205383                      Russia in International Relations                      (3-0:3)**

This course explores the modern socio-political history of imperial, Soviet, and Post-Soviet Russia. It focuses on the interplay of domestic and international factors in shaping the Russian State, its foreign policy attitudes, and its world-view. The course traces continuities of the foreign policy challenges that imperial, Soviet, and post-Soviet Russian states share in common. It helps students learn why and how Russia became a great power and how it pursued reform in its attempt to remain a global power.

**0205384                      Central Asia in International Relations                      (3-0:3)**

This course explores the history and politics of Central Asia from pre-modern times to post-Soviet present. The course will focus on the historical continuities that profoundly shaped the society and politics of Central Asia for more than millennia. Through studying the historical events we shall trace continuities of the foreign policy challenges that Imperial, Soviet and post-Soviet Russian states share in common. By studying the Russian society students will learn why and how Russia became a great power; how it pursued reform in its attempt to remain the global power.

**0205387                      Turkey in International Relations                      (3-0:3)**

This course aims at providing students with an understanding of Turkish foreign policy in conjunction with Turkish domestic politics. The first element of the course (foreign policy) brings out Turkey's role as a regional player in multiple regions (Middle East, Black Sea, Southeastern Europe), as a member of NATO and, more recently, as a candidate for EU membership, and also explains developments in the era of AKP government since 2002 in order to explain Turkey's regional and global visibility and influence. The second element of the course (domestic politics) discusses Turkey's Kurdish question and its impact on Turkish foreign policy. It also discusses Turkey's status as a one-party constitutional democracy or as an 'imperfect democracy', with a history of successive army interventions and, subsequently, with the rise to power of the Islamic AKP and the turn of Turkish society towards religious conservatism.

**0205388                      The Palestinian Question                      (3-0:3)**

This course introduces students to the central issues in the Israeli-Palestinian conflict. In particular, it focuses on the Palestinian search for self-determination and statehood, the status of Jerusalem (Particularly East Jerusalem), Jewish immigration and settlements in the West Bank, and the Right of Return for the Palestinians in diaspora. The course also addresses the responses of the international community to this conflict.

**Group – III: Description of Group III electives follows.**

**0205350                      National Internships                      (3-0:3)**

The objective of the National Internships is to provide students with the opportunity to gain a first-hand practical experience in a national institution. Students are required to contact local and national governmental institutions, local businesses, NGOs and alike to conduct a practical experience equivalent to (3) credit hours.

**0205351                      International Internships                      (3-0:3)**

The objective of the International Internships is to provide students with the opportunity to obtain practical experience with an international organization such as the GCC, the Organization of Islamic States, The Arab League, the United Nations, the World Bank, and the International Monetary Fund.

**0205352                      International Programs                      (3-0:3)**

Each student at the Department of International Relations is highly encouraged to take part in the international programs organized by the department. The goal of international programs is to provide students with the opportunity to gain first-hand understanding of a specific issue in international relations. International programs will visit Arab countries, Islamic countries, Africa, Russia, Central Asia, China, Japan, and the Americas.

## Department of Education

### Department Chair

Bushra Ahmed AlAKashee

### Mission Statement

The mission is to engage professional educational practitioners and school administrators in learning at a graduate level. The department shall provide educational provision for modules including theoretical and practical courses which include:

**First:** general preparation through the provision of courses in curriculum and instruction, educational psychology and technology education.

**Second:** professional training preparation related to curriculum design, teaching methods and school administration.

**Third:** department programs will attempt to provide a holistic education relying on various teaching approaches and methods to engage teachers in teaching and learning

**Fourth:** the department will seek to develop its graduate programs in areas of teaching and learning and school leadership.

### Department Objectives

#### The Department of Education aims to:

- 1) Prepare the teachers academically and professionally to work in the public and private educational sectors.
- 2) Participate in the development of curriculum and teacher standards and competency standards for teachers and school leaders.
- 3) Participate and produce opportunities for students, teachers and school leaders that contribute to the learning of the community.
- 4) Provide students with research skills to enable them to carry research studies in education.
- 5) Provide professional services that contribute to the continuous teacher development at all levels.

### Current Programs

**Diploma Level:** The department offers a professional diploma program in teaching.

**Bachelor level:** The Department offers Bachelor Degree in Early Childhood Education.

### Job opportunities

The Professional Diploma in Teaching qualifies graduates to work as teachers and administrators in the UAE. The Bachelor Degree in Early Childhood Education qualifies graduates to work in early childhood institutions, kindergartens. It also qualifies them work as administrators in Education Zones in the UAE.

# College of Business Administration



## College of Business Administration

### Officers of the College

|                          |           |
|--------------------------|-----------|
| Prof. Dima Rachid Jamali | Dean      |
| Dr. Mohammed Al-Hawari   | Vice Dean |

### Administrative Support Staff

|                        |  |
|------------------------|--|
| Aesha Ahmed Al Mehrezi | Sr. Administrative Officer                     |
| Fazlur Rahman          | Administrative Assistant                       |
| Mohannad Adnan         | Administrative Assistant                       |
| Noora AlBloushi        | Administrative Assistant                       |
| Reed Ahmed Almail      | Administrative Assistant                       |
| Salwa El Nassar        | St. Outreach Officer                           |
| Muhammad Amjad Maqsood | Sr. Lab Officer                                |
| Huda Mussad Qayed      | Lab Officer                                    |
| Amna Al Suwaidi        | Administrative Assistant - MIS                 |
| Aisha Alhammadi        | Administrative Assistant - Management          |
| Nawal Al Khzaimi       | Administrative Assistant - Finance & Economics |
| Amira El-Hamdani       | Administrative Assistant - Accounting          |
| Ahlam Al Khayyal       | Sr. Internship Officer                         |
| Irtifaa Al Khatib      | Sr. Student Service Officer (EMBA)             |
| Rawda Al Ali           | Administrative Assistant (MBA)                 |
| C.M. Faizullah         | Employee – Women's Campus                      |
| Kunjahamed Kolkaran    | Employee – Men's Campus                        |

### Contact Information

College of Business Administration, Building M5 & W5  
University City

Sharjah, UAE

+971-6-5053501, 5050547

[www.sharjah.ac.ae/](http://www.sharjah.ac.ae/)

### Accreditation

All programs offered in the College of Business Administration are accredited by the Ministry of Education (MOE) and the Association to Advance Collegiate Schools of Business (AACSB).

### History

The College of Business Administration (CBA) is one of the oldest and largest colleges in the University having started in 1997 with 160 students. Currently we have more than 1,000 students in the college with about 60% of the students in the Women's College. We are located in one of the most impressive campuses of any University in the world. The CBA has over the years played its role in providing the Emirate of Sharjah and the UAE with skilled managers to lead the astronomical developments in the region.

### Organization Structure

The College of Business Administration is led by the College Dean, who is responsible for the college to higher administration. He also represents the College in all relevant committees. The effective management and decision making in the college is achieved through a hierarchy that extends from Department Committees to the College Council chaired by the Dean. The College Council also includes the Assistant Dean, Department chairs and Department representatives. The College Council serves as the ultimate forum at the college level in which issues are discussed and decisions are made. Further, and in addition to the Assistant Dean, a number of College Committees chaired by senior faculty members assist the Dean in matters related to curriculum and accreditation, research and graduate studies, faculty selection and promotions, and student affairs. The organizational structure of the college is presented in the following figure.

### Vision

To be the leading business school in the region known for excellence in teaching, research and community engagement.

### Mission

The mission of the College of Business Administration is to serve the Sharjah Community, the UAE and the region overall by enhancing the analytical and overall intellectual skills of students. This will enable them to become high achieving ethical professionals, business persons, public organization figureheads and leaders in their community. All our students discover, disseminate and preserve knowledge in a spirit of free and open intellectual inquiry throughout the College community. Students will continue to engage in partnerships with community organizations in order to address the social and economic challenges of Sharjah and the UAE region.

### Goals

The College of Business Administration is led by the College Dean, who is responsible for the College to higher administration. He also represents the College in all relevant committees. The effective management and decision making in the College is achieved through a hierarchy that extends from Department committees to the College Council chaired by the Dean. The College Council also includes the Assistant Dean, Department chairs and Department representatives. The College Council serves as the ultimate forum at the College level in which issues are discussed and decisions are made. Further, and in addition to the Assistant Dean, a number of College Committees chaired by senior faculty members assist

the Dean in matters related to curriculum and accreditation, research and graduate studies, faculty selection and promotions, and student affairs.

### Objectives

- 1) Produce graduates with academic excellence, analytical fervor and entrepreneurial abilities
- 2) Recruit and retain high quality faculty
- 3) Improve the teaching and learning environment
- 4) Improve research productivity of the College
- 5) Ensure that College research is in the service of the community
- 6) Improve student satisfaction with College processes and programs
- 7) Increase relationship and cooperation with the community and make programs relevant to the business community
- 8) Develop cooperation and solicit feedback with the alumni
- 9) Develop a spirit of cooperation and awareness with high schools.

### Academic Programs

The College of Business Administration offers five Bachelor of Science (B.Sc.) programs and three postgraduate degree; two Master degree and one PhD programs that lead to the following degrees:

- Doctor of Business Administration (DBA)
- Master of Science in Business Analytics
- Master in Business Administration
- Executive Master in Business Administration
- Bachelor of Science in Accounting
- Bachelor of Science in Business Administration - Management
- Bachelor of Science in Business Administration - Marketing
- Bachelor of Science in Finance
- Bachelor of Science in Supply Chain Management

Additionally, the College of Business Administration offers a 15-credit hours minor in each of the following undergraduate programs - Accounting, Economics, Finance, Public administration, Marketing, Management, and Management Information Systems. Any student may choose to add a minor in his/her study plan, provided that the minor is independent of his/her area of specialization.

### Admission Requirements

Any student who satisfies the university's admission requirements as stipulated in the Admission section of this bulletin and chooses to study in one of the programs offered in the College of Business Administration shall be admitted as a "General Business" student. After completing 36 credit hours in the General Business program of which at least 18 credit hours are college requirements and attaining a GPA of 2.0 or above, the student may be admitted to continue in one of the college majors pending availability of seats in the desired major and subject to taking and receiving a grade of "C" in the major prerequisite courses indicated below.

|                   |                                       |
|-------------------|---------------------------------------|
| <b>Accounting</b> | Accounting (1) or Accounting (2)      |
| <b>Finance</b>    | Accounting (1) / Financial Management |

|                                       |                          |
|---------------------------------------|--------------------------|
| <b>Management</b>                     | Principles of Management |
| <b>Marketing</b>                      | Principles of Marketing  |
| <b>Management Information Systems</b> | Introduction to MIS      |

Students are strongly advised to refer and carefully review the admissions section of the University bulletin for admission and degree requirements as well as all related academic policies.

### Graduation Requirements

Each degree program comprises three categories – university requirements (UR), college requirements (CR) and program requirements (PR). The university and college requirements are common to all departments in the College of Business Administration. Each department has its own required and elective courses. The credit hours allocations for each program are shown in the following table:

| <b>B.Sc. in Accounting (123 Credit)</b> |           |           |           |              |
|---|-----------|-----------|-----------|--------------|
|   | <b>UR</b> | <b>CR</b> | <b>PR</b> | <b>Total</b> |
| <b>Mandatory Courses</b>                | 15        | 48        | 21        | 84           |
| <b>Elective Courses</b>                 | 9         | 6         | 9         | 24           |
| <b>Minor Courses*</b>                   | -         | -         | 15        | 15           |
| <b>Total</b>                            | <b>24</b> | <b>54</b> | <b>45</b> | <b>123</b>   |

| <b>B.Sc. in Finance – Business Finance Track (123 Credits)</b> |           |           |           |              |
|--|-----------|-----------|-----------|--------------|
|  | <b>UR</b> | <b>CR</b> | <b>PR</b> | <b>Total</b> |
| <b>Mandatory Courses</b>                                       | 15        | 48        | 24        | 84           |
| <b>Elective Courses</b>  | 9         | 6         | 6         | 21           |
| <b>Minor Courses*</b>  | -         | -         | 15        | 15           |
| <b>Total</b>   | <b>24</b> | <b>54</b> | <b>45</b> | <b>123</b>   |

| <b>B.Sc. in Finance – Islamic Banking Track (123 Credit)</b> |           |           |           |              |
|--|-----------|-----------|-----------|--------------|
|  | <b>UR</b> | <b>CR</b> | <b>PR</b> | <b>Total</b> |
| <b>Mandatory Courses</b>                                     | 15        | 48        | 24        | 87           |
| <b>Elective Courses</b>                                      | 9         | 6         | 0         | 15           |
| <b>Minor Courses</b>   | -         | -         | -         | -            |
| <b>Islamic Banking Track</b>                                 | -         | -         | 21*       | 21           |
| <b>Total</b>   | <b>24</b> | <b>54</b> | <b>45</b> | <b>123</b>   |

\*15 credits mandatory and 6 credits electives

| <b>B.Sc. in Business Administration - Management or Marketing (123 Credits)</b> |           |           |           |              |
|---|-----------|-----------|-----------|--------------|
|   | <b>UR</b> | <b>CR</b> | <b>PR</b> | <b>Total</b> |
| <b>Mandatory Courses</b>  | 15        | 48        | 24        | 87           |

|                         |           |           |           |            |
|-------------------------|-----------|-----------|-----------|------------|
| <b>Elective Courses</b> | 9         | 6         | 6         | 21         |
| <b>Minor Courses*</b>   | -         | -         | 15        | 15         |
| <b>Total</b>            | <b>24</b> | <b>54</b> | <b>45</b> | <b>123</b> |

| <b>B.Sc. in Management Information Systems (123 Credit Hours)</b> |           |           |           |              |
|---|-----------|-----------|-----------|--------------|
|   | <b>UR</b> | <b>CR</b> | <b>PR</b> | <b>Total</b> |
| <b>Mandatory Courses</b>  | 15        | 48        | 21        | 84           |
| <b>Elective Courses</b>   | 9         | 6         | 9         | 24           |
| <b>Minor Courses*</b>   | -         | -         | 15        | 15           |
| <b>Total</b>  | <b>24</b> | <b>54</b> | <b>45</b> | <b>123</b>   |

### I. University Requirements

Every student is required to take 24 credit hours of general education courses distributed over seven domains. Fifteen (15) mandatory credit hours are selected from domains 1, 2, 3 and 4 and (9) elective credit hours selected from domains 5, 6 and 7 as indicated in the University section (General Education).

### II. College Requirements

#### A. Remedial Courses

Students whose high school certificate's track is Literature must take a Remedial Mathematics or University Requirement Mathematics course. Students whose High School certificate is in Science may directly take the Business Mathematics course.

#### B. Mandatory Courses

Every student in the College of Business Administration – irrespective of specialization– is required to complete 54 (48+6) credit hours of General Business courses. These courses consist of foundation and skill courses required of all business students. Following are the 16 Mandatory courses for 48 credit hours.

| <b>Course #</b> | <b>Title</b>                        | <b>CrHrs</b> | <b>Prerequisite</b> |
|-----------------|-------------------------------------|--------------|---------------------|
| 1440162         | Business Mathematics                | 3            | Note 1              |
| 1440264         | Business Statistics                 | 3            | 1440162             |
| 0308151         | Principles of Microeconomics        | 3            | None                |
| 0308252         | Principles of Macroeconomics        | 3            | 0308151             |
| 0301120         | Accounting 1: Financial Accounting  | 3            | None                |
| 0301211         | Accounting 2: Managerial Accounting | 3            | 0301120             |
| 0308230         | Financial Management                | 3            | None                |
| 0302160         | Principles of Management            | 3            | None                |
| 0302170         | Principles of Marketing             | 3            | None                |
| 0302250         | Legal Environment of Business       | 3            | 0302160             |
| 0302254         | Business Communication              | 3            | 0202112             |

|  |   |   |                 |
|--|---|---|-----------------|
| 0302350  | Ethics and Islamic Values in Business               | 3 | 0302250         |
| 0302361  | Operations and Supply Chain Management <sup>1</sup> | 3 | 1440264         |
| 0302461  | Research Methods <sup>2</sup>                       | 3 | 1440264         |
| 0302467  | Strategic Management                                | 3 | Senior Standing |
| 0303130  | Introduction to MIS                                 | 3 | None            |
| <sup>1</sup> Equivalent to 0302311 Operations Management   |   |   |                 |
| <sup>2</sup> Equivalent to 0302461 - Business Research Methods and 0302473 - Marketing Research Methods. |   |   |                 |

### C. Elective Core Courses

Each Student in the College must successfully complete 6 credit hours from the following:

| Course  | Title                                  | CrHrs | Prerequisite |
|---|--|-------|--------------|
| 0301327   | Taxation and Zakat                     | 3     | 0301120      |
| 0301425   | Financial Statement Analysis           | 3     | 0301120      |
| 0308450   | Money and Banking                      | 3     | 0308252      |
| 0308461   | Credit Analysis and Lending Management | 3     | 0308230      |
| 0302383   | Business and Government                | 3     | 0302160      |
| 0302354   | Internship in Business                 | 3     | Note 1       |
| 0303228   | E-Business                             | 3     | 0303130      |
| <b>Note 1: Minimum 75 Credit Hours/ Department Approval</b> |  |       |              |

### III. Program Requirements

Requirements for the Bachelor of Science degree are program-specific. They encompass three categories: Major core Mandatory courses, major core elective courses and minor courses. The program requirements for the bachelor degrees in the different Business Administration majors are given hereafter. Details and titles of relevant courses are included in the Student's Study Plan (SSP) that every Business Administration student will have.

### Course Coding

Courses offered in the College of Business Administration are assigned numbers of the form 030XABC where:

|     |  |
|-----|--|
| X   | 1: Accounting<br>2: Marketing and Management<br>3: Management Information Systems<br>8: Finance and Economics<br>6.Executive Master of Business Administration<br>7. Master of Business Administration |
| ABC | Program specific course number described in the program sections   |

## Department of Accounting

### Personnel

|                              |  |
|------------------------------|--|
| <b>Chairperson</b>           | Walaa Elkeslish                        |
| <b>Professors</b>            | A Aziz Bin Jaafar                      |
| <b>Associate Professor</b>   | Walaa Elkeslish, Yousif Abdelbagi Omer |
| <b>Assistant Professors:</b> | Atia Hussain, Muhammad Al Mahameed     |

### Vision

To be the Department of Accounting of choice in the region for aspirant students, professionals, and scholars for its commitment to learning and scholarship.

### Mission

To create and sustain an environment where responsive business scholars educate responsible learners to advance their personal and professional aspirations in the field of Accounting and Auditing.

### Objectives

The objectives of the Department of Accounting are:

- 1) Design academic programs as platforms for further advancement of our graduates
- 2) Hire and support responsive scholars/educators
- 3) Attract aspirant students
- 4) Develop a supportive, intellectual, professional and learning environment
- 5) Develop engaging intellectual and learning experiences
- 6) Expand college-society initiatives by working closely with key stakeholders
- 7) Reinforce the crafting of a distinctive college identity.

### Goals

- 1) To record, analyze, interpret and communicate accounting information
- 2) To apply contemporary accounting tools
- 3) To acquire social and communication skills needed for a business career (using IT, teamwork, presentation and research skills)
- 4) To understand and respond to ethical/professional obligation and engage in continuous education.

### Career Opportunities

Students have the opportunity to hold jobs at public and business organizations such as: public accounting firms, financial institutions, e.g., banks, insurance companies, business and industrial corporations, governmental agencies, and not-for-profit organizations and sole proprietorships, partnerships and corporations.

Expected accounting positions include:

- Financial accountant
- Cost accountant
- Certified public accountant
- Financial consultant
- Insurance adjuster
- Auditor

- Public accountant
- Financial controller
- Payroll accountant
- Managerial accountant
- Internal auditor
- Tax accountant
- Management consultant and others.

### Program Learning Outcomes

1. Explain the need of different users of accounting information and how to use Accounting procedures/inputs to communicate in writing and orally.
2. Apply Accounting standards in the preparation of financial statements and Accounting information to advise users on alternative courses of action.
3. Apply management decision-making techniques/tools in real life situations through projects and case study analysis.
4. Evaluate the effectiveness of accounting techniques/tools in various business sectors.
5. Design Accounting/auditing systems/procedures in light of IT/software specifications in real life and virtual context.
6. Integrate Accounting/auditing to manage disputable (or) debatable situations while being responsible of situational outcomes.
7. Analyze the effect of Accounting/auditing regulatory environment on financial statement preparation.
8. Apply professional standards to design an audit program in accordance with professional ethics and obligations.

### Program Overview

The Bachelor of Science degree in Accounting requires the satisfactory completion of a minimum of 123 semester hours of credit with a minimum cumulative GPA of 2.00. The program consists of the categories listed in the table below.

| B.Sc. in Accounting (123 Credits) |    |    |    |       |
|-----------------------------------|----|----|----|-------|
|                                   | UR | CR | PR | Total |
| <b>Mandatory Core Course</b>      | 15 | 48 | 21 | 84    |
| <b>Electives Core Courses</b>     | 9  | 6  | 9  | 24    |
| <b>Minor Courses</b>              | -  | -  | 15 | 15    |
| <b>Total</b>                      | 24 | 54 | 45 | 123   |

### I. University Requirements

Every student is required to take 24 credit hours of general education courses distributed over seven domains. Fifteen (15) mandatory credit hours are selected from domains 1, 2, 3 and 4 and (9) elective credit hours selected from domains 5, 6 and 7 as indicated in the University section (General Education).



## II. College Requirements

Every student in the College of Business Administration – irrespective of specialization – is required to complete 54 credit hours of General Business courses: 48 credit hours are Mandatory core courses and 6 credits are core elective courses. These courses consist of foundation and skill courses required of all business students. Descriptions are presented in the introductory pages of the College of Business Administration section in this bulletin.

## III. Program Requirements

The Department of Accounting requires students to take 30 credit hours in their specialization and 15 credit hours to be used from a minor from an approved list. The specialization courses are divided into Mandatory and Elective courses as follows.

### A. Mandatory Core Courses

The list of the Mandatory core courses of the Accounting program encompasses the 21 credit hours summarized in the table below.

| Course # | Course Title                   | CrHrs | Prerequisites |
|----------|--------------------------------|-------|---------------|
| 0301310  | Cost and Management Accounting | 3     | 0301211       |
| 0301321  | Financial Reporting I          | 3     | 0301120       |
| 0301322  | Financial Reporting II         | 3     | 0301321       |
| 0301325  | International Accounting       | 3     | 0301321       |
| 0301343  | Accounting Information Systems | 3     | 0301120       |
| 0301428  | Internal Audit                 | 3     | 0301322       |
| 0301429  | Accounting Seminar             | 3     | 0301322       |

### A. Elective Core Courses

The Accounting program requires nine credit hours of core elective courses chosen from the following list:

| Course #   | Course Title                                  | CrHrs | Prerequisites |
|--|---|-------|---------------|
| 0301324  | Government and Non-Profit Accounting (Arabic) | 3     | 0301120       |
| 0301327  | Taxation and Zakat                            | 3     | 0301120       |
| 0301414  | Advanced Management Accounting                | 3     | 0301211       |
| 0301420  | Advanced Financial Accounting                 | 3     | 0301322       |
| 0301421  | Auditing Principles                           | 3     | 0301322       |
| 0301425  | Financial Statement Analysis                  | 3     | 0301120       |
| 0301426  | Special Topics in Accounting                  | 3     | 0301322       |
| 0301329  | Internship in Accounting                      | 3     | Note 1        |
| Note 1: Minimum 75 Credit Hours/ Department Approval |   |       |               |

### Study Plan (123 Credits)

The study plan for Accounting Program is presented in the table below. The plan shows that the students can normally complete the program within eight regular semesters over a period of four academic years.

| Year 1, First Level (Freshman), Semester 1 (15 Credits) |                                       |       |               |
|---|---------------------------------------|-------|---------------|
| Course #  | Title                                 | CrHrs | Prerequisites |
|   | University Requirements (1)           | 3     |               |
|   | University Requirements (2)           | 3     |               |
| 0302160   | Principles of Management              | 3     |               |
| 0301120   | Accounting (1) - Financial Accounting | 3     |               |
|   | University Requirements (3)           | 3     |               |
| Year 1, First Level (Freshman), Semester 2 (15 Credits) |                                       |       |               |
| Course #  | Title                                 | CrHrs | Prerequisites |
|   | University Requirements (4)           | 3     |               |
|   | University Requirements (5)           | 3     |               |
| 0302170   | Principles of Marketing               | 3     |               |
|   | University Requirements (6)           | 3     |               |
| 0303130   | Introduction to MIS                   | 3     |               |

| Year 2, Semester 1 (15 Credits) |  |       |               |
|---------------------------------|--|-------|---------------|
| Course #                        | Title                                  | CrHrs | Prerequisites |
| 0301211                         | Accounting (2) – Managerial Accounting | 3     | 0301120       |
| 0308151                         | Principles of Microeconomics           | 3     |               |
| 0308230                         | Financial Management                   | 3     |               |
| 1440162                         | Business Mathematics                   | 3     | 1440100       |
| 0302254                         | Business Communication                 | 3     |               |
| Year 2, Semester 2 (15 Credits) |  |       |               |
| Course #                        | Title                                  | CrHrs | Prerequisites |
| 0301321                         | Financial Reporting (1)                | 3     |               |
| 0308252                         | Principles of Macroeconomics           | 3     | 0308151       |
| 0302250                         | Legal Environment of Business          | 3     |               |
| 0301310                         | Cost and Management Accounting         | 3     |               |
|                                 | University Requirement (7)             | 3     |               |

| Year 3, Semester 1 (18 Credits) |                                |       |               |
|---------------------------------|--------------------------------|-------|---------------|
| Course #                        | Title                          | CrHrs | Prerequisites |
| 0301322                         | Financial Reporting (2)        | 3     |               |
| 1440264                         | Business Statistics            | 3     |               |
| 0301343                         | Accounting Information Systems | 3     |               |

|  |  |              |                      |
|--|--|--------------|----------------------|
|  | Minor (1)                              | 3            |                      |
|  | College Elective (1)                   | 3            |                      |
| 0302350                                | Ethics and Islamic Values in Business  | 3            |                      |
| <b>Year 3, Semester 2 (18 Credits)</b> |  |              |                      |
| <b>Course #</b>                        | <b>Title</b>                           | <b>CrHrs</b> | <b>Prerequisites</b> |
| 0301325                                | International Accounting               | 3            |                      |
|  | University Requirement (8)             | 3            |                      |
| 0302361                                | Operations and Supply Chain Management | 3            |                      |
|  | <i>Program Elective (1)</i>            | 3            |                      |
|  | Minor (2)                              | 3            |                      |
|  | College Elective (2)                   | 3            |                      |

|  |                             |              |                      |
|--|-----------------------------|--------------|----------------------|
| <b>Year 4, Semester 1 (12 Credits)</b> |                             |              |                      |
| <b>Course #</b>                        | <b>Title</b>                | <b>CrHrs</b> | <b>Prerequisites</b> |
|  | <i>Program Elective (2)</i> | 3            |                      |
| 0301428                                | Internal Audit              | 3            |                      |
|  | Minor (3)                   | 3            |                      |
|  | Minor (4)                   | 3            |                      |
| <b>Year 4, Semester 2 (15 Credits)</b> |                             |              |                      |
| <b>Course #</b>                        | <b>Title</b>                | <b>CrHrs</b> | <b>Prerequisites</b> |
|  | Minor (5)                   | 3            |                      |
| 0301429                                | Accounting Seminar          | 3            | 0301322              |
| 0302461                                | Research Methods            | 3            |                      |
| 0302467                                | Strategic Management        | 3            |                      |
|  | <i>Program Elective (3)</i> | 3            |                      |

### Course coding

Accounting program courses are designated by numbers of the form 0301ABC where:

|   |                         |  |
|---|-------------------------|--|
| A | Year (level)            |  |
| B | Areas (as follows)      |  |
|   | 0:                      |  |
|   | 1:                      |  |
|   | 2:                      |  |
|   | 3:                      |  |
| C | Course sequence in area |  |

### Course Description

Descriptions of all courses offered by the Accounting program are given below.

**0301120                      Accounting (1) Financial Accounting                      (3-0:3)**

**Prerequisite: None**

This course introduces students to accounting concepts underlying financial statements. It focuses on the analysis, measurement and reporting of business transactions to users of financial statements. It also examines the uses and limitations of accounting information for investment and credit decisions.

**0301211                      Accounting (2): Managerial Accounting (3-0:3)**

**Prerequisite: 0301120**

This course examines the role of accounting information in managing organizations. It focuses on concepts and techniques used in planning operations, controlling activities, decision making and performance evaluation.

**0301310                      Cost and Management Accounting                      (3-0:3)**

**Prerequisite: 0301211**

This course examines the techniques, systems, and procedures applicable to the use of accounting information for planning, control and decision-making. Topics include cost accumulation and allocation, product and process costing, activity-based costing, transfer pricing, flexible budgeting and variance analysis.

**0301321                      Financial Reporting I                      (3-0:3)**

**Prerequisite: 0301120**

This course builds on and extends the material covered in Accounting (1): Financial Accounting. It covers the conceptual framework of accounting and organizations involved in setting accounting standards, measurement and disclosure issues of financial reports, and the theory and practice of accounting for assets.

**0301322                      Financial Reporting II                      (3-0:3)**

**Prerequisite: 0301321**

This course discusses the theory and practice of accounting for liabilities, shareholders' equity and earnings per share, leases and pension accounting. It covers applicable accounting standards, measurement and related disclosure issues.

**0301324                      Government and Non-Profit Accounting (Arabic)                      (3-0:3)**

**Prerequisite: 0301120**

This course introduces the theory and concepts underlying financial accounting, control, and reporting in the UAE governmental and non-profit organizations. It focuses on budgeting and accounting for governmental revenues and expenditures.

**0301325                      International Accounting                      (3-0:3)**

**Prerequisite: 0301321**

This course provides a theoretical background about the effect of the institutional and cultural factors on accounting rules and practices around the world. It discusses different accounting systems and the need for harmonization of accounting standards. It also covers an implementation of a selection of accounting practices under international financial reporting standards.

**0301327                      Taxation and Zakat                      (3-0:3)**

**Prerequisite: 0301120**

This course introduces the principles of the Islamic system of taxation (Zakat accounting) and how this system differs from the western taxation systems. It addresses sources of income that are subject to taxation, measurement of income and wealth, taxation rates, tax exemptions, and the role of the state in collecting and distributing taxes.

**0301343                      Accounting Information Systems                      (3-0:3)**

**Prerequisite: 0301120**

This course examines the role and function of computerized accounting information systems in processing business transactions and storing accounting data necessary for planning, decision-making and control of organizations. The course also deals with designing, creating, and maintaining accounting records.

**0301414                      Advanced Management Accounting                      (3-0:3)**

**Prerequisite: 0301211**

This course builds on and extends the material covered in cost and management accounting. It covers statistical cost estimation techniques, theory of constraints, and decision-making under uncertainty, variance investigation decisions, performance evaluation, and current trends in management accounting.

**0301420                      Advanced Financial Accounting                      (3-0:3)**

**Prerequisite: 0301322**

This course examines the theory and practice of accounting for inter-corporate investments, business combinations, consolidation of financial statements, foreign currency translation, segment and interim reporting.

**0301421                      Auditing Principles                      (3-0:3)**

**Prerequisite: 0301322**

This course examines auditing concepts and methodology underlying audits of financial statements in terms of current practice and standards. It covers auditing standards, audit evidence, review and testing of internal controls, and types of financial audit reports.

**0301425                      Financial Statement Analysis                      (3-0:3)**

**Prerequisite: 0301120**

This course introduces and analyses the relationship between business activities (planning, financing, investing and operating) and financial statements. It demonstrates popular tools and techniques in analyzing and interpreting financial statements with an emphasis on the need of users' of financial statements.

**0301426                      Special Topics in Accounting                      (3-0:3)**

**Prerequisite: 0301322**

This course is designed to meet special educational interests of students. Special topics might include business valuation, contract and venture accounting, petroleum accounting, partnership and branch accounting, accounting for the environment, and segment and interim reporting.

**0301428 Internal Audit (3-0:3)**

**Prerequisite: 0301322**

The course provides students with a variety of contents associated with internal audit. It covers issues such as professional ethics and internal audit standards, the relation between internal audit and independent audit, role of internal audit in businesses administration, internal control and risk management. The course is an introduction to internal auditing, and its role in the modern corporation. Topics include internal auditing standards, scope, responsibilities, ethics, controls, techniques, and reporting practices. Various techniques are used to study internal auditing theory and practice; these may include the use of problem sets and case studies.

**0301429 Accounting Seminar (3-0:0)**

**Prerequisite: 0301322**

This course is designed as a capstone experience before entering the workplace. Students will use previously prepared knowledge to make informed judgments, identify and apply analytical and critical skills to effectively communicate this information to others both orally and in writing. The course prepares students for (1) completing degree requirements; (2) qualifying for an accounting job; and (3) understanding accounting theories. The course exposes students to real life cases centered on contemporary issues in accounting.

**0301329 Internship in Accounting (3-0:0)**

**Prerequisite: Minimum 75 Credit Hours and Department Approval**

During the period of internship, the students are employed and supervised by firms and participate in various types of accounting work in accordance with a plan approved by the department and the college. A student must complete a minimum of four weeks of training during regular working hours of the firm. This course can be taken during the summer between the student's junior and senior year.

**Accounting Minor**

The Department of Accounting offers a minor in Accounting to students studying a major independent of Accounting. This minor benefits all Business Administration students, particularly those who are majoring in management information systems, marketing, finance, public administration, and business management. It will help them to:

- Improve their marketability
- Identify, select, and evaluate business problems
- Be one of the people in the organization who can successfully interact and work with accounting professionals.

To satisfy the minor requirement, students must successfully complete 15 credit hours from the following courses:

| Course # | Title   | CrHrs | Prerequisite |
|----------|---|-------|--------------|
| 0301310  | Cost and Management Accounting                | 3     | 0301211      |
| 0301321  | Financial Reporting I                         | 3     | 0301120      |
| 0301322  | Financial Reporting II                        | 3     | 0301321      |
| 0301343  | Accounting Information Systems                | 3     | 0301120      |
| 0301324  | Government and Non-Profit Accounting (Arabic) | 3     | 0301120      |
| 0301327  | Taxation and Zakat                            | 3     | 0301120      |
| 0301325  | International Accounting                      | 3     | 0301321      |
| 0301425  | Financial Statement Analysis                  | 3     | 0301120      |
| 0301428  | Internal Audit                                | 3     | 0301322      |
| 0301414  | Advanced Management Accounting                | 3     | 0301211      |
| 0301420  | Advanced Financial Accounting                 | 3     | 0301322      |
| 0301426  | Special Topics in Accounting                  | 3     | 0301322      |

## Department of Finance and Economics

### Personnel

|                             |  |
|-----------------------------|--|
| <b>Chairperson</b>          | Ilhan Ozturk   |
| <b>Professors</b>           | Ilhan Ozturk, Mohammad Azhar Hussain, Abdus Sabur Mollah, Hussein A. Hassan  |
| <b>Associate Professors</b> | Atif Awad Abdallah, Eyup Dogan, Mohamed Shikh Abubaker Al-Baity,<br>Mohammad Qasem Al-Shboul   |
| <b>Assistant Professors</b> | Ijaz-Ur-Rehman Ali Zaman, MD Mahfuzur Rahman, Ismail Ben Douissa,<br>Mohammed Hersi, Noura Saad Abdelhamid Metawa, Ray Saadaoui Mallek |

### Vision

To be the Department of Finance and Economics of choice in the region for aspirant students, professionals, and scholars for its commitment to learning and scholarship.

### Mission

The department's mission is to create and sustain an environment where responsive business scholars educate responsible learners in the fields of Finance and Economics to advance their aspirations in service of their society.

### Objectives

The objectives of the Department of Finance and Economics are:

- 1) Design academic programs as platforms for further advancement of our graduates
- 2) Hire and support responsive scholars/educators
- 3) Attract aspirant students
- 4) Develop a supportive intellectual, professional & learning environment
- 5) Develop engaging and intellectual learning experiences
- 6) Expand college-society initiatives by working closely with key stakeholders
- 7) Reinforce the crafting of a distinctive college identity

### Goals

- 1) To provide students with a conceptual knowledge and understanding of finance and its applications to real world settings.
- 2) To emphasize the importance of linking theory and practice by studying the major finance models and getting students trained by the most successful financial institutions in the UAE
- 3) To understand the regulatory and ethical aspects of the Finance industry.
- 4) To be familiar with cultural and global aspects of Finance and their applications in the UAE/Gulf area
- 5) To be able to use quantitative methods and information technology in the Finance area.

### Career Opportunities

A degree in Finance will provide students with the necessary background to embark on a wide variety of careers in finance such as:

**Corporate Finance:** Graduates employed in financial management work in any of several capacities. They may handle cash and working capital, do project analysis for a firm's investment decisions, or be involved in raising funds in the capital markets or manage risks.



**Investments:** Graduates who are employed in investments work as stock brokers, bond brokers, traders, or in company research and investment analysis.

**Banking:** Graduates employed in the banking sector serve as loan officers, or credit analysts. They also help manage customers' money through the trust department or the bank's funds through its investment arm.

**Financial Planning Consultation:** Graduates employed in the area of financial planning consultation generally work with clients to determine the best mix of investments and insurance.

**Real Estate:** Graduates who work in real estate often work as real estate brokers or in real estate firms developing, financing, and valuing property. There are also opportunities in financial institutions or in the management of a company's real property.

**Insurance:** Some graduates choose the insurance industry working as sales representatives, analysts or actuaries.

**Investment Banking:** Employees in this area deal with fund raising for corporations from capital markets through public offer of securities, institutional placements of securities etc.

**Treasury:** Graduates in this area deals with risk management, hedging, and currency trading.

**Fund Managers:** Manages investments of securities in financial markets.

**Islamic Banking:** This is a fast-growing area in the banking sector with numerous opportunities for finance graduates having adequate knowledge in Islamic Banking

**Government:** Finance graduates are often employed by government agencies to conduct project analysis and manage public finances.

The major also prepares students who want to pursue graduate studies in finance. They will also be academically prepared to take prestigious professional certifications such as the Chartered Financial Analyst (CFA), the Certified Management Accountant (CMA), Certified Financial Management (CFM) and Certified Financial Planner (CFP).

### Program Learning Outcomes

Upon the successful completion of the program, students should be able to:

1. Utilize theories and methods in Finance to reach sound financial decisions
2. Critically analyze the financial decision - making process in corporations, investment firms, banks, and other financial institutions
3. Develop innovative and advanced approaches to evaluate the operations of financial markets and institutions
4. Design solutions for real world Finance problems individually and as a team
5. Analyze ethical, global and cultural issues related to the real world

6. Implement financial regulations, standards, codes and corporate policies for compliance and for ensuring financial stability
7. Analyze the features of the UAE/Gulf financial environment in the context of global financial environments and draw conclusions about financial resilience & stability
8. Apply information technology and quantitative methods in research and evaluate the results in the area of finance individually and in groups

### Program Overview

The Bachelor of Science program in Finance requires that a student completes 123 credits of courses and attain a minimum cumulative GPA of 2.00. The program consists of the categories summarized below.

| <b>B.Sc. in Finance - Business Finance Track (123 Credits)</b> |           |           |           |              |
|--|-----------|-----------|-----------|--------------|
|  | <b>UR</b> | <b>CR</b> | <b>PR</b> | <b>Total</b> |
| <b>Mandatory Courses</b>                                       | 15        | 48        | 24        | 87           |
| <b>Electives Courses</b>                                       | 9         | 6         | 6         | 21           |
| <b>Minor Courses</b>   | -         | -         | 15        | 15           |
| <b>Total</b>   | 24        | 54        | 45        | 123          |

| <b>B.Sc. in Finance – Islamic Banking Track (123 Credits)</b> |           |           |           |              |
|---|-----------|-----------|-----------|--------------|
|   | <b>UR</b> | <b>CR</b> | <b>PR</b> | <b>Total</b> |
| <b>Mandatory Courses</b>                                      | 15        | 48        | 24        | 87           |
| <b>Electives Courses</b>                                      | 9         | 6         | -         | 15           |
| <b>Minor Courses</b>  | -         | -         | -         | -            |
| <b>Islamic Banking Track</b>                                  | -         | -         | 21*       | 21           |
| <b>Total</b>  | 24        | 54        | 45        | 123          |
| *15 credits mandatory and 6 credits electives                 |           |           |           |              |

### I. University Requirements

Every student is required to take 24 credit hours of general education courses distributed over seven domains. Fifteen (15) mandatory credit hours are selected from domains 1, 2, 3 and 4 and (9) elective credit hours selected from domains 5, 6 and 7 as indicated in the University section (General Education).

### II. College Requirements

Every student in the College of Business Administration – irrespective of specialization – is required to complete 54 credit hours of General Business courses. 48 credit hours are Mandatory Core Courses and 6 credit hours are Elective Core Courses. These courses consist of foundation and skill courses required of all business students. Descriptions are presented in the introductory pages of the College of Business Administration section in this bulletin.

### III. Program Requirements

The Department of Finance and Economics requires students to take 30 credit hours in the specialization and 15 credit hours from an approved minor. The major core courses are divided into two categories: Mandatory core and elective core courses. These courses are described for each track and program below.

## Business Finance Track

### A. Mandatory Core Courses

The Business Finance Track requires 24 credit hours of Mandatory courses listed below.

| Course #                                     | Course Title                                | CrHrs | Prerequisites |
|--|---|-------|---------------|
| 0308331                                      | Corporate Finance                           | 3     | 0308230       |
| 0308332                                      | Investment Analysis                         | 3     | 0308230       |
| 0308361                                      | Banking Operations Management               | 3     | 0308230       |
| 0308362                                      | Introduction to Islamic Banking and Finance | 3     | 0308230       |
| 0308365                                      | Risk Management                             | 3     | 0308230       |
| 0308430                                      | International Financial Management          | 3     | 0308230       |
| 0308431                                      | Financial Markets and Institutions          | 3     | 0308230       |
| 0308438                                      | Seminar in Finance and Banking              | 3     | Note 1        |
| Note 1: Senior Standing/ Department Approval |   |       |               |

### B. Electives Core Courses

Business Finance Track students may choose 6 credit hours of Elective Courses from the following list.

| Course #   | Course Title                           | CrHrs | Prerequisites |
|--|--|-------|---------------|
| 0308333  | Quantitative Methods for Finance       | 3     | 1440264       |
| 0308334  | Real Estate Finance                    | 3     | 0308230       |
| 0308366  | Internship in Finance                  | 3     | Note 1        |
| 0308466  | Special Topics in Finance and Banking  | 3     | 0308361       |
| 0308433  | Portfolio Management                   | 3     | 0308332       |
| 0308434  | Derivatives                            | 3     | 0308332       |
| 0308461  | Credit Analysis and Lending Management | 3     | 0308230       |
| 0308463  | Islamic Financial Instruments          | 3     | 0308362       |
| Note 1: Minimum 75 Credit Hours/ Department Approval |  |       |               |

## Islamic Finance Track – Business Majors (English)

### A. Mandatory Core Courses

The Islamic Banking Track requires the 15 credit hours of Mandatory core courses listed below.

| Course # | Course Title                            | CrHrs | Prerequisites |
|----------|---|-------|---------------|
| 0308255  | Principles of Islamic Economics         | 3     | 0308151       |
| 0308256  | Islamic Financial Contracts 1           | 3     | 0308255       |
| 0308364  | Islamic Banking and Finance in Practice | 3     | 0308362       |
| 0308463  | Islamic Financial Instruments           | 3     | 0308362       |
| 0308469  | Accounting for Islamic Banks            | 3     | 0308362       |

## B. Electives Core Courses

Islamic Finance Track students may choose 6 credit hours of Elective courses from the following list.

| Course #   | Course Title                      | CrHrs | Prerequisites |
|--|-----------------------------------|-------|---------------|
| 0308341  | Islamic Insurance (Takaful)       | 3     | 0308255       |
| 0308333  | Quantitative Methods for Finance  | 3     | 1440264       |
| 0308334  | Real Estate Finance               | 3     | 0308230       |
| 0308357  | Islamic Financial Contract II     | 3     | 0308255       |
| 0308365  | Risk Management                   | 3     | 0308230       |
| 0308366  | Internship in Finance             | 3     | Note 1        |
| 0308467  | Special Topics in Islamic Finance | 3     | 0308120       |
| 0308468  | Islamic Portfolio Management      | 3     | 0308332       |
| Note 1: Minimum 75 Credit Hours/ Department Approval |                                   |       |               |

## Study Plan – Business Finance Track (123 Credits)

The study plan for the Business Finance Bachelor of Science Degree is presented in the table below. The plan shows that the students can normally complete the program within eight regular semesters over a period of four academic years.

| Year 1, Level I (Freshman), Semester 1 (15 Credits) |                                       |       |               |
|---|---------------------------------------|-------|---------------|
| Course #  | Title                                 | CrHrs | Prerequisites |
|   | University Requirements (1)           | 3     |               |
|   | University Requirements (2)           | 3     |               |
| 0302160   | Principles of Management              | 3     |               |
| 0301120   | Accounting (1) – Financial Accounting | 3     |               |
|   | University Requirements (3)           | 3     |               |

| Year 1, Level I (Freshman), Semester 2 (15 Credits) |                             |       |               |
|---|-----------------------------|-------|---------------|
| Course #  | Title                       | CrHrs | Prerequisites |
|   | University Requirements (4) | 3     |               |
|   | University Requirements (5) | 3     |               |
| 0302170   | Principles of Marketing     | 3     |               |
| 1440162   | Business Mathematics        | 3     | 1440100       |
| 0303130   | Introduction to MIS         | 3     |               |

| Year 2, Level II (Sophomore), Semester 3 (15 Credits) |  |       |               |
|---|--|-------|---------------|
| Course #  | Title                                  | CrHrs | Prerequisites |
| 0301211   | Accounting (2) – Managerial Accounting | 3     | 0301120       |
| 0308230   | Financial Management                   | 3     |               |
| 1440264   | Business Statistics                    | 3     | 1440162       |
| 0308151   | Principles of Microeconomics           | 3     |               |
|   | University Requirement (6)             | 3     |               |

| Year 2, Level II (Sophomore), Semester 4 (15 Credits) |                               |       |               |
|---|-------------------------------|-------|---------------|
| Course #  | Title                         | CrHrs | Prerequisites |
| 0302254   | Business Communication        | 3     | 0202112       |
| 0308252   | Principles of Macroeconomics  | 3     | 0308151       |
| 0302250   | Legal Environment of Business | 3     | 0302160       |
| 0308331   | Corporate Finance             | 3     | 0308230       |
|   | University Requirement (7)    | 3     |               |

| Year 3, Level III (Junior), Semester 5 (18 Credits) |                                       |       |               |
|---|---------------------------------------|-------|---------------|
| Course #  | Title                                 | CrHrs | Prerequisites |
| 0308365   | Risk Management                       | 3     | 0308230       |
| 0308361   | Banking Operations Management         | 3     | 0308230       |
| 0302361   | Operation and Supply Chain Management | 3     | 1440264       |
| 0302350   | Ethics and Islamic Values in Business | 3     | 0302250       |
|   | Program Elective (1)                  | 3     |               |
|   | College Elective (1)                  | 3     |               |

| Year 3, Level III (Junior), Semester 6 (18 Credits) |   |       |               |
|---|---|-------|---------------|
| Course #  | Title                                       | CrHrs | Prerequisites |
| 0308332   | Investment Analysis                         | 3     | 0308230       |
| 0308362   | Introduction to Islamic Banking and Finance | 3     | 0308230       |
|   | Program Elective (2)                        | 3     |               |
|   | College Elective (2)                        | 3     |               |
|   | Minor Course (1)                            | 3     |               |
|   | Minor Course (2)                            | 3     |               |

| Year 4, Level IV (Senior), Semester 7 (12 Credits) |                                    |       |               |
|--|------------------------------------|-------|---------------|
| Course #   | Title                              | CrHrs | Prerequisites |
| 0308430  | International Financial Management | 3     | 0308230       |
|  | Minor Course (3)                   | 3     |               |
|  | Minor Course (4)                   | 3     |               |
| 0302461  | Research Methods                   | 3     | 1440264       |

| Year 4, Level IV (Senior), Semester 8 (15 Credits) |                                    |       |                                    |
|--|------------------------------------|-------|------------------------------------|
| Course #   | Title                              | CrHrs | Prerequisites                      |
| 0308431  | Financial Markets and Institutions | 3     | 0308230                            |
| 0308432  | Seminar in Finance and Banking     | 3     | Senior standing/<br>Dept. Approval |
| 0302476  | Strategic Management               | 3     | Senior standing/<br>Dept. Approval |
|  | University Requirement (8)         | 3     |                                    |
|  | Minor Course (5)                   |       |                                    |

### Study Plan – Islamic Finance Track (123 Credits)

The Islamic Banking program encompasses 123 credits hours that are spread over eight semesters and could be completed in four years. The following study plan serves as a roadmap for a smooth progression toward graduation.

| Year 1, Level I (Freshman), Semester 1 (15 Credits) |                                       |       |               |
|---|---------------------------------------|-------|---------------|
| Course #  | Title                                 | CrHrs | Prerequisites |
|   | University Requirements (1)           | 3     |               |
|   | University Requirements (2)           | 3     |               |
| 0302160   | Principles of Management              | 3     |               |
| 0301120   | Accounting (1) – Financial Accounting | 3     |               |
|   | University Requirements (3)           | 3     |               |

| Year 1, Level I (Freshman), Semester 2 (15 Credits) |                             |       |               |
|---|-----------------------------|-------|---------------|
| Course #  | Title                       | CrHrs | Prerequisites |
|   | University Requirements (4) | 3     |               |
|   | University Requirements (5) | 3     |               |
| 0302170   | Principles of Marketing     | 3     |               |
| 1440162   | Business Mathematics        | 3     | 1440100       |
| 0303130   | Introduction to MIS         | 3     |               |

| Year 2, Level II (Sophomore), Semester 3 (15 Credits) |  |       |               |
|---|--|-------|---------------|
| Course #  | Title                                  | CrHrs | Prerequisites |
| 0301211   | Accounting (2) – Managerial Accounting | 3     | 0301120       |
| 0308230   | Financial Management                   | 3     |               |
| 0308151   | Principles of Microeconomics           | 3     |               |
| 0302254   | Business Communication                 | 3     | 0202112       |
|   | University Requirement (6)             | 3     |               |

| Year 2, Level II (Sophomore), Semester 4 (15 Credits) |                               |       |               |
|---|-------------------------------|-------|---------------|
| Course #  | Title                         | CrHrs | Prerequisites |
| 1440264   | Business Statistics           | 3     | 1440162       |
| 0308252   | Principles of Macroeconomics  | 3     | 0308151       |
| 0302250   | Legal Environment of Business | 3     | 0302160       |
| 0308331   | Corporate Finance             | 3     | 0308230       |
|   | University Requirement (7)    | 3     |               |

| Year 3, Level III (Junior), Semester 5 (18 Credits) |                                       |       |               |
|---|---------------------------------------|-------|---------------|
| Course #  | Title                                 | CrHrs | Prerequisites |
| 0308365   | Risk Management                       | 3     | 0308230       |
| 0308361   | Banking Operations Management         | 3     | 0308230       |
| 0302361   | Operation and Supply Chain Management | 3     | 1440264       |

|         |   |   |         |
|---------|---|---|---------|
| 0308362 | Introduction to Islamic Banking and Finance | 3 | 0308230 |
| 0308240 | Principles of Islamic Economics             | 3 |         |
|         | Program Elective (1)                        | 3 |         |

**Year 3, Level III (Junior), Semester 6 (18 Credits)**

| Course # | Title                                   | CrHrs | Prerequisites |
|----------|---|-------|---------------|
| 0308332  | Investment Analysis                     | 3     | 0308230       |
| 0308364  | Islamic Banking and Finance in Practice | 3     | 0308362       |
| 0302350  | Ethics and Islamic Values in Business   | 3     | 0302250       |
| 0308256  | Islamic Financial Contract 1            | 3     | 0308255       |
|          | College Elective (1)                    | 3     |               |

**Year 4, Level IV (Senior), Semester 7 (15 Credits)**

| Course # | Title                              | CrHrs | Prerequisites |
|----------|------------------------------------|-------|---------------|
| 0302461  | Research Methods                   | 3     | 1440264       |
| 0308430  | International Financial Management | 3     | 0308230       |
| 0308463  | Islamic Financial Instruments      | 3     | 0308362       |
|          | College Elective (2)               | 3     |               |
|          | Program Elective (2)               | 3     |               |

**Year 4, Level IV (Senior), Semester 8 (15 Credits)**

| Course # | Title                              | CrHrs | Prerequisites                       |
|----------|------------------------------------|-------|-------------------------------------|
| 0308431  | Financial Markets and Institutions | 3     | 0308230                             |
| 0308432  | Seminar in Finance and Banking     | 3     | Senior standing/<br>Dept. Approval. |
| 0302476  | Strategic Management               | 3     | Senior standing/<br>Dept. Approval. |
| 0308467  | Special Topics in Islamic Finance  | 3     | 0308362                             |
|          | University Requirement (8)         | 3     |                                     |

**Course coding**

Courses offered by the Department of Finance and Economics are designated numbers of the form 0308ABC where:

|   |  |
|---|--|
| A | Year (level)                               |
| B | Areas (as follows)<br>0:<br>1:<br>2:<br>3: |
| C | Course sequence in area                    |

### Course Description

The courses described below constitute all courses, mandatory and electives, that are offered by the Department of Finance and Economics to various tracks. College required courses are described in the College of Business Administration section.

#### **0308341 Islamic Insurance (Takaful) (3-0:0)**

**Prerequisite: 0103240. This course is equivalent to the course Introduction to Islamic Insurance (0103341)**

This course analyzes the basic elements of Islamic cooperative insurance or takaful as distinct from conventional insurance and how a takaful company can be organized offering a complete range of insurance-related services. The first part of this course deals with life insurance while the second part covers general insurance. It also covers challenges relating to retakaful or reinsurance.

#### **0308230 Financial Management (3-0:3)**

**Prerequisite: None**

This course is designed to provide students with a basic understanding of financial decision making within a firm. The course deals with the goals and functions of financial management, financial analysis and planning, working capital management, the capital budgeting process, cost of capital, dividend policy and long-term financing.

#### **0308255 Principles of Islamic Economics (3-0:3)**

**Prerequisite: 0308151**

The course starts by looking into the current assumptions of the conventional economic system based on the foundation of the classical school of thought. It discusses the types of markets and the problems the current system is facing. The course then explains the philosophical foundation of Islamic economics taking into account the conflicting views of the scholars. It elaborates further the concept of rule of behavior and how and why it is important in the free market and how it might improve efficiency further. In addition, the course explains the acceptable ethics and behaviors in the market and how the government is supposed to enforce them. The concept of prohibited elements is discussed and the rationale behind the prohibition. Concepts such as: private and state property, money, ways of property transfer and its exceptional restrictions, the role of the state in developing the economy, taxes and their rules and controls, work and its importance, conditions and controls, the rights of workers and owners, unemployment, its causes and the ways of dealing with it, capital and its effects on stimulating the economy and development, productivity, consumption, and income distribution are discussed.

#### **0308256 Islamic Financial Contract I (3-0:3)**

**Prerequisite: 0308255**

This course deals with the theories of property rights and ownership. However, the course is more focused on the general theory of contract and on its pillars.



**0308331 Corporate Finance (3-0:3)**

**Prerequisite: 0308230**

The course includes the scope of corporate finance, present value, risk and return, capital budgeting, the cost of capital, capital structure, financial planning, working capital management, dividend policy, and mergers. The course will concentrate on financial decision making by applying the tools, techniques, and theories of finance to actual business decisions.

**0308332 Investment Analysis (3-0:3)**

**Prerequisite: 0308230**

This course covers investment environment, risk and return, efficient markets and portfolio performance, security valuation, options, futures and financial engineering, and investment companies.

**0308333 Quantitative Methods for Finance (3-0:3)**

**Prerequisite: 1440264**

The purpose of the course is to introduce students to a range of quantitative methods that are commonly used in several areas of finance. The course introduces concepts and methods from probability theory, statistical inference, regression analysis, financial modeling, and Monte Carlo simulation techniques.

**0308334 Real Estate Finance (3-0:3)**

**Prerequisite: 0308230**

The course focuses on the financing issues related to real estate. It provides an introduction to real estate and goes on to discuss techniques of project evaluation, financing strategies and capital market issues related to real estate.

**0308357 Islamic Financial Contract II (3-0:3)**

**Prerequisite: 0308255**

This course exposes students to the various types of commercial contracts and their applications. This course deals with the regulations of the following issues: bill of exchange, agreement, companies, deposit, usurpation, grant, crop sharing, use of uncultivated land, Waqf (endowment) and the jurists' views and their supporting arguments.

**0308361 Banking Operations Management (3-0:3)**

**Prerequisite: 0308230**

This course covers bank accounts, bank services, methods of payment through the banking system, asset management, liability management, credit analysis, investment policies, and bank marketing.

**0308362 Introduction to Islamic Banking and Finance (3-0:3)**

**Prerequisite: 0308230**

This course focuses on principles of Islamic finance, Islamic approaches to money, banking and monetary policy, economics of profit-sharing, operations of Islamic banking.

**0308364 Islamic Banking and Finance in Practice (3-0:3)**

**Prerequisite: 0308362**

The course covers many practical areas towards Islamic commercial and investment banking. They include implementation of Islamic finance, Musharakah accounts in Islamic banking, financing projects through Islamic banks, Islamic financing for imports and exports and use of Musharakah for working capital. The course also covers Murabaha, installment sales, speculation, leasing and Istisna'a.

**0308365 Risk Management (3-0:3)**

**Prerequisite: 0308230**

An operational approach to risk management in business and personal affairs. Principles of risk management; risk identification; risk financing; types of insurance coverage; and insurance contracts and premiums. Special reference will be made to the insurance market in the UAE.

**0308430 International Financial Management (3-0:3)**

**Prerequisite: 0308230**

This course includes the fundamentals of financial evaluation, tools, and procedures, which are needed to facilitate decision-making of multinational corporations. The course also covers theories of international finance, the currency markets, and foreign exchange risk.

**0308431 Financial Markets and Institutions (3-0:0)**

**Prerequisite: 0308230**

The focus of this course is on how resources are efficiently transferred from those with a surplus to those with a deficit, and on the instruments, which facilitate this transfer. The discussion will cover financial markets, flow of funds, interest rate determination, market efficiency, financial intermediaries, bond markets, equity markets, mortgage markets and foreign exchange markets.

**0308432 Seminar in Finance and Banking (3-0:0)**

**Prerequisite: Senior Standing or Department Approval**

The course serves as a capstone course in finance and banking. It exposes students to a wide range of finance and banking related topics, including issues affecting the current financial environment of business firms. The course integrates material from previous courses taken in the finance major.

**0308433 Portfolio Management (3-0:0)**

**Prerequisite: 0308332**

This course deals with the analysis of quantitative and qualitative factors leading to the valuation of equity and fixed-income securities, application of alternative valuation techniques theories and fundamental and technical approaches as well as contemporary developments.

**0308434 Derivatives (3-0:0)**

**Prerequisite: 0308332**

This advanced course offers the theory and the practical tools needed to price and hedge derivatives in the professional marketplace. Equal coverage is given to options pricing theory and futures pricing theory.

**0308461 Credit Analysis and Lending Management (3-0:0)**

**Prerequisite: 0308230**

The course focuses on the principles of lending, financial statement analysis, credit scoring techniques, credit risk analysis, consumer lending, real estate lending, corporate and business lending, international lending and electronic banking and lending.

**0308462 Internship in Finance (3-0:0)**

**Prerequisite: Minimum 75 Credit Hours and Department Approval**

During the period of internship, the students are employed and supervised by firms and participate in various types of finance work in accordance with a plan approved by the department and the college. A student must complete eight weeks of training during regular working hours of the firm. This course can be taken during the summer between the student's junior and senior year.

**0308463 Islamic Financial Instruments (3-0:0)**

**Prerequisite: 0308362**

The course focuses on Islamic investment, Islamic bonds (Sukuk), stock exchange in the Islamic financial system, venture capital under Islamic system, profit sharing agreement, leasing under the Islamic system, sales contract, and Islamic unit trusts.

**0308466 Current Issues in Finance and Banking (3-0:0)**

**Prerequisite: 0308361**

This course addresses contemporary topics and issues in Islamic Banking.

**0308467 Special Topics in Islamic Finance (3-0:3)**

**Prerequisite: 0308362**

This course is dedicated towards refining students' understanding of the basic principles involved in Islamic Finance as well as developing some more advanced techniques in Finance and Islamic banking. In addition, contemporary topics and issues in Islamic Finance are addressed.

**0308469 Accounting for Islamic Banks (3-0:0)**

**Prerequisite: 0308120**

The course covers the processes required to record the bank's unique transactions, as well as how to prepare financial statements as required by the bank's stakeholders.

**0308468 Islamic Portfolio Management (3-0:0)**

**Prerequisite: 0308332**

This course focuses on the techniques for portfolio selection. The course addresses both theory and practical aspects of portfolio management with an emphasis on the Islamic world. It will also consider the use of derivatives in managing risks.

## Economics Courses

### **0308150 Introduction to Economics for NBS (3-0:0)**

#### **Prerequisites: None**

This course is offered to non-business students. It covers topics from both microeconomics and macroeconomics perspectives. Microeconomics covers topics like market supply and demand, price elasticity of supply and demand, consumer behavior, production and costs, perfect competition, and monopoly. Topics from macroeconomics include national income accounts, national income determination, money and banking, inflation, monetary and fiscal policies, and international trade. This course will be offered in both Arabic and English.

### **0308151 Principles of Microeconomics (3-0:0)**

#### **Prerequisite: None**

This course introduces economic analysis of individual, business, and industry choices in the market economy. Starting from defining economies and its principles, we will study how the market forces of supply and demand is key determinates for prices. We will see the sense in which market economies are efficient, and the way governments can make our economy less or more efficient. We will delve behind the supply curve to see how firms choose their production levels to maximize profits, culminating in the model of perfect competition. Time permitting; we will look at market failures such as monopoly, externalities, the markets for the factors of production and the theory of consumer choice.

### **0308252 Principles of Macroeconomics (3-0:0)**

#### **Prerequisite: 0308151**

Principles of Macroeconomics introduce the basic concepts of macroeconomics for students. The topics covered include the measurement of aggregate output, unemployment and inflation, determinants of economic growth in the long-run, year-to-year fluctuations in economic activity, the role of monetary and fiscal policy in the economy, comparative advantage in international transactions, and exchange rates.

### **0308351 Intermediate Microeconomics (3-0:0)**

#### **Prerequisite: 0308151 Principles of Microeconomics**

This course provides students with an advanced knowledge of the functioning of the economy at the micro level. The focus is on the theories of consumer and firm decision making, how prices and quantities are determined in equilibrium, how resources are allocated, different market structures, input demand, welfare economics, market failure, and public goods.

### **0308352 Intermediate Macroeconomics (3-0:0)**

#### **Prerequisite: 0308252 Principles of Macroeconomics**

The primary goal of this course is to enable students to develop a consistent way of thinking about key macroeconomic phenomena and to analyze complex issues and current events. This should give students the ability to understand how economic policy and shocks affect the economy as reflected in aggregate macro variables such as output, interest rates, prices, and employment, and also have insights about the different schools of economic thought (Keynesianism, Monetarism, Classical Economics).

**0308253                      Managerial Economics                      (3-0:0)**

**Prerequisite 0308151 Principles of Microeconomics**

This course is designed to provide students with a basic understanding of microeconomic concepts and applications relevant to managerial decision-making. The course topics include demand and supply analysis, consumer theory, forecasting, production and cost analysis, market structure, risk analysis, linear programming, decision making under uncertainty, regulatory theory, and the role of government in the market.

**0308355                      Introduction to Econometrics                      (3-0:0)**

**Prerequisites: Business Statistics (1440264) & Principles of Macroeconomics( 0308252)**

This course is developed to equip students with a basic understanding of analysis of economic data. The course covers descriptive statistics, hypothesis testing, analysis of variance, regression analysis, heteroskedasticity, multicollinearity, serial correlation, and simultaneous equations.

**0308452                      Public Economics                      (3-0:0)**

**Prerequisite: 0308252 Principles of Macroeconomics**

This course provides students with an understanding of market failure and government intervention requirement. The course deals with the imperfect nature of government intervention, how the intervention affects the economy, particularly in the areas of resource allocation, income distribution, and the incidence of taxation.

**0308450                      Money and Banking                      (3-0:0)**

**Prerequisite: 0308252, Principles of Macroeconomics**

This course studies the role of financial markets & institutions and money in the economy. It examines how interest rates are determined, why fluctuated over time, how money is created by the banking system, and the role of the Central Bank in the whole process. Issues like the banking crisis and the proper role of monetary policy will be examined in detail. The interaction between the goods sector and the financial sector, as well as the interrelationships between the domestic and the international financial sectors will be analyzed.

**0308453                      International Economics                      (3-0:0)**

**Prerequisite 0308252, Principles of Macroeconomics**

This course concentrates on two parts international trade and international finance. From the first part the course covers the following topics: comparative and absolute advantage in production, trade policies, trade barriers, and terms of trade, multinational corporations and international trade agreements, the nature of the gains from trade, winners and losers. From the second part the course focuses on the following topics: fundamentals of international monetary economics, determination of exchange rate, exchange rate arrangements and balance of payments.

**0308455                      Economic Development                      (3-0:0)**

**Prerequisite: 0308252, Principles of Macroeconomics**

Economic Development introduce an analysis to the economic development process of newly developing nations for students. The course focuses on economic growth, economic development theories, population growth, human capital, poverty, and income distribution. Additionally, it explores the impact of public policies on economic growth and development.

### 0308336

### Economics of Health Care

(3-0-0)

#### Prerequisite: 0308351, Intermediate Microeconomics

Economics of Health Care introduce the basic concepts within health-related economic issues incl. health care economics, government policy/regulations, uncertainty, and measures of efficiency/equality/fairness. The covered topics include government intervention in factors affecting people's health, the financial structure of the healthcare sector, payment of healthcare providers, and the evaluation of healthcare programs.

### 0308XXX

### Welfare Economics

(3-0-0)

#### Prerequisite: 0308351, Intermediate Microeconomics

Welfare Economics introduce concepts within welfare related economic issues, including rationales about distribution, fairness, societal utility, inequality, poverty, polarization, deprivation, multi-dimensional welfare, developing nations, advanced economies, consequences of inequality, social and tax policy, structural policies, the inequality-growth trade off, and empirical evidence. The covered topics include economic and moral reasons behind distributional goals, how analyses of distributions are conducted in practice, government intervention to reach desired distributional outcomes, the actual structure of distribution, and evaluation of different state approaches to welfare.

### Minor Program in Finance

The Department of Finance and Economics offers a minor in Finance to students studying a major independent of Finance and Islamic banking. To satisfy the minor requirement, students must successfully complete five courses (15 credit hours) from the following list:

| Course # | Title                                       | CrHrs | Prerequisites |
|----------|---|-------|---------------|
| 0308230  | Financial Management*                       | 3     |               |
| 0308331  | Corporate Finance                           | 3     | 0308230       |
| 0308332  | Investment Analysis                         | 3     | 0308230       |
| 0308334  | Real Estate Finance                         | 3     | 0308230       |
| 0308361  | Banking Operations Management               | 3     | 0308230       |
| 0308362  | Introduction to Islamic Banking and Finance | 3     | 0308230       |
| 0308365  | Risk Management                             | 3     | 0308230       |
| 0308430  | International Financial Management          | 3     | 0308230       |
| 0308431  | Financial Markets and Institutions          | 3     | 0308230       |
| 0308461  | Credit Analysis and Lending Management      | 3     | 0308230       |

### Minor Program in Economics

The Department of Finance and Economics offers a minor in Economics to all Business Administration students. To satisfy the minor requirement, students must successfully complete five courses (15 credit hours) from the following list:

| Course #  | Title                        | CrHrs | Prerequisites       |
|-----------|------------------------------|-------|---------------------|
| 0301351 * | Intermediate Microeconomics  | 3     | 0308151             |
| 0308352 * | Intermediate Macroeconomics  | 3     | 0308252             |
| 0301253   | Managerial Economics         | 3     | 0308151             |
| 0308355   | Introduction to Econometrics | 3     | 0308252 and 1440264 |
| 0301452   | Public Economics             | 3     | 0308252             |
| 0301450   | Money and Banking            | 3     | 0308252             |
| 0301453   | International Economics      | 3     | 0308252             |
| 0301455   | Economic Development         | 3     | 0308252             |

\*Either one of these courses is Mandatory

## Department of Management

### Personnel

|                             |  |
|-----------------------------|--|
| <b>Chairperson</b>          | Shaker Jamal Bani Melhem   |
| <b>Professor</b>            | Dima Rachid Jamali, John Lewis Rice, Matloub Hussain, Mohamed Gamal Aboelmaged, Mohd Ahmad AL Hawari, Syed Awais Ahmed   |
| <b>Associate Professors</b> | Abu Elias Sarker, Avraam Papastathopoulos, Azaddin Salem Khalifa, Faridahwati Binti Mohd Shamsudin, Muhammad Mustafa Raziq, Muhammad Turki Alshurideh, Norhayati Binti Zakaria, Panagiotis Zervopoulos, Shaker Jamal Saleh Bani Melhem, Yazid Abubakar Abdullahi |
| <b>Assistant Professors</b> | Georges Iskandar Samara, Mohamed D. A. Shamout, Moyassar Zuhair Al Yas Al Taie, Narjes Haj Salem, Salima Hamouche, Salman Yousaf, Syed Abidur Rahman   |

### Vision

To create and sustain an environment where responsive business scholars educate responsible learners to advance their aspirations in the fields of management, marketing and public administration in service of their society.

### Mission

The department's mission is to create and sustain an environment where responsive business scholars educate responsible learners in the fields of Management, Marketing, and Public Administration to advance their aspirations in service of their society.

### Objectives

The objectives of the Department of Management, Marketing and Public Administration are:

- 1) Design academic programs as platforms for further advancement of our graduates
- 2) Hire and support responsive scholars/educators
- 3) Attract aspirant students
- 4) Develop a supportive intellectual, professional & learning environment
- 5) Develop engaging intellectual & learning experiences
- 6) Expand college-society initiatives by working closely with key stakeholders
- 7) Reinforce the crafting of a distinctive college identity

### Learning Outcomes - Business Administration

- 1) Demonstrate understanding of the basic theories and concepts in different areas of management.
- 2) Demonstrate knowledge of problem solving techniques as they apply to business issues.
- 3) Work effectively in teams and take responsibility for own and coordinated performance.
- 4) Communicate competently, orally and in writing.
- 5) Analyze various real world ethical and legal matters in business and management.
- 6) Discuss global and macro-level matters in business and management.
- 7) Analyze management practices in the UAE/Gulf region in comparison to other countries.



## Career Opportunities

In pursuing the Business Administration degree program, students will learn how to work in a variety of business, government and non-profit organizations. The program prepares students for a variety of career choices. Upon completion, the Business Administration graduate will be well-equipped to seek and gain employment in a variety of fields, which include for example; business management, marketing, sales, quality management, customer service, event management, management consulting, human resource management, international business, public relations manager, market research analyst, advertising manager, brand manager, media buyer, meeting, convention and event planners, chief marketing officer, promotions manager consulting, entrepreneurship, general management, operations management, strategic planning

Public Administration graduates can go on to the positions in the following fields: government, public budgeting, human resources management, community development, environmental management, educational administration, tourism, recreational services, client relations management, health service administration, public information management, and public relations management.

## Program Learning Outcomes

1. Identify and describe theories, concepts, and practices in different areas of business.
2. Apply theoretical and practical knowledge to provide innovative and socially responsible and sustainable business solutions.
3. Use effective communicational skills to promote respect and trust and build adaptability to achieve team performance.
4. Utilize information by applying a variety of business and industry standard software and hardware to major business functions.
5. Demonstrate effective conflict and diversity management practices to lead change in diverse business contexts.
6. Identify and evaluate social, cultural, global, ethical, and environmental responsibilities and issues.
7. Conduct research to identify contemporary business issues and recommend innovative and sustainable solutions.
8. Evaluate the business trends in the UAE and beyond to design innovative solutions that tackle contemporary challenges.

## Program Overview

The Bachelor of Science of Business Administration - Management Concentration program requires that a student complete 123 credits of course work and attain a minimum cumulative GPA of 2.00. The program consists of three categories as summarized below: University Requirements (UR), College Requirements (CR) and Program Requirements (PR).

| <b>B.Sc. in Business Administration – Management and Marketing (123 Credits)</b> |           |           |           |              |
|--|-----------|-----------|-----------|--------------|
|  | <b>UR</b> | <b>CR</b> | <b>PR</b> | <b>Total</b> |
| <b>Mandatory Core Courses</b>  | 15        | 48        | 15        | 78           |
| <b>Electives Core Courses</b>  | 9         | 6         | 15        | 30           |
| <b>Minor Courses</b>   | -         | -         | 15        | 15           |
| <b>Total</b>   | 24        | 54        | 45        | 123          |

## I. University Requirements

Every student is required to take 24 credit hours of general education courses distributed over seven domains. Fifteen (15) mandatory credit hours are selected from domains 1, 2, 3 and 4 and (9) elective credit hours selected from domains 5, 6 and 7 as indicated in the University section (General Education).

## II. College Requirements

Every student in the College of Business Administration – irrespective of specialization – is required to complete 54 credit hours of General Business courses. 48 credit hours are Mandatory Core Courses and 6 credit hours are Elective Core Courses. These courses consist of foundation and skill courses required of all business students. Descriptions are presented in the introductory pages of the College of Business Administration section in this Bulletin.

## III. Program Requirements

The Department of Management requires students to take 30 credit hours in the specialization and 15 credit hours from an approved minor. The specialization courses are divided into mandatory and elective courses as follows.

### Management and Marketing

#### A. Mandatory Core Courses

Students in the management or marketing track are required to take the following 15 credit hours of mandatory courses listed below.

| Course #  | Course Title                    | CrHrs | Prerequisites |
|---|---------------------------------|-------|---------------|
| 0302260   | Quantitative Business Analysis* | 3     | 1440264       |
| 0302262   | Organizational Behavior         | 3     | 0302160       |
| 0302367   | Entrepreneurship                | 3     | 0302160       |
| 0302370   | Consumer Behavior               | 3     | 0302170       |
| 0302360   | Human Resources Management      | 3     | 0302160       |
| *Equivalent to (0302368) Introduction to Management Science |                                 |       |               |

#### B. Electives Core Courses

##### Management Concentration

Each student who chooses Management as his/her area of concentration must successfully complete 15 credit hours (five courses) from the following list of courses:

| Course # | Course Title              | CrHrs | Prerequisites |
|----------|---------------------------|-------|---------------|
| 0302355  | Internship in Business II | 3     | Note 1        |
| 0302362  | International Business    | 3     | 0302262       |

| Course # | Course Title                             | CrHrs | Prerequisites   |
|----------|--|-------|-----------------|
| 0302363  | Creative Thinking and Problem Solving    | 3     | 0302160         |
| 0302366  | Organizational Analysis and Design       | 3     | 0302262         |
| 0302364  | Human Resources Development              | 3     | 0302262         |
| 0302365  | Recruitment and Selection                | 3     | 0302360         |
| 0302369  | Total Quality Management *               | 3     | 1440264;0302160 |
| 0302384  | Management of Non-profit Organizations   | 3     | 0302160         |
| 0302460  | International Human Resources Management | 3     | 0302360         |
| 0302462  | Managing Change and Innovation           | 3     | 0302262         |
| 0302463  | Small Business Management                | 3     | 0302160         |
| 0302464  | Leadership and Management                | 3     | 0302160         |
| 0302465  | Special Topics in Management             | 3     | 0302160         |
| 0302466  | Corporate Social Responsibility          | 3     | 0302160         |
| 0302468  | Major Project                            | 3     | 0302461         |

Note 1: Students should have 42 credit hours left to graduate and Departmental approval.

\* Equivalent to (0302312) Total Quality Management

### Marketing Concentration

Each student who intends to have Marketing as his/her area of concentration must successfully complete 15 credit hours (five courses) from the following list:

| Course # | Course Title                     | CrHrs | Prerequisites   |
|----------|----------------------------------|-------|-----------------|
| 0302355  | Internship in Business II        | 3     | Note 1          |
| 0302386  | Public Sector Marketing          | 3     | 0302170         |
| 0302371  | Strategic Marketing              | 3     | 0302170         |
| 0302372  | Services Marketing               | 3     | 0302170         |
| 0302373  | Sales Management                 | 3     | 0302170         |
| 0302374  | Management of Marketing Channels | 3     | 0302170         |
| 0302375  | Marketing Communications         | 3     | 0302170         |
| 0302376  | Internet Marketing               | 3     | 0302170;0303130 |
| 0302466  | Corporate Social Responsibility  | 3     | 0302160         |
| 0302468  | Major Project                    | 3     | 0302461         |
| 0302470  | Global Marketing                 | 3     | 0302170         |
| 0302471  | Event Marketing and Management   | 3     | 0302170         |
| 0302472  | Customer Relationship Management | 3     | 0302370         |
| 0302474  | Special Topics in Marketing      | 3     | 0302170         |
| 0302475  | Entrepreneurial Marketing        | 3     | 0302170         |
| 0302476  | Sustainable Marketing            | 3     | 0302170         |

Note 1: Students should have 42 credit hours left to graduate and Departmental approval.

### Study Plan – Management Concentration (123 Credits)

The Business Administration - Management Concentration program encompasses 123 credits hours that are spread over eight semesters and could be completed in four years. The following study plan serves as a roadmap for a smooth progression toward graduation

| Year 1, Level I (Freshman), Semester 1 (15 Credits) |                               |       |               |
|---|-------------------------------|-------|---------------|
| Course #  | Title                         | CrHrs | Prerequisites |
| 0202112   | English for Academic Purposes | 3     |               |
| 0201102   | Arabic Language               | 3     |               |
| 0302160   | Principles of Management      | 3     |               |
| 1440100   | Mathematics                   | 3     |               |
| 0302170   | Principles of Marketing       | 3     |               |

| Year 1, Level I (Freshman), Semester 2 (15 Credits) |                                     |       |               |
|---|-------------------------------------|-------|---------------|
| Course #  | Title                               | CrHrs | Prerequisites |
| 0104101   | Islamic Culture                     | 3     |               |
| 1440162   | Business Mathematics                | 3     | 1440100       |
| 0301120   | Accounting I – Financial Accounting | 3     |               |
| 0308151   | Principles of Microeconomics        | 3     |               |
| 0303130   | Introduction to MIS                 | 3     |               |

| Year 2, Level II (Sophomore), Semester 3 (15 Credits) |                                       |       |               |
|---|---------------------------------------|-------|---------------|
| Course #  | Title                                 | CrHrs | Prerequisites |
| 0308230   | Financial Management                  | 3     |               |
| 1440264   | Business Statistics                   | 3     | 1440162       |
| 0302260   | Quantitative Business Analysis        | 3     | 1440264       |
| 0301211   | Accounting II - Managerial Accounting | 3     | 0301120       |
|   | University Requirement                | 3     |               |

| Year 2, Level II (Sophomore), Semester 4 (15 Credits) |                               |       |               |
|---|-------------------------------|-------|---------------|
| Course #  | Title                         | CrHrs | Prerequisites |
| 0308252   | Principles of Macroeconomics  | 3     | 0308151       |
| 0302254   | Business Communication        | 3     | 0202112       |
| 0302250   | Legal Environment of Business | 3     | 0302160       |
| 0302262   | Organizational Behavior       | 3     | 0302160       |
|   | University Requirement        | 3     |               |

| Year 3, Level III (Junior), Semester 5 (15 Credits) |                       |       |               |
|---|-----------------------|-------|---------------|
| Course #  | Title                 | CrHrs | Prerequisites |
| 0302370   | Consumer Behaviour    | 3     | 0302170       |
| 0302367   | Entrepreneurship      | 3     | 0302160       |
|   | College Elective (1)  | 3     |               |
|   | Minor Requirement (1) | 3     |               |
|   | Minor Requirement (2) | 3     |               |

| Year 3, Level III (Junior), Semester 6 (15 Credits) |  |       |               |
|---|--|-------|---------------|
| Course #  | Title                                  | CrHrs | Prerequisites |
| 0302361   | Operations and Supply Chain Management | 3     | 1440264       |
| 0302360   | Human Resources Management             | 3     | 0302160       |
| 0302350   | Ethics and Islamic Values in Business  | 3     | 0302250       |
|   | College Elective (2)                   | 3     |               |
|   | Concentration Requirement (1)          | 3     |               |

| Year 4, Level IV (Senior), Semester 7 (18 Credits) |                               |       |               |
|--|-------------------------------|-------|---------------|
| Course #   | Title                         | CrHrs | Prerequisites |
| 0302461  | Research Methods              | 3     | 1440264       |
|  | University Requirement        | 3     |               |
|  | Concentration Requirement (2) | 3     |               |
|  | Concentration Requirement (3) | 3     |               |
|  | Minor Requirement (3)         | 3     |               |
|  | Minor Requirement (4)         | 3     |               |

| Year 4, Level IV (Senior), Semester 8 (15 Credits) |                               |       |                 |
|--|-------------------------------|-------|-----------------|
| Course #   | Title                         | CrHrs | Prerequisites   |
| 0302467  | Strategic Management          | 3     | Senior Standing |
|  | Concentration Requirement (4) | 3     |                 |
|  | Concentration Requirement (5) | 3     |                 |
|  | Minor Requirement (5)         | 3     |                 |
|  | University Requirement (8)    | 3     |                 |

### Study Plan – Marketing Concentration (123 Credits)

The Business Administration - Marketing Concentration encompasses 123 credits hours that are spread over eight semesters and could be completed in four years. The following study plan serves as a roadmap for a smooth progression toward graduation.

| Year 1, Level I (Freshman), Semester 1 (15 Credits) |                               |       |               |
|---|-------------------------------|-------|---------------|
| Course #  | Title                         | CrHrs | Prerequisites |
| 0202112   | English for Academic Purposes | 3     |               |
| 0201102   | Arabic Language               | 3     |               |
| 0302160   | Principles of Management      | 3     |               |
| 1440100   | Mathematics                   | 3     |               |
| 0302170   | Principles of Marketing       | 3     |               |

| Year 1, Level I (Freshman), Semester 2 (15 Credits) |                                     |       |               |
|---|-------------------------------------|-------|---------------|
| Course #  | Title                               | CrHrs | Prerequisites |
| 0104101   | Islamic Culture                     | 3     |               |
| 1440162   | Business Mathematics                | 3     |               |
| 0301120   | Accounting I – Financial Accounting | 3     |               |
| 0308151   | Principles of Microeconomics        | 3     |               |
| 0303130   | Introduction to MIS                 | 3     |               |

| Year 2, Level II (Sophomore), Semester 3 (15 Credits) |                                       |       |               |
|---|---------------------------------------|-------|---------------|
| Course #  | Title                                 | CrHrs | Prerequisites |
| 0308230   | Financial Management                  | 3     |               |
| 1440264   | Business Statistics                   | 3     | 1440162       |
| 0302260   | Quantitative Business Analysis        | 3     | 1440264       |
| 0301211   | Accounting II – Managerial Accounting | 3     | 0301120       |
|   | University Requirement (5)            | 3     |               |

| Year 2, Level II (Sophomore), Semester 4 (15 Credits) |                               |       |               |
|---|-------------------------------|-------|---------------|
| Course #  | Title                         | CrHrs | Prerequisites |
| 0301252   | Principles of Macroeconomics  | 3     | 0301151       |
| 0302254   | Business Communication        | 3     | 0202112       |
| 0302250   | Legal Environment of Business | 3     | 0302160       |
| 0302262   | Organizational Behavior       | 3     | 0302160       |
|   | University Requirement (6)    | 3     |               |

| Year 3, Level III (Junior), Semester 5 (18 Credits) |                            |       |               |
|---|----------------------------|-------|---------------|
| Course #  | Title                      | CrHrs | Prerequisites |
| 0302370   | Consumer Behavior          | 3     | 0302170       |
| 0302367   | Entrepreneurship           | 3     | 0302160       |
|   | College Elective (1)       | 3     |               |
|   | Minor Requirement (2)      | 3     |               |
| 0302360   | Human Resources Management | 3     | 0302160       |

| Year 3, Level III (Junior), Semester 6 (18 Credits) |  |       |               |
|---|--|-------|---------------|
| Course #  | Title                                  | CrHrs | Prerequisites |
| 0302361   | Operations and Supply Chain Management | 3     | 1440264       |
| 0302350   | Ethics and Islamic Values in Business  | 3     | 0302250       |
|   | College Elective (2)                   | 3     |               |
|   | Concentration Requirement (1)          | 3     |               |
|   | Minor Requirement (3)                  | 3     |               |

| Year 4, Level IV (Senior), Semester 7 (12 Credits) |                               |       |               |
|--|-------------------------------|-------|---------------|
| Course #   | Title                         | CrHrs | Prerequisites |
|  | University Requirement (7)    | 3     |               |
|  | Concentration Requirement (3) | 3     |               |
|  | Minor Requirement (4)         | 3     |               |
| 0302461  | Research Methods              | 3     | 1440264       |

| Year 4, Level IV (Senior), Semester 8 (15 Credits) |                               |       |                 |
|--|-------------------------------|-------|-----------------|
| Course #   | Title                         | CrHrs | Prerequisites   |
| 0302467  | Strategic Management          | 3     | Senior Standing |
|  | Concentration Requirement (4) | 3     |                 |
|  | Concentration Requirement (5) | 3     |                 |
|  | Minor Requirement (5)         | 3     |                 |
|  | University Requirement (8)    | 3     |                 |

### Course Description

Courses offered by the Department of Management, Marketing and Public Administration are designated numbers of the form 0302ABC where:

|   |  |  |
|---|--|--|
| A | Year (level)   |  |
| B | Areas (as follows)<br>5: Business / Service courses<br>6: Management<br>7: Marketing<br>8: Public Administration |  |
| C | Course sequence in area  |  |

### Management Courses

The list of Management courses are described below.

**0302160 Principles of Management (3-0:3)**

**Prerequisite: None.**

**Equivalent to: 0302210 - Principles of Management**

This course presents the current management practices as they apply in the modern business world. The course discusses the four cornerstones of the management function: planning, organizing, leading, and controlling. It addresses the function of management from classical, behavioral, contingency and system perspectives.

**0302200 Fundamentals of Innovation & Entrepreneurship (3-0:3)**

**Prerequisite: None**

A non-conventional highly interactive course designed to provide UOS students with a unique experience into identifying the concepts of innovation, entrepreneurship, growth and leadership. This course equips students with the necessary design thinking and entrepreneurial skills and tools to enhance their personal development, character and future career.

**0302250 Legal Environment of Business (3-0:3)**

**Prerequisite: 0302160- Principles of Management / 0302210- Principles of Management**

This course will provide a general introduction to the legal environment that affects business people, businesses, and business transactions. It will consider how laws are applied in business contexts and how it impacts upon its activities, contracts, business organizations and commercial transactions. The course will address various legal subjects including contract law, commercial law, litigation law, Alternative Dispute Resolution (ADR), corporate law, tort law, professional liability law (particularly auditors' liability), intellectual property and Internet laws. The focus will be on common law, but the course will also consider the civil legal system in the UAE.



**0302254                      Business Communication                      (3-0:3)**

**Prerequisite:** Prerequisite: 0202112- English for Academic Purposes

This course introduces students to the essentials of business communication in order to enable them to achieve better organizational effectiveness and conduct better business transactions. It emphasizes verbal, written, and non-verbal communication skills that are required in any business environment. This course also examines issues related to international and cross-cultural communication.

**0302260                      Quantitative Business Analysis                      (3-0:3)**

**Prerequisite:** 1440264 -Business Statistics/ 0212264 Business Statistics

This course aims to equip business students with various tools and techniques that allow them to identify business problems using quantitative terms, analyze the problem, generate appropriate solutions and evaluate the results. It clarifies the main stages of the problem-solving process and nurtures analytical decision making skills concerning real life service and industrial situations in the areas of linear programming, transportations models, assignments, decision analysis and regression models.

**0302262                      Organizational Behavior                      (3-0:3)**

**Prerequisite** 0302160- Principles of Management /0302210- Principles of Management

This course seeks to familiarize students with the basic principles of individual and group behavior and their applications within organizations. Topics covered include job design, perceptions, learning, communication, decision-making, motivation, group dynamics, conflict management, power and politics, leadership, organizational change and effectiveness.

**0302350                      Ethics and Islamic Values in Business                      (3-0:3)**

**Prerequisite:** 0302250- Legal Environment of Business, 0302211- Legal Environment of Business /0302160- Principles of Management /0302210- Principles of Management

This course focuses on the role of business ethics and Islamic values in conducting business. Topics covered include approaches to setting ethical standards, stages of moral development, Islamic ethics and values at work, factors affecting ethical behavior, and Islamic values underpinning business management. The course also demonstrates Islamic finance, investment, and pricing of commodities as applications of Islamic ethics and values. In addition, the course will provide, where appropriate, comparisons between the views of western business-related theories and the Islamic theory.

**0302354                      Internship in Business                      (3-0:3)**

**Prerequisite:** None

This course is intended to provide students with practical training in their areas of concentration (management or marketing) according to an approved plan. Each student must complete a minimum of six weeks in a full-time supervised training in an organization designated by the College in cooperation with the University training office.

**0302355                      Internship in Business II                      (3-0:3)**

**Prerequisite: None.**

This is an additional elective course meant for those students who want more practical training in their areas of concentration (management or marketing) according to an approved plan. Each student must complete a minimum of six weeks in a full-time supervised training in an organization designated by the College in cooperation with the University training office.

**0302360                      Human Resources Management                      (3-0:3)**

**Prerequisite: 0302160- Principles of Management / 0302210- Principles of Management**

This course deals with the role and functions of human resources management. It helps students appreciate the necessity for sound human resources management in a competitive environment. It covers topics such as job analysis, recruitment, selection, and performance appraisal, and pay and reward systems. These are addressed from both theoretical and practical perspectives.

**0302361                      Operations and Supply Chain Management                      (3-0:3)**

**Prerequisite: 1440264- Business Statistics / 0212264- Business Statistics**

This course provides an explanation to the concepts and applications of Operations Management and Supply Chain Management. Operations management is the design of the system that develops outputs and then produces outputs by transforming input resources into outputs (both products and services) and the management of this system. Supply chain management is the management of the material flow from the suppliers through the customers. Topics covered in this course include forecasting, product design and development, managing quality, layout strategy, supply-chain management, inventory and logistics management, sequencing and scheduling, and quantitative tools for operation managers.

**0302362                      International Business                      (3-0:3)**

**Prerequisites: 0302262- Organizational Behavior**

This course is a theoretical and practical introduction to the issues, opportunities, and complexities associated with doing business internationally. The course provides students a managerial perspective on international business issues. The focus is primarily on the international business environment and the activities of multinational corporations. However, topics covered in the course are relevant and applicable to the smallest of companies, including those operating in a purely domestic context and preparing to begin a foreign operation. Among the key topics to be covered are foreign direct investment, international trade, firm and country competitiveness, regional trade associations, international institutions, managerial functions in an international context, and organizational and national cultures.

**0302363 Creative Thinking and Problem Solving (3-0:3)**

**Prerequisites: 0302160- Principles of Management / 0302210- Principles of Management**

This course aims to enhance the critical and creative thinking of students and to sharpen their problem-solving skills. This, in turn, prepares them to face the challenges of making good decisions in the face of complexity, uncertainty, and change; helping them to become better managers and leaders in their future career.

**0302364 Human Resources Development (3-0:3)**

**Prerequisites: 0302262 – Organizational Behavior / 0302419- Organizational Behavior**

The course is designed to provide comprehensive understanding of the developments in the field of human resource development (HRD). The emphasis is on how HRD relates to the changing needs of organizations. The course aims to provide understanding of strategic HRD initiatives, policies, practices and development tools to support organizational learning and development competencies. Knowledge of how new approaches to HRD strategies function in the international context and understanding how to analyze and design HRD strategies at societal and organizational level are important objectives of the course.

**0302365 Recruitment and Selection (3-0:3)**

**Prerequisites: 0302360- Human Resources Management / 0302411- Human Resources Management**

This course introduces students to the fundamental principles and techniques of the recruitment and selection of Human Resources in the workplace. Students will be informed of the various approaches and strategies for analyzing job and workplace requirements, planning for staffing needs, and recruitment and selection best practice. Topics covered include job analysis, recruitment, selection, and performance assessment. In particular, the course will expose students to the various instruments of recruitment and selection, including job analysis, techniques of screening and interviewing job candidates, reference checks, testing, etc.

**0302366 Organizational Analysis and Design (3-0:3)**

**Prerequisite: 0302262- Organizational Behavior / 0302419- Organizational Behavior**

This course aims to provide students with the knowledge and the skills which enable them to design effective organizational structure of the business organizations. It covers topics such as organizational effectiveness, dimensions of organization structure and its determinants (e.g., size, strategy, technology, environment, and power), different forms of organization structure and management of the environment.

**0302367 Entrepreneurship (3-0:3)**

**Prerequisite:** 0302160 - Principles of Management / 0302210- Principles of Management

**Equivalent to:** 0302317 - Entrepreneurship.

This course deals with the process of creating new ventures and the entrepreneurial philosophy, attitudes and characteristics required. Topics include success and failure factors of new ventures, identifying and evaluating opportunities, developing a business plan, gathering resources to convert opportunities into business ventures and successfully managing new ventures.

**0302369 Total Quality Management (3-0:3)**

**Prerequisite:** 1440264- Business Statistics / 0212264- Business Statistics /0302160- Principles of Management /0302210- Principles of Management

This course is aimed at introducing students to the concepts and tools of TQM. Topics covered in this course include the gurus of TQM, quality and profitability, TQM corporate culture, planning for TQM, customer focus, continuous improvement, benchmarking, restructuring for TQM, business process reengineering, leadership, dynamic control, JIT, and statistical process control.

**0302460 International Human Resources Management (3-0:3)**

**Prerequisite:** 0302360- Human Resources Management / 0302411- Human Resources Management

This course helps students develop a critical understanding of the role and functions of human resources management in a multinational and global context. It covers topics such as the recruitment and selection of expatriates, performance management; reward systems in a multinational context. Students will also be exposed to the challenge of multiculturalism in the modern workplace. Case studies are used to enhance understanding of the practical issues in international human resource management.

**0302461 Research Methods (3-0:3)**

**Prerequisites:** 1440264- Business Statistics / 0212264- Business Statistics

The course introduces students to the basics of business research. Students will gain an understanding of the importance of business research and how research is carried out in business settings. The course will cover both qualitative and quantitative research tools (survey, experimentation, observation focus group and depth interviews) and the processes of developing and assessing the validity of measurement tools. Additionally, the course will introduce common sampling procedures and will expose students to basic data analysis techniques using SPSS software. At the end of the course, students will complete in groups, a research project based on a business topic of interest.

**0302462                      Managing Change and Innovation                      (3-0:3)**

**Prerequisite: 0302262- Organizational Behavior / 0302419- Organizational Behavior**

**Equivalent to: 0302314 - Technology Management.**

This course focuses primarily on the variety of ways in which the process of change can be implemented and managed in an organizational setting. The course involves an exploration of the theoretical frameworks for planning the change and the innovation process. It also critically examines a range of intervention techniques utilized in practice in such processes.

**0302463                      Small Business Management                      (3-0:3)**

**Prerequisite: 0302160- Principles of Management /0302210- Principles of Management**

**Equivalent to: 0302413 - Small Business Management.**

This course explores crucial aspects in managing small business enterprises. It emphasizes identification and analysis of major operating constraints and issues confronting small businesses as well as appropriate methods for their resolution. Topics covered in this course include obtaining capital, controlling inventory, setting prices, promotion strategies, and growth and expansion decisions.

**0302464                      Leadership and Management                      (3-0:3)**

**Prerequisites: 0302160- Principles of Management /0302210- Principles of Management**

This course provides the basis for understanding what leadership is and what leaders do to be successful. The main focus of the course is to provide students with knowledge and skills on different approaches to leadership from both a theoretical and practical perspective. It exposes students to different forms of leaderships in a corporate setting, and their importance in achieving the organization's overall goals.

**0302465                      Special Topics in Management                      (3-0:3)**

**Prerequisite: 0302160- Principles of Management /0302210- Principles of Management.**

**Equivalent to: 0302415 Special Topics in Management.**

This course addresses contemporary topics and issues in management.

**0302466                      Corporate Social Responsibility                      (3-0:3)**

**Prerequisite: 0302160- Principles of Management /0302210- Principles of Management**

In this course, students will discover, differentiate and discuss the scope and consequences of corporate decision making and decisions for various constituencies, develop a framework for discussing good corporate decisions, explore the role and responsibility of the individual in the stewardship of a culture of quality decision making, explore the role and responsibility of leadership and governance in the formation of policies and processes of good decision making and best practices and understand a company's obligation to and impact on its constituencies for the decisions that its leaders make and its employees implement.

**0302467                      Strategic Management                      (3-0:3)**

**Prerequisites: Senior Standing**

Strategic Management is a course designed to expose students to a strategic perspective on issues that concern the firm as a whole. The course draws on and integrates concepts from the functional areas (i.e. marketing, finance, accounting, management, management information systems, and operations) in the analysis and resolution of complex business situations. It allows moving from a functional perspective to a strategic one. Beyond internal integration, Strategic Management concerns the processes by which firms choose, maintain or redirect their strategic positions within ever-changing external environments. The course also explores the issues of defining corporate missions, objectives, and goals. It focuses on the analysis of the firm's external and internal environment to identify reasons for competitive advantage in a global context. In that perspective, the course takes into account the cultural, ethical, political, and regulatory issues in the global business environment context.

Through the combination of lectures, readings, case studies, class engagement, and project paper this course introduces the students to the concepts, theories, and tools and techniques prerequisite to critical and effective strategic analysis, thinking and communication.

**0302468                      Major Project                      (3-0:3)**

**Prerequisites: 0302461- Research Methods**

This course aims to develop in students the ability to work independently under the guidance of their supervisor to develop a research report which demonstrates the ability to use theoretical and empirical knowledge and skills of public sector management issues in a real public sector organizational environment.

**Courses Offered to Non-Business Majors**

**0302150                      Introduction to Business Administration (for non-business students)  
(3-0:3)**

**Prerequisite: None.**

The course provides a balanced coverage of business fundamentals, trends, issues, and practices. It includes a survey of basic concepts of business and will help to build a vocabulary of key business terms and a background for further study.

**Marketing Courses**

**0302170                      Principles of Marketing                      (3-0:3)**

**Prerequisites: None**

This course presents an overview of the nature and scope of the marketing function and the environment affecting marketing managers. The course explains the process of creating values and building profitable relationship with targeted customers. Students would be familiarized by the process of analyzing the business market, identifying and targeting the right customers, deciding the right positioning and branding strategies, and finally deciding the best use of the marketing mix for the company to achieve their value creation goals under ethical considerations. Topics covered include: marketing definition and function, marketing plan process, the marketing environment, consumer buying behavior, market segmentation targeting, and positioning, and finally marketing mix strategies (product, price, promotion, and place).

**0302370                      Consumer Behaviour                      (3-0:3)**

**Prerequisite: 0302170 - Principles of Marketing.**

**Equivalent to: 0302440 - Consumer Behaviour.**

This course seeks to illustrate the practical importance of understanding of consumer behaviors and attitudes and how such understanding helps organizations make strategic decisions such as market segmentation and marketing mix allocations. The course discusses various approaches for assessing such behaviors and attitudes and the major factors that influence how and why consumers behave in the marketplace. It also deals with various techniques at the marketer's disposal for influencing consumer attitudes and buying behaviors.

**0302371                      Strategic Marketing                      (3-0:3)**

**Prerequisites: 0302170- Principles of Marketing /0302220- Principles of Marketing**

This course concentrates on the development of marketing strategies and programs. An operational framework is built for analyzing the marketing environment and for selecting among strategic alternatives. Case analyses predominate

**0302372                      Services Marketing                      (3-0:3)**

**Prerequisites: 0302170- Principles of Marketing /0302220- Principles of Marketing**

**Equivalent to: 0302423 - Services Marketing.**

This course focuses on the special issues related to the marketing of services compared to the marketing of products. Students will learn the subtle differences involved in the marketing process for services compared to products. The course provides students with the opportunities to discuss and analyze strategies of a cross-section of service organizations.

**0302373                      Sales Management                      (3-0:3)**

**Prerequisite: 0302170- Principles of Marketing /0302220- Principles of Marketing.**

The central goal of this course is to understand the challenges a sales manager meets in order to solve the organizations sales objectives. The course is not about sales, but about managing a sales force and achieving these objectives through the efforts of the sales people. An important goal is that the students should be able to develop a sales strategy, organize the sales force, manage the sales people and evaluate sales performance. The students will learn how to best recruit, motivate and evaluate a sales force. In addition, the students will develop skills in how to plan and execute profitable sales activities. Upon completion of the course the students should know central labor laws and be aware of ethical issues concerning sales management.

**0302374                      Management of Marketing Channels                      (3-0:3)**

**Prerequisite: 0302170- Principles of Marketing /0302220- Principles of Marketing.**

**Equivalent to: 0302421 - Marketing and E-Commerce.**

This course is designed to examine the activities and technologies associated with the distribution of goods and services from both social and managerial perspectives. Topics include design and management of channels, distribution systems including franchising, shopping centers and other types of institutions. Various aspects related to retail management are also considered.

**0302375                      Marketing Communications                      (3-0:3)**

**Prerequisites: 0302170- Principles of Marketing /0302220- Principles of Marketing.**

This course examines the role of the promotion mix in relation to the marketing plan and its strategies. It covers the promotion mix and the relationship of its components: personal selling, advertising, sales promotion, and public relations. Emphasis will be placed on involving the student in the role of promotion planning, decision making and the development of Integrated Marketing Communications.

**0302376                      Internet Marketing                      (3-0:3)**

**Prerequisites: 0302170- Principles of Marketing / 0303130- Introduction to MIS**

The Internet is dramatically changing the way in which businesses interact and deliver value to customers and to the entire supply chain. Nowhere is this more evident than in the field of marketing. The ability to reach out to customers in a personal "1 to 1" dialogue creates new opportunities for businesses to develop relationships and long-term loyalty with customers. Some companies are more successful than others in using the Internet to enhance their performance. The objective of this course is to encourage students to critically analyze how the companies are using this new tool in marketing and to make them aware of the current issues in this field.

**0302470                      Global Marketing                      (3-0:3)**

**Prerequisite: 0302170- Principles of Marketing / 0302220- Principles of Marketing**

**Equivalent to: 0302324 - International Marketing.**

The interdependence among world economies has forced many business organizations to practice marketing beyond domestic boundaries. This course addresses this issue and endeavors to expose the students to the important role of marketing abroad through the application of marketing strategies and programs in a global environment. This will be done by using case studies, problem solving exercises and local field projects among other course activities.



**0302471 Event Marketing and Management (3-0:3)**

**Prerequisite:** 0302170- Principles of Marketing) / 0302220- Principles of Marketing

This course is designed to provide students a venue to integrate previously learned concepts into a workable body of knowledge about event marketing. This will be accomplished using current local events, a hands-on project, and cases with a focus on fundamental event marketing topics. The course deals with the proper delineation of events' participants and visitors, identifying their needs and motivations, developing appropriate products/services that meet these needs and design an effective marketing mix program which effectively explores the event's purpose and objectives.

**0302472 Customer Relations Management (3-0:3)**

**Prerequisite:** 0302370 - Consumer Behavior / 0302440- Consumer Behavior

This course is designed to illustrate the importance of understanding and applying contemporary concepts and strategies in promoting effective customers relations. The course particularly focuses on how to deal effectively with guests, visitors and customers face to face, in writing, on the phone, and on the internet.

**0302474 Special Topics in Marketing (3-0:3)**

**Prerequisite:** 0302170- Principles of Marketing / 0302220- Principles of Marketing

**Equivalent to:** 0302329 Special Topics in Marketing.

This course addresses contemporary topics and issues in marketing. The main thrust of the course is to deepen the students' understanding of specialized areas in the marketing field.

**0302475 Entrepreneurial Marketing (3-0:3)**

**Prerequisite:** 0302170- Principles of Marketing / 0302220- Principles of Marketing

This course is designed to help students learn about best practices in Entrepreneurial Marketing. Entrepreneurs, in companies large and small, face unique challenges in successfully building competitive advantages with limited marketing resources. This course covers the analysis of marketing opportunities, identification of the target audience, and the development of a marketing strategy, brand positioning and an integrated marketing plan.

**0302476 Sustainable Marketing (3-0:3)**

**Prerequisite:** 0302170- Principles of Marketing / 0302220- Principles of Marketing.

This course evaluates the role of marketing and marketers by examining how firms create value, reduce risk and build sustainable thinking and processes into their marketing activities and strategies as they respond to opportunities and threats that arise from both social, economic and environmental change, and changing consumers' attitudes and behavior. Sustainable marketing requires a rethink of the assumptions that underlie traditional marketing practices and therefore presents a new paradigm through a holistic integrative approach that puts equal emphasis on environmental, social equity and economic / financial concerns in the development of marketing strategies and tactics.

## **Public Administration Course**

### **0302280 Introduction to Public Administration (3-0:3)**

**Prerequisite:** None.

**Equivalent to:** 0304330 - Introduction to Public Administration.

This course is structured around three basic themes: political management, program management and resources management. Political management focuses on three distinct aspects such as political environment of public administration, intergovernmental and inter organizational relations and public sector responsibility and ethics. Planning, decision making, organizing, leadership and implementation and evaluation in the public sector are the major areas of program management. Finally, resources management concentrates on human resources management, budgeting and the information revolution in the public sector.

### **0302380 Introduction to Public Policy (3-0:3)**

**Prerequisite:** None.

**Equivalent to:** 0304331 - Introduction to Public Policy.

This course is designed to introduce students to the public policy-making process, to the basics of policy analysis, and to the substance of some of today's major policy debates. An important part of the course will involve developing an understanding of the role of government, policy environment and what "public policy" means. We will then consider why some problems reach the public agenda, why some solutions are adopted and others rejected, and why some policies appear to succeed while others appear to fail. This is essentially a process aspect of the course which will be further substantiated by a focus on some contemporary and pressing policy areas.

### **0302381 Emirates Governance (3-0:3)**

**Prerequisite:** 0302280- Intro to Public Admin / 0304330- Intro to Public Admin.

**Equivalent to:** 0304332- Emirates Governance.

The course has a strong emphasis on the intersection among the state, market, and institutions of civil society. The enabling environment that allows states, markets, and the institutions of civil society to operate in harmony is addressed with particular reference to the United Arab Emirates. The first part of the course will focus on developing a framework. The second part will cover state institutions in the UAE, their governance and their implications for economic performance. Finally, an analysis of the emergence and role of civil society in the UAE and its implications for governance will be made.

**0302382                      Electronic Governance                      (3-0:3)**

**Prerequisite: 0303130- Introduction to MIS**

The course provides an overview of information technology, particularly the concept of e-government, and the applications of the Internet and other technologies within the public sector, as well as their impact upon both governments and constituents. Information technology recently has become a strategic tool that allows governmental organizations to make both internal and external operations more efficient and productive. We will use E-government framework to cover various aspects of information technology including E-services, E-democracy, and E-management.

**0302383                      Business and Government                      (3-0:3)**

**Prerequisites: 0302160- Principles of Management / 0302210- Principles of Management**

This course examines the relationship between government and business with a focus on contemporary issues. Topics include: international models in business/government relations, business power, corporate social responsibility, globalization and its implications for the regulatory regime, and regulations. Applied aspects of the regulatory regime will include competition, environment, tax reform, consumerism and workforce with particular focus on the UAE.

**0302386                      Public Sector Marketing                      (3-0:3)**

**Prerequisites: 0302170- Principles of Marketing / 0302220- Principles of Marketing**

This is a course for students interested in understanding the basic principles of marketing and how they can be applied in government organizations. First, we will review marketing as it applies to public service organizations. Second, we will use this as a springboard to launch future discussions on how government managers can use the marketing strategy and instruments to implement marketing programs within their organizations. Third, special emphasis will be given on the roles, strategies and instruments of public communications.

**0302480                      Public Budgeting and Finance                      (3-0:3)**

**Prerequisite: 0301252- Principles of Macroeconomics / 0305212- Principles of Macroeconomics**

**Equivalent to: 0304430 Public Budgeting and Finance.**

This course seeks to provide students with an understanding of the nature and the process of public budgeting and finance. The course combines both the theoretical and practical knowledge about the various approaches and techniques applied in public sector financial administration. This will be incorporated within the three orientations displayed by public sector organizations, namely: control, management, and planning.

**0302482                      Public Program Evaluation                      (3-0:3)**

**Prerequisite:** 0302280- Intro to Public Admin / 0304330- Intro to Public Admin.

**Equivalent to:** 0304436 - Public Program Evaluation.

Public managers are facing increasing pressures to do more with less as well as to be responsive to changing needs of citizens and environmental conditions. The ability to evaluate policy and programs is a critical component for increasing such a learning and adapting capacity to serve citizens better. This course will enable students to become better producers and consumers of policy and program evaluation research and reports. Main topics include steps of policy analysis, evaluation approaches and processes, research design, data collection and analysis, and performance measurement.

**0302483                      Development Management                      (3-0:3)**

**Prerequisite:** 0302280 - Introduction to Public Administration. **Equivalent to:** 0304432 - Development Management.

The course discusses the concepts, issues, and practice of development management. The course examines the state of development management in the context of changing environments of the transitional and developing world. It provides the conceptual and practical knowledge that is helpful in understanding and critically evaluating developmental issues, endeavors, and challenges in transitional and developing countries. Topics include the fundamentals of development management, contemporary developments including the roles of the state versus market, civil society, governance, and planned development. Management of selected applied areas including sustainability, health, education and gender will also be covered with focus on the UAE.

**0302486                      Comparative Public Administration                      (3-0:3)**

**Prerequisite:** 0302280-Intro to Public Admin / 0304330- Intro to Public Admin.

**Equivalent to:** 0304333 - Comparative Public Administration.

The course deals with cross-national comparisons of administrative processes, institutions, policy formation, and behavior with consideration of cultural, social, and economic environments. The course will cover such topics as criteria for comparison, concepts of transformation, developed and developing nations and regimes in which bureaucracy predominates.

**Management Minor**

The Department of Management offers a minor in Management to students studying a major independent of Management. To satisfy the minor requirement, students must successfully complete five courses (15 credit hours) from the following list:

| Course # | Course Title                     | CrHrs | Prerequisites |
|----------|----------------------------------|-------|---------------|
| 0302160  | Principles of Management*        | 3     | None          |
| 0302250  | Legal Environment of Business*   | 3     | 0302160       |
| 0302260  | Quantitative Business Analysis** | 3     | 1440264       |
| 0302262  | Organizational Behavior**        | 3     | 0302160       |

| Course #   | Course Title                             | CrHrs | Prerequisites    |
|--|--|-------|------------------|
| 0302360  | Human Resources Management**             | 3     | 0302160          |
| 0302361  | Operations and Supply Chain Management*  | 3     | 0302260          |
| 0302362  | International Business                   | 3     | 0302262          |
| 0302363  | Creative Thinking and Problem Solving    | 3     | 0302160          |
| 0302366  | Organizational Analysis and Design       | 3     | 0302262          |
| 0302367  | Entrepreneurship **                      | 3     | 0302160          |
| 0302369  | Total Quality Management                 | 3     | 1440264, 0302160 |
| 0302384  | Management of Non-profit Organizations   | 3     | 0302160          |
| 0302460  | International Human Resources Management | 3     | 0302360          |
| 0302462  | Managing Change and Innovation           | 3     | 0302262          |
| 0302463  | Small Business Management                | 3     | 0302160          |
| 0302464  | Leadership and Management                | 3     | 0302160          |
| 0302465  | Special Topics in Management             | 3     | 0302160          |
| 0302466  | Corporate Social Responsibility**        | 3     | 0302160          |
| * Principles of Management, Legal Environment of Business and Operations and Supply Chain Management are for students from outside the College of Business Administration                                      |  |       |                  |
| ** Organizational Behavior, Human Resources Management, Quantitative Business Analysis, Corporate Social Relationship, and Entrepreneurship are only available for students who are not majoring in Marketing. |  |       |                  |

### Marketing Minor

The Department of Management offers a minor in Marketing to students studying a major independent of Marketing. To satisfy the minor requirement, students must successfully complete five courses (15 credit hours) from the following list:

| Course # | Course Title                      | CrHrs | Prerequisites    |
|----------|-----------------------------------|-------|------------------|
| 0302170  | Principles of Marketing*          | 3     | None             |
| 0302362  | International Business**          | 3     | 0302262          |
| 0302370  | Consumer Behavior**               | 3     | 0302170          |
| 0302371  | Strategic Marketing               | 3     | 0302170          |
| 0302372  | Services Marketing                | 3     | 0302170          |
| 0302373  | Sales Management                  | 3     | 0302170          |
| 0302374  | Management of Marketing Channels  | 3     | 0302170          |
| 0302375  | Marketing Communications          | 3     | 0302170          |
| 0302376  | Internet Marketing                | 3     | 0302170; 0303130 |
| 0302386  | Public Sector Marketing           | 3     | 0302170          |
| 0302466  | Corporate Social Responsibility** | 3     | 0302160          |
| 0302470  | Global Marketing                  | 3     | 0302170          |
| 0302471  | Event Marketing and Management    | 3     | 0302170          |
| 0302472  | Customer Relationship Management  | 3     | 0302370          |
| 0302474  | Special Topics in Marketing       | 3     | 0302170          |
| 0302475  | Entrepreneurial Marketing         | 3     | 0302170          |

| Course #   | Course Title          | CrHrs | Prerequisites |
|--|-----------------------|-------|---------------|
| 0302476  | Sustainable Marketing | 3     | 0302170       |
| <p>* Principles of Marketing is for students from outside the College of Business Administration</p> <p>** Consumer Behavior, International Business and Corporate Social Responsibility are only available for students who are not majoring in Management.</p> |                       |       |               |

### Public Administration Minor

The Department of Management offers a minor in Public Administration to students studying a major independent of Public Administration. To satisfy the minor requirement, students must successfully complete five courses (15 credit hours), one of which (0302280 - Introduction to Public Administration) is mandatory and four are chosen from the list below.

| Course #     | Course Title                                 | CrHrs | Prerequisites |
|--------------|--|-------|---------------|
| 0302280<br>1 | Introduction to Public Administration        | 3     | -             |
| 0302380      | Introduction to Public Policy                | 3     | -             |
| 0302381      | Emirates Governance                          | 3     | 0302280       |
| 0302382      | Electronic Governance                        | 3     | 0303130       |
| 0302383      | Business and Government                      | 3     | 0302160       |
| 0302386      | Public Sector Marketing                      | 3     | 0302170       |
| 0302480      | Public Budgeting and Finance                 | 3     | 0301252       |
|              | Public Program Evaluation                    | 3     | 0302280       |
| 0302483      | Development Management                       | 3     | 0302280       |
| 0302485      | Creative Strategies in Public Administration | 3     | 0302280       |
| 0302486      | Comparative Public Administration            | 3     | 0302280       |

**1 Mandatory.**

**\*Not considered for those who take this course as a college elective**

# College of Engineering

## College of Engineering

### Officers of the College

|  |                                     |
|--|-------------------------------------|
| Professor Hamid Al Naimiy              | Chancellor                          |
| Professor <i>Prof. Youssef Al Haik</i> | Acting Dean                         |
| Professor Mohamed Maalej               | Vice-Dean                           |
| Prof. Khalil Adbdulmawgoud             | Assistant Dean for Graduate Studies |

### History

The College of Engineering at the University of Sharjah was established in 1997. Since then, the College has grown significantly and presently offers eight Bachelor of Science (BSc) undergraduate engineering programs in Architectural, Civil & Environmental, Electrical and Electronics, Industrial Engineering and Engineering Management, Mechanical, Nuclear, Chemical & Water Desalination Engineering, and Sustainable and Renewable Energy Engineering. These programs are accredited by the American Board of Engineering & Technology (ABET) and the Ministry of Education.

The College also offers eight graduate programs at the Master's (MSc) level in Conservation Management of Cultural Heritage, Civil Engineering, Environmental Science and Engineering, Electrical and Electronics Engineering, Biomedical Engineering, Sustainable & Renewal Energy Engineering, and Mechanical Engineering, and Engineering Management. In addition, the College offers three Doctor of Philosophy (Ph.D.) programs in Engineering Management in collaboration with ETS University from Montreal, Canada, Civil Engineering and Electrical & Computer Engineering.

### Overview

The College of Engineering is led by the College Dean, who is responsible for and represents the College to higher administration and other colleges. The effective management and decision-making in the college are being carried out through a hierarchy that extends from Department Committees to the College Council chaired by the Dean and includes the Vice-Dean-Education, Assistant Dean-Research & Graduate Studies, Department Chairs, and Department representatives. The College Council serves as the ultimate forum at the College level in which issues are discussed, and decisions are made.

Furthermore, several College committees chaired by senior faculty members assist the Dean in teaching & learning, curriculum and accreditation, research and graduate studies, faculty selection and promotions, media and social events, and student affairs.

### Vision

To be recognized nationally and internationally as a leading Engineering College in teaching and learning, research, and community service, and to prepare graduates who are valued for their knowledge, skills, commitment to excellence, ethics, and leadership.

### Mission

The College is dedicated to preparing graduates to solve engineering problems in a professional, ethical, and socially-responsible manner through:

1. Providing high-quality accredited programs at the undergraduate and graduate levels in line with market needs.
2. Conducting research that provides innovative sustainable solutions to real problems towards enhancing the quality of life and meeting the industry sector needs.
3. Offering quality community service.



## Goals

The College of Engineering has three goals:

1. Provide students with quality educational programs that are consistent with national and international standards and define the college brand.
2. Promote quality research and disseminate knowledge that contributes to advancing technology and prepare graduates to pursue post graduate studies.
3. Serve as an effective source of engineering expertise and offer a range of professional and continuing educational opportunities, with particular emphasis on the national and regional needs.

## Objectives

The College of Engineering has the following ten objectives that are derived from the above 3 College goals and are strongly related to the goals and objectives of the University of Sharjah:

1. Maintain national and international accreditation status (Goal 1).
2. Recruit quality faculty and staff and provide relevant professional development programs (Goal 1).
3. Attract and prepare students for a professional practice that is highly employable nationally and internationally (Goal 1).
4. Offer unique multi-disciplinary graduate programs (Goal 2).
5. Support faculty in seeking and conduct quality research on international standards relevant to the community (Goal 2).
6. Build international solid research collaboration to enhance our research outcomes' quality and impact (Goal 2).
7. Engage undergraduate students in research activities and research-based courses (Goal 2).
8. Offer community training, consultation, and lifelong learning opportunities (Goal 3).
9. Engage in public/technical/professional activities (Goal 3).
10. Align research activities and student projects with the community's needs (Goal 3)

## Academic Programs

The College of Engineering offers eight undergraduate programs leading to a Bachelor of Science (BS) degree, three programs leading to a Master of Science Degree (M.Sc.), and one program leading to a Doctor of Philosophy (Ph.D.) degree:

- 1) Bachelor of Science in Civil Engineering
- 2) Bachelor of Science in Electrical and Electronics Engineering
- 3) Bachelor of Science in Architectural Engineering
- 4) Bachelor of Science in Industrial Engineering and Engineering Management
- 5) Bachelor of Science in Sustainable and Renewable Energy Engineering
- 6) Bachelor of Science in Mechanical Engineering
- 7) Bachelor of Science in Nuclear Engineering
- 8) Bachelor of Science in Chemical & Water Desalination Engineering
- 9) Master of Science in Civil Engineering
- 10) Master of Science in Environmental Science and Engineering
- 11) Master of Science in Electrical and Electronics Engineering
- 12) Master of Science in Engineering Management
- 13) Master of Science in Biomedical Engineering
- 14) Master of Science in Sustainable and Renewable Energy Engineering
- 15) Master of Science in Mechanical Engineering
- 16) Master in Conservation Management of Cultural Heritage
- 17) Doctor of Philosophy in Engineering Management
- 18) Doctor of Philosophy in Civil Engineering

## 19) Doctor of Philosophy in Electrical and Computer Engineering

### Admission Requirements

Further to fulfilling the University admission requirements, students aspiring to study in one of the engineering majors must take a placement examination in mathematics and physics. Students who fail to attain a passing score in one of these subjects are required to pass a related remedial course to ensure their mastery of basic skills and improve their ability to handle the rigor of college-level subjects. Students are strongly advised to carefully review the University Bulletin for admission and degree requirements and all related academic policies.

### Graduation Requirements

**Each Bachelor's** degree program comprises University Requirements (UR), College Requirements (CR), and Program Requirements (PR). The University and College requirements are common to all departments in the College of Engineering. Each department has its own required elective courses. The credit hour allocations for each program are shown in the following table:

| BSc in Architectural Engineering (158Credits) |    |    |     |       |
|---|----|----|-----|-------|
|   | UR | CR | PR  | Total |
| Mandatory Credits                             | 18 | 26 | 102 | 146   |
| Elective Credits                              | 6  | -  | 6   | 12    |
| Total   | 24 | 26 | 108 | 158   |

| BSc in Civil Engineering (135 Credits) |    |    |    |       |
|--|----|----|----|-------|
|  | UR | CR | PR | Total |
| Mandatory Credits                      | 18 | 26 | 79 | 123   |
| Elective Credits                       | 6  | -  | 6  | 12    |
| Total                                  | 24 | 26 | 85 | 135   |

| BSc in Electrical and Electronics Engineering (132 Credits) |    |    |    |       |
|---|----|----|----|-------|
|   | UR | CR | PR | Total |
| Mandatory Credits   | 18 | 26 | 67 | 111   |
| Elective Credits  | 6  | -  | 15 | 21    |
| Total   | 24 | 26 | 82 | 132   |

| BSc in Industrial Engineering and Engineering Management (134 Credits) |    |    |    |       |
|--|----|----|----|-------|
|  | UR | CR | PR | Total |
| Mandatory Credits  | 18 | 26 | 72 | 116   |
| Elective Credits   | 6  | -  | 12 | 18    |
| Total  | 24 | 26 | 84 | 134   |

| BSc in Mechanical Engineering (132 Credits) |    |    |    |       |
|---|----|----|----|-------|
|   | UR | CR | PR | Total |
| Mandatory Credits                           | 18 | 26 | 76 | 120   |
| Elective Credits                            | 6  | -  | 6  | 12    |
| Total                                       | 24 | 26 | 82 | 132   |

| BSc in Nuclear Engineering (131 Credits) |    |    |    |       |
|--|----|----|----|-------|
|  | UR | CR | PR | Total |

|                   |    |    |    |     |
|-------------------|----|----|----|-----|
| Mandatory Credits | 18 | 26 | 75 | 119 |
| Elective Credits  | 6  | -  | 6  | 12  |
| Total             | 24 | 26 | 81 | 131 |

| BSc in Chemical and Water Desalination Engineering (131) |    |    |    |       |
|--|----|----|----|-------|
|  | UR | CR | PR | Total |
| Mandatory Credits  | 18 | 26 | 72 | 116   |
| Elective Credits   | 6  | -  | 9  | 15    |
| Total  | 24 | 26 | 81 | 131   |

| BSc in Sustainable and Renewable Energy Engineering (133 Credits) |    |    |    |       |
|---|----|----|----|-------|
|   | UR | CR | PR | Total |
| Mandatory Credits   | 18 | 26 | 71 | 115   |
| Elective Credits  | 6  | -  | 12 | 18    |
| Total   | 24 | 26 | 83 | 133   |

An engineering student in all programs is eligible for graduation if they have:

- 1) Completed all the requirements of the degree
- 2) Attained a cumulative GPA of 2.0 or higher.

### I. University Requirements

Every student must take 24 credit hours of general education courses distributed over seven domains. Fifteen (15) mandatory credit hours are selected from domains 1, 2, 3, and 4, and (9) elective credit hours are chosen from domains 5, 6, and 7 as indicated in the University section (General Education).

### II. College Requirements

#### A. Remedial programs and Courses

Proficiency in the English Language is required for admission to any program in the College of Engineering. In addition, all incoming engineering students must also pass the placement exams in mathematics and physics before taking program-level calculus and physics courses. Those who fail a placement exam(s) are required to take the corresponding remedial course(s):

- 1440098 Pre-Calculus
- 1430106 Remedial Physics

These two remedial courses do not count toward fulfilling the degree requirements; i.e., each is assigned zero credits but is equivalent to 3-credits in terms of student load. Description of the remedial courses follows.

|   |              |         |
|---|--------------|---------|
| 1440098   | Pre-Calculus | (0-3:0) |
| Real numbers, equations, inequalities, functions and their graphs, linear and quadratic functions, exponential and logarithmic functions, and trigonometry.<br><b>Prerequisite:</b> None. |              |         |

|  |                  |         |
|--|------------------|---------|
| 1430106  | Remedial Physics | (0-3:0) |
| This course is designed for science and engineering students with insufficient backgrounds in physics. The study of the systems of units, vectors, elements of kinematics (one-dimensional motion), dynamics (Newton's laws, work, and energy), thermodynamics, and basic electricity.<br><b>Prerequisite:</b> None. |                  |         |

## B. Mandatory Courses

All College of Engineering students must take 26 credit hours of mandatory foundation and skill courses. A list of these courses and their descriptions follow.

| Course  | Title                                | CrHrs | Prerequisite                                     |
|---------|--------------------------------------|-------|--|
| 0202207 | Technical Writing                    | 3     | 0202112  |
| 1420101 | General Chemistry I                  | 3     | None   |
| 1420102 | General Chemistry I Lab              | 1     | Pre/Co: 1420101                                  |
| 1430115 | Physics I                            | 3     | Pass placement Test or 1430106 ; Pre/Co: 1440133 |
| 1430116 | Physics I Lab                        | 1     | Pre/Co: 1430115                                  |
| 1430117 | Physics II                           | 3     | 1430115, 1430116                                 |
| 1440133 | Calculus I for Engineers             | 3     | None   |
| 1440161 | Calculus II for Engineers            | 3     | 1440133  |
| 1440261 | Differential Equations for Engineers | 3     | 1440161  |
| 0401301 | Engineering Economics                | 3     | 3rd Year Standing                                |

Descriptions the mandatory foundation and skill courses are given below.

|  |                   |         |
|--|-------------------|---------|
| 0202207  | Technical Writing | (0-3:0) |
| This ESP (English Specific Purpose) course is task-based and intended for Engineering students to increase their proficiency in managing technical data and workplace writing, such as memorandums, letters, reports, applications, and research projects.<br><b>Prerequisite:</b> 0202112 |                   |         |

|  |                     |         |
|--|---------------------|---------|
| 1420101  | General Chemistry I | (0-3:0) |
| Topics Covered include Matter, Atomic structure; stoichiometry of chemical reactions; chemical reactions in solution; energy and thermochemistry; atomic and electronic structure; chemical bonding, periodic correlation, properties of gases, liquids and Solids; solutions. |                     |         |

|  |                         |         |
|--|-------------------------|---------|
| 1420102  | General Chemistry I Lab | (0-3:1) |
| Experiments on qualitative and quantitative aspects of General Chemistry I.<br><b>Prerequisite:</b> Pre/Co 1420101 |                         |         |

|   |                                      |         |
|---|--------------------------------------|---------|
| 1430115   | Physics I                            | (0-3:0) |
| Motion in 1 and 2 dimensions, vectors, particle dynamics, and Newton's laws; work and energy, momentum and collision, rigid body rotation, elasticity, oscillatory motion, fluid mechanics, and heat.<br><b>Prerequisites:</b> Placement Test or 1430106; Pre/Co: 1440133   |                                      |         |
| 1430116   | Physics I Laboratory                 | (0-3:1) |
| Various experiments cover the topics mentioned in the Physics I course.<br><b>Prerequisite:</b> Pre/Co 1430115  |                                      |         |
| 1430117   | Physics II                           | (0-3:3) |
| Charge and matter, electric field, Gauss's law, electric potential, capacitors and dielectrics, current and resistance, electromotive force and circuits, magnetic field, Ampere's law, Faraday's law of induction, Maxwell's equations.<br><b>Prerequisites:</b> 1430115 and 1430116   |                                      |         |
| 1440133   | Calculus I for Engineers             | (0-3:3) |
| The course includes Limits and continuity. Derivatives, applications of derivatives in optimization, linearization and graphing, the Mean Value Theorem. Integration, the Fundamental Theorem of Calculus, areas, volumes of solids of revolution, arc length. Conic sections.  |                                      |         |
| 1440161   | Calculus II for Engineers            | (0-3:3) |
| Inverse functions; transcendental functions; techniques of integration, Improper integrals; graphing in polar coordinates; vectors and analytic geometry in space; Functions of several variables; extreme values and saddle points; double integrals in rectangular and polar coordinates; triple integrals in rectangular coordinates.<br><b>Prerequisite:</b> 1440133  |                                      |         |
| 1440261   | Differential Equations for Engineers | (0-3:3) |
| First and second-order ordinary differential equations; applications; some higher-order equations; power series solutions; special functions; Laplace transform; applications.<br><b>Prerequisite:</b> 1440161  |                                      |         |
| 0401301   | Engineering Economics                | (0-3:3) |
| Fundamental concepts involve the time value of money. Evaluation of loans and bonds; consideration of inflation and handling changing interest rates. Economic measures for determining a project's worth (annual, present, future), rates of return, savings, investment ratio, and payback period. Comparing investment alternatives. Depreciation and benefit-cost analysis, cost concepts, and an introduction to project cost estimation.<br><b>Prerequisite:</b> 3rd Year Standing. |                                      |         |

### III. Program Requirements

Requirements for the Bachelor of Science degree are program-specific. They encompass three categories: Major specific core courses, major-specific elective courses, and engineering courses from outside the major. The program requirements for the bachelor's degrees in the different engineering majors are given hereafter. Details and titles of relevant courses are included in the Student's Study Plan (SSP) that every engineering student will have.

#### Course Coding

The courses offered by the College of Engineering programs are designated according to the following coding System (040XABC):

|    |   |   |
|----|---|---|
| 04 | College of Engineering Code   |   |
| 0X | Program as follows  |   |
|    | 01: Civil and Environmental Engineering<br>02: Electrical and Electronics Engineering<br>04: Architectural Engineering<br>05: Industrial Engineering and Engineering management | 06: Sustainable and Renewable Energy Engineering<br>07: Nuclear Engineering<br>08: Mechanical Engineering<br>08: Chemical Engineering |
| AB | "A" designate the Year or level 1, 2, 3, 4; "B" program focus area; "C" course sequence - 0, 1, 2, 3, 4, 5, 6   |   |
| C  |   |   |

The designation used to represent the credit hours breakdown (t-p: s) of a course is as follows: "t" stands for the theoretical component of the course; "p" practical or laboratory component; and "c" the total credit hours. For example (3-0:3) represents a 3-credit-hour course with three contact lecture hours and zero laboratory hours.

## Department of Architectural Engineering (AE)

### Personnel

|                             |   |
|-----------------------------|---|
| <b>Chairperson</b>          | Emad Mushtaha   |
| <b>Associate Professors</b> | Emad Mushtaha, Mamun Rashid, Monther Jamhawi, Alex Opuko, Samir Dirar   |
| <b>Assistant Professors</b> | Majd Musa, Salem Abdalla, Vittorino Belpoliti, Reyhan Sabri, Aref Maksoud, Aseel Hussien, Ahmad Sukkar, Moohammed Wasim Yahia, Ahmed Abdeen Salim |
| <b>Lecturers</b>            | Mariam Hassan, Marta Bialko, Sumana Hossain, Usha Rani  |

### Vision

To be internationally recognized for the quality of education, research, and community service to meet the needs of the United Arab Emirates and beyond.

### Mission

The mission of the Department of Architectural Engineering (AE) is to support the development of the UAE and its region by providing an internationally competitive educational program, establishing research, and by offering technical services related to architectural engineering for a sustainable built environment in the Digital Age.

### Objectives

Graduates from the Architectural Engineering undergraduate program will:

1. Acquire the critical thinking capabilities and creative problem-solving skills that respond to global construction and technological challenges.
2. Be ethically responsible professionals with high communication and leadership skills, who recognize social, and community needs and values.
3. Continue career advancement by obtaining higher academic degrees and pursuing state-of-the-art professional expertise.

### Program Outcomes

Upon successful completion of the Bachelor of Science in Architectural Engineering (B.Sc.) program, graduates will have:

- a) an ability to apply knowledge of mathematics, science, and engineering.
- b) an ability to design and conduct experiments, as well as to analyze and interpret data.
- c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- d) an ability to function on multidisciplinary teams.
- e) an ability to identify, formulate, and solve engineering problems.
- f) an understanding of professional and ethical responsibility.
- g) an ability to communicate effectively.

- h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- i) a recognition of the need for and an ability to engage in lifelong learning
- j) a knowledge of contemporary issues.
- k) the ability to use the techniques, skills, and modern engineering tools necessary for architectural engineering practice.

### Career Opportunities

The Bachelor of Science in Architectural Engineering (B.Sc.) program enables students to acquire the skills to work or pursue further studies in the following fields:

- architecture
- building construction
- urban design
- property development
- project management
- environmental consulting

### Program Overview

To obtain a Bachelor of Science degree in Architectural Engineering, a student must complete a total of 158 credit hours spanning University requirements (UR), College requirements (CR), and Program requirements (PR), as shown below.

| BSc in Architectural Engineering (158 Credits) |    |    |     |       |
|--|----|----|-----|-------|
|  | UR | CR | PR  | Total |
| Mandatory Credits                              | 18 | 26 | 102 | 146   |
| Elective Credits                               | 6  | -  | 6   | 12    |
| Total  | 24 | 26 | 108 | 158   |

### I. University Requirements (UR)

Every student must take 24 credit hours of general education courses distributed over four domains. Eighteen (18) mandatory credit hours (listed in Domain 1) and (6) elective credit hours are selected from domains 2, 3, and 4 as indicated in the University section (General Education).

### II. College Requirements (CR)

The list of the College's required courses and their descriptions are presented in the introductory pages of the College of Engineering section in this bulletin.

### III. Program Requirements (PR)

#### A. Mandatory Courses

The mandatory program requirements comprise the 108 credit hours listed in the table below.

| Course # | Title                                     | CrHrs | Prerequisites                  |
|----------|---|-------|--------------------------------|
| 0404100  | Introduction to Architectural Engineering | 1     | None                           |
| 1440151  | Analytic Geometry                         | 3     | Pass Placement Test or 1440098 |
| 1430102  | Introduction to General Geology           | 3     | None                           |



|         |  |   |                          |
|---------|--|---|--------------------------|
| 1450103 | Introduction to Ecology                          | 3 | 1420101                  |
| 0404101 | Architectural Drawing I                          | 3 | Pre/Co: 0404100          |
| 0404221 | Basic Design                                     | 3 | 0404101; 1440151         |
| 1501113 | Programming for Engineers                        | 3 | None                     |
| 1440281 | Introduction to Probability and Statistics       | 3 | 1440133                  |
| 0401201 | Statics  | 3 | 1430115                  |
| 0401202 | Mechanics of Materials                           | 3 | 0401201                  |
| 0404241 | Thermal Sciences                                 | 2 | 2nd Year Standing        |
| 0401243 | Dynamics   | 3 | 0401201                  |
| 0401343 | Fluid Mechanics                                  | 3 | 0401243                  |
| 0404201 | Architectural Drawing II                         | 2 | 0404101                  |
| 0404204 | Surveying  | 2 | 2nd Year Standing        |
| 0404222 | Architectural Design I                           | 3 | 0404221                  |
| 0404231 | Building Construction I                          | 3 | 0404101                  |
| 0404261 | History of Architecture I                        | 3 | None                     |
| 0404301 | Computer Aided Architectural Design              | 3 | 3rd Year Standing        |
| 0404305 | Electricity and Power Distribution for Buildings | 2 | 1430117                  |
| 0404311 | Fundamentals of Structural Analysis              | 3 | 0401202                  |
| 0404313 | Reinforced Concrete Design of Buildings I        | 3 | 0404311                  |
| 0404321 | Architectural Design II                          | 3 | 0404222; Pre/Co: 0404201 |
| 0404322 | Architectural Design III                         | 4 | 0404321                  |
| 0404331 | Building Construction II                         | 3 | 0404231                  |
| 0404341 | Building Illumination and Acoustics              | 3 | 1430117                  |
| 0404361 | History of Architecture II                       | 3 | 0404261                  |
| 0404401 | Professional Engineering Practice & Ethics       | 2 | 4th Year Standing        |
| 0404417 | Structural Steel Design                          | 3 | 0404311                  |
| 0404421 | Architectural Design IV                          | 4 | 0404322; Pre/Co: 0404331 |
| 0404422 | Architectural Design V                           | 4 | 0404421                  |
| 0404438 | Project Management                               | 2 | 0404331                  |
| 0404441 | HVAC Design for Buildings                        | 2 | 0404241; 0404331         |
| 0404451 | Urban Planning and Design                        | 3 | 4th Year Standing        |
| 0404491 | Senior Design Project I                          | 2 | 0404422; 0202207         |
| 0404492 | Senior Design Project II                         | 4 | 0404491                  |
| 0404xxx | Department Elective 1                            | 3 | Depends on Elective      |
| 0404xxx | Department Elective 2                            | 3 | Depends on Elective      |

#### A. Electives Courses

Students can register for these courses at the beginning of the fourth year to develop a deeper understanding of a specific area of their choice. The department offers the following set of courses as electives.

| Course # | Title  | CrHrs | Prerequisites       |
|----------|--|-------|---------------------|
| 0404405  | Advanced Computer Aided Design               | 3     | 0404301             |
| 0404406  | Working Drawings                             | 3     | 0404331             |
| 0404418  | Modern Structural Systems                    | 3     | 0404313             |
| 0404435  | Specifications and Quantity Surveying        | 3     | 0404331             |
| 0404436  | Construction Contracts                       | 3     | 0404331             |
| 0404437  | Construction Engineering                     | 3     | 0404331             |
| 0404442  | Building Environmental Control System Design | 3     | 0404331;<br>0404441 |
| 0404443  | Building Illumination System Design          | 3     | 0404341             |
| 0404444  | Building Electrical System Design            | 3     | 0404341             |
| 0404445  | Building HVAC System Design                  | 3     | 0404441             |
| 0404446  | Mechanical Systems                           | 3     | 0404331             |
| 0404447  | Environmental and Climatic Design            | 3     | 0404331             |
| 0404455  | Landscape Design                             | 3     | 0404451             |
| 0404456  | Desert Habitation                            | 3     | 0404451             |
| 0404465  | Contemporary Architecture                    | 3     | 0404261             |
| 0404466  | Islamic Architecture                         | 3     | 0404261             |
| 0404467  | Local and Regional Architecture              | 3     | 0404261             |
| 0404303  | Building Information Modeling "BIM"          | 3     | 0404301             |
| 0404487  | Solar Energy in Buildings                    | 3     | 4th year standing   |
| 0404480  | Selected Topics in Architectural Engineering | 3     | 4th year standing   |
| 0404481  | Selected Topics in Structural Engineering    | 3     | Depends on topic    |
| 0404482  | Selected Topics in Architectural Design      | 3     | 4th year standing   |
| 0404483  | Selected Topics in Construction              | 3     | Depends on topic    |
| 0404484  | Selected Topics in Environmental Control     | 3     | Depends on topic    |

## Study Plan

The Bachelor of Science in Architectural Engineering encompasses 158 credit hours spread over 10 semesters plus a summer training period and can typically be completed in five years. The following study plan serves as a roadmap for a smooth progression toward graduation.

| Year 1, Semester 1 (17 Credits) |   |       |  |
|---------------------------------|---|-------|--|
| Course #                        | Title                                     | CrHrs | Prerequisites                                      |
| 0404100                         | Introduction to Architectural Engineering | 1     | None   |
| 1440151                         | Analytic Geometry                         | 3     | Pass Placement Test or 1440098                     |
| 0104100                         | Islamic Culture                           | 3     | None   |
| 0202112                         | English for Academic Purposes             | 3     | None   |
| 1440133                         | Calculus I for Engineering                | 3     | Pass Placement Test or 1440098                     |
| 1430115                         | Physics I                                 | 3     | Pass Placement Test or 1430106;<br>Pre/Co: 1440133 |
| 1430116                         | Physics I Laboratory                      | 1     | Pre/Co: 1430115                                    |

| Year 1, Semester 1 (17 Credits) |   |       |   |
|---------------------------------|---|-------|---|
| Course #                        | Title                                     | CrHrs | Prerequisites                                   |
| 0404100                         | Introduction to Architectural Engineering | 1     | None  |
| 1440151                         | Analytic Geometry                         | 3     | Pass Placement Test or 1440098                  |
| 0104100                         | Islamic Culture                           | 3     | None  |
| 0202112                         | English for Academic Purposes             | 3     | None  |
| 1440133                         | Calculus I for Engineering                | 3     | Pass Placement Test or 1440098                  |
| 1430115                         | Physics I                                 | 3     | Pass Placement Test or 1430106; Pre/Co: 1440133 |
| 1430116                         | Physics I Laboratory                      | 1     | Pre/Co: 1430115                                 |

| Year 2, Semester 3 (17 Credits) |                           |       |                  |
|---------------------------------|---------------------------|-------|------------------|
| Course #                        | Title                     | CrHrs | Prerequisites    |
| 0404221                         | Basic Design              | 3     | 0404101; 1440151 |
| 0404201                         | Architectural Drawing II  | 2     | 0404101          |
| 0404261                         | History of Architecture I | 3     | None             |
| 1450103                         | Introduction to Ecology   | 3     | 1420101          |
| 0401201                         | Statics                   | 3     | 1430115          |
| 1501113                         | Programming for Engineers | 3     | None             |

| Year 2, Semester 4 (16 Credits) |                                     |       |                               |
|---------------------------------|-------------------------------------|-------|-------------------------------|
| Course #                        | Title                               | CrHrs | Prerequisites                 |
| 0404222                         | Architectural Design I              | 3     | 0404221                       |
| 0404301                         | Computer Aided Architectural Design | 3     | 0404101                       |
| 0404231                         | Building Construction I             | 3     | 0404101                       |
| 0404241                         | Thermal Sciences                    | 2     | 2 <sup>nd</sup> Year Standing |
| 0401202                         | Mechanics of Materials              | 3     | 0401201                       |
| 0404204                         | Surveying                           | 2     | 2 <sup>nd</sup> Year Standing |

| Year 3, Semester 5 (16 Credits) |  |       |                            |
|---------------------------------|--|-------|----------------------------|
| Course #                        | Title  | CrHrs | Prerequisites              |
| 0404321                         | Architectural Design II                          | 3     | 0404222<br>Pre/Co: 0404201 |
| 1430102                         | Introduction to General Geology                  | 3     | None                       |
| 0404331                         | Building Construction II                         | 3     | 0404231                    |
| 0404441                         | HVAC Design for Buildings                        | 2     | 0404241<br>Pre/Co: 0404331 |
| 0404311                         | Fundamentals of Structural Analysis              | 3     | 0401202                    |
| 0404305                         | Electricity and Power Distribution for Buildings | 2     | 1430117                    |

| Year 3, Semester 6 (16 Credits) |  |       |               |
|---------------------------------|--|-------|---------------|
| Course #                        | Title                                      | CrHrs | Prerequisites |
| 0404322                         | Architectural Design III                   | 4     | 0404321       |
| 1440281                         | Introduction to Probability and Statistics | 3     | 1440133       |
| 0404361                         | History of Architecture II                 | 3     | 0404261       |
| 0401243                         | Dynamics                                   | 3     | 0401201       |
| 0404313                         | Reinforced Concrete Design of Buildings I  | 3     | 0404311       |

| Year 4, Semester 7 (16 Credits) |                                     |       |                            |
|---------------------------------|-------------------------------------|-------|----------------------------|
| Course #                        | Title                               | CrHrs | Prerequisites              |
| 0404421                         | Architectural Design IV             | 4     | 0404322<br>Pre/Co: 0404331 |
| 0202207                         | Technical Writing                   | 3     | 0202110                    |
| 0404xxx                         | Department Elective 1               | 3     | Depends on<br>Elective     |
| 0404341                         | Building Illumination and Acoustics | 3     | 0404305                    |
| 0404417                         | Structural Steel Design             | 3     | 0404311                    |

| Year 4, Semester 8 (16 Credits) |   |       |                               |
|---------------------------------|---|-------|-------------------------------|
| Course #                        | Title   | CrHrs | Prerequisites                 |
| 0404422                         | Architectural Design V                          | 4     | 0404421                       |
| 0404451                         | Urban Planning and Design                       | 3     | 4 <sup>th</sup> Year Standing |
| 1440261                         | Differential Equations for Engineers            | 3     | 1440161                       |
| 0404xxx                         | Department Elective 2                           | 3     | Depends on<br>Elective        |
| 0302200                         | Fundamentals of Innovation and Entrepreneurship | 3     | None                          |

| Year 4, Summer Training (0 Credits) |                                |       |                               |
|-------------------------------------|--------------------------------|-------|-------------------------------|
| Course #                            | Title                          | CrHrs | Prerequisites                 |
| 0404490                             | Practical Training (240 hours) | 0     | 4 <sup>th</sup> Year Standing |

| Year 5, Semester 9 (16 Credits) |  |       |                               |
|---------------------------------|--|-------|-------------------------------|
| Course #                        | Title                                      | CrHrs | Prerequisites                 |
| 0404491                         | Senior Design Project I                    | 2     | 0404422; 0202207              |
| 0404401                         | Professional Engineering Practice & Ethics | 2     | 4 <sup>th</sup> Year Standing |
| 0401343                         | Fluid Mechanics                            | 3     | 0401243                       |
| 0401301                         | Engineering Economics                      | 3     | 3 <sup>rd</sup> Year Standing |
| 0201102                         | Arabic Language                            | 3     | None                          |
|                                 | University Elective 1                      | 3     | None                          |

| Year 5, Semester 10 (12 Credits) |                          |       |                   |
|----------------------------------|--------------------------|-------|-------------------|
| Course #                         | Title                    | CrHrs | Pre/Co-requisites |
| 0404492                          | Senior Design Project II | 4     | 0404491           |
| 0404438                          | Project Management       | 2     | 0404331           |
|                                  | University Elective 2    | 3     | None              |
|                                  | University Elective 3    | 3     | None              |

### Course Coding

The courses offered in the Architectural Engineering are designated code numbers in the form of (0404XYZ) where:

|   |   |  |
|---|---|--|
| X | Year (level)  |  |
| Y | Areas (as follows)<br>0: General<br>1: Structures<br>2: Architectural Design<br>3: Construction<br>4: Environmental Control Systems | 5: Urban Planning and Design<br>6: History and Theory of Architecture<br>8: Special Topics<br>9: Projects and Seminars |
| Z | Course sequence in the area   |  |

### Course Description

#### A. Mandatory Courses

Descriptions of the Mandatory courses are given below.

|   |  |                |
|---|--|----------------|
| <b>0404100</b>  | <b>Introduction to Architectural Engineering</b> | <b>(1-0:1)</b> |
| <p>The course explains architectural engineering as a profession and its position in the building industry. It introduces building forms, functions, materials, construction methods, and architectural styles. It emphasizes the connection between architectural engineering and its socio-economic and cultural contexts and stresses the significance of ethics. The course involves lectures and small group projects with an emphasis on teamwork.</p> <p><b>Prerequisite:</b> None</p> |  |                |

|   |                                |                |
|---|--------------------------------|----------------|
| <b>0404101</b>  | <b>Architectural Drawing I</b> | <b>(2-3:3)</b> |
| <p>The course is designed to enable students to understand, read and draw architectural drawings and acquire the basic skills of drawing techniques. The first part of the course introduces the 2-dimensional drawings in terms of plans sections and elevations in multiple stories, it includes rendering techniques such as textures and tonal values. The second part introduces 3-dimensional drawings, including isometric drawing only as a basic transformation from 2D to 3D; it includes shadow projections in both 2D and 3D drawings. The basic layout of drawings is introduced and an emphasis on freehand sketching for 2D and 3D drawings.</p> <p><b>Pre-/Co-requisite:</b> 0404100 Introduction to Architectural Engineering</p> <p><b>Prerequisite:</b> None</p> |                                |                |

|  |                     |                |
|--|---------------------|----------------|
| <b>0404221</b>   | <b>Basic Design</b> | <b>(2-3:3)</b> |
| <p>This course is a basic introduction to design principles, spatial organizations, and compositions. Emphasize space typologies to create abstract forms by introducing elements such as masses, planes, frames, and linear elements. Solid and void relationships are introduced through volumetric addition and subtraction techniques. Basic introduction of form and function relationships are included in this course.</p> <p><b>Prerequisite:</b> 0404101 Architectural Drawing I; 1440151 Analytic Geometry</p> |                     |                |

|  |                                  |                |
|--|----------------------------------|----------------|
| <b>1501113</b>   | <b>Programming for Engineers</b> | <b>(3-0:3)</b> |
| <p>This course introduces fundamental programming techniques to non-major students. Subjects include computer science fields, general introduction to computers and numbering systems, software development process, programming languages, selection structures, repetition structures, functions and procedures, structured and user-defined data types, text files, arrays, and dynamic memory allocation.</p> <p><b>Prerequisite:</b> None</p> |                                  |                |

|  |   |                |
|--|---|----------------|
| <b>1440281</b>   | <b>Introduction to Probability and Statistics</b> | <b>(3-0:3)</b> |
| <p>Descriptive statistics; Axiomatic probability; Random variables and their moments; Special discrete and continuous distributions; Sampling distributions; Estimation; Hypothesis testing; Linear regression; Analysis of variance; analysis of categorical data.</p> <p><b>Prerequisite:</b> 1440133 Calculus I for Engineering</p> |   |                |

|  |                |                |
|--|----------------|----------------|
| <b>0401201</b>   | <b>Statics</b> | <b>(3-0:3)</b> |
| <p>Knowledge and understanding of vector resultant of forces in two and three dimensions; type of structural supports; equilibrium of particles and rigid bodies; analysis of internal forces in beams and trusses; static and kinetic friction; centroids of lines, areas, and volumes; moments of inertia.</p> <p><b>Prerequisite:</b> 1430115 Physics I</p> |                |                |

|  |                               |                |
|--|-------------------------------|----------------|
| <b>0401202</b>   | <b>Mechanics of Materials</b> | <b>(3-0:3)</b> |
| <p>Simple states of stress and strain; Hook's law; torsional stresses; axial deformation; internal forces in beams; bending and shearing diagrams and stresses; beam design; stress transformation; thin-walled pressure vessels; beam deflection, lab session, and experiments.</p> <p><b>Prerequisite:</b> 0401201 Statics</p> |                               |                |

|   |                                 |                |
|---|---------------------------------|----------------|
| <b>0404241</b>  | <b>Thermal Sciences</b>         | <b>(2-0:2)</b> |
| <p>This course introduces the fundamental concepts of thermodynamics and heat transfer, including conservation of mass, energy, momentum, and the first and second laws of thermodynamics. It also introduces basic evaluation techniques of heat transfer modes involving conduction, convection, and radiation.</p> <p><b>Prerequisite:</b> 2nd Year Standing</p>   |                                 |                |
| <b>0401243</b>  | <b>Dynamics</b>                 | <b>(3-0:3)</b> |
| <p>Introduction and Fundamental Principles, Kinematics of a particle: Rectilinear and curvilinear motion of a particle with normal and tangential components, force and acceleration, Work and energy, Impulse and momentum.</p> <p><b>Prerequisite:</b> 0401201 Statics</p>  |                                 |                |
| <b>0401343</b>  | <b>Fluid Mechanics</b>          | <b>(3-0:3)</b> |
| <p>Properties of fluids; Fluid statics; Translation and rotation of fluid masses; Dimensional analysis and similitude; Fundamentals of fluid flow; Fluid resistance; Compressible flow; Ideal fluid flow; Fluid measurements.</p> <p><b>Pre-/Co-requisite:</b> 0401243 Dynamics</p>   |                                 |                |
| <b>0404201</b>  | <b>Architectural Drawing II</b> | <b>(1-3:2)</b> |
| <p>Sketching is used to develop the spatial ability and the ability to visualize and communicate an architectural idea. The course covers principles of 1-point and 2-point perspective, viewpoint selection, "depth" through shadows, textures, and detail, and matching a building image to a site.</p> <p><b>Prerequisite:</b> 0404201 Architectural Drawing I</p> |                                 |                |
| <b>0404204</b>  | <b>Surveying</b>                | <b>(1-3:2)</b> |
| <p>Surveying methods, instruments, and computations related to field problems; construction applications in surveying, leveling, and linear measurement; applications of GPS in land surveying; GIS applications and importance in urban planning. (Laboratory sessions are included to cover the above topics)</p> <p><b>Prerequisite:</b> 2nd Year Standing.</p>    |                                 |                |
| <b>0404222</b>  | <b>Architectural Design I</b>   | <b>(1-6:3)</b> |
| <p>Introducing buildings as an environmental and cultural product having spatial and functional relationships. Students are taught how to analyze and solve these relationships in an integrated manner.</p> <p><b>Prerequisite:</b> 0404221 Basic Design</p>   |                                 |                |

|  |   |                |
|--|---|----------------|
| <b>0404231</b>   | <b>Building Construction I</b>                          | <b>(2-3:3)</b> |
| Principles of building materials cover structural, thermal, and aesthetic properties of materials; Introduction of specific materials like lime, cement, fine and coarse aggregates, concrete, bricks, and blocks. Elements and types of superstructure, substructure, and foundations cover international and local building construction methods; concrete constructions: formwork, reinforcement, slabs, site-cast, and precast framing systems; soils; shallow and deep foundations; masonry wall construction; insulation materials and applications; exterior wall cladding systems. (Laboratory sessions are included in basic tests on materials).<br><b>Prerequisite:</b> 0404101 Architectural Drawing I |   |                |
| <b>0404261</b>   | <b>History of Architecture I</b>                        | <b>(3-0:3)</b> |
| Exploration of architectural history from Prehistory until the 18th century in different regions around the world, in chronological format. Study of the links between social and historical context and cultural production. Focus on cities and building analysis and architectural design strategies.<br><b>Prerequisite:</b> None  |   |                |
| <b>0404301</b>   | <b>Computer Aided Architectural Design</b>              | <b>(2-3:3)</b> |
| Application of computer-Aided Design to architecture, planning, building construction, and project management: line, surface, and solid modeling; perspective and other relevant projections; data-gathering techniques; analysis of both design and execution phases; building model and design ideas.<br><b>Prerequisite:</b> 0404101 Architecture Drawing I   |   |                |
| <b>0404305</b>   | <b>Electricity and Power Distribution for Buildings</b> | <b>(2-0:2)</b> |
| Codes and standards of electrical power systems for buildings; system components such as conductors, fuses, circuit breakers, motors, generators, and transformers; power management, distribution, power quality, and safety; electric wiring and metering, emergency and standby power systems and protective devices.<br><b>Prerequisite:</b> 1430117 Physics II  |   |                |
| <b>0404311</b>   | <b>Fundamentals of Structural Analysis</b>              | <b>(3-0:3)</b> |
| Classification of structures; loads; truss analysis, internal loadings in structures, shear and moment diagrams for beams and frames; influence lines for determinate structures; deflections; introduction to methods of analysis of statically indeterminate structures.<br><b>Prerequisite:</b> 0401202 Mechanics of Materials  |   |                |
| <b>0404313</b>   | <b>Reinforced Concrete Design of Buildings I</b>        | <b>(3-0:3)</b> |
| Materials and mechanical properties of concrete; the code and specifications. The behavior of compression and tension members; analysis and design of various shaped sections for flexure by the ultimate strength method; shear and diagonal tension; bond and anchorage of reinforcement; edge-supported slabs, short columns, continuous beams, detailing of reinforced concrete structures, design sessions (computer applications).<br><b>Prerequisite:</b> 0404311 Fundamentals of Structural Analysis   |   |                |



|  |                                |                |
|--|--------------------------------|----------------|
| <b>0404321</b>   | <b>Architectural Design II</b> | <b>(1-6:3)</b> |
| <p>The course introduces additional and more complex spatial requirements and functions, as well as other requirements. Structural grids, horizontal and vertical circulation, car parking, and traffic flow. All are expected to be creatively solved in an integrated manner in, for example, a hotel or commercial building.</p> <p><b>Prerequisite:</b> 0404222 Architectural Design I;<br/><b>Pre-/Co-requisite:</b> 0404201 Architectural Drawing II</p> |                                |                |

|  |                                 |                |
|--|---------------------------------|----------------|
| <b>0404322</b>   | <b>Architectural Design III</b> | <b>(2-6:4)</b> |
| <p>The emphasis is on response to the urban and environmental contexts. Social factors, market factors, and various spatial typologies are introduced in, for example, a high-density residential complex.</p> <p><b>Prerequisite:</b> 0404321 Architectural Design II</p> |                                 |                |

|  |                                 |                |
|--|---------------------------------|----------------|
| <b>0404331</b>   | <b>Building Construction II</b> | <b>(2-3:3)</b> |
| <p>Skeleton structures; overview of international and local building construction methods for specific materials: wood and manufactured wood; heavy timber and wood light-frame constructions; steel - Structural Steel and Light Gauge Steel Constructions. Introduction to international and local building construction methods for major and minor components: low-slope and steep roofs; staircases and elevators; windows and doors – specific material glass; interior walls and partitions – specific material gypsum; floor coverings and ceilings.</p> <p><b>Prerequisite:</b> 0404231 Building Construction I</p> |                                 |                |

|  |  |                |
|--|--|----------------|
| <b>0404341</b>   | <b>Building Illumination and Acoustics</b> | <b>(3-0:3)</b> |
| <p>The course introduces the fundamental principles, systems, and planning concepts for electrical and illumination systems in modern buildings. It also introduces the acoustic design for noise control and good hearing conditions, construction and materials details, acoustic properties of room shapes, and sound transmission and absorption.</p> <p><b>Prerequisite:</b> 0404305 Electricity and Power Distribution for Buildings</p> |  |                |

|  |                                   |                |
|--|-----------------------------------|----------------|
| <b>0404361</b>   | <b>History of Architecture II</b> | <b>(3-0:3)</b> |
| <p>Overview of the history of architecture in the Islamic world. Analysis of the main features of Islamic architecture and cities, emphasizing architecture in the UAE, heritage conservation strategies, and contemporary developments.</p> <p><b>Prerequisite:</b> 0404261 History of Architecture I</p> |                                   |                |

|   |   |                |
|---|---|----------------|
| <b>0404401</b>  | <b>Professional Engineering Practice &amp; Ethics</b> | <b>(2-0:2)</b> |
| <p>Factors that affect the practice of architectural engineering, in particular professional ethics, ethical and legal responsibilities towards clients and employees, business considerations, office management, legal aspects, and risks.</p> <p><b>Prerequisite:</b> 4<sup>th</sup> Year Standing</p> |   |                |

|  |                                |                |
|--|--------------------------------|----------------|
| <b>0404417</b>   | <b>Structural Steel Design</b> | <b>(3-0:3)</b> |
| <p>Introduction to Structural Steel Design, LRFD design concept and its applicability, analysis, and design of steel tension members, beams, columns, beam-column connections; elastic and plastic methods; structural steel; and design applications.</p> <p><b>Prerequisite:</b> 0404311 Fundamentals of Structural Analysis</p> |                                |                |

|  |                                  |                |
|--|----------------------------------|----------------|
| <b>0404421</b>   | <b>Architectural Design IV</b>   | <b>(2-6:4)</b> |
| <p>The advanced design of buildings with problems of complex structures, requirements, and functions in addition to acoustics, heating, and ventilation. Students are expected to apply the knowledge acquired in related subjects (building construction and environmental physics) to the design process—at least one major project with a specific and complex problem.</p> <p><b>Prerequisite:</b> 0404322 Architectural Design III;<br/> <b>Pre-/Co-requisite:</b> 0404331 Building Construction II</p>   |                                  |                |
| <b>0404422</b>   | <b>Architectural Design V</b>    | <b>(2-6:4)</b> |
| <p>Design of building complex within the context of a related urban fabric where urban design analysis is required prior to building design that involves complex functions and acoustic, heating, and ventilation requirements.</p> <p><b>Prerequisite:</b> 0404421 Architectural Design IV</p>   |                                  |                |
| <b>0404438</b>   | <b>Project Management</b>        | <b>(2-0:2)</b> |
| <p>Project management processes such as initiating, planning, executing, controlling, and closing the work of a team to achieve specific goals and meet specific success criteria. Includes Integration, Scope, Human Resources, Communication, Risk, and Procurement Management methods as well as methods of managing and estimating cost and time and control of quality, focusing on Construction Projects. Includes an introduction to the critical path analysis.</p> <p><b>Prerequisite:</b> 0404331 Building Construction II</p>   |                                  |                |
| <b>0404441</b>   | <b>HVAC Design for Buildings</b> | <b>(2-0:2)</b> |
| <p>This course introduces the fundamental principles and engineering procedures for the design of HVAC systems (heating and cooling), thermal comfort, ventilation mechanisms and concepts, air conditioning systems and types, air diffusion design and layout techniques, duct design and distribution, architectural and constructional space requirements for HVAC systems. The course introduces energy utilization techniques, conservation constraints, mixed-mode systems, and other sustainable alternatives.</p> <p><b>Prerequisite:</b> 0404241 Thermal Sciences;<br/> <b>Pre-/Co-requisite:</b> 0404331 Building Construction II</p> |                                  |                |
| <b>0404451</b>   | <b>Urban Planning and Design</b> | <b>(2-3:3)</b> |
| <p>Evolution and history of city development. Fundamental theories, principles, and skills are involved in planning the physical environment. Land-use planning. Comprehensive urban development process. Environmental planning. Historic preservation. Application of theoretical concepts on city design and problems; emphasis on the historical aspects specific to the region.</p> <p><b>Prerequisite:</b> 4th Year Standing</p>   |                                  |                |

|   |                                |                |
|---|--------------------------------|----------------|
| <b>0404491</b>  | <b>Senior Design Project I</b> | <b>(2-0:2)</b> |
| An interdisciplinary teamwork design experience includes preparation of a project plan, data collection and analysis, building selection, preliminary investigation of building systems, and evaluation of possible architectural solutions. Teams are required to submit and present technical progress reports. |                                |                |
| <b>Prerequisites:</b> 0404422 Architectural Design V; 0202207 Technical Writing   |                                |                |

|   |                                 |                |
|---|---------------------------------|----------------|
| <b>0404492</b>  | <b>Senior Design Project II</b> | <b>(1-9:4)</b> |
| Continuation of 0404491. Emphasis on engineering analysis and design of building systems. Individual students in a team are expected to handle a specific project task and coordinate with the rest of the group. The team must submit preliminary and final technical reports with all necessary documents and drawings. A presentation of the project results will be part of the evaluation. |                                 |                |
| <b>Prerequisite:</b> 0404491 Senior Design Project I  |                                 |                |

|   |                           |                |
|---|---------------------------|----------------|
| <b>0404490</b>  | <b>Practical Training</b> | <b>(0-0:0)</b> |
| At least eight weeks of practical field training. The purpose is to introduce students to local and regional practices in their specialization. In addition, it exposes students to possible career opportunities. Students must submit a technical report to the practical training supervisor and the Department Chair upon completion. |                           |                |
| <b>Prerequisite:</b> 4th year standing  |                           |                |

|   |                                |                |
|---|--------------------------------|----------------|
| <b>1450103</b>  | <b>Introduction to Ecology</b> | <b>(3-0:3)</b> |
| This course focuses on the science of ecology with historical background and its relationships with the other relative sciences. It deals with the ecosystem structure and functions, Energy flow, and matter transfer in the food chain and among the different trophic levels. The course covers the biogeochemical cycles and their components, examples of the diverse ecosystems in the world biomes, and the desert ecosystem in the United Arab Emirates. The course contents also cover some population attributes such as density, age structure, mortality, and population growth rate, in addition to the study of life tables and the application to a case study of human population growth in the UAE. Interactive relationships between living organisms in the ecosystems are also covered. These include predation, herbivory, parasitism and diseases, and mutualism. Pollution problems are also covered in relation to pollutant sources, composition, impacts on living organisms, and solutions to the problem. |                                |                |
| <b>Prerequisite:</b> 1420101 General Chemistry I  |                                |                |

|  |  |                |
|--|--|----------------|
| <b>1430102</b>   | <b>Introduction to General Geology</b> | <b>(3-0:3)</b> |
| History of the earth and geological time; atoms, bonding, and crystals; minerals and rocks; volcanoes; streams and flooding: weathering, glaciations, glacial deposits, and other unconsolidated deposits; plate tectonics; earthquakes; water as a resource; energy resources and alternative sources; waste disposal and water pollution; geology of UAE; lab session and experiments. |  |                |
| <b>Prerequisite:</b> None  |  |                |

|   |                          |                |
|---|--------------------------|----------------|
| <b>1440151</b>  | <b>Analytic Geometry</b> | <b>(3-0:3)</b> |
| <p>Cartesian and parametric equations of curves (including lines) in a plane and in space; and surfaces (including planes) in space. Conic sections and hyperbolic functions (Cartesian and Parametric Forms). Quadric surfaces (Cartesian and Parametric Forms). Cylindrical and Spherical Coordinates Systems. Level curves of scalar-valued functions of two variables and level surfaces of scalar-valued functions of three variables. Introductory optimization, linear programming, Simplex method.</p> <p><b>Prerequisite:</b> Pass Placement Test or 1440098 Pre-Calculus.</p> |                          |                |

## Elective Courses

Descriptions of the elective courses available to Architectural Engineering students follow.

|   |                                       |                |
|---|---------------------------------------|----------------|
| <b>0404405</b>  | <b>Advanced Computer Aided Design</b> | <b>(2-3:3)</b> |
| <p>Advanced applications of Computer-Aided Design to architecture, planning, building construction, and project management, including experimentation of 3D drawings; simulations and animations as basic devices in design developments.</p> <p><b>Prerequisite:</b> 0404301 Computer Aided Architectural Design</p> |                                       |                |

|   |                         |                |
|---|-------------------------|----------------|
| <b>0404406</b>  | <b>Working Drawings</b> | <b>(2-3:3)</b> |
| <p>This course includes the production of a complete set of working drawings in order to expose students to actual and practical projects and to bridge the gap between the design and construction stage.</p> <p><b>Prerequisite:</b> 0404331 Building Construction II</p> |                         |                |

|  |                                  |                |
|--|----------------------------------|----------------|
| <b>0404418</b>   | <b>Modern Structural Systems</b> | <b>(3-0:3)</b> |
| <p>Analysis and design of building structures of unusual types. The course also addresses the dynamics logic of building technology and structural systems and their effect on architectural space and language. Review of pre-industrial structural systems and post-industrial structural systems.</p> <p><b>Prerequisite:</b> 0404313 Reinforced Concrete Design of Buildings</p> |                                  |                |

|  |  |                |
|--|--|----------------|
| <b>0404435</b>   | <b>Specifications and Quantity Surveying</b> | <b>(3-0:3)</b> |
| <p>Introduction; types and documents of tenders; types of construction contracts; bonds and insurance requirements; international general conditions and obligations of construction contracts; preparation of specifications; regulations pertinent to buildings, construction works, and building materials; quantity surveying and bill of quantities; rights and obligations of engineering consulting offices.</p> <p><b>Prerequisite:</b> 0404331 Building Construction II</p> |  |                |

|   |                               |                |
|---|-------------------------------|----------------|
| <b>0404436</b>  | <b>Construction Contracts</b> | <b>(3-0:3)</b> |
| <p>Contracts law and application to engineering services agreements and construction contracts; specifications agency, torts, professional liability and alternate dispute resolution.</p> <p><b>Prerequisite:</b> 0404331 Building Construction II</p> |                               |                |

|  |   |                |
|--|---|----------------|
| <b>0404442</b>   | <b>Building Environmental Control System Design</b> | <b>(3-0:3)</b> |
| Global and local climate factors, indoor environment and human comfort, heat stress and thermal balance of buildings, condensation, heat and moisture transfer in building fabrics, shading device designs, thermal control in buildings, ventilation and air movement requirements and patterns, natural cooling techniques in buildings, mechanical solutions through air conditioning systems design.<br><b>Prerequisites:</b> 0404331 Building Construction II; 0404441 HVAC Design for Buildings  |   |                |
| <b>0404443</b>   | <b>Building Illumination System Design</b>          | <b>(3-0:3)</b> |
| Work in daylighting, light distribution, interreflections, vision, and color; electric light, related equipment circuitry; illumination design procedures.<br><b>Prerequisite:</b> 0404341 Building Illumination and Acoustics   |   |                |
| <b>0404444</b>   | <b>Building Electrical System Design</b>            | <b>(3-0:3)</b> |
| Design electrical systems for commercial and industrial facilities emphasizing design practice and integration with codes and standards.<br><b>Prerequisite:</b> 0404341 Building Illumination and Acoustics   |   |                |
| <b>0404445</b>   | <b>Building HVAC System Design</b>                  | <b>(3-0:3)</b> |
| Design several different systems for a course project building; control strategy; economic comparison using lifecycle cost techniques.<br><b>Prerequisite:</b> 0404441 HVAC Design for Buildings   |   |                |
| <b>0404446</b>   | <b>Mechanical Systems</b>                           | <b>(3-0:3)</b> |
| Design detail and evaluation of cold and hot water supply systems within buildings and neighborhoods, cold and hot water cisterns, sanitary systems: drainage above and below ground, sewage disposal, and stormwater systems. HVAC systems: boiler and firing equipment, hot water heating systems components and piping, air distribution systems and components, vertical circulation systems, firefighting systems, landscape mechanical systems: fountain designs, and irrigation systems.<br><b>Prerequisite:</b> 0404331 Building Construction II |   |                |
| <b>0404447</b>   | <b>Environmental and Climatic Design</b>            | <b>(3-0:3)</b> |
| The sun, the earth, and time and their effect on architecture. Sun angles and ray projection, and building orientation in different climatic conditions. Solar energy and examples of solar architecture.<br><b>Prerequisite:</b> 0404331 Building Construction II   |   |                |
| <b>0404455</b>   | <b>Landscape Design</b>                             | <b>(2-3:3)</b> |
| Factors influencing site development and site analysis; site planning with in-depth analysis leads to site development as an integral part of the Landscape Design process. Design of outdoor spaces in conjunction with built or open spaces and land planning, design, and management.<br><b>Prerequisite:</b> 0404451 Urban Planning and Design   |   |                |

|   |                                  |                |
|---|----------------------------------|----------------|
| <b>0404465</b>  | <b>Contemporary Architecture</b> | <b>(3-0:3)</b> |
| <p>This course investigates the evolution of architecture since the industrial revolution. It covers architectural movements and schools, as well as pioneering architects and their influences on architecture. The course addresses political, socio-economic, cultural, and technological transformations that affected architecture in the 19th and 20th centuries and also touch upon architectural transformations as they relate to global influences in the early 21st century.</p> <p><b>Prerequisite:</b> 0404261 History of Architecture I</p> |                                  |                |

|   |                             |                |
|---|-----------------------------|----------------|
| <b>0404466</b>  | <b>Islamic Architecture</b> | <b>(3-0:3)</b> |
| <p>The development of Architecture in the Islamic World with examples from several Islamic periods. Analysis of elements, methods, and functions of Islamic architecture, including contemporary development in various Islamic regions. Strategies used for renovation, preservation, conservation, and reuse of Islamic historical buildings. Emphasis on recent experiments intends to achieve the continuity of Islamic architecture.</p> <p><b>Prerequisite:</b> 0404261 History of Architecture I</p> |                             |                |

|  |  |                |
|--|--|----------------|
| <b>0404467</b>   | <b>Local and Regional Architecture</b> | <b>(3-0:3)</b> |
| <p>Study of formative influences, climate, sociology, economics, technology, and materials and how region people use them to create new solutions in various contexts: identification of local and regional characteristics and change to recognize common factors and variables in the development of architectural language. Particular focus on the contemporary contributions with their influence on current theories towards creating local and regional architectural theories.</p> <p><b>Prerequisite:</b> 0404261 History of Architecture I</p> |  |                |

|  |  |                |
|--|--|----------------|
| <b>0404303</b>   | <b>Building Information Modeling "BIM"</b> | <b>(2-3:3)</b> |
| <p>This course deals with the rapidly growing technology of Building Information Modeling (BIM). It covers the basic principles (fundamental concepts) of BIM, such as concept, evolution, implementation, standards, collaboration/communication, documentation, visualization, coordination, and simulation.</p> <p><b>Prerequisite:</b> 0404301 Computer Aided Architectural Design</p> |  |                |

|  |                                  |                |
|--|----------------------------------|----------------|
| <b>0404487</b>   | <b>Solar Energy in Buildings</b> | <b>(3-0:3)</b> |
| <p>The course introduces students to the applications of solar energy in buildings as an alternative source of energy for modern buildings. The course aims to enhance the students' understanding of solar energy collection, conversion, storage, and distribution principles. Solar water heating, space heating, and cooling applications, components, and systems, in addition to the concepts of passive solar strategies and sustainable architecture, are also highlighted in this course.</p> <p><b>Prerequisite:</b> 4th year standing</p> |                                  |                |

|   |  |                |
|---|--|----------------|
| <b>0404481</b>  | <b>Selected Topics in Structural Engineering</b> | <b>(3-0:3)</b> |
| <p>This course covers a special topic in the field of structural engineering. Content varies according to the topic.</p> <p><b>Prerequisite:</b> Depends on the topic</p> |  |                |

|   |  |                |
|---|--|----------------|
| <b>0404482</b>  | <b>Selected Topics in Architectural Design</b> | <b>(3-0:3)</b> |
| This course covers a special topic in the field of architectural design. Content varies according to the topic.<br><b>Prerequisite:</b> 4th year standing |  |                |

|  |  |                |
|--|--|----------------|
| <b>0404483</b>   | <b>Selected Topics in Construction</b> | <b>(3-0:3)</b> |
| This course covers a special topic in the field of construction. Content varies according to the topic.<br><b>Prerequisite:</b> Depends on topic |  |                |

|   |   |                |
|---|---|----------------|
| <b>0404484</b>  | <b>Selected Topics in Environmental Control</b> | <b>(3-0:3)</b> |
| This course covers a special topic in the field of environmental control. Content varies according to the topic.<br><b>Prerequisite:</b> Depends on the topic |   |                |

## Department of Civil and Environmental Engineering (CEE)

### Personnel

|                             |   |
|-----------------------------|---|
| <b>Chairperson</b>          | Ghazi Alkhateeb   |
| <b>Professors</b>           | Abdallah Shanableh, Mohamed Maalej, Samer Barakat, Radhi Al Zubaidi, Salah Al Toubat, Maher Omar, Rami Al- Ruzouq, Ghazi Al-khateeb, Tewfik Mahdi |
| <b>Associate Professors</b> | Khaled Hamad, Tarek Merabtene, Moussa Leblouba, Saleh Abu Dabous, Waleed A. Zeiada, Mohammad G Arab   |
| <b>Assistant Professors</b> | Muamer Abuzwidah, Mohammad Talha Junaid, Mohammad Abdallah, Zaid AlSadoon, Sourjya Bhattacharjee, Ram Kumar Mantha                                |
| <b>Lecturers:</b>           | Faiza Shadoudd, Ali A. Tohmaz   |

### Vision

The Department of Civil and Environmental Engineering (CEE) aspires to be a regional leader in Civil Engineering education, research, and community service with a particular focus on the needs of the United Arab Emirates.

### Mission

The Department of Civil and Environmental Engineering's mission is to provide unique quality educational programs that meet the 21st-century job market, challenges, and skills; contribute to the discovery and application of knowledge through research, and serve the community and the civil engineering profession.

### Core values

The Department of Civil and Environmental Engineering endeavors to achieve its mission through the following set of core values that define its character and culture:

1. Ethical and Civic Responsibility following progressive Arab and Islamic ideals.
2. Highest standards of integrity, transparency, and accountability.
3. Mutual respect, fairness, and collegiality among all.
4. Freedom of intellectual thought and expression.
5. Excellence with a limitless drive for quality enhancement and continuous improvement.
6. Promotion of creativity and innovation in the pursuit of academic excellence.

### Goals

The Bachelor of Science in Civil Engineering (BSCE) Program at the University of Sharjah will produce graduates who:

1. Are prepared to practice the civil engineering profession responsibly for the benefit of the community.
2. Will achieve, upon a few years of practice, levels of technical knowledge and professional expertise necessary for career advancement and assuming leadership positions in the Civil Engineering profession.
3. Will pursue scientific inquiry and lifelong learning opportunities, such as self- directed learning, graduate studies, participation in professional activities, and continuing education.



### Program Outcomes

Upon successful completion of the BSCE Program at the University of Sharjah, the student should be able to:

1. Identify, formulate, and solve complex engineering problems by applying engineering, science, and mathematics principles.
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. Function effectively on a team whose members provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to conclude.
7. Apply new knowledge as needed, using appropriate learning strategies.

### Career Opportunities

The graduates of the BSc Program work as structural engineers, transportation, traffic or highway engineers, geotechnical engineers, environmental engineers, or water engineers. These jobs can be found virtually in all of the major consulting engineering firms, government agencies, and construction companies all across the United Arab Emirates and the region.

### Program Overview

The CEE Department is the oldest in the College of Engineering at the University of Sharjah. The Department has highly-qualified instructors and supporting lab engineers and technicians. Their specializations and expertise span the main disciplines of modern civil engineering, including Structural Engineering, Civil Engineering Materials, Construction Engineering and Management, Transportation Engineering, Geotechnical Engineering, Water Resources Engineering, Environmental Engineering, and Surveying.

The CEE Department offers a Bachelor of Science Degree in Civil Engineering (BSCE).

It is a four-year program fully accredited by the UAE Ministry of Education – Higher Education Affairs and the Accreditation Board for Engineering and Technology (ABET). The Program is designed to reflect the particular needs of the United Arab Emirates and the region in developing structures and infrastructure.

**Program Options:** The CEE Department offers only one Civil Engineering Program, which leads to a Bachelor of Science Degree in Civil Engineering. The Program provides students with the opportunity to cover various sub-fields of civil engineering through the choice of final year technical electives. The Department also offers, under the umbrella of the Civil Engineering Program, a Concentration in Environmental Engineering.

## Program Requirements

The Bachelor of Science in Civil Engineering Program requires the completion of 135 credit hours distributed as follows:

| BSc in Civil Engineering (135 Credits) |    |    |    |       |
|--|----|----|----|-------|
|  | UR | CR | PR | Total |
| Mandatory Credits                      | 18 | 29 | 76 | 123   |
| Electives Credits                      | 6  | -  | 6  | 12    |
| Total                                  | 24 | 29 | 82 | 135   |

### I. University Requirements (UR)

Every student must take 24 credit hours of general education courses distributed over seven domains. Eighteen (18) mandatory credit hours are selected from domains 1, 2, 3, and 4, and (6) elective credit hours are chosen from domains 5, 6, and 7 as indicated in the University section (General Education).

### II. College Requirements (CR)

These courses must be taken by students in any of the College of Engineering's programs. Descriptions are presented in the introductory pages of the College of Engineering section in this bulletin.

### III. Program Requirements (PR)

These courses must be taken only by students enrolled in the Civil Engineering Program. This category is divided into the following two groups.

#### A. Mandatory Courses

The mandatory department requirement courses cover the main civil engineering disciplines, including Geotechnical, Materials; Structural, Surveying; Transportation; Construction; Water Resources; and Environmental Engineering. Subjects in these areas are introduced using lectures and tutorials, whereby emphasis is placed on both principles and design. Laboratory classes are used alongside some courses to develop practical engineering skills and basic knowledge and reinforce the theory presented in the lectures. In addition, as part of the senior design projects, students are required to conduct a feasibility study, develop a complete analysis and design of an engineering project in one of the major areas of civil engineering, and submit a technical report supplemented with all necessary documents and drawings.

| Course # | Course Title  | CrHrs | Prerequisites   |
|----------|---|-------|-----------------|
| 1450103  | Ecology   | 3     | None            |
| 1440281  | Introduction to Probability and Statistics          | 3     | 1440133         |
| 0401100  | Introduction to Civil and Environmental Engineering | 1     | None            |
| 0401102  | Engineering Drawing                                 | 2     | Pre/Co: 0401100 |
| 1411113  | Programming for Engineers                           | 3     | None            |
| 0401201  | Statics*  | 3     | 1430115         |

|         |  |   |  |
|---------|--|---|--|
| 0401202 | Mechanics of Materials*                                      | 3 | 0401201                                  |
| 0401222 | Surveying  | 2 | 0401102; Co:<br>0401225                  |
| 0401225 | Surveying Lab  | 1 | Pre/Co: 0401222                          |
| 0401233 | Materials for Civil Engineers                                | 3 | 1420101; Pre/Co:<br>0401202;<br>1430117; |
| 0401234 | Materials for Civil Engineers Lab                            | 1 | Pre/Co: 401233                           |
| 0401243 | Dynamics   | 3 | 0401201                                  |
| 0401310 | Structural Analysis  | 3 | 0401202                                  |
| 0401315 | Reinforced Concrete Design I                                 | 3 | 0401310;<br>0401233                      |
| 0401321 | Transportation Engineering                                   | 3 | 0401222;<br>0401243;                     |
| 0401343 | Fluid Mechanics  | 3 | 0401243                                  |
| 0401344 | Fluid Mechanics Laboratory                                   | 1 | Pre/Co: 0401343                          |
| 0401345 | Introduction to Environmental Engineering                    | 3 | 1420101                                  |
| 0401346 | Introduction to Environmental Engineering Laboratory         | 1 | Pre/Co: 0401345                          |
| 0401351 | Geotechnical Engineering                                     | 3 | 0401202; Co:<br>0401355                  |
| 0401355 | Geotechnical Engineering Laboratory                          | 1 | Pre/Co: 0401351                          |
| 0401358 | Foundation Engineering I                                     | 3 | 0401351;<br>Pre/Co:0401315               |
| 0401445 | Hydraulic Engineering & Design                               | 3 | 0401343; Pre/Co:<br>0401305              |
| 0401305 | Computational Methods in Civil Engineering                   | 3 | 1440261;<br>Pre/Co:1411113               |
| 0401437 | Construction Engineering                                     | 3 | Pre/Co: 0401315                          |
| 0401496 | Professional Practice in Civil and Environmental Engineering | 2 | 4th Year Standing                        |
| 0401448 | Water and Wastewater Treatment                               | 3 | 0401345                                  |
| 0401426 | Highway Design   | 3 | 0401321                                  |

|              |                                  |           |                               |
|--------------|----------------------------------|-----------|-------------------------------|
| 0401418      | Steel Design                     | 3         | Pre: 0401310                  |
| 0401425      | Pavement Design                  | 3         | Pre: 0401233                  |
| 0401498      | Senior Design Project I          | 1         | 4th Year Standing;<br>0202207 |
| 0401499      | Senior Design Project II         | 3         | 0401498                       |
| 0401493      | Environmental Outreach Project** | 0         | None                          |
| <b>Total</b> |                                  | <b>79</b> |                               |

\* A minimum grade of C is required.

\*\* The course is required for environmental concentration program.

### B. Electives Courses

The CEE Department offers several electives and special studies in the various civil engineering sub-disciplines. The elective courses are designed to provide students with advanced knowledge and skills in the multiple areas of civil engineering. Students can generally register for these courses in the final year after completing the proper pre- requisite courses, typically offered during the third year in the Program. The unique study courses provide the flexibility to further develop unique skills and explore the state-of-the-art civil engineering.

The following are the Department Elective Requirements in the BSCE Program:

| Course #                          | Course Title                                 | CrHrs | Prerequisites                     |
|-----------------------------------|--|-------|-----------------------------------|
| <b>Structural Engineering</b>     |  |       |                                   |
| 0401413                           | Advanced Structural Analysis and Design      | 3     | 0401315                           |
| 0401414                           | Reinforced Concrete Design II                | 3     | 0401315                           |
| 0401416                           | Pre-stressed Concrete Design                 | 3     | 0401315                           |
| 0401472                           | Analysis and Design for Lateral Loads        | 3     | 0401315                           |
| 0401461                           | Special Topics in Structural Engineering     | 3     | 0401310                           |
| 0401471                           | Dynamics of Structures                       | 3     | 0401310; Pre/Co: 0401305; 1411113 |
| <b>Transportation Engineering</b> |  |       |                                   |
| 0401427                           | Traffic Systems Design                       | 3     | 0401321                           |
| 0401428                           | Transportation and the Environment           | 3     | 0401321; 0401345                  |
| 0401462                           | Special Topics in Transportation Engineering | 3     | 0401321                           |
| <b>Construction Engineering</b>   |  |       |                                   |

|  |   |   |                           |
|--|---|---|---------------------------|
| 0401435                                  | Specifications and Quantity Surveying           | 3 | Pre/Co: 0401315;0401358   |
| 0401463                                  | Special Topics in Construction Engineering      | 3 | 0401437                   |
| 0401439                                  | Construction Site Safety and Quality Management | 3 | 0401437                   |
| <b>Water / Environmental Engineering</b> |   |   |                           |
| 0401447                                  | Water Resources Engineering                     | 3 | 0401446                   |
| 0401443                                  | Solid and Hazardous Waste Management            | 3 | 0401345                   |
| 0401444                                  | Coastal Engineering                             | 3 | 0401446; 1440261          |
| 0401466                                  | Special Topics in Water Resources Engineering   | 3 | 0401343                   |
| 0401467                                  | Special Topics in Environmental Engineering     | 3 | 0401345                   |
| 0401458                                  | Remote Sensing of the Environment               | 3 | 0401222; 0401345          |
| <b>Geotechnical Engineering</b>          |   |   |                           |
| 0401450                                  | Foundation Engineering II                       | 3 | 0401358                   |
| 0401457                                  | Slopes and Embankments                          | 3 | 0401351                   |
| 0401452                                  | Geotechnical Engineering II                     | 3 | 0401351                   |
| 0401451                                  | Introduction to Geo-Environmental Engineering   | 3 | 0401345; 0401351; 0401343 |
| 0401465                                  | Special Topics in Geotechnical Engineering      | 3 | 0401351                   |
| <b>Civil Engineering</b>                 |   |   |                           |
| 0401460                                  | Special Topics in Civil Engineering             | 3 | Topics Dependent          |
| 0401429                                  | Introduction to GIS for Civil Engineers         | 3 | 0401222; 1411113          |
| 0401494                                  | Sustainable Design and Construction             | 3 | 0401345; 0401321; 0401315 |

### Environmental Engineering Concentration

Students who want to pursue the CE Program with a concentration in environmental engineering must complete the requirements described below.

- 1) Must complete one elective course from the environmental engineering list of courses below.
- 2) The senior design project must be in the environmental engineering area. CE Program students can choose projects in any area, including environmental engineering. However, students wishing to pursue the concentration have no choice but to do a project in the environmental engineering area, or their projects must contain substantial environmental considerations.
- 3) Must take 0401493 - Environmental Outreach Project course. This course requires compiling a portfolio of creative works/activities done by the student to help advance environmental/sustainability knowledge and awareness. The course is equivalent to 1 credit in terms of workload.

| Course # | Course Title                         | CrHrs | Prerequisites      |
|----------|--------------------------------------|-------|--------------------|
| 0401447  | Water Resources Engineering          | 3     | 0401445            |
| 0401449  | Solid and Hazardous Waste Management | 3     | 0401345<br>0401321 |

| Course # | Course Title                                  | CrHrs | Prerequisites             |
|----------|---|-------|---------------------------|
| 0401494  | Sustainable Design and Construction           | 3     | 0401345; 0401321; 0401315 |
| 0401451  | Introduction to Geo-Environmental Engineering | 3     | 0401345; 0401351 0401343  |
| 0401428  | Transportation and the Environment            | 3     | 0401345; 0401321          |
| 0401444  | Coastal Engineering                           | 3     | 0401445                   |
| 0401466  | Special Topics in Water Resources Engineering | 3     | 0401343                   |
| 0401467  | Special Topics in Environmental Engineering   | 3     | 0401345                   |
| 0401458  | Remote Sensing of the Environment             | 3     | 0401222; 0401345          |

### Study Plan

The Bachelor of Science in Civil Engineering Program encompasses 135 credit hours spread over eight semesters and can typically be completed in four years. The following study plan serves as a roadmap for a smooth progression towards graduation.

| Year 1, Semester 1 (17 Credits) |   |       |   |
|---------------------------------|---|-------|---|
| Course #                        | Title   | CrHrs | Prerequisites   |
| 0401100                         | Introduction to Civil & Environmental Engineering | 1     | None  |
| 0104100                         | Islamic Culture                                   | 3     | None  |
| 0202112                         | English for Academic Purposes                     | 3     | None  |
| 0201102                         | Arabic Language                                   | 3     | None  |
| 1440133                         | Calculus I for Engineers                          | 3     | Meet the Emirates Standard Test (EMSAT) score (900) OR 1440098                  |
| 1430115                         | Physics I   | 3     | Meet the Emirates Standard Test (EMSAT) score (800) OR 1430106; Pre/Co: 1440133 |
| 1430116                         | Physics I Laboratory                              | 1     | Pre/Co: 1430115   |

| Year 1, Semester 2 (19 Credits) |                           |       |                  |
|---------------------------------|---------------------------|-------|------------------|
| Course #                        | Title                     | CrHrs | Prerequisites    |
| 0401102                         | Engineering Drawing       | 2     | Pre/Co: 0401100  |
| 0401201                         | Statics <sup>2</sup>      | 3     | 1430115          |
| 1430117                         | Physics II                | 3     | 1430115; 1430116 |
| 1440161                         | Calculus II for Engineers | 3     | 1440133          |
| 1420101                         | General Chemistry I       | 3     | None             |
| 1420102                         | General Chemistry I Lab   | 1     | 1420101          |
| 1501100                         | Intro to IT               | 3     |                  |

| Year 2, Semester 1 (18 Credits) |                                      |       |                      |
|---------------------------------|--------------------------------------|-------|----------------------|
| Course #                        | Title                                | CrHrs | Prerequisites        |
| 1450103                         | Ecology                              | 3     | None                 |
| 0401202                         | Mechanics of Materials <sup>2</sup>  | 3     | Pre/Co:0401201       |
| 0401243                         | Dynamics                             | 3     | 0401201              |
| 1501113                         | Programming for Engineers            | 3     | None                 |
| 1440261                         | Differential Equations for Engineers | 3     | 1440161              |
| 0401222                         | Surveying                            | 2     | 0401102; Co: 0401225 |
| 0401225                         | Surveying Lab                        | 1     | Pre/Co: 0401222      |

| Year 2, Semester 2 (17 Credits) |  |       |  |
|---------------------------------|--|-------|--|
| Course #                        | Title                                      | CrHrs | Prerequisites                                  |
| 1440281                         | Introduction to Probability and Statistics | 3     | 1440133  |
| 0401305                         | Computational Methods in Civil Engineering | 3     | 1440261; Pre/Co: 1411113                       |
| 0401310                         | Structural Analysis                        | 3     | 0401202  |
| 0401233                         | Materials for Civil Engineering            | 3     | 1420101; Pre/Co: 0401202, 1430117; Co: 0401234 |
| 0401234                         | Materials for Civil Engineering Lab        | 1     | Pre/Co: 401233                                 |
| 0401343                         | Fluid Mechanics                            | 3     | 0401201, 1440261; Pre/Co: 0401241              |
| 0401344                         | Fluid Mechanics Lab                        | 1     | Pre/Co: 0401343, 1440161                       |

| Year 3, Semester 1 (17 Credits) |   |       |                               |
|---------------------------------|---|-------|-------------------------------|
| Course #                        | Title   | CrHrs | Prerequisites                 |
| 0401321                         | Transportation Engineering                    | 3     | 0401222; Pre/Co: 1440281      |
| 0401345                         | Introduction to Environmental Engineering     | 3     | 1420101                       |
| 0401346                         | Introduction to Environmental Engineering Lab | 1     | Pre/Co: 0401345               |
| 0401351                         | Geotechnical Engineering                      | 3     | 0401202, 0401344; Co: 0401355 |
| 0401355                         | Geotechnical Engineering Lab                  | 1     | Pre/Co: 0401351               |
| 0401301                         | Engineering Economics                         | 3     | 3 <sup>rd</sup> year standing |
| 0401445                         | Hydraulic Engineering & Design                | 3     | 0401343; Pre/Co: 0401305      |

| Year 3, Semester 2 (18 Credits) |                               |       |                             |
|---------------------------------|-------------------------------|-------|-----------------------------|
| Course #                        | Title                         | CrHrs | Prerequisites               |
| 0401426                         | Highway Design                | 3     | 0401321                     |
| 0302200                         | Fund. of Innovation & Entrep. | 3     | None                        |
| 0401358                         | Foundation Engineering I      | 3     | 0401351;<br>Pre/Co: 0401315 |
| 0401315                         | Reinforced Concrete Design I  | 3     | 0401310; 0401233            |
| 0401437                         | Construction Engineering      | 3     | Pre/Co: 0401315             |
| 0202207                         | Technical Writing             | 3     | 0202112                     |

| Summer Session |  |       |                   |
|----------------|--|-------|-------------------|
| Course #       | Title  | CrHrs | Prerequisites     |
| 0400490        | Practical Training (at least 240 hours within 6-8 weeks) | 0     | 4th Year Standing |

| Year 4, Semester 1 (16 Credits) |                                  |       |                               |
|---------------------------------|----------------------------------|-------|-------------------------------|
| Course #                        | Title                            | CrHrs | Prerequisites                 |
| 0401498                         | Senior Design Project I          | 1     | 4th Year Standing;<br>0202207 |
| 04014xx                         | Department Elective 1            | 3     | depends on the elective       |
|                                 | University Elective 1 (Domain 4) | 3     | None                          |
| 0401448                         | Water and Wastewater Treatment   | 3     | 0401345                       |
| 0401418                         | Steel Design                     | 3     | 0401310                       |
| 0401425                         | Pavement Design                  | 3     | 0401321,0401351,<br>0401355   |

| Year 4, Semester 2 (14 Credits) |   |       |                         |
|---------------------------------|---|-------|-------------------------|
| Course #                        | Title   | CrHrs | Prerequisites           |
|                                 | University Elective 2 (Domain 5)  | 3     | None                    |
|                                 | University Elective 3 (Replaced by 0204102 UAE Society effective Fall 2021) | 3     | None                    |
| 0401493                         | Environmental Outreach Project <sup>1</sup>                                 | 0     | None                    |
| 0401493                         | Professional Practice in Civil  | 2     | 4th Year Standing       |
| 04014xx                         | Department Elective 2   | 3     | depends on the elective |
| 0401499                         | Senior Design Project II  | 3     | 0401498                 |

1 The course is required for the environmental concentration program.

2 A minimum grade of C or higher is required for graduation.



## Course Description

### A. Mandatory Courses

|   |   |         |
|---|---|---------|
| 0401100   | Introduction to Civil and Environmental Engineering | (0-1:3) |
| Introduction to Civil and Environmental Engineering. Introduction to Engineering Design (Design Process and Working in Teams). Technical Communication Skills (Written and Oral). Introduction to Problem Solving in Engineering. Introduction to Engineering Ethics and Professionalism (Engineer's Code of Ethics with Cases and Engineer's Creed). Introduction to management and leadership skills and public policy.<br><b>Prerequisite:</b> None.             |   |         |
| 0401102   | Engineering Drawing                                 | (0-6:2) |
| Introduction to engineering drawing, Scales, Dimensioning, Types of lines, Construction geometry, Theory of Orthographic Projection, Pictorial drawing, Sections, and Introduction to Computer-Aided Drafting (AutoCAD).<br><b>Prerequisite:</b> Pre/Co: 0401100 - Introduction to Civil and Environmental Engineering.   |   |         |
| 0401201   | Statics   | (3-0:3) |
| Knowledge and understanding vector resultant of forces in two and three dimensions; type of structural supports; equilibrium of particles and rigid bodies; analysis of internal forces in beams and trusses; static and kinetic friction; centroids of lines, areas, and volumes; moments of inertia.<br><b>Prerequisite:</b> 1430115 - Physics I.   |   |         |
| 0401202   | Mechanics of Materials                              | (3-0:3) |
| Simple states of stress and strain; Hook's law; torsional stresses; axial deformation; internal forces in beams; bending and shearing diagrams and stresses; beam design; stress transformation; thin-walled pressure vessels; beam deflection, lab session, and experiments.<br><b>Prerequisite:</b> Pre/Co: 0401201 - Statics.  |   |         |
| 0401222   | Surveying   | (2-0:2) |
| An introductory overview of the theory and practice of surveying, surveying instruments, and measurement and computations techniques related to field problems, with emphasis on leveling and traversing; introduction to the theory and applications of Global Positioning System (GPS). Students must register 0401225 Field Surveying when registering for this course.<br><b>Prerequisite:</b> 0401102 - Engineering Drawing; Co: 0401225-Surveying Laboratory. |   |         |
| 0401225   | Surveying Laboratory                                | (0-3:1) |
| Use of various surveying instruments, field measurements, and processing of field surveying data. Students must register for this course when registering for 0401222 Surveying.<br><b>Prerequisite:</b> Pre/Co: 0401222 - Surveying  |   |         |

|   |   |         |
|---|---|---------|
| 0401233   | <b>Materials for Civil Engineers</b>            | (3-0:3) |
| <p>Material for Civil Engineering Course covers the fundamentals and applications of civil engineering materials. The course includes an introduction of relationships between composition and microstructure; correlation with physical and mechanical behavior of metals, ceramic, and polymers; manufacturing, types, and properties of steel and corrosion; properties and types of cement and aggregates, hydration, mix design, properties of fresh and hardened concrete; manufacturing, types, and properties of asphalt, aggregate, asphalt mix, and mix design; types, defects, and properties of wood; and types and properties of composite materials.</p> <p><b>Prerequisite:</b> 1420101 - General Chemistry I; Co: 0401234 - Materials for Civil Engineers Laboratory; Pre/Co: 0401202 - Mechanics of Materials; 1430117 - Physics II.</p> |   |         |
| 0401234   | <b>Materials for Civil Engineers Laboratory</b> | (0-3:1) |
| <p>Experiments on physical properties and behavior of aggregates, cement, fresh concrete, hardened concrete, mix design, steel, and timber.</p> <p><b>Prerequisite:</b> Pre/Co: 0401233 - Materials for Civil Engineers.</p>  |   |         |
| 0401243   | <b>Dynamics</b>                                 | (3-0:3) |
| <p>Introduction and fundamental principles, the basic theory of engineering mechanics, using calculus, involving the motion of particles and systems of particles; Newton's Laws; work and energy relationships; principles of impulse and momentum; application of kinetics and kinematics to the solution of engineering problems; vibration problems.</p> <p><b>Prerequisite:</b> 0401201 - Statics.</p>   |   |         |
| 0401310   | <b>Structural Analysis</b>                      | (3-0:3) |
| <p>This course covers the basic principles and methods of structural analysis. Topics include classification of structures and loads; computing internal forces and deformation in determinate structures using geometric and energy methods; force method of analysis; slope-deflection equations; moment distribution method; stiffness method for trusses, beams, and frames; influence lines for determinate and indeterminate structures. Specialized computer programs for analyzing structures will be introduced well.</p> <p><b>Prerequisite:</b> 0401202 - Mechanics of Materials.</p>  |   |         |
| 0401321   | <b>Transportation Engineering</b>               | (3-0:3) |
| <p>Intro to transportation engineering; transportation systems and components; human, operational, and vehicular characteristics; basic transportation planning and travel demand forecasting; traffic studies; traffic flow characteristics and models; highway capacity and level of service analysis.</p> <p><b>Prerequisite:</b> 0401222 - Surveying; 0401243 - Dynamics; Pre/Co: 1440281 - Introduction Probability and Statistics</p>   |   |         |

|  |                 |         |
|--|-----------------|---------|
| 0401343  | Fluid Mechanics | (3-0:3) |
| <p>The course provides students with basic information on statics, kinematics, and dynamics of fluids. These include the study of Properties of fluids, Fluid statics, Translation and rotation of fluid masses, and Dimensional analysis and similitude; Fundamentals of fluid flow; Fluid resistance; Compressible flow; Ideal fluid flow; Fluid measurements.</p> <p><b>Prerequisite:</b> 0401201 – Statics, 1440261-Differential equations for Engineers<br/>Pre/Co: 0401243 - Dynamics.</p> |                 |         |

|   |                            |         |
|---|----------------------------|---------|
| 0401344   | Fluid Mechanics Laboratory | (0-3:1) |
| <p>Determination of fluid properties (density, pressure, surface tension, viscosity, capillarity); Measurement of hydrostatic forces; Verifying Bernoulli's theorem; Flow measurements, Measurements of free and forced vortex profiles; Calibration of pressure gauges.</p> <p><b>Prerequisite:</b> Pre/Co:1440161 Calculus II for Engineering; Pre/Co: 0401343 - Fluid Mechanics.</p> |                            |         |

|  |   |         |
|--|---|---------|
| 0401345  | Introduction to Environmental Engineering | (3-0:3) |
| <p>This course introduces students to basic principles in environmental science and engineering and the relevance of these principles to the area of civil engineering. The course provides students with an understanding of the challenges imposed on the environment due to human activity and the role of environmental engineering in dealing with such challenges. The topics include the study of relevant principles in ecology, chemistry, microbiology, environmental quality and pollution, pollution control systems and technologies, and the impacts of development on the environment.</p> <p><b>Prerequisite:</b> 1420101 - General Chemistry I.</p> |   |         |

|   |  |         |
|---|--|---------|
| 0401346   | Introduction to Environmental Engineering Laboratory | (0-3:1) |
| <p>This course complements the theoretical principles in (0401345 Introduction to Environmental Engineering) by introducing students to environmental quality analysis and unit operations in environmental engineering. The environmental analysis component aims to assess the quality and pollution of water, air, and soil, emphasizing water quality and pollution of water, air, and soil, emphasizing water quality and pollution of water, air, and soil, emphasizing water quality and pollution. The experiments include the operation of selected pollution control processes.</p> <p><b>Prerequisite:</b> Pre/Co 0401345 - Introduction to Environmental Engineering.</p> |  |         |

|  |                          |         |
|--|--------------------------|---------|
| 0401351  | Geotechnical Engineering | (3-0:3) |
| <p>The soil in Engineering; Soil related to in-situ problems; Soil formation; subsurface exploration; Types of soils; Grain Size Distribution; Soil Classification; Physical and Index Properties; Compaction; Permeability and Seepage. Stresses in soils; Consolidation and Expansion of clays; Shear strength of soils; Lateral Earth Pressure; Slope Stability.</p> <p><b>Prerequisite:</b> 0401202 - Mechanics of Materials; 0401344 Fluid Mechanics; Co: 0401355 - Geotechnical Engineering Lab.</p> |                          |         |

|  |                                     |         |
|--|-------------------------------------|---------|
| 0401355  | Geotechnical Engineering Laboratory | (0-3:1) |
| <p>Soil Description and Identification, Moisture Content, Sieves, and Hydrometer Analysis; Atterberg Limits (Liquid, Plastic, and Shrinkage Limits); Compaction; Permeability tests (constant and falling head); Consolidation; Swell test; Direct Shear; Unconfined Compression test; Triaxial Compression test.</p> <p><b>Prerequisite:</b> Pre/Co 0401351 - Geotechnical Engineering.</p> |                                     |         |

|  |   |                |
|--|---|----------------|
| 0401315  | <b>Reinforced Concrete Design I</b>               | <b>(3-0:3)</b> |
| <p>Materials and mechanical properties of reinforced concrete; the Code and specifications; analysis and design of various-shaped - sections for flexure by the ultimate strength methods; shear and diagonal tension; bond and anchorage of reinforcement; edge-supported slabs; columns under axial and bending; continuous beams; two-way slabs, detailing of reinforced concrete structures; design sessions, and computer applications.</p> <p><b>Prerequisite:</b> 0401310 – Structural Analysis; 0401233 – Materials for Civil Engineering.</p>   |   |                |
| 0401358  | <b>Foundation Engineering I</b>                   | <b>(3-0:3)</b> |
| <p>Subsurface exploration; Load transfer; types of foundations; bearing capacity; settlement: immediate and consolidations; tilting; design and analysis of spread footings: square, rectangular, circular, and continuous with concentric and eccentric loads; rectangular combined footings; cantilever walls; Pile foundations: load-bearing capacity, settlement, and efficiency of pile groups.</p> <p><b>Prerequisite:</b> 0401351 - Geotechnical Engineering; Pre/Co: 0401315 - Reinforced Concrete Design I.</p>   |   |                |
| 0401305  | <b>Computational Methods in Civil Engineering</b> | <b>(3-0:3)</b> |
| <p>The course introduces students to computational methods of solving civil engineering problems. Topics covered include systems of linear equations; matrix problems; eigen problems and their applications to stability of structures and structural systems; singular-value decomposition with applications to civil engineering problems; numerical solution of linear and nonlinear algebraic equations; regression analysis and its application to civil engineering data; introduction to sensitivity analysis; numerical integration and differentiation; numerical solution of ordinary differential equations with applications to statics and dynamics systems; introduction to optimization and its use in civil engineering problems. The course consists of a series of lectures incorporating hands-on computer training sessions.</p> <p><b>Prerequisite:</b> 1440261 - Differential Equations for Engineers; Pre/Co: 1501113 – Programming for Engineers.</p> |   |                |
| 0401445  | <b>Hydraulic Engineering &amp; Design</b>         | <b>(3-0:3)</b> |
| <p>Application of hydraulic engineering principles to the design of water and wastewater systems and their components. The course will cover the design of water distribution systems, turbomachines, open channel systems, weirs, culverts, and/or flood detention basins.</p> <p><b>Prerequisite:</b> 0401343 - Fluid Mechanics; Pre/Co: 0401305 - Computational Methods in Civil Engineering.</p>   |   |                |
| 0401437  | <b>Construction Engineering</b>                   | <b>(3-0:3)</b> |
| <p>Construction methods and processes, equipment, earthmoving, excavation, and concrete production phases of civil engineering construction projects. Management methods and techniques, network diagrams, estimating, tendering, planning, and scheduling. Professional responsibility and engineering ethics. Productivity, quality, health, and safety issues.</p> <p><b>Prerequisite:</b> Pre/Co: 0401315 - Reinforced Concrete Design I.</p>  |   |                |

|   |                                |         |
|---|--------------------------------|---------|
| 0401426   | Highway Design                 | (3-0:3) |
| Planning, geometric, location, and design of urban and rural highway systems including; geometric design concepts; geometric design controls and criteria; geometric design elements: horizontal alignment, vertical alignment, and cross sectionals alignment; intersection geometric design controls; at-grade intersection design and channelization.<br><b>Prerequisite:</b> 0401321 - Transportation Engineering.  |                                |         |
| 0401418   | Steel Design                   | (3-0:3) |
| Design of steel tension members; beams; beam-columns; connections; elastic and plastic methods; design applications.<br><b>Prerequisite:</b> 0401310 - Structural Analysis.   |                                |         |
| 0401425   | Pavement Design                | (3-0:3) |
| Pavement design processes; materials selection and characterization methods; design of flexible pavements; design of rigid concrete pavements; design of overlays; road drainage system; and computer applications.<br><b>Prerequisite:</b> 0401321 - Transportation Engineering, 0401351- Geotechnical Engineering, 0401355- Geotechnical Engineering Lab  |                                |         |
| 0401448   | Water and Wastewater Treatment | (3-0:3) |
| This course is focused on water and wastewater treatment engineering. Topics include water and wastewater pollutants and characterization; water quality and impacts of pollutants; principles of physiochemical and biological treatment of water and wastewater; preliminary design of selected water and wastewater treatment processes; integration of treatment processes into the water and wastewater treatment plants; wastewater reuse and disposal options; treatment residues management options.<br><b>Prerequisite:</b> 0401345 - Introduction to Environmental Engineering. |                                |         |
| 0401493   | Environmental Outreach Project | (0-2:0) |
| This course requires students to work individually and/or in teams on their own choice of environmental project activities involving providing services to the community, participation in environmental activities and functions, presenting seminars, exhibiting relevant materials, and/or preparing informative websites and newsletters. Students will be required to submit individual portfolios documenting their activities and efforts.<br><b>Prerequisite:</b> Enrollment in the Environmental Engineering Concentration.  |                                |         |

|  |  |         |
|--|--|---------|
| 0401496  | Professional Practice in Civil and Environmental Engineering | (2-0:2) |
| <p>This course covers various professional and non-technical issues pertaining to civil engineering practice. The topics covered include work and careers of civil engineers; consequences of civil engineering; importance and requirements of professional licensure; management concepts for civil engineers; contemporary issues and engineering practice; leadership in civil engineering practice; life-long learning in modern engineering practice; concepts in business and public policy for civil engineers; communication skills for practicing engineers; and professional responsibilities and ethics. Guest speakers will be invited to address various issues relevant to Civil Engineering Practice. Students will generally be required to learn independently, with guidance provided by the course coordinator.</p> <p><b>Prerequisite:</b> 4th year standing.</p> |  |         |
| 0401498  | Senior Design Project I                                      | (1-0:1) |
| <p>SDP1 is a comprehensive design experience. A group of students working as a team, under the supervision of faculty members, are required to complete a major civil engineering design project. The team must prepare a proposal, develop a work plan, acquire data, conduct preliminary design and feasibility studies, and evaluate alternatives in preparation for Senior Design Project II. Teams are also required to submit and present technical progress reports.</p> <p><b>Prerequisites:</b> 0202207- Technical Writing, 4th year standing.</p>  |  |         |
| 0401499  | Senior Design Project II                                     | (3-0:3) |
| <p>In continuation of Senior Design Project I, the teams work out a complete analysis and design of their project. Each student in the team is expected to handle a specific project task and coordinate his/her work with the rest of the group. Each team must submit its preliminary design with all necessary documents and drawings. The team is also required to give a final public presentation.</p> <p><b>Prerequisite:</b> 0401498 - Senior Design Project 1.</p>  |  |         |
| 0401490  | Practical Training   | (0-0:0) |
| <p>Six to eight weeks and a minimum of 240 hours of field practical training. The purpose of this training is to introduce students firsthand to local and regional practices in the area of specialization. Further, it exposes students to possible career opportunities. Upon completion, students are required to submit a technical report to the training supervisor</p> <p><b>Prerequisite:</b> 4th year standing.</p>  |  |         |

## B. Elective Courses

The list of elective courses in the various Civil Engineering areas is described below.

|   |   |         |
|---|---|---------|
| 0401413   | Advanced Structural Analysis and Design | (3-0:3) |
| <p>This course introduces topics based on the recent developments and advances in structural engineering. It includes topics related to the analysis and design of structural systems through the use of computers. Emphasis will be placed on available computer software used in the industry, such as SAP, SAFE, ETABS, and STADPRO.</p> <p><b>Prerequisite:</b> 0401315 - Reinforced Concrete Design I.</p> |   |         |

|  |  |                |
|--|--|----------------|
| <b>0401414</b>   | <b>Reinforced Concrete Design 2</b>          | <b>(3-0:3)</b> |
| Working stress and ultimate design methods; crack and deflection control provisions; continuous beams, analysis and design of two-way slab systems; design of short and slender columns; computer applications.<br><b>Prerequisite:</b> 0401315 - Reinforced Concrete Design I   |  |                |
| <b>0401416</b>   | <b>Pre-stressed Concrete Design</b>          | <b>(3-0:3)</b> |
| Principles and methods of prestressing; stress computation and prestress loss estimation, structural design philosophy; Flexure: working stress and ultimate strength analysis and design, design for shear and torsion; deflection computation and control; analysis and design of composite beams and continuous beams; application of prestressed concrete in bridges.<br><b>Prerequisite:</b> 0401315 - Reinforced Concrete Design I.  |  |                |
| <b>0401471</b>   | <b>Dynamics of Structures</b>                | <b>(3-0:3)</b> |
| This course covers the dynamic response of single degrees of freedom (SDOF) systems and multiple degrees of freedom (MDOF) systems. Topics include free and forced vibration of undamped and damped structures; numerical solution techniques to the equations of motion; earthquake analysis of linear systems. Applications to the study of buildings are introduced using computer programs. Lab experiments involve the dynamic test of a few structures.<br><b>Prerequisite:</b> 0401310 - Structural Analysis; Pre/Co: 0401305 - Structural Analysis; 1501113 - Programming for Engineers. |  |                |
| <b>0401472</b>   | <b>Analysis and Design for Lateral Loads</b> | <b>(3-0:3)</b> |
| Introduces basic principles of horizontal loads and their effect on the building, covering both wind and earthquake loads. Static analysis of wind and earthquake loads using relevant codes. Introduces lateral load resisting systems such as shear walls and frames; selection of the structural system, design of structural system components based on current code design provisions. Emphasizes the use of computers in analysis and design for lateral loads.<br><b>Prerequisite:</b> 0401315 - Reinforced Concrete Design I.  |  |                |
| <b>0401427</b>   | <b>Traffic Systems Design</b>                | <b>(3-0:3)</b> |
| Traffic flow characteristics and modeling; traffic control devices; intersection traffic control; warrant analysis; basics of signal timing and design; delay models and level of service; specialized optimization and simulation traffic software.<br><b>Prerequisite:</b> 0401321 - Transportation Engineering.   |  |                |
| <b>0401428</b>   | <b>Transportation and Environment</b>        | <b>(3-0:3)</b> |
| This is a project-based course that covers the impacts of transportation on the environment, including air quality issues, noise pollution issues, hazardous materials issues, land use issues; water pollution and wetlands issues; and related environmental issues. The course will also introduce travel demand forecasting as the primary tool in transportation planning.<br><b>Prerequisite:</b> 0401321 - Transportation Engineering; 0401345 - Introduction to Environmental Engineering  |  |                |

|   |   |         |
|---|---|---------|
| 0401429   | Introduction to GIS for Civil Engineers | (2-2:3) |
| <p>This course is designed to introduce Geographical Information Systems (GIS) for civil engineering students. It introduces students to the concepts and fundamentals of GIS regarding a diverse range of applications in civil engineering. Topics covered include GIS definitions and history, components of GIS, data types and formats, geographic referencing frameworks, data capture techniques, and analysis methods. The course will allow students to develop skills to capture and analyze spatially referenced data and communicate results obtained using GIS. The course includes a lab for hands-on training with GIS software.</p> <p><b>Prerequisite:</b> 0401222 – Surveying; 1501113 - Programming for Engineers.</p> |   |         |

|   |                                       |         |
|---|---------------------------------------|---------|
| 0401435   | Specifications and Quantity Surveying | (3-0:3) |
| <p>Introduction; types and documents of tenders; types of construction contracts; bonds and insurance requirements; International general conditions and obligations of construction contracts; preparation of specifications; project cost components, cost estimation; overheads, quantity surveying and bill of quantities; earthwork estimation, concrete, and steel work estimation.</p> <p><b>Prerequisites:</b> Pre/Co: 0401315 - Reinforced Concrete Design 1; 0401358 - Foundation Engineering</p> |                                       |         |

|   |   |         |
|---|---|---------|
| 0401439   | Construction Site Safety and Quality Management | (3-0:3) |
| <p>Construction Safety before the Work Commences; Construction Safety Process Key Components; Legal Aspects and standards In Construction Safety; Technical Issues in Construction Safety; Other Considerations. Introduction to Construction Quality Management, Application of Total Quality Management (TQM) in Construction, Cost of Total Quality, Management and Technical Tools for Quality in Construction projects, Introduction to Quality Standards, Principles, and Procedures.</p> <p><b>Prerequisite:</b> Pre/Co: 0401437 – Construction Engineering.</p> |   |         |

|  |                                      |         |
|--|--------------------------------------|---------|
| 0401443  | Solid and Hazardous Waste Management | (3-0:3) |
| <p>The course introduces students to solid and hazardous waste management, the risk to human health and the environment, and applications of these principles in professional practice. The course covers various aspects of solid and hazardous waste management, including characterization, transport, management strategies, treatment, technologies, and disposal. The course includes material for developing skills in planning, assessment, investigation, and design of waste management projects.</p> <p><b>Prerequisite:</b> 0401345 - Introduction to Environmental Engineering.</p> |                                      |         |

|   |                     |         |
|---|---------------------|---------|
| 0401444   | Coastal Engineering | (3-0:3) |
| <p>This course aims at conveying basic knowledge about coastal processes and management strategies. It will familiarize students with wave theories, the beach evolution process, coastal protection structures, and coastal zone management strategies for sustainable beaches.</p> <p><b>Prerequisite:</b> 0401445 - Hydraulic Engineering &amp; Design, 1440261- Differential equations for Engineers.</p> |                     |         |



|  |                             |         |
|--|-----------------------------|---------|
| 0401447  | Water Resources Engineering | (3-0:3) |
| <p>It intends to provide a basic background for the planning and designing systems to manage water resources. Concepts of hydrology, hydraulics, geology, and economics are introduced in a unified framework. They emphasize why and how things are done.</p> <p><b>Prerequisite:</b> 0401445 - Hydraulic Engineering &amp; Design, Introduction to Probability and Statistics.</p> |                             |         |

|  |                                   |         |
|--|-----------------------------------|---------|
| 0401449  | Remote Sensing of the Environment | (3-0:3) |
| <p>This course is designed to expose students to principles of remote sensing, photogrammetry, image interpretation, and their applications in natural resource management and environmental monitoring. The first part of the course will cover the remote sensing principles and techniques to acquire, enhance, interpret and analyze remote sensing imagery using visual and computer-based methods. The second part of the course will focus on applying remote sensing imagery and data, specifically Multispectral, Thermal Infrared, and LiDAR (Light Detection and Ranging) for wetlands, watersheds, pollution, environmental monitoring, and land use planning. Students of this course will come out with a mastery of interpretation, classification, measurement, environmental monitoring, and map- making skills specific to hazards monitoring, hydrology, and land use/land cover. <b>Prerequisite:</b> 0401222 - Surveying.</p> |                                   |         |

|   |                           |         |
|---|---------------------------|---------|
| 0401450   | Foundation Engineering II | (3-0:3) |
| <p>Design trapezoidal footings, Strap footings, Mat foundations, Sheet piles, and anchored sheet pile walls, Braced cuts, Reinforced earth, and Pile foundations. Topics that can also be included (depending on time availability) are the design of foundations on difficult soils (collapsible and expansive soils).</p> <p><b>Prerequisite:</b> 0401358 - Foundation Engineering 1.</p> |                           |         |

|   |   |         |
|---|---|---------|
| 0401451   | Introduction to Geo-Environmental Engineering | (3-0:3) |
| <p>The course covers the investigation, designing, and construction solutions to waste containment and soil and groundwater pollution problems by developing an understanding of the engineering concepts and processes and introducing them to specialist techniques, such as contaminant transport modeling.</p> <p><b>Prerequisite:</b> 0401345 - Introduction to Environmental Engineering; 0401351 - Geotechnical Engineering, 0401343 -Fluid Mechanics, 04014344 -Fluid Mechanics Laboratory.</p> |   |         |

|   |                             |         |
|---|-----------------------------|---------|
| 0401452   | Geotechnical Engineering II | (3-0:3) |
| <p>Nature and origin of soil; Permeability and seepage; stress within a soil mass; stress-strain behavior; shear strength of cohesionless soil; theories of compressibility and consolidation; undrained and drained shear strength of cohesive soil; creep in soft soil.</p> <p><b>Prerequisite:</b> 0401358- Foundation Engineering</p> |                             |         |

|   |                        |         |
|---|------------------------|---------|
| 0401457   | Slopes and Embankments | (3-0:3) |
| Design and analyze earth slopes; the use and application of stability formulae; charts and computer programs. Stability analysis; slope movement, mechanics of slope failure, determination of phreatic surface, and remedial measures for correcting slopes.<br><b>Prerequisite:</b> 0401351 - Geotechnical Engineering. |                        |         |

|   |                |         |
|---|----------------|---------|
| 040146X   | Special Topics | (3-0:3) |
| These courses cover special advanced topics in one of the areas of Civil Engineering. The contents vary depending on the topic.<br><b>Prerequisite:</b> Depends on the topic. |                |         |

|  |                                     |         |
|--|-------------------------------------|---------|
| 0401494  | Sustainable Design and Construction | (3-0:3) |
| This course introduces students to the concept and implications of sustainable development for the practice of design and construction in civil engineering. Two approaches for integrating sustainable design considerations are discussed: life cycle analysis and the US Green Buildings Council (USGBC) Leadership in Energy and Environmental Design (LEED) system. The course is project-based and involves theoretical lectures and teamwork involving applying knowledge of sustainable design and construction to a design project.<br><b>Prerequisites:</b> 0401345 - Introduction to Environmental Engineering; 0401321 - Transportation Engineering; 0401315 - Reinforced Concrete Design I. |                                     |         |

### C. Courses offered for other majors

The Civil Engineering department offers the course described below for students in other engineering majors.

|  |                         |         |
|--|-------------------------|---------|
| 0401142  | Man and the Environment | (3-0:3) |
| The course aims to raise awareness and introduce fundamental environmental engineering and sciences principles. It covers domestic, regional, and global environmental problems; man's relation with the environment and its balancing systems; types of pollution, measurement, and control; consumption of natural resources; waste production, and sustainable development. Students will conduct practical laboratory experiments to develop basic research skills; produce, display, analyze relevant data, and report results. Students are encouraged to volunteer for community activities to improve the environment.<br><b>Prerequisite:</b> None. |                         |         |

## Department of Electrical Engineering (EE)

### Personnel

|                             |  |
|-----------------------------|--|
| <b>Chairperson</b>          | Amr Mohamed Elnadi   |
| <b>Professors</b>           | Soliman Mahmoud, Maamar Bettayeb, Ahmed Al- Shamma'a, Abdul-Kadir Hamid, Ahmad Elsayed Elwakil, Ramesh Bansal, Amr Elnady, Hissam Tawfik, Abir Hussain |
| <b>Associate Professors</b> | Ismail Shahin, Anwar Hasan Jarndal, Sohaib Majzoub, Raouf Fareh  |
| <b>Assistant Professors</b> | Ali Ahmed Adam Ismail, Sofiane Khadraoui, Saeed Abdallah, Khawla Alnajjar, Eqab Almajali, Venkata Chandu, Mahmoud Elbreem,                             |
| <b>Lecturers</b>            | Mahmoud Abu Shammeh  |

### Vision

The department strives to be recognized, within the university and worldwide, of high quality in teaching and learning, research, community, and professional services and to provide highly qualified engineers who can tackle the rapid technological advances by providing innovative solutions.

### Mission

The department is committed to inspiring, educating, and graduating electrical and computer engineers equipped with state-of-the-art knowledge and skills who can contribute to the economic development of the community and have the ability for lifelong learning with the highest commitment to quality, integrity, and respect to others.

### Electrical and Electronics Engineering (EEE) Program

The Electrical and Electronics Engineering program combines the analysis and design of electrical and electronic circuits, mechanisms for automated control of processes, communication systems, signal processing, and electrical power generation and delivery.

Integrating modern science with practical applications is the core of advanced technology, particularly in electrical engineering. Electrical engineers are involved in all areas of today's information society. The advancement in modern technologies - such as the Internet, mobile communication, high-performance computers, power plants, renewable energy, and robotics – was based on applied electrical and electronics engineering principles. Therefore, a modern Electrical and Electronics Engineering curriculum needs to be thoroughly grounded in the founding theories of electrical engineering while being dynamic to accommodate the advancement of the current technologies and the development of new ones.

The curriculum offered by the Department of Electrical and Electronics Engineering teaches sound engineering principles and the ability to apply them to solve problems. This is done by emphasizing practical problem solving, design capability, laboratory work, and team projects. Some flexibility is provided through a choice of departmental electives in the different areas of electrical and electronics engineering.

### Program Educational Goals

The Electrical and Electronics Engineering program's educational goals are:

1. Provide students with quality educational programs consistent with national and international standards and define the department brand.
2. Promote quality research, disseminate knowledge contributing to advancing technology, and prepare graduates to pursue post-graduate studies.
3. Serve as an effective source of engineering expertise and offer professional and continuing educational opportunities, particularly on national and regional needs.

### Student outcomes

Upon successful completion of the B.Sc. EEE program, a student will have:

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. Communicate effectively with a range of audiences.
4. Describe ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. Apply new knowledge as needed, using appropriate learning strategies.

### Career Opportunities

Graduates from the Electrical Engineering program will be prepared to pursue careers in many fields and seek advanced degrees in related fields.

- Utility companies.
- Communications and networking industry.
- Petroleum sectors.
- Aviation industry.
- Power systems industry.
- Control and Automation industry.

### Program Overview

To obtain a Bachelor of Science degree in Electrical and Electronics Engineering, the student must complete 132 credit hours. These hours include University, College, and Departmental requirements. The allocation of the credit hours is shown in the following table:

| BSc in Electrical and Electronics Engineering (132) |    |    |    |       |
|---|----|----|----|-------|
|   | UR | CR | PR | Total |
| Compulsory  | 18 | 26 | 67 | 108   |
| Electives   | 6  | -  | 15 | 24    |
| Total   | 24 | 26 | 82 | 132   |

### I. University Requirements (UR)

Every student must take 24 credit hours of general education courses distributed over seven domains. Eighteen (18) mandatory credit hours are selected from domains 1, 2, 3, and 4, and (6) elective credit hours are selected from domains 5, 6, and 7 as indicated in the University section (General Education).

### II. College Requirements (CR)

The list of the College required courses and their descriptions are presented in the introductory pages of the College of Engineering section in this catalog.

### III. Program Requirements (PR)

#### A. Mandatory Courses

The EEE core courses are listed in the table below.

| Course # | Title  | CrHrs | Prerequisites                      |
|----------|--|-------|------------------------------------|
| 1440262  | Mathematics for Engineers                              | 3     | Pre: 1440161                       |
| 0402100  | Introduction to Electrical and Electronics Engineering | 2     | 1411102<br>Pre/Co:1501100          |
| 0402202  | Circuit Analysis I                                     | 3     | Pre/Co: 1430117<br>Pre/Co: 1440261 |
| 0402203  | Circuit Analysis I Laboratory                          | 1     | Pre/Co: 0402202<br>Pre/Co: 1430118 |
| 0402205  | Circuit Analysis II                                    | 3     | Pre: 0402202                       |
| 0402206  | Circuit Analysis II Laboratory                         | 1     | Pre: 0402203, Pre/Co:<br>0402205   |
| 0402240  | Signals and Systems                                    | 3     | Pre: 0402202                       |
| 0402241  | Random Signal Theory                                   | 3     | Pre/Co: 0402202                    |
| 0402250  | Fundamentals of Electronic Circuits                    | 3     | Pre: 0402202<br>Pre: 1502201       |
| 0402251  | Fundamentals of Electronic Circuits Lab                | 1     | Pre: 0402203<br>Pre/Co: 0402250    |
| 0402310  | Electromechanical Systems                              | 3     | Pre: 0402205                       |
| 0402311  | Electromechanical Systems Lab                          | 1     | Pre: 0402206<br>Pre/Co: 0402310    |
| 0402320  | Field Analysis   | 3     | Pre: 1430117<br>Pre/Co: 1440262    |
| 0402330  | Feedback Control Systems                               | 3     | Pre: 0402240                       |
| 0402331  | Feedback Control Systems Lab                           | 1     | Pre/Co: 0402330                    |
| 0402340  | Engineering Computation & Linear Algebra               | 3     | Pre: 1411116, Pre:<br>1440261      |
| 0402341  | Multimedia Technology Lab                              | 1     | Pre: 0402240                       |
| 0402343  | Random Signal & Systems                                | 3     | Pre: 0402240<br>Pre: 0402241       |
| 0402346  | Telecommunication Systems I                            | 3     | Pre: 0402240<br>Pre: 0402241       |
| 0402347  | Telecommunication Systems I Lab                        | 1     | Pre: 0402346                       |
| 0402353  | Electronic Circuits                                    | 3     | Pre: 0402250                       |
| 0402354  | Electronic Circuits Lab                                | 1     | Pre: 0402251 Pre/Co:               |

|         |   |   |                                    |
|---------|---|---|------------------------------------|
|         |   |   | 0402353                            |
| 0402490 | Practical Training  | 0 | Completion of 90 credits           |
| 0402491 | Senior Design Project I                                   | 1 | Senior Standing, Pre/Co: 0202207   |
| 0402492 | Senior Design Project II                                  | 3 | Pre: 0402491                       |
| 1502201 | Digital Logic Design                                      | 3 | Pre: 1411116                       |
| 1502202 | Digital Logic Design Laboratory                           | 1 | Pre: 1502201                       |
| 1502336 | Microcontroller Based Design                              | 3 | Pre: 1411116<br>Pre: 1502201       |
| 1502337 | Microcontroller Based Design Laboratory                   | 1 | Pre/Co: 1502336<br>Pre/Co: 1502202 |
| 1502300 | Professional, Societal, and Ethical Issues in Engineering | 1 | 3rd Year Standing                  |
| 1430118 | Physics II Laboratory                                     | 1 | Pre: 1430116<br>Pre/Co: 1430117    |
| 1501116 | Programming I   | 4 | None                               |

## B. Elective courses

As part of the Bachelor of Science in Electrical and Electronics Engineering program, the student is required to study 15 credit hours of technical elective courses. These courses allow the student to focus on a specific area for in- depth knowledge and understanding. The student can also mix and match elective courses from different areas to get a more advanced exposure to the other Electrical and Electronics Engineering disciplines. The student should select the list of electives that best meet their needs and aspirations in collaboration with their academic advisor. It is highly recommended that the student registers for these courses after completing all department-required courses. The following table shows the list of elective courses.

| Course # | Title   | CrHrs | Prerequisites                |
|----------|---|-------|------------------------------|
| 0402410  | Power System Analysis                           | 3     | Pre: 0402310                 |
| 0402411  | Electric Power Distribution Systems             | 3     | Pre/Co: 0402310              |
| 0402420  | Microwave Engineering                           | 3     | Pre: 0402320                 |
| 0402421  | Antenna Analysis                                | 3     | Pre: 0402320                 |
| 0402430  | Instrumentation and Measurements                | 3     | Pre: 0402353,<br>Pre:0402240 |
| 0402434  | Digital Control Systems                         | 3     | Pre: 0402330                 |
| 0402436  | Applied Control Engineering                     | 3     | Pre: 0402330                 |
| 0402437  | Programmable Logic Controllers and Applications | 3     | Pre: 1502336 or<br>1502334   |
| 0402442  | Telecommunication Systems II                    | 3     | Pre: 0402346                 |
| 0402444  | Digital Signal Processing                       | 3     | Pre: 0402240                 |
| 0402446  | Cellular Telephony                              | 3     | Pre: 0402346                 |
| 0402447  | Wireless Communication                          | 3     | Pre: 0402346                 |
| 0402448  | Speech Signal Processing and Applications       | 3     | Pre: 0402340 Pre:<br>0402346 |
| 0402449  | Optical Fiber Communication                     | 3     | Pre: 0402250 Pre:<br>0402346 |
| 0402450  | Power Electronics                               | 3     | Pre: 0402353                 |
| 0402452  | Communication Electronics                       | 3     | Pre: 0402353 Pre:<br>0402346 |
| 0402454  | Optoelectronics                                 | 3     | Pre: 0402353                 |

|         |  |   |                 |
|---------|--|---|-----------------|
| 0402455 | Analog Integrated Circuits                               | 3 | Pre: 0402353    |
| 0402460 | Special Topics in Electrical Engineering                 | 3 | 4 Year Standing |
| 0402461 | Special Topics in Control and Automation                 | 3 | Pre: 0402330    |
| 0402462 | Special Topics in Communication Systems                  | 3 | Pre: 0402346    |
| 0402463 | Special Topics in Electronics                            | 3 | Pre: 0402250    |
| 0402464 | Special Topics in Signal and Image Processing            | 3 | Pre: 0402240    |
| 0402493 | Senior Seminar in Electrical and Electronics Engineering | 1 | Senior standing |
| 0402415 | Grid Connected PV System                                 | 3 | Pre: 0402353    |

## Study Plan

The Bachelor of Science in Electrical and Electronics Engineering encompasses 132 credit hours spread over eight semesters and can be completed in four years. The following study plan serves as a roadmap for a smooth progression toward graduation.

| Year 1, Semester 1 (17 Credits) |                                |       |                 |
|---------------------------------|--------------------------------|-------|-----------------|
| Course #                        | Title                          | CrHrs | Prerequisites   |
| 0201102                         | Arabic Language                | 3     |                 |
| 0202112                         | English for Academic Purposes  | 3     |                 |
| 1420101                         | General Chemistry I            | 3     |                 |
| 1420102                         | General Chemistry I Laboratory | 1     | Pre: 1420101    |
| 1440133                         | Calculus I For Engineering     | 3     |                 |
| 1430115                         | Physics I                      | 3     | Pre/Co: 1440133 |
| 1430116                         | Physics I Laboratory           | 1     | Pre/Co: 1430115 |

| Year 1, Semester 2 (16 Credits) |  |       |                               |
|---------------------------------|--|-------|-------------------------------|
| Course #                        | Title  | CrHrs | Prerequisites                 |
| 1501100                         | Intro to IT  | 3     |                               |
| 1501116                         | Programming I  | 4     |                               |
| 1440161                         | Calculus II For Engineers                              | 3     | Pre: 1440133                  |
| 1430117                         | Physics II   | 3     | Pre: 1430115, Pre/Co: 1440161 |
| 1430118                         | Physics II Laboratory                                  | 1     | Pre: 1430116, Pre/Co: 1430117 |
| 0402100                         | Introduction to Electrical and Electronics Engineering | 2     |                               |

| Year 2, Semester 3 (16 Credits) |                                      |       |                                  |
|---------------------------------|--------------------------------------|-------|----------------------------------|
| Course #                        | Title                                | CrHrs | Prerequisites                    |
| 0204102                         | UAE Society                          |       |                                  |
| 1440261                         | Differential Equations for Engineers | 3     | Pre: 1440161                     |
| 1440262                         | Mathematics for Engineers            | 3     | 1440161                          |
| 0402202                         | Circuit Analysis I                   | 3     | Pre/Co: 1430117, Pre/Co: 1440261 |
| 0402203                         | Circuit Analysis I Laboratory        | 1     | Pre/Co: 0402202 Pre/Co: 1430118  |
| 1502201                         | Digital Logic Design                 | 3     | Pre: 1411116                     |

| Year 2, Semester 4 (15 Credits) |  |       |                               |
|---------------------------------|--|-------|-------------------------------|
| Course #                        | Title  | CrHrs | Prerequisites                 |
| 0402205                         | Circuit Analysis II                            | 3     | Pre: 0402202                  |
| 0402206                         | Circuit Analysis II Laboratory                 | 1     | Pre: 0402203, Pre/Co: 0402205 |
| 0402240                         | Signals and Systems                            | 3     | Pre: 0402202                  |
| 0402241                         | Random Signal Theory                           | 3     | Pre/Co: 0402202               |
| 1502202                         | Digital Logic Design Laboratory                | 1     | Pre: 1502201                  |
| 0402250                         | Fundamentals of Electronic Circuits            | 3     | Pre: 0402202, Pre: 1502201    |
| 0402251                         | Fundamentals of Electronic Circuits Laboratory | 1     | Pre: 0402203, Pre/Co: 0402250 |

| Year 3, Semester 5 (18 Credits) |  |       |                          |
|---------------------------------|--|-------|--------------------------|
| Course #                        | Title                                      | CrHrs | Prerequisites            |
| 0402340                         | Engineering Computation and Linear Algebra | 3     | 1411116; 1440261         |
| 0402341                         | Multimedia Technology Laboratory           | 1     | 0402240                  |
| 0402346                         | Telecommunication Systems I                | 3     | 0402240; 0402241         |
| 0402353                         | Electronic Circuits                        | 3     | Pre: 0402250             |
| 0402354                         | Electronic Circuits Laboratory             | 1     | Pre/Co: 0402353          |
| 0402343                         | Random Signals and Systems                 | 3     | 0402240; 0402241         |
| 0402310                         | Electromechanical Systems                  | 3     | 0402205                  |
| 0402311                         | Electromechanical Systems Laboratory       | 1     | 0402206; Pre/Co: 0402310 |

| Year 3, Semester 6 (18 Credits) |   |       |                                  |
|---------------------------------|---|-------|----------------------------------|
| Course #                        | Title                                   | CrHrs | Prerequisites                    |
| 0402320                         | Field Analysis                          | 3     | Pre: 1430117, Pre/Co: 1440262    |
| 0402330                         | Feedback Control Systems                | 3     | 0402240                          |
| 0402331                         | Feedback Control Systems Laboratory     | 1     | Pre/Co: 0402330                  |
| 0302200                         | Fundamentals of Innovation              | 3     |                                  |
| 0402347                         | Telecommunication Systems I Laboratory  | 1     | 0402346                          |
| 0202207                         | Technical Writing                       | 3     | 0202112                          |
| 1502336                         | Microcontroller Based Design            | 3     | 1502201                          |
| 1502337                         | Microcontroller Based Design Laboratory | 1     | Pre/Co: 1502336; Pre/Co: 1502202 |

| Year 3, Summer Training (0 Credits) |                                |       |                                     |
|-------------------------------------|--------------------------------|-------|-------------------------------------|
| Course #                            | Title                          | CrHrs | Prerequisites                       |
| 0402490                             | Practical Training for 8 weeks | 0     | Successful completion of 90 credits |



| Year 4, Semester 7 (16 Credits) |                         |       |   |
|---------------------------------|-------------------------|-------|---|
| Course #                        | Title                   | CrHrs | Prerequisites   |
| 0402491                         | Senior Design Project I | 1     | Senior Standing<br>Pre/Co: 0202207<br>Pre/Co: 0202110 |
| 040XXXX                         | Department Elective 1   | 3     |   |
| 040XXXX                         | Department Elective 2   | 3     |   |
| 040XXXX                         | Department Elective 3   | 3     |   |
| 0401301                         | Engineering Economics   | 3     |   |
| 0104100                         | Islamic Culture         | 3     |   |

| Year 4, Semester 8 (14 Credits) |  |       |                   |
|---------------------------------|--|-------|-------------------|
| Course #                        | Title                                  | CrHrs | Prerequisites     |
| 0402492                         | Senior Design Project II               | 3     | Pre: 0402491      |
| 040XXXX                         | Department Elective 4                  | 3     |                   |
| 040XXXX                         | Department Elective 5                  | 3     |                   |
| 1502300                         | Profession, Society and Ethical Issues | 1     | 3rd Year Standing |
|                                 | University Elective 2                  | 3     |                   |

### Course Description

Courses in the proposed program offered in the department of electrical and electronics engineering start with (0402). The program of study contains courses offered by other Engineering departments and from outside the college. Consistent with the university policies, EEE courses in the program will be assigned numbers of the form (0402ABC) where:

|   |                                   |                                       |
|---|-----------------------------------|---------------------------------------|
| A | Year (level)                      |                                       |
| B | Areas (as follows)                | 4: Communications & Signal Processing |
|   | 0: General Electrical Engineering | 5: Electronics                        |
|   | 1: Electromechanical and Power    | 6: Special Topics                     |
|   | 2: Electromagnetism               | 9: Projects and Seminars              |
|   | 3: Control & Instrumentation      |                                       |
| C | Course sequence in the area       |                                       |

### A. Mandatory Courses

Descriptions of the core courses are given below.

|   |  |         |
|---|--|---------|
| 0402100   | Introduction to Electrical and Electronics Engineering | (1-2:2) |
| This introductory course cover aspects such as the engineering profession, nature, and scope of Electrical Engineering, Engineering design and problem-solving, study skills, communication, and teamwork. The course deals with library search, lab facilities, resources available, and lab associated with the course, such as lab tools familiarization, Lab Safety, MATLAB/Simulink experiments. |  |         |
| <b>Prerequisite(s):</b> Pre/Co: 1501100- Intro to IT  |  |         |

|   |                    |         |
|---|--------------------|---------|
| 0402202   | Circuit Analysis I | (3-0:3) |
| <p>This course covers the fundamentals of DC and AC circuit laws, mathematical models for circuit elements, techniques for circuit analysis and writing and solving circuit equations, circuit theorems, introduction to Op-Amps, transient analysis of first-order circuits, phasor technique for a steady-state sinusoidal response. <b>Prerequisite(s):</b> Pre/Co: 1430117- Physics II; Pre/Co: 1440261 - Differential Equations for Engineers.</p> |                    |         |

|   |                               |         |
|---|-------------------------------|---------|
| 0402203   | Circuit Analysis I Laboratory | (0-3:1) |
| <p>This course covers the Fundamentals of DC circuits. Experiments revolve around DC networks and their behavior under transient and steady-state conditions. SPICE modeling of circuits, test, and measurement equipment such as function generators and oscilloscopes.<br/><b>Prerequisite(s):</b> Pre/Co: 1430118 - Physics II Laboratory; Pre/Co: 0402202 - Circuit Analysis I.</p> |                               |         |

|  |                     |         |
|--|---------------------|---------|
| 0402205  | Circuit Analysis II | (3-0:3) |
| <p>This course covers AC power concepts, three-phase systems, magnetically coupled circuits, transformers, Laplace transforms, transfer functions and Bode plots, frequency selective circuits, and two-port networks.<br/><b>Prerequisite:</b> 0402202- Circuit Analysis I.</p> |                     |         |

|  |                                |         |
|--|--------------------------------|---------|
| 0402206  | Circuit Analysis II Laboratory | (0-3:1) |
| <p>The laboratory is designed to provide virtual, practical, and hands-on experience of various AC Circuits with the help of Electrical Laboratory Equipment applying electrical principles and techniques. Laboratory work includes AC power measurements and resonance in RLC series and parallel circuits. Frequency response for low pass, band pass, and notch filters. Transformer operation and characteristics, two-port network measurements, Spice circuit simulation, three-phase circuits.<br/><b>Prerequisites:</b> 0402203 - Circuit Analysis I Laboratory; Pre/Co: 0402205 - Circuit Analysis II.</p> |                                |         |

|   |                     |         |
|---|---------------------|---------|
| 0402240   | Signals and Systems | (3-0:3) |
| <p>This course covers the representation and analysis of signals. Fourier transforms. Linear time-invariant systems, impulse response, amplitude, and phase responses. Representation and analysis of discrete-time signals. Z-transforms. Introduction to analog and digital filters.<br/><b>Prerequisite:</b> 0402202 - Circuit Analysis I.</p> |                     |         |

|   |                      |         |
|---|----------------------|---------|
| 0402241   | Random Signal Theory | (3-0:3) |
| <p>This course provides an overview of statistics in engineering, probability, and data summary at the undergraduate level. This course starts with an overview of the probability concepts, discrete random variables, and probability distribution. Then, it covers the continuous random variables, probability distribution, and joint probability distribution. The last part of the course introduces parameter estimation and computation of confidence intervals.<br/><b>Prerequisite:</b> Pre/Co 0402202 - Circuit Analysis I.</p> |                      |         |

|  |  |         |
|--|--|---------|
| 0402250  | Fundamentals of Electronic Circuits            | (3-0:3) |
| <p>Fundamentals of semiconductor physics, the PN junction diode (characteristics, modeling, and applications), the Bipolar Junction Transistor (structure, characteristics, modeling, DC circuit analysis, and biasing techniques), the Metal-Oxide Semi-Conductor transistor (structure, characteristics, modeling, DC circuit analysis, and biasing techniques), digital applications of diodes (DTL logic), digital applications of BJTs (e.g., ECL logic), digital applications of MOSFETs (NMOS and CMOS static logic), introduction to small-signal analysis.</p> <p><b>Prerequisite(s):</b> 0402202-Circuit Analysis I; 0402203 Circuit Analysis I lab - 0403201-Digital Logic Design</p> |  |         |
| 0402251  | Fundamentals of Electronic Circuits Laboratory | (0-3:1) |
| <p>This course deals with CADENCE and its usage AC &amp; transient analysis. Signal and Zener diode characteristics and application circuits. Bipolar and MOS transistor characteristics and DC biasing circuits. BJT and MOS digital circuit simulation using Spice and experiments using discrete components and transistor arrays.</p> <p><b>Prerequisite(s):</b> Pre: 0402203-Circuit Analysis I Laboratory; Pre/Co: 0402250-Fundamentals of Electronic Circuits.</p>  |  |         |
| 0402310  | Electromechanical Systems                      | (3-0:3) |
| <p>The course covers fundamentals of magnetic circuits, principles of electromechanical energy conversions, principles of DC and AC, machines, steady- state analysis of AC and DC machines, transformers, stepper, and servo motors.</p> <p><b>Pre-Requisite:</b> 0402205 Circuit Analysis II</p>   |  |         |
| 0402311  | Electromechanical Systems Lab                  | (3-0:3) |
| <p>This course provides Hands-on exercises to set up circuits along with many measurement and observation capabilities of the virtual instrumentation system to explore the operating principles characteristic of transformers, DC and AC Motors, and Generators.</p> <p><b>Prerequisites:</b> 0402206 - Circuit Analysis II Laboratory; Pre/Co: 0402310 – Electromechanical Systems.</p>   |  |         |
| 0402320  | Field Analysis                                 | (3-0:3) |
| <p>This course mainly provides a solid foundation on electrostatic and magnetostatic fields. The course covers time-varying fields and Maxwell equations. It also explores the concepts of plane wave propagation, reflection, and refraction. Transmission lines, waveguides, antennas, and fiber optics are also briefly discussed.</p> <p><b>Prerequisites:</b> Pre: 1430117 - Physics II, Pre/Co: 1440262 - Mathematics for Engineers.</p>   |  |         |
| 0402330  | Feedback Control Systems                       | (3-0:3) |
| <p>This course introduces linear control systems, open-loop, and closed-loop control systems. It covers mathematical representations of linear time-invariant systems such as differential equations, transfer functions, and state-space equations. It includes the time response and performance analysis of feedback control systems. It provides the basic tools for stability analysis using the Routh-Hurwitz method and Bode and Nyquist diagrams. It covers control design techniques such as the root locus method, state feedback control technique, and PID controllers.</p> <p><b>Prerequisite:</b> 0402240 - Signals and Systems.</p>   |  |         |

|  |                                     |         |
|--|-------------------------------------|---------|
| 0402331  | Feedback Control Systems Laboratory | (0-3:1) |
| <p>This course deals with the response of electromechanical devices and mechanisms in open-loop and closed-loop systems. Analog and digital systems with cascade and feedback compensation techniques. Computer-Aided design and analysis using MATLAB software.</p> <p><b>Prerequisite:</b> Pre/Co: 0402330 Feedback Control Systems.</p> |                                     |         |

|  |  |         |
|--|--|---------|
| 0402340  | Engineering Computation and Linear Algebra | (3-0:3) |
| <p>This course covers topics such as a numerical solution of linear and nonlinear equations and system of equations using exact and approximative methods; determining ill-conditioned systems; Error terminology, IEEE 754 floating-point representation, number approximation, and precision, truncation error; eigenvalues and eigenvectors; interpolation and curve fitting; numerical differentiation and integration of functions, numerical solution of ordinary differential equations, use of MATLAB to solve complex engineering problems.</p> <p><b>Prerequisites:</b> 1501116 - Programming I; 1440261 - Differential Equations for Engineers.</p> |  |         |

|  |                                  |         |
|--|----------------------------------|---------|
| 0402341  | Multimedia Technology Laboratory | (0-3:1) |
| <p>This lab provides an introduction to MATLAB for signals at the undergraduate level. The lab starts with signal operations in the time and frequency domains. Then the lab covers speech manipulation and analysis. After that, the lab deals with image manipulation and analysis. Demonstration of filtering and spectral analysis is also covered.</p> <p><b>Prerequisite:</b> 0402240 - Signals and Systems.</p> |                                  |         |

|  |                         |         |
|--|-------------------------|---------|
| 0402343  | Random Signal & Systems | (3-0:3) |
| <p>This course introduces random processes and their filtering at the undergraduate level. It starts with the statistical representation of multiple random variables, including the joint PMF, joint PDF, expectation, moments, covariance matrix, and correlation matrix. The course then covers the basic concepts and statistical representation of random processes, including the autocorrelation function and the concepts of stationarity and ergodicity. The frequency-domain analysis of random processes using the power spectral density is then addressed. The last part of the course covers the topic of filtering, including the application of linear filters to random processes, the noise-equivalent bandwidth, the signal-to-noise ratio and matched filtering.</p> <p><b>Prerequisites:</b> 0402240 - Signals and Systems; 0402241 - Random Signal Theory.</p> |                         |         |

|   |  |         |
|---|--|---------|
| 0402346   | Telecommunication Systems I            | (3-0:3) |
| <p>This course introduces analog and digital communications systems at the undergraduate level. After an overview of communication systems and their basic components, the course focuses on analog modulation. The main amplitude modulation techniques are covered, including AM-LC, DSBSC, SSB, QAM, and VSB. Angle modulation techniques are then studied, including frequency modulation (FM) and phase modulation (PM). Then the course covers the concepts of analog-to-digital (A/D) conversion, including sampling, quantization, and PCM. The last part of the course provides an introduction to digital communication systems, including the concepts of line-coding, digital carrier modulation (ASK, PSK, FSK, QAM) and demodulation.</p> <p><b>Prerequisites:</b> 0402240-Signals and Systems; 0402241 - Random Signal Theory.</p> |  |         |
| 0402347   | Telecommunication Systems I Laboratory | (0-3:1) |
| <p>This lab course provides a practical application of the basic principles of Telecommunication Systems already studied in the theory course. The first set of experiments covers analog modulation techniques, including amplitude modulation (AM) transmission and reception (DSB-SC and DSB-TC) and frequency modulation (FM) transmission and reception. The second set of experiments covers concepts related to pulse modulation and analog-to-digital conversion, including sampling and reconstruction, pulse amplitude modulation (PAM), PAM-TDM, quantization, and PCM. The last set of lab experiments deals with digital modulation techniques such as FSK, ASK, PSK, and their demodulation.</p> <p><b>Prerequisite:</b> 0402346 - Telecommunication Systems I.</p>   |  |         |
| 0402353   | Electronic Circuits                    | (3-0:3) |
| <p>This course reviews semiconductor device characteristics and DC analysis (diodes, BJTs, and MOSFETs). Small-signal AC analysis and basic application circuits (single-stage amplifiers, multiple-stage amplifiers, differential amplifiers, active biasing). Frequency response and feedback topologies. The operational amplifier and its linear and nonlinear applications (waveform generators, oscillators, first and second-order filters).</p> <p><b>Prerequisite:</b> 0402250 - Fundamentals of Electronic Circuits.</p>  |  |         |
| 0402354   | Electronic Circuits Laboratory         | (0-3:1) |
| <p>This course deals with Bipolar transistor single and multiple-stage amplifiers, MOS transistor amplifiers, frequency response measurements, op-amp filters, and oscillator circuits.</p> <p><b>Prerequisite:</b> Pre/Co: 0402353-Electronic Circuits, 0402251- Fundamentals of Electronics lab</p>   |  |         |
| 0402491   | Senior Design Project I                | (1-0:1) |
| <p>This is the first phase of the capstone project, consisting of two courses, Senior Design Project I and Senior Design Project II. Subjects for the projects are linked to research interests in the department or sometimes in cooperation with local industries. Small groups of students work together to design, build, refine and test complete hardware or software systems to meet specifications. During this phase, students are expected to study the current literature, acquire the required skills for the project, and finalize the design's high-level specifications. Each group of students submits a report and gives a presentation.</p> <p><b>Prerequisites:</b> Senior standing in Electrical and Electronics Engineering, Pre/Co: 0202207 - Technical Writing</p>   |  |         |

|  |                          |         |
|--|--------------------------|---------|
| 0402492  | Senior Design Project II | (3-0:3) |
| <p>This is the second phase of the capstone project, consisting of two courses, Senior Design Project I and Senior Design Project II. During this phase, students are expected to implement the proposed project as outlined in the report produced at the end of Senior Design Project I. Each group of students is required to prepare a detailed report, a n d a poster and make a formal presentation of their work that will be used to evaluate their engineering design and verbal and communication skills.</p> <p><b>Prerequisite:</b> 0402491 - Senior Design Project I.</p> |                          |         |

## B. Elective Courses

Descriptions of the elective courses are given below.

|  |                       |         |
|--|-----------------------|---------|
| 0402410  | Power System Analysis | (3-0:3) |
| <p>This course covers Load studies, fault calculations, stability studies, transmission lines parameters, the impedance of transmission lines, capacitance of transmission lines, bundled conductors and parallel three-phase lines, current and voltage relations on a transmission line, power flow in transmission lines, one-line diagrams, per unit power system representation, network equations and solutions, load flow studies and methods.</p> <p><b>Prerequisite:</b> 0402310 - Electromechanical Systems.</p> |                       |         |

|  |                                     |         |
|--|-------------------------------------|---------|
| 0402411  | Electric Power Distribution Systems | (3-0:3) |
| <p>This course covers an introduction to electric distribution systems, distribution system indices and load characteristics, different topologies, and configurations of distribution systems, distribution system equipment, single-phase and three-phase distribution transformers, overhead distribution lines, underground cables, distribution protective systems, protective equipment and devices, voltage drop over distribution feeders, voltage regulation, distribution system compensation, distribution generation units, power quality issues and electric distribution within the buildings.</p> <p><b>Prerequisite:</b> Pre/Co: 0402310- Electromechanical Systems.</p> |                                     |         |

|  |                             |         |
|--|-----------------------------|---------|
| 0402449  | Optical Fiber Communication | (3-0:3) |
| <p>This course provides an introduction to optical communication systems at the undergraduate level. It starts with the characterization of optical fibers, waveguides, and wave propagation. The course then covers the design of optical transmitters (light-emitting diode, semi-conductor lasers) and receivers (common photodetectors, receiver sensitivity, noise). The course also studies lightwave systems dispersion management techniques, including pre-compensation, post- compensation, and optical filters. The course also visits multi-channel techniques, including WDM systems. The last part of the course covers coherent light-wave systems, including modulation, demodulation, and performance.</p> <p><b>Prerequisites:</b> 0402250 - Fundamentals of Electronic Circuits; 0402346 Telecommunication Systems I.</p> |                             |         |

|  |                                  |         |
|--|----------------------------------|---------|
| 0402420  | Microwave Engineering            | (3-0:3) |
| <p>The course includes a review of Maxwell's equations and waves propagations in bounded media followed by a detailed discussion of transmission line theory, Smith chart, and impedance matching and tuning. Rectangular waveguides and their respective modes of propagation are discussed. Microwave network analysis using impedance, transmission, and scattering matrix representations is also discussed. The working of passive microwave circuits like power dividers and directional couplers is covered. Project work is included to develop student engineering design and report writing skills.</p> <p><b>Prerequisite:</b> 0402320 - Field Analysis.</p>  |                                  |         |
| 0402421  | Antenna Analysis                 | (3-0:3) |
| <p>This course covers the fundamentals of the analysis and design of antennas and antenna arrays. The basic properties of antennas include gain, radiation patterns, polarization, antenna temperature, antenna equivalent circuit, radiation efficiency, EIRP, and near-field and far-field zones. Detailed analysis of traditional antennas such as dipoles, loops, helices, and aperture antennas are followed by the design of more modern antennas such as microstrip and dielectric resonator antennas. Basic theory will also be covered for the analysis and design of linear and planar arrays, including array factors, pattern multiplication, beam scanning, amplitude weighting, and mutual coupling.</p> <p><b>Prerequisite:</b> 0402320 - Field Analysis.</p> |                                  |         |
| 0402430  | Instrumentation and Measurements | (2-3:3) |
| <p>This course covers the measurement process. Errors and sources of errors, signals, noise instrumentation, and filtering. Display and recording systems. Elements of signal processing in instrumentation. Transducers. Sensors. Microprocessor-based instrumentation systems, data logging, interfaces, and data processing</p> <p><b>Prerequisites:</b> 0402240 - Signals and Systems; 0402353 - Electronic Circuits.</p>  |                                  |         |
| 0402434  | Digital Control Systems          | (3-0:3) |
| <p>This course deals with Discrete-time systems and the Z-transform. Sampling and reconstruction. Open-loop and closed-loop discrete-time Systems. System time-response characteristics. Stability analysis techniques. Digital controller design. State-space representations of discrete-time Systems. Pole-assignment design and state estimation. Linear quadratic optimal control.</p> <p><b>Prerequisite:</b> 0402330 - Feedback Control Systems.</p>  |                                  |         |
| 0402436  | Applied Control Engineering      | (3-0:3) |
| <p>This course covers an introduction to process control, feedback, and feed-forward control configurations, modeling of dynamic systems: time delays, high-order systems, multivariable systems, process identification, analysis and controller design performances, PID controller tuning, Intelligent controller tuning, advanced control techniques, process interaction, and decoupling control, introduction to distributed control systems and digital control issues.</p> <p><b>Prerequisite:</b> 0402330 - Feedback Control Systems.</p>   |                                  |         |

|  |   |         |
|--|---|---------|
| 0402442  | Telecommunication Systems II                    | (3-0:3) |
| <p>This course provides an advanced topic in digital communications systems at the undergraduate level. The course starts with an overview of the basics of pulse-digital modulation systems such as sampling, quantization, and quantization noise, Pulse Code Modulation (PCM), then Differential PCM and Delta Modulation. Then the course introduces information theory concepts to be used for PCM bit encoders. Then the course covers intersymbol distortion and its cancellation, such as pulse shaping and channel equalization. The last part of the course covers the signal space and its use for determining the performance of digital transmission systems such as MASK, MPSK, MFSK, QAM in the presence of noise.</p> <p><b>Prerequisite:</b> 0402346-Telecommunication Systems I.</p> |   |         |
| 0402444  | Digital Signal Processing                       | (3-0:3) |
| <p>This course covers the classification of discrete-time signals and systems. Digital filter structures and transfer functions. Design algorithms for IIR and FIR filters. DFT and its implementation. Z transform and digital signal processing applications. <b>Prerequisite:</b> 0402240 - Signals and Systems.</p>  |   |         |
| 0402437  | Programmable Logic Controllers and Applications | (2-2:3) |
| <p>This course is an introductory course on programmable logic controllers (PLCs) and their basic applications. Topics include an overview of PLCs, PLC hardware components, basics of PLC programming, development of fundamental PLC ladder programming, timers and counters, data manipulation, concepts in analog data I/O advanced programming techniques, PLC sensors, and actuators, and PLC communication Networks. Classroom instruction is supported by laboratory activities through which students use PLCs to perform industrial control functions, troubleshooting, and networking PLCs in situations of typical industrial projects.</p> <p><b>Prerequisite:</b> 1502336 - Microcontroller Based Design or 1502334 - Embedded Systems Design.</p>                                       |   |         |
| 0402446  | Cellular Telephony                              | (3-0:3) |
| <p>This class provides a solid foundation on cellular systems, including cellular networks, cellular technologies, and mobile radio propagation. The course covers network architecture, network planning, and optimization. It also explores the concepts of co-channel interference, noise, receiver sensitivity, and link budget. Propagation modeling, path loss models, and data detection will be illustrated. The evolution of cellular technologies, including 2G, 3G, 4G, 5G, and beyond 5G (B5G) will be explored. Concepts of multiple-input multiple-output (MIMO), massive MIMO, cell-free massive MIMO, and millimeter wave (mm Wave) will also be visited. <b>Prerequisite:</b> 0402346 - Telecommunication Systems I.</p>  |   |         |



|  |   |         |
|--|---|---------|
| 0402447  | Wireless Communication                    | (3-0:3) |
| <p>This course provides a foundation in Wireless Communications at the undergraduate level. It begins with an overview of Wireless Communications and its technical challenges. It then covers the basics, characterization, and types of wireless propagation channels. Wireless transceiver systems, including digital modulation/demodulation and error performance, are also studied. Diversity schemes (SC, MRC, EGC) and their respective gains are then visited. The course covers error correction coding, including linear block codes, convolutional codes, and Viterbi decoding. The course also studies multiple access schemes (FDMA, TDMA, CDMA) and cellular systems, including the concepts of frequency reuse, capacity, and blocking probability. The last part of the course covers advanced wireless systems such as spread spectrum communication.</p> <p><b>Prerequisite:</b> 0402346 - Telecommunication Systems I.</p> |   |         |
| 0402448  | Speech Signal Processing and Applications | (3-0:3) |
| <p>This course deals with speech analysis and modelling, digital processing of speech signals, parametric coding of speech: linear predictive coding, stochastic modelling of speech signals, pattern recognition and its application to speech, speech recognition and its applications, speaker recognition and its applications, and the latest developments in the different areas of speech.</p> <p><b>Prerequisites:</b> 0402346 – Telecommunication Systems I; 0402340 - Engineering Computation and Linear Algebra.</p>  |   |         |
| 0402450  | Power Electronics                         | (2-3:3) |
| <p>This course covers applications of power diodes and silicon-controlled rectifiers. Static converters. AC voltage controllers. DC power supplies. Choppers, Inverters in power systems experimental sessions on power electronic Circuits and equipment</p> <p><b>Prerequisite:</b> 0402353 - Electronic Circuits.</p>   |   |         |
| 0402452  | Communications Electronics                | (3-0:3) |
| <p>This course covers the Design of communication circuits such as oscillators, mixers, and tuned networks. AM and FM transmitters. Low noise amplifier design, matching, higher-order filter design.</p> <p><b>Prerequisites:</b> 0402353 - Electronic Circuits; 0402346 - Telecommunication systems I.</p>   |   |         |
| 0402454  | Optoelectronics                           | (3-0:3) |
| <p>This course deals with the Physics and operating characteristics of optoelectronic semiconductor devices. Modern optoelectronic components include waveguides, optical fibers, photodetectors, light-emitting diodes, and semiconductor lasers.</p> <p><b>Prerequisite:</b> 0402353 - Electronic Circuits.</p>  |   |         |

|  |  |         |
|--|--|---------|
| 0402455  | Analog Integrated Circuits                             | (3-0:3) |
| <p>The course is an advanced course for electronics students in analog integrated circuits (IC) design. The course will focus on conventional and modern analog building blocks for analog signal processing in BJT and MOS technology, both in continuous-time and discrete-time applications. The course includes analog multipliers, the op-amp applications in active filters, op-amp non-idealities, Nonlinearity cancellation of the MOS transistors, MOS-C Continuous-time filters, Switched-C Circuits, and High-frequency analog blocks (ex: Current Conveyors and current feedback amplifiers).</p> <p><b>Prerequisite:</b> 0402353 - Electronic Circuits.</p>   |  |         |
| 0402460  | Special Topics in Electrical Engineering               | (3-0:3) |
| <p>This course covers emerging and advanced topics in electrical engineering. The contents and pre-requisite will vary depending on the topic.</p> <p><b>Prerequisite:</b> 4th Year standing.</p>  |  |         |
| 0402461  | Special Topics in Control and Automation               | (3-0:3) |
| <p>This course covers emerging and advanced topics in control and automation. The contents will vary depending on the topic.</p> <p><b>Prerequisite:</b> 0402330 - Feedback Control Systems.</p>   |  |         |
| 0402462  | Special Topics in Communication Systems                | (3-0:3) |
| <p>Shannon Theory, Nyquist Sampling, Single-Carrier Modulation, Statistical Detection and Error Performance, Channel Coding, Adaptive Filters, Equalization, Orthogonal Frequency-Division Multiplexing (OFDM), and Multiple-Input Multiple-Output (MIMO).</p> <p><b>Prerequisite:</b> 0402346 - Telecommunication Systems I.</p>  |  |         |
| 0402463  | Special Topics in Electronics                          | (3-0:3) |
| <p>This course covers emerging and advanced topics in the field of electronics. The contents will vary depending on the topic.</p> <p><b>Prerequisite:</b> 0402250 - Fundamentals of Electronic Circuits.</p>  |  |         |
| 0402464  | Special Topics in Signal and Image Processing          | (3-0:3) |
| <p>This course covers emerging and advanced topics in signal and image processing. The contents will vary depending on the topic.</p> <p><b>Prerequisites:</b> 0402240 - Signals and Systems; 0402340</p>  |  |         |
| 0402493  | Senior Seminar in Electrical & Electronics Engineering | (1-0:1) |
| <p>The course reviews contemporary topics in electrical and electronics engineering to enrich senior students' knowledge about the latest technologies and research areas in the electrical and electronics engineering field. It includes the latest in circuit analysis and design, automatic control, electronic devices, and telecommunications with numerous practical applications. The course introduces the students to research methodologies and sharpens skills needed to succeed as future engineers. It helps senior students to understand the career development process and explore trends in the market while at the same time preparing them to start their career path. The course aims to enhance oral communication skills by allowing senior students to give seminars about new topics of their selection.</p> <p><b>Prerequisite:</b> Senior standing.</p> |  |         |

|   |   |         |
|---|---|---------|
| 0402415   | Grid Connected PV System                  | (3-0:3) |
| <p>This course reviews PV systems. Power conditioning and maximum power point tracking (MPPT) algorithms based buck- and boost converter technologies. Maximum power point (MPP) methods for PV system. Inverter topologies for stand-alone and grid-connected PV operation. Introduction to Matlab Simulink. Simulation models and examples using Matlab Simulink. Active power filtering with real power injection. Grid-connected PV system economics.</p> <p><b>Prerequisite:</b> 0402353 Electronic Circuits</p>   |   |         |
| 0402490   | Practical training Electrical Engineering | (0-0:0) |
| <p>Students are expected to engage in a practical learning experience in one of the organizations whose scope of work is in Electrical and Electronics Engineering. The trainee should monitor and practice (if possible) all technical and admin activities related to the job performed. Students are expected to identify technical and soft skills gaps and work to improve their skills. Students should document their weekly activities and finally write a full report to summarize their practical learning experience. Students are expected to assess the training organization and give their comments and feedback.</p> <p><b>Prerequisite:</b> Senior standing.</p> |   |         |

## Department of Industrial Engineering & Engineering Management (IEEM)

### Personnel

|                             |  |
|-----------------------------|--|
| <b>Chairperson</b>          | Atidel Aboubaker Ep  |
| <b>Professors</b>           | Gordian Udi Ojiako, Imad Alsayouf, Mohammad Shamsuzzaman, Atidel Aboubaker Ep Ben Hadj Alouane, Fikri Dweiri, Hamdi Bashir                     |
| <b>Associate Professors</b> | Ali Cheaitou, Dorid Dalalah, In-Ju Kim, Salah Haridy, Hamad Rashid, Mohammad Miftaur Rahman Khan Khadem, Sameh Tawfiq AlShihabi, Malek Masmoud |
| <b>Assistant Professors</b> | Ridvan Aydin, Zehra Canan Araci, Concetta Semeraro   |
| <b>Lecturer</b>             | Mohamed Khasawneh  |

### Vision

To be recognized nationally and internationally in Industrial Engineering and Engineering Management education, interdisciplinary research, and community service.

### Goals

The goals of the Department of Industrial Engineering and Engineering Management are to:

1. Prepare students for successful careers and professions in Industrial Engineering and Engineering Management.
2. Engage in multidisciplinary and cutting-edge research on global impact in Industrial Engineering and Engineering Management.
3. Participate in community services and societal development in areas related to Industrial Engineering and Engineering Management.

### Objectives

The BSc Program in Industrial Engineering and Engineering Management (IEEM) has the following program goals:

- 1) Graduates are expected to use modern tools and analytical skills to provide creative, innovative, and practical solutions to various industries' industrial engineering and engineering management problems.
- 2) Graduates are expected to pursue further learning through participation in continuing education and/or graduate studies and contribute to professional practice.
- 3) Graduates are expected to assume leadership roles and responsibilities in diverse positions and act ethically according to socio-cultural norms.
- 4) Graduates are expected to possess good interpersonal communication skills and work effectively in a team or individually.

### Student Outcomes

Upon successful completion of the BSc program in IEEM, graduates will have:

1. An ability to apply knowledge of mathematics, science, management, and engineering in identifying, formulating, and solving Industrial Engineering and Engineering Management problems.

2. An ability to apply engineering design of integrated systems of people, materials, information, facilities, and technology, to solve Industrial Engineering and Engineering Management problems with consideration of health, environment, safety, globalization, as well as cultural, social, and economic factors.
3. An ability to communicate effectively with diverse audiences.
4. An ability to recognize and properly deal with professional and ethical responsibilities in engineering situations with consideration of the impact of engineering solutions in global, economic, environmental, and social contexts.
5. An ability to work in a team that establishes goals, plans tasks, meets objectives, and provides leadership in a collaborative and inclusive environment.
6. An ability to design and conduct experiments, analyze and interpret data to draw conclusions using modern Industrial Engineering and Engineering Management tools.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

### Career Opportunities

Graduates from the Industrial Engineering and Engineering Management program will be prepared to pursue careers in logistics and supply chain management, quality management, industrial safety, project management, maintenance management, facilities planning, industrial automation, production planning and control, and operations management. The employment opportunities are in many industries, including the manufacturing, service industry (e.g., airports, airlines, logistics, hospitals, etc.), and oil and gas.

### Program Overview

This program structure is applied to new students enrolled in the academic year 2016/2017 onwards. Previous students should follow the older study plan. The program has an option for students to choose a Co-op that will enhance and complement their technical preparations and better prepare them for practice in the UAE market. To obtain a Bachelor of Science degree in IEEM, the student must complete 134 credit hours. These hours are University Requirements (UR), College Requirements (CR), and Program Requirements (PR). The allocation of the credit hours is shown in the following table:

| BSc in Industrial Engineering and Engineering Management (134) |    |    |    |       |
|--|----|----|----|-------|
|  | UR | CR | PR | Total |
| Mandatory Credits  | 18 | 26 | 72 | 116   |
| Elective Credits   | 6  | -  | 12 | 18    |
| Total  | 24 | 26 | 84 | 134   |

#### I. University Requirements (UR)

Every student must take 24 credit hours of general education courses distributed over seven domains. Eighteen (18) mandatory credit hours are selected from domains 1, 2, 3, and 4, and (6) elective credit hours are chosen from domains 5, 6, and 7 as indicated in the University section (General Education).

#### II. College Requirements (CR)

The list of the College required courses and their descriptions are presented in the introductory pages of the College of Engineering section in this catalog.

### III. Program Requirements (PR)

#### A. Mandatory Courses

IEEM core courses are listed in the table below.

| Course #                                    | Title   | CrHrs                  | Prerequisites  |
|---|---|------------------------|--|
| 0405103                                     | Introduction to Industrial Engineering and Engineering Management | 1                      | None   |
| 0405102                                     | Engineering Graphics *  | 1                      | None   |
| 0405202                                     | Manufacturing Processes *   | 3                      | 0405102, 0405103, 1420101 for IEEM students or 0406302 for ME students |
| 0405221                                     | Engineering Probability and Statistics                            | 3                      | 1440133  |
| 1440211                                     | Linear Algebra  | 3                      | 1440133  |
| 1501113                                     | Programming for Engineers   | 3                      | None   |
| 0301150                                     | Introduction to Economics (E)                                     | 3                      | None   |
| 0302160                                     | Principles of Management  | 3                      | None   |
| 1430118                                     | Physics II Lab *  | 1                      | Pre/Co 1430117   |
| 0402207                                     | Applied Electronic Circuits *                                     | 3                      | 1430117  |
| 0405262                                     | Database Management and Industrial Information Systems *          | 3                      | 1411113  |
| 0405312                                     | Operations Research I   | 3                      | 1440211, 1440261, 0405221  |
| 0405322                                     | Engineering Statistics  | 3                      | 0405221  |
| 0405323                                     | Quality Control and Improvement                                   | 3                      | 0405322  |
| 0405325                                     | Stochastic Simulation *   | 4                      | 0405312, 0405322   |
| 0405341                                     | Ergonomics and Work and Process Improvement *                     | 4                      | 0405221; Pre/Co 0405202  |
| 0405361                                     | Management for Engineers  | 3                      | 0308150, 0301215, 0302160  |
| 0405431                                     | Production and Inventory Systems                                  | 3                      | 0405221, 0405312   |
| 0405432                                     | Facilities Planning   | 3                      | 0405341  |
| 0405433                                     | Supply Chain Management   | 3                      | 0405431  |
| 0405440                                     | Industrial Automation *   | 3                      | 0402207, 0405202   |
| 0405442                                     | Safety for Engineers  | 3                      | 0405341  |
| 0301215                                     | Accounting for Engineers  | 3                      | None   |
| 0405464                                     | Project Management  | 3                      | 0401301, 0405361   |
| 0405490                                     | Practical Training  | 0                      | Completion of at least 90 Credit Hours                                 |
| 0405491                                     | Senior Design Project I **  | 1                      | Pre/Co 0202207, 4 <sup>th</sup> Year Standing                          |
| 0405492                                     | Senior Design Project II **                                       | 3                      | 0405491 or 0405497   |
| 0405497                                     | Co-op in Industry I ***   | 1                      | 0202207, 4 <sup>th</sup> Year Standing                                 |
| 0405498                                     | Co-op in Industry II ***  | 3                      | 0405497  |
| <b>Total mandatory Program Requirements</b> |   | <b>72 credit-hours</b> |  |
|   | Department Elective 1   | 3                      | Depending on Selected Courses  |
|   | Department Elective 2   | 3                      |  |
|   | Department Elective 3   | 3                      |  |

|   |                       |                        |
|---|-----------------------|------------------------|
|   | Department Elective 4 | 3                      |
| <b>Total Program Requirements</b>   |                       | <b>84 credit hours</b> |
| * Course includes practical laboratory session<br>** Course not required for the Co-op option<br>*** Course not required for Senior Design Project option |                       |                        |

## B. Elective Courses

As part of the Bachelor of Science in Industrial Engineering and Engineering Management program, the student is required to study 12 credit hours of department elective courses. Students should select with the help of their academic advisor from the department elective courses best meet their needs and aspirations. The following two areas are available for the students where students need to take two courses from each area:

**Industrial Engineering Area.** Students need to select two of the following elective courses:

- Human Factors and Ergonomics
- Quality Engineering Principles and Analysis
- Lean Production Systems
- Maintenance Planning and Control
- Operations Research II
- Reliability Engineering
- Special Topics in Industrial Engineering

| Industrial Engineering Area |   |        |  |
|-----------------------------|---|--------|--|
| Course #                    | Title                                       | Cr-Hrs | Prerequisites  |
| 0405425                     | Quality Engineering Principles and Analysis | 3      | 0405323  |
| 0405434                     | Maintenance Planning and Control            | 3      | 4 <sup>th</sup> Year Standing                        |
| 0405438                     | Lean Production Systems                     | 3      | 0405431  |
| 0405441                     | Human Factors and Ergonomics                | 3      | 0405341  |
| 0405414                     | Operations Research II                      | 3      | 0405221, 0405312                                     |
| 0408460                     | Reliability Engineering                     | 3      | 0402241 for ME students or 0405322 for IEEM students |
| 0405482                     | Special Topics in Industrial Engineering    | 3      | Instructor's consent                                 |

**Engineering Management and Business Area.** Students need to select two of the following elective courses:

- Principles of Marketing
- Human Resources Management
- Organization Behavior
- Innovation Management
- Strategic Management
- Special Topics in Engineering Management

| Business and Management |  |       |                               |
|-------------------------|--|-------|-------------------------------|
| Course                  | Title                                    | CrHrs | Prerequisites                 |
| 0302170                 | Principles of Marketing                  | 3     | None                          |
| 0302262                 | Organizational Behavior                  | 3     | 0302160                       |
| 0302360                 | Human Resource Management                | 3     | 0302160                       |
| 0302467                 | Strategic Management                     | 3     | 4 <sup>th</sup> Year Standing |
| 0405462                 | Innovation Management                    | 3     | 0405361                       |
| 0405485                 | Special Topics in Engineering Management | 3     | Instructor's consent          |

### C. Co-op Program Option

Students have an option to take Co-op training in the industry. In this option, students must complete a 4 credits Co-op project over two semesters: Co-op in Industry I (1 credit) and Co-op in Industry II (3 credits). In Co-op in Industry II, the students will spend one semester in a carefully selected organization where they receive practical training and engagement in meaningful projects applying their knowledge to solve real-world problems. Co-op students must submit a final report on the project(s) they participated in during their co-op practice, including a major capstone design project.

### D. Senior Design Project Option

Students participating in the Senior Design Project option must complete a 4 credits Senior Design project over two semesters: Senior Design Project I (1 credit) and Senior Design Project II (3 credits).

IEEM Study Plan Effective 2016-17 (134 Credits)

| Year I, Semester 1 (17 Credits) |                               |       |   |
|---------------------------------|-------------------------------|-------|---|
| Course #                        | Title                         | CrHrs | Prerequisites                           |
| 0201102                         | Arabic Language               | 3     |   |
| 0202112                         | English for Academic Purposes | 3     | 500 TOEFL or 5 IELTS                    |
| 1420101                         | General Chemistry             | 3     |   |
| 1420102                         | General Chemistry I Lab       | 1     | Pre/Co: 1420101                         |
| 1430115                         | Physics I                     | 3     | Pl. Test or 1430106;<br>Pre/Co 14430133 |
| 1430116                         | Physics I Lab                 | 1     | Pre/Co: 1430115                         |
| 1440133                         | Calculus I for Engineers      | 3     | Placement Test or<br>1440098            |

| Year 1, Semester 2 (17 Credits) |                                 |       |                  |
|---------------------------------|---------------------------------|-------|------------------|
| Course #                        | Title                           | CrHrs | Prerequisites    |
| 0104101                         | Islamic Culture                 | 3     |                  |
| 0302160                         | Principles of Management        | 3     |                  |
| 0301150                         | Introduction to Economics (E)   | 3     |                  |
| 0405103                         | Intro. to Ind. Eng. & Eng. Man. | 1     |                  |
| 1430117                         | Physics II                      | 3     | 1430115; 1430116 |
| 1430118                         | Physics II Lab                  | 1     | Pre/Co 1430117   |
| 1440161                         | Calculus II for Engineers       | 3     | 1440133          |



| Year 2, Semester 3 (16 Credits) |                                 |       |               |
|---------------------------------|---------------------------------|-------|---------------|
| Course #                        | Title                           | CrHrs | Prerequisites |
| 1501100                         | Intro to IT                     | 3     |               |
| 1440211                         | Linear Algebra                  | 3     | 1440133       |
| 0301215                         | Accounting for Engineers        | 3     |               |
| 0405221                         | Eng. Probability and Statistics | 3     | 1440133       |
| 0405102                         | Engineering Graphics            | 1     |               |
| 1501113                         | Programming for Engineers       | 3     |               |

| Year 2, Semester 4 (18 Credits) |  |       |  |
|---------------------------------|--|-------|--|
| Course #                        | Title  | CrHrs | Prerequisites  |
| 0202207                         | Technical Writing                                      | 3     | 0202112  |
| 1440261                         | Differential Equations for Engineers                   | 3     | 1440161  |
| 0405202                         | Manufacturing Processes                                | 3     | 0405102, 0405103,<br>1420101 for IEEM;<br>0406302 for ME<br>students |
| 0405262                         | Database Management and Industrial Information Systems | 3     | 1411113  |
| 0402207                         | Applied Electronic Circuits                            | 3     | 1430117  |
| 0302200                         | Fundamentals of Innovation & Entr.                     | 3     |  |

| Year 3, Semester 5 (16 Credits) |   |       |                            |
|---------------------------------|---|-------|----------------------------|
| Course #                        | Title                                       | CrHrs | Prerequisites              |
| 0401301                         | Engineering Economics                       | 3     | 3rd Year Standing          |
| 0405312                         | Operations Research I                       | 3     | 1440211; 1440261           |
| 0405322                         | Engineering Statistics                      | 3     | 0405221                    |
| 0405341                         | Ergonomics and Work and Process Improvement | 4     | 0405221;<br>Pre/Co 0405202 |
|                                 | University Elective 1                       | 3     |                            |

| Year 3, Semester 6 (16 Credits) |                                  |       |                              |
|---------------------------------|----------------------------------|-------|------------------------------|
| Course #                        | Title                            | CrHrs | Prerequisites                |
| 0405361                         | Management for Engineers         | 3     | 0301150, 0301215,<br>0302160 |
| 0405323                         | Quality Control and Improvement  | 3     | 0405322                      |
| 0405325                         | Stochastic Simulation            | 4     | 0405322, 0405312             |
| 0405431                         | Production and Inventory Systems | 3     | 0405221, 0405312             |
|                                 | Department Elective 1            | 3     |                              |

| Year 3, Summer Training (0 Credits) |                                  |       |   |
|-------------------------------------|----------------------------------|-------|---|
| Course #                            | Title                            | CrHrs | Prerequisites                             |
| 0405490                             | Practical Training for 6-8 weeks | 0     | Completion of at least<br>90 credit hours |

### Option I: Co-op in Industry

| Year 4, Semester 7, Co-op Option I (15 Credits) |                       |       |                  |
|---|-----------------------|-------|------------------|
| Course #  | Title                 | CrHrs | Prerequisites    |
| 0405440   | Industrial Automation | 3     | 0402207; 0405202 |
| 0405442   | Safety for Engineers  | 3     | 0405341          |
| 0405464   | Project Management    | 3     | 0401301, 0405361 |
|   | Department Elective 2 | 3     |                  |
|   | University Elective 2 | 3     |                  |

| Year 4, Semester 8, Co-op Option I (16 Credits) |                         |       |                          |
|---|-------------------------|-------|--------------------------|
| Course #  | Title                   | CrHrs | Prerequisites            |
| 0405432   | Facilities Planning     | 3     | 0405341                  |
| 0405433   | Supply Chain Management | 3     | 0405431                  |
| 0405497   | Co-op in Industry I     | 1     | 0202207; senior standing |
|   | Department Elective 3   | 3     |                          |
|   | Department Elective 4   | 3     |                          |
|   | University Elective 3   | 3     |                          |

| Year 5, Semester 9, Co-op Option I (3 Credits) |                   |       |                                 |
|--|-------------------|-------|---------------------------------|
| Course   | Title             | CrHrs | Pre/Co-requisites               |
| 0405498  | Co-op in Industry | 3     | 0405997 and Department Approval |

### Option II: Senior Design Project

| Year 4, Semester 7, Senior Project Option II (16 Credits) |                         |       |                                 |
|---|-------------------------|-------|---------------------------------|
| Course #  | Title                   | CrHrs | Prerequisites                   |
| 0405440   | Industrial Automation   | 3     | 0402207; 0405202                |
| 0405442   | Safety for Engineers    | 3     | 0405341                         |
| 0405464   | Project Management      | 3     | 0401301, 0405361                |
| 0405491   | Senior Design Project I | 1     | Pre/Co 0202207; Senior Standing |
|   | Department Elective 2   | 3     |                                 |
|   | University Elective 3   | 3     |                                 |

| Year 4, Semester 8, Senior Project Option II (18 Credits) |                          |       |                    |
|---|--------------------------|-------|--------------------|
| Course  | Title                    | CrHrs | Prerequisites      |
| 0405432   | Facilities Planning      | 3     | 0405341            |
| 0405433   | Supply Chain Management  | 3     | 0405431            |
| 0405492   | Senior Design Project II | 3     | 0405491 or 0405497 |
|   | Department Elective 3    | 3     |                    |
|   | Department Elective 4    | 3     |                    |
|   | University Elective 4    | 3     |                    |

## Course Coding

Courses offered in the IEEM program are designated code numbers of the form (0405ABC) where:

|   |  |  |
|---|--|--|
| A | Year (level)   |  |
| B | Areas (as follows)<br>0: General<br>1: Operations Research<br>2: Statistics<br>3: Production Systems<br>4: Human Factors | 5: Information Systems<br>6: Engineering Management<br>8: Special Topics<br>9: Projects and Seminars |
| C | Course sequence in the area  |  |

## Course Description

### A. Mandatory Courses

Descriptions of the Mandatory core courses are given below.

|   |   |         |
|---|---|---------|
| 0405103   | Introduction to Industrial Engineering and Engineering Management | (1-0:1) |
| An introduction to and overview of the profession, including career planning, professionalism and communication, ethics, teamwork, industrial speakers, engineering design process, and selected topics in industrial engineering and engineering management.<br><b>Prerequisite:</b> None. |   |         |

|   |                      |         |
|---|----------------------|---------|
| 0405102   | Engineering Graphics | (0-3:1) |
| Engineering graphics for product design and manufacturing. Orthographic projection, pictorial views, dimensioning, and four fundamental views of descriptive geometry. Use of AUTOCAD for engineering drawings. |                      |         |

|  |                         |         |
|--|-------------------------|---------|
| 0405202  | Manufacturing Processes | (2-3:3) |
| Introduction and classification of engineering materials and their properties. Traditional manufacturing processing of materials (ferrous and non-ferrous), including metal cutting, casting, rolling, forging, and drawing. Modern manufacturing processes and related topics include ceramics, composites, powder metallurgy, property enhancing and surface processing operations, and rapid prototyping. The course consists of lab and visits to different manufacturing facilities.<br><b>Prerequisite:</b> 0405102, 0405103, and 1420101 for IEEM students; or 0406302 for ME students. |                         |         |

|   |  |         |
|---|--|---------|
| 0405221   | Engineering Probability and Statistics | (3-0:3) |
| Descriptive statistics and sampling, sample space and events, axioms of probability, conditional probability, statistical independence, Bayes theorem, discrete probability distributions (uniform, binomial, geometric, Poisson), continuous probability distributions (normal, exponential, gamma and Weibull), joint probability distribution, point estimation, central limit theorem, interval estimation, use of statistical software.<br><b>Prerequisite:</b> 1440133. |  |         |

|   |                             |         |
|---|-----------------------------|---------|
| 1501113   | Programming for Engineers   | (2-2:3) |
| This course covers introductory concepts in computer programming using C++. We assume that students have no programming experience. There is an emphasis on both the concepts and practice of computer programming. This course covers principles of problem-solving and requires a number of labs and programming assignments. You should expect to spend at least 8 hours per week on this course.<br><b>Prerequisite:</b> None                                 |                             |         |
| 1430118   | Physics II Lab              | (0-3:1) |
| 10 experiments in electricity and magnetism, covering topics in the Physics II course. The experiments are DC Measurements, Ohm's Law, Wheatstone Bridge, and Capacitors Bridge, Kirchhoff's Laws, Resistance and resistivity, RCCircuit, Oscilloscope, Magnetic Force I and II, Magnetic field, Electromagnetic Induction (manual experiment), Electromagnetic induction II (computerized experiment)<br><b>Prerequisite:</b> Pre/Co 1430117 Physics II .        |                             |         |
| 1440211   | Linear Algebra              | (3-0:3) |
| Systems of linear equations; Gaussian and Gauss-Jordan elimination processes; Matrix algebra; Determinants; Cramer's rule; Vector spaces; Subspaces; Basis and dimension; Rank; Change of basis; Characteristic polynomial; Eigenvalues and eigenvectors of square matrices; Diagonalization; Inner product spaces; Orthogonal projections; Gram-Schmidt process; Computer applications; Introduction to linear transformations.<br><b>Prerequisite:</b> 1440133. |                             |         |
| 0308150   | Introduction to Economics   | (3-0:3) |
| Introduction to Economics for NBS studies basic economic principles of both Microeconomics and Macroeconomics. This course stresses how consumers, producers, and policymakers make rational economic decisions under varying economic conditions.<br><b>Prerequisite:</b> None.  |                             |         |
| 0302160   | Principles of Management    | (3-0:3) |
| This course presents the current management practices in the modern business world. The course discusses the four cornerstones of the management function: planning, organizing, leading, and controlling. It addresses the function of management from classical, behavioral, contingency, and system perspectives.<br><b>Prerequisite:</b> None.  |                             |         |
| 0301215   | Accounting for Engineers    | (3-0:3) |
| This course provides an overview of the nature and principles of financial and management accounting. The course will give students a grounding in the principles of accounting, an understanding of the terminology, and an appreciation of the practical application of accountancy.<br><b>Prerequisite:</b> None.  |                             |         |
| 0402207   | Applied Electronic Circuits | (2-3:3) |
| Basic DC Circuits, General DC circuit analysis, Transient Circuits, Basic AC Circuits, Diodes, and their applications, Transistors, Operational Amplifiers, Basic Combinational Circuits, Decoders, Adders and Multiplexers, Transformers.<br><b>Prerequisites:</b> 1430117.  |                             |         |

|  |  |         |
|--|--|---------|
| 0405262  | Database Management and Industrial Information Systems | (2-3:3) |
| <p><b>Part 1: Database management systems:</b> Concepts and methods for the design. Functions and characteristics of the leading database management systems. Query languages such as SQL and application development tools.</p> <p><b>Part 2: Industrial Information Systems:</b> Developing creative solutions to open-ended business and manufacturing problems using systems analysis and design tools such as systems development life cycle, feasibility study, cost-benefit analysis, structured analysis, and design. Students must be able to complete a project by the end of the term.</p> <p><b>Prerequisite:</b> 1411113.</p> |  |         |
| 0405312  | Operations Research I                                  | (3-0:3) |
| <p>An introduction to deterministic models in operations research with particular emphasis on linear programming, the simplex algorithm, and their engineering applications. Brief introduction to integer programming and network flow models. This course has a tutorial component in which some software packages are shown.</p> <p><b>Prerequisites:</b> 1440211, 1440261, and 0405221.</p>  |  |         |
| 0405322  | Engineering Statistics                                 | (3-0:3) |
| <p>Statistical test of hypotheses, simple linear regression and correlation, multiple linear regression, analysis of variance, planning and design of experiments, design, and analysis of the single-factor experiment, and design and analysis of experiments with several factors. Case studies.</p> <p><b>Prerequisite:</b> 0405221.</p>   |  |         |
| 0405323  | Quality Control and Improvement                        | (3-0:3) |
| <p>Quality control and process improvement, cost of quality and the effects of quality on productivity; concepts of variation; statistical process control (SPC tools); control charts for variables and attributes and their applications in process control; process capability studies; acceptance sampling; quality audits; case studies from manufacturing and service sectors.</p> <p><b>Prerequisite:</b> 0405222.</p>  |  |         |
| 0405325  | Stochastic Simulation                                  | (3-3:4) |
| <p>Introduction to discrete event simulation and queuing theory, manual and computerized simulation of single server queue, systems simulation structure, conceptual models; system simulation languages, model verification and validation, design of experiments for simulation runs, output analysis; applications to industrial situations. The course contains a team simulation project and a simulation lab.</p> <p><b>Prerequisites:</b> 0405312 and 0405322.</p>  |  |         |
| 0405341  | Ergonomics and Work and Process Improvement            | (3-3:4) |
| <p>Introduction to anthropometric measurements. Human capacity in terms of workload. Principles of design of workstations and work environment. Work system design. Human-machine systems, motion study, time study. Laboratory sessions and projects in ergonomics, work system design, and time study.</p> <p><b>Prerequisite:</b> 0405221. <b>Pre/Co</b> 0405202.</p>   |  |         |

|  |   |                |
|--|---|----------------|
| <b>0405361</b>   | <b>Management for Engineers</b>         | <b>(3-0:3)</b> |
| <p>This course builds on the fundamentals that were learned in the principles of management. It covers key engineering management topics and practices, including an introduction to engineering management and its historical development, planning and forecasting of production and resources, decision making, leadership traits, leadership styles, and challenges, managing human resources, product and service development process, managing marketing and sales functions, professional responsibility, ethics, and legal issues.</p> <p><b>Prerequisites:</b> 0308150, 0301215, 0302160.</p> |   |                |
| <b>0405431</b>   | <b>Production and Inventory Systems</b> | <b>(3-0:3)</b> |
| <p>Analysis of production and inventory systems, deterministic and stochastic inventory models for single and multi-item systems, aggregate production planning, material requirement planning, forecasting, scheduling, and sequencing.</p> <p><b>Prerequisite:</b> 0405221, 0405312.</p>   |   |                |
| <b>0405432</b>   | <b>Facilities Planning</b>              | <b>(3-0:3)</b> |
| <p>Principles and requirements for analyzing and designing facilities layout, models for layout planning, computerized layout planning, warehouse design, material handling equipment, and facility location models.</p> <p><b>Prerequisite:</b> 0405341.</p>  |   |                |
| <b>0405433</b>   | <b>Supply Chain Management</b>          | <b>(3-0:3)</b> |
| <p>This course adopts a modelling approach to supply chains designed to study trade-offs between system costs and customer service. Topics covered include supply chain design, multi-location inventory-distribution models, bullwhip effect, delayed differentiation, and supply chain integration: E-commerce and the role of information technology in supporting supply chain operations.</p> <p><b>Prerequisite:</b> 0405431.</p>  |   |                |
| <b>0405440</b>   | <b>Industrial Automation</b>            | <b>(3-3:3)</b> |
| <p>This course presents modern automation tools in the industry. It focuses on the following issues: Manufacturing Models and Metrics, Industrial Control Systems, Hardware Components for Automation and Process Control, Numerical Control, Industrial Robotics, Programmable Logic Controllers, Automatic Identification and Data Capture, and Automated Production Lines.</p> <p><b>Prerequisite:</b> 0402207 and 0405202.</p>   |   |                |
| <b>0405442</b>   | <b>Safety for Engineers</b>             | <b>(3-0:3)</b> |
| <p>Introduction to safety engineering. Types of occupational hazards. Safety management systems. Risk management and control. Establishing a safety culture at work. Air quality, industrial pollutants, and pollution prevention. Professional and ethical responsibilities of engineers. Safety engineering practices.</p> <p><b>Prerequisite:</b> 0405341.</p>  |   |                |
| <b>0405464</b>   | <b>Project Management</b>               | <b>(3-0:3)</b> |
| <p>Factors for project initiation, project planning (cost estimation, scheduling, risk management), project control, project quality management, PMI standards, and practice using software packages.</p> <p><b>Prerequisite:</b> 0405361, 0401301.</p>  |   |                |

|   |                    |         |
|---|--------------------|---------|
| 0405490   | Practical Training | (0-0:0) |
| <p>There is a minimum of 240 hours within six to eight weeks of practical field training. The purpose of this training is to introduce students firsthand to local and regional practices in the field of industrial engineering and engineering management. Furthermore, it exposes students to possible career opportunities. Upon completion, students are required to submit a technical report to the training supervisor.</p> <p><b>Prerequisite:</b> Completion of at least 90 credit hours.</p> |                    |         |

|  |                         |         |
|--|-------------------------|---------|
| 0405491  | Senior Design Project I | (1-0:1) |
| <p>A capstone design experience will enhance students' capability to solve real-life industrial engineering and engineering management problems and improve their teamwork and communication skills. Each group of students, under the supervision of one or two faculty members, is required to handle a problem by connecting several subjects and using some of the techniques students have learned in undergraduate studies to increase their ability to deal with problem-solving in the profession. The team must prepare proposals, manage data acquisition, carry out feasibility studies and evaluate alternatives in preparation for Senior Design Project II. Teams are also required to submit a report and give a presentation at the end of the semester.</p> <p><b>Prerequisites:</b> Senior Standing; Pre/Co 0202207.</p> |                         |         |

|   |                          |         |
|---|--------------------------|---------|
| 0405492   | Senior Design Project II | (3-0:3) |
| <p>In continuation of Senior Design Project I, each team works towards completing their capstone design project. Each student in the team is expected to handle a specific project task and coordinate his/her work with the rest of the group in a team spirit. The team is required to submit their final report and give a presentation and a poster on their project at the end of the semester.</p> <p><b>Prerequisites:</b> 0405491 or 0405497.</p> |                          |         |

|   |                     |         |
|---|---------------------|---------|
| 0405497   | Co-op in Industry I | (1-0:1) |
| <p>The students are expected to select an organization for conducting the co-op training, explore the organization and identify an engineering problem area, conduct a relevant literature review, define the engineering problem clearly, state the purpose, relevance and limitations or constraints, and define the co-op project objectives, discuss the methodological approach (procedures) that will be used to meet the stated objectives, develop a project plan and understand professional and ethical responsibility, write a project proposal and defend it orally. If the students pass the course, they will be permitted to pursue co-op in industry II, or take SDPII.</p> <p><b>Prerequisites:</b> Senior standing &amp; 0202207 Technical Writing.</p> |                     |         |

|  |                      |         |
|--|----------------------|---------|
| 0405498  | Co-op in Industry II | (3-0:3) |
| <p>This course enables students to apply acquired academic knowledge and skills in the work environment. Students will set realistic, measurable, and achievable job objectives. Students will demonstrate the connection between the classroom and practical experience through completing the job objectives in a way that reflects knowledge and skills acquired in the classroom and in the workplace. Students should gain and develop employability skills and understand professional and ethical responsibility. Students should develop their ability to solve an engineering problem involving the design, development, implementation, and/or improve a system. Students also will prepare a scientific report and present it orally and through a poster.</p> <p><b>Prerequisite:</b> 0405497 Co-op in Industry I and Department Approval.</p> |                      |         |

## B. Elective Courses

Descriptions of the technical elective courses are given below.

|   |   |         |
|---|---|---------|
| 0405425   | Quality Engineering Principles and Analysis | (3-0:3) |
| Introduction to principles and philosophies of total quality management, advanced methods for process control, six sigma approach to quality, design of experiments, and Taguchi approach to quality and parameter optimization.<br><b>Prerequisite:</b> 0405323 - Quality Control and Improvement. |   |         |

|  |                        |         |
|--|------------------------|---------|
| 0405414  | Operations Research II | (3-0:3) |
| An introduction to stochastic models in operations research with special emphasis on Poisson processes, discrete-time Markov chains, Markovian decision processes, birth-death processes, elementary queuing models, and deterministic dynamic programming.<br><b>Prerequisite:</b> 0405221 and 0405312. |                        |         |

|   |                                  |         |
|---|----------------------------------|---------|
| 0405434   | Maintenance Planning and Control | (3-0:3) |
| Basic maintenance concepts, relevant maintenance approaches such as preventive maintenance, predictive condition-monitoring techniques, and other appropriate practices. Improving systems' performance through implementing proper maintenance practices, identifying KPI's, collecting data, assessing performance, analyzing results, and suggesting improvement solutions and reading relevant case studies and conducting an industry-based project.<br><b>Prerequisites:</b> 0405202; and 0405322 or 0402241. |                                  |         |

|   |                         |         |
|---|-------------------------|---------|
| 0408460   | Reliability Engineering | (3-0:3) |
| The course introduces the basic reliability concepts and tools. It enables the students to apply the reliability theory at different phases of an asset's life cycle: at the acquisition phase model and predict equipment reliability and make cost-effective decisions; at the utilization phase, understand how maintenance can improve the availability and how to reduce downtime through proper design of dependability (reliability, maintainability, and supportability) of mechanical systems.<br><b>Prerequisite:</b> 0402241 (ME) or 0405322 (IEEM). |                         |         |

|  |                         |         |
|--|-------------------------|---------|
| 0405438  | Lean Production Systems | (3-0:3) |
| History of manufacturing. Principles, design, and analysis of lean manufacturing systems. Small lot production, setup-time reduction, continuous improvement. Principles and control of push and pull manufacturing systems. Production planning and operations scheduling.<br><b>Prerequisite:</b> 0405431. |                         |         |

|   |                              |         |
|---|------------------------------|---------|
| 0405441   | Human Factors and Ergonomics | (3-0:3) |
| This course is designed to help the students to understand human constraints and needs. The students will learn how to improve productivity, health & safety and identify methods for assessing the success (or failure) of artifacts and systems in terms of human ability to use and interact with them.<br><b>Prerequisite:</b> 0405341. |                              |         |



|  |                            |         |
|--|----------------------------|---------|
| 0405462  | Innovation Management      | (3-0:3) |
| <p>This course focuses on the main issues in innovation management, emphasizing product innovation. It covers the conceptual phases of innovation from an interdisciplinary standpoint (marketing, management, and engineering). Topics include basic terms related to innovation, innovation models, factors influencing innovation, managing innovation within organizations, intellectual property, strategic alliance and networks, product and brand strategy, new product development, market research, managing the new development process, and teamwork projects, and case studies.</p> <p><b>Prerequisite:</b> 0405361.</p>  |                            |         |
| 0302170  | Principles of Marketing    | (3-0:3) |
| <p>This course is designed to acquaint students with the scope and nature of the marketing function and how business organizations build and maintain profitable relationships with customers and create value to optimize their positions in today's dynamic competitive environment. The course will help students understand and develop a marketing plan by integrating the components of the marketing mix and by making valid, sustainable, and ethical decisions. Subjects covered include marketing definition and function, marketing plan process, the marketing environment, critical customer-driven marketing strategy decisions (i.e., segmentation, targeting, positioning), and the tactical marketing tools or marketing mix (product, price, Promotion, and Place).</p> <p><b>Prerequisite:</b> None</p> |                            |         |
| 0302262  | Organizational Behavior    | (3-0:3) |
| <p>This course seeks to familiarize students with the basic principles of individual and group behavior and their applications within organizations. Topics covered include job design, perceptions, learning, communication, decision-making, motivation, group dynamics, conflict management, power and politics, leadership, organizational change, and effectiveness.</p> <p><b>Prerequisite:</b> 0302160 - Principles of Management.</p>  |                            |         |
| 0302360  | Human Resources Management | (3-0:3) |
| <p>This course is designed to acquaint the students with the theories, practices, and methods related to the effective utilization and management of employees in a business organization. It covers the critical talent management practices that can facilitate effective position planning, talent recruitment &amp; selection, training &amp; development, performance appraisal, compensation, rewards, and retention.</p> <p><b>Prerequisite:</b> 0302160 - Principles of Management.</p>  |                            |         |

|   |                             |                |
|---|-----------------------------|----------------|
| 0302467   | <b>Strategic Management</b> | <b>(3-0:3)</b> |
| <p>Strategic Management is a course designed to expose students to a strategic perspective on issues that concern the firm. The course draws on and integrates concepts from the functional areas (i.e., marketing, finance, accounting, management, management information systems, and operations) to analyze and resolve complex business situations. It allows moving from a functional perspective to a strategic one. Beyond internal integration, Strategic Management concerns the processes by which firms choose, maintain, or redirect their strategic positions within ever-changing external environments. The course also explores the issues of defining corporate mission, objectives, and goals. It focuses on analyzing the firm's external and internal environment to identify reasons for competitive advantage in a global context. From that perspective, the course considers the cultural, ethical, political, and regulatory issues in the global business environment context. Through the combination of lectures, readings, case studies, class engagement, and project papers, this course introduces the students to the concepts, theories, tools, and techniques prerequisite to critical and effective strategic analysis, thinking, and communication. <b>Prerequisite:</b> Senior Standing.</p> |                             |                |

|   |   |                |
|---|---|----------------|
| 0405485   | <b>Special Topics in Engineering Management</b> | <b>(3-0:3)</b> |
| <p>Investigations in selected areas of engineering management.<br/><b>Prerequisite:</b> Consent of the Instructor</p> |   |                |

### Courses offered for other majors

The IEEM offers the three courses described below to mechanical engineering students.

|   |                                |                |
|---|--------------------------------|----------------|
| 0405202   | <b>Manufacturing Processes</b> | <b>(2-3:3)</b> |
| <p>Introduction and classification of engineering materials and their properties. Traditional manufacturing processing of materials (ferrous and non-ferrous), including metal cutting, casting, rolling, forging, and drawing. Modern manufacturing processes and related topics include ceramics, composites, powder metallurgy, property enhancing and surface processing operations, and rapid prototyping. The course includes lab and visits to different manufacturing facilities.<br/><b>Prerequisite:</b> 0405102, 0405103, and 1420101 for IEEM students; or 0406302 for ME students.</p> |                                |                |

## Department of Mechanical & Nuclear Engineering (MNE)

### Personnel

|                             |  |
|-----------------------------|--|
| <b>Chairperson</b>          | Naser Nawayseh   |
| <b>Professors</b>           | Naser Nawayseh, Khalil Abdelrazek Khalil, Tahar Laoui, Muataz Ali,<br>Mohd Sobri Bin Takriff         |
| <b>Associate Professors</b> | Syarif Junaidi, Khalid Ramadan, Muhammad Zubair, Iyad Al-Qasir,<br>Mohammad Al-Shabi, Mohammed Kamil |
| <b>Assistant Professors</b> | Bassam Khuwaileh, Hussien Ali  |

### Vision

The Department aspires to be recognized nationally and internationally for the high quality of its graduates in their educational background and research capabilities.

### Mission

Prepare students for a successful career by providing high-quality education and research through a healthy learning environment and state-of-the-art facilities, satisfying the manpower demand in the United Arab Emirates and the international community.

### Mechanical Engineering (ME) Program Objectives

The educational objectives of the Mechanical Engineering program are intended to enable graduates to:

1. Have a productive career in mechanical engineering or related fields, either in industrial, governmental, research, or academic institutions.
2. Continue to develop their knowledge through lifelong learning opportunities and/or advanced degrees.
3. Contribute to society in a responsible manner through engagement in professional organizations and/or community services.

### Program Outcomes

Upon successful completion of the BS program in Mechanical Engineering, graduates will have:

1. an ability to identify, formulate, and solve complex engineering problems by applying engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences.

4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to conclude.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

### **Career Opportunities**

Mechanical engineers attain a broad spectrum of skills sought after by many professions. Industrial sectors, enterprises, and services in which a mechanical engineer can pursue a career including power generation and distribution, building and construction, medicine and pharmacology, aerospace, automotive, chemicals, computers and electronics, renewable energy, entertainment, water resources, sports, environmental institutions, and government.

Mechanical engineering also serves as an excellent foundation for, business consulting, business management, and business consulting jobs.

### **Program Overview**

Mechanical engineering is one of the broadest, oldest, and most versatile engineering professions. It is at the heart of the design, development, and manufacturing of every product we have today. The Mechanical Engineering field significantly contributes to developing our daily lives, from the power plants to coffee machines. Mechanical Engineering utilizes the engineering skills, designs, and knowledge in various fields and industries, including but not limited to Air Conditioning, Power production, Robotics, Biomedical, Aircraft, and water desalination, Automotive, Manufacturing, Heavy Machinery, and many more. The Mechanical Engineering Program at UOS is a four-year study that provides students with a broad scientific and technical background in this field.

During the first three semesters, there is a focus on mathematics, basic sciences, physics, and chemistry. The following three semesters include courses and labs that are more specialized and closely related to mechanical engineering, including manufacturing, mechanics of solids, fluid mechanics, heat transfer, and thermodynamics.

In the final semesters of their study, students take advanced courses in mechanical engineering, undergo an eight-week practical training, and complete senior design projects.

The Mechanical Engineering Program at the University of Sharjah puts what is in the best interest of students first and foremost. Every little experience the student attains represents a block in building a competent, confident, purposeful, problem solving, competitive, responsible, and conscientious individual. This is accomplished using a curriculum and facilities that conform to the highest of standards, faculty members committed to the academic and personal growth of the student, and an environment that inspires learning and drives creativity.

To obtain a Bachelor of Science degree in ME, the student must complete a total of 132 credit hours. These hours are University requirements (UR), College requirements (CR), and Program requirements (PR). The allocation of the credit hours is shown in the following table:

| BSc in Mechanical Engineering (132) |    |    |    |       |
|-------------------------------------|----|----|----|-------|
|                                     | UR | CR | PR | Total |
| Mandatory Credits                   | 18 | 26 | 76 | 120   |
| Elective Credits                    | 6  | -  | 6  | 12    |
| Total                               | 24 | 26 | 82 | 132   |

### I. University Requirements (UR)

Every student must take 24 credit hours of general education courses distributed over seven domains. Eighteen (18) mandatory credit hours are selected from domains 1, 2, 3, and 4, and (6) elective credit hours are selected from domains 5, 6, and 7 as indicated in the University section (General Education).

### II. College Requirements (CR)

The list of the College required courses and their descriptions are presented in the introductory pages of the College of Engineering section in this catalog.

### III. Program Requirements (PR)

#### A. Mandatory requirements

The ME program core courses are listed in the table below.

| Course # | Title                                      | CrHrs | Prerequisites                 |
|----------|--|-------|-------------------------------|
| 1501113  | Programming for Engineers                  | 3     | None                          |
| 1430118  | Physics II Lab                             | 1     | 1430116<br>Pre/Co: 1430117    |
| 1502300  | Prof. & Social Issues in Engineering       | 1     | 3 <sup>rd</sup> year standing |
| 0401201  | Statics                                    | 3     | 1430115                       |
| 0402202  | Circuit Analysis I                         | 3     | Pre/Co: 1430117,<br>1440261   |
| 0402203  | Circuit Analysis I Lab                     | 1     | Pre/Co: 0402202               |
| 0402340  | Engineering Computation and Linear Algebra | 3     | 1411113, 1440261              |
| 0402348  | Signals and Control Systems                | 3     | 1440261, 0402202,<br>0408200  |
| 0405202  | Manufacturing Processes                    | 3     | 0406302                       |
| 0405221  | Engineering Probability and Statistics     | 3     | 1440133                       |
| 0406300  | Heat Transfer                              | 3     | 0408201, 0408202              |
| 0406301  | Heat Transfer Lab                          | 1     | Pre/Co: 0406300               |
| 0406302  | Engineering Materials                      | 3     | 1420101                       |
| 0408100  | Introduction to Mechanical Engineering     | 2     | Pre/Co: 1440133               |
| 0408150  | Engineering Graphics Design                | 2     | 0408100                       |
| 0408200  | Dynamics for Mechanical Engineering        | 3     | 0401201                       |

|                                   |  |                        |                                     |
|-----------------------------------|--|------------------------|-------------------------------------|
| 0408201                           | Engineering Thermodynamics               | 3                      | Pre/Co: 0408200                     |
| 0408202                           | Fluid Mechanics for Mechanical Engineers | 3                      | 0408200                             |
| 0408203                           | Strength of Materials                    | 3                      | 0401201                             |
| 0408220                           | Kinematics                               | 3                      | 1440261, 0408200<br>Pre/Co: 0408150 |
| 0408300                           | Analytical Methods in Engineering        | 3                      | 1440161                             |
| 0408318                           | Instrumentation and Measurements         | 3                      | 0402348, 0408202                    |
| 0408330                           | Machine Elements and Design              | 3                      | 0408203, 0408220<br>Pre/Co: 0405202 |
| 0408340                           | Advanced Thermodynamics                  | 3                      | 0408201                             |
| 0408341                           | Thermo-Fluid Lab                         | 1                      | 0408202<br>Pre/Co: 0408340          |
| 0408420                           | Thermal System Design                    | 3                      | 0406300, 0408202                    |
| 0408432                           | Advanced Fluid Mechanics                 | 3                      | 0408202                             |
| 0408440                           | Mechanical System Design                 | 3                      | 0408202, 0408300,<br>0408330        |
| 0408491                           | Senior Design Project I                  | 1                      | Senior Standing                     |
| 0408492                           | Senior Design Project II                 | 3                      | 0407491                             |
| 04084XX                           | ME Technical Elective I                  | 3                      | Depending on<br>Selected courses    |
| 04084XX                           | ME Technical Elective II                 | 3                      |                                     |
| <b>Total Program Requirements</b> |  | <b>82 credit-hours</b> |                                     |

## B. Technical Electives

As part of the Bachelor of Science in Mechanical Engineering program, the student is required to study 6 credit hours of technical elective courses. These courses allow the student to focus on a specific area for in-depth knowledge and understanding. The student can also mix and match elective courses from the different areas to get more broad exposure to the other Mechanical Engineering disciplines. In cooperation with the academic advisor, the student should select the list of electives that best meet their needs and aspirations. The listed technical elective courses and the required program courses are designed to allow the student to develop in-depth knowledge and understanding in the following areas:

1. Thermo-fluids
2. Solid mechanics
3. Materials and manufacturing

It is highly recommended that the student registers for these courses after completing the program requirements.

| Course # | Title   | CrHrs | Prerequisites              |
|----------|---|-------|----------------------------|
| 0408345  | Mechanical Vibrations                         | 3     | 1440261, 0408200           |
| 0408349  | Internal Combustion Engines                   | 3     | 0406300<br>Pre/Co: 0408340 |
| 0408410  | Introduction to Finite Element Methods        | 3     | 0408330                    |
| 0408430  | Numerical Simulation of Thermo-fluids Systems | 3     | 0402340, 0406300           |
| 0408465  | Robotics and Automation                       | 3     | 0402348, 0408220           |
| 0408466  | Energy Conversion                             | 3     | 0406201, 0406202           |
| 0408467  | Heating, Ventilation and Air-Conditioning     | 3     | 0406300, 0408201, 0408202  |
| 0408468  | Power Generation Plants                       | 3     | 0408340                    |
| 0408460  | Reliability Engineering                       | 3     | 0405202, 0405221           |
| 0408475  | Mechanical Metallurgy                         | 3     | 0406302                    |
| 0408480  | Special Topics in ME                          | 3     | Senior standing            |

### C. Senior Design Project

Students will have a Senior Design Project during their senior year of study over two semesters:

- Senior Design Project I (1 credit).
- Senior Design Project II (3 credits).

### Study Plan

The Bachelor of Science in Mechanical Engineering encompasses 132 credit hours spread over 8 semesters plus a summer training period normally completed in four years. The following study plan serves as a roadmap for a smooth progression toward graduation.

| Year 1, Semester 1 (16 Credits) |                                  |       |   |
|---------------------------------|----------------------------------|-------|---|
| Course #                        | Title                            | CrHrs | Prerequisites                                     |
| 1420101                         | General Chemistry I              | 3     |   |
| 1420102                         | General Chemistry I Lab          | 1     | Pre/Co: 1420101                                   |
| 1430115                         | Physics I                        | 3     | Pass placement Test or 1430106<br>Pre/Co: 1440133 |
| 1430116                         | Physics I Lab                    | 1     | Pre/Co: 1430115                                   |
| 1440133                         | Calculus I for Engineering       | 3     | EMSAT or 1440098                                  |
| 0202112                         | English for Academic Purposes    | 3     |   |
| 0408100                         | Intro. to Mechanical Engineering | 2     | Pre/Co: 1440133                                   |

| Year 1, Semester 2 (18 Credits) |                             |       |                            |
|---------------------------------|-----------------------------|-------|----------------------------|
| Course #                        | Title                       | CrHrs | Prerequisites              |
| 1411113                         | Programming for Engineering | 3     |                            |
| 1430117                         | Physics II                  | 3     | 1430115<br>Pre/Co: 1440161 |
| 1430118                         | Physics II Lab              | 1     | 1430116, Pre/Co: 1430117   |
| 1440161                         | Calculus II for Engineering | 3     | 1440133                    |
| 1501100                         | Introduction to IT          | 3     |                            |
| 0401201                         | Statics                     | 3     | 1430115                    |
| 0408150                         | Engineering Graphics Design | 2     | 0408100                    |

| Year 2, Semester 3 (18 Credits) |                                 |       |                        |
|---------------------------------|---------------------------------|-------|------------------------|
| Course #                        | Title                           | CrHrs | Prerequisites          |
| 1440261                         | Differential Equations for Eng. | 3     | 1440161                |
| 0402202                         | Circuit Analysis I              | 3     | Pre/Co:143011, 1440261 |
| 0406302                         | Engineering Materials           | 3     | 1420101                |
| 0408200                         | Dynamics for Mechanical Eng.    | 3     | 0401201                |
| 0408201                         | Engineering Thermodynamics      | 3     | Pre/Co: 0408200        |
| 0201102                         | Arabic Language                 | 3     |                        |

| Year 2, Semester 4 (16 Credits) |                                   |       |                                     |
|---------------------------------|-----------------------------------|-------|-------------------------------------|
| Course #                        | Title                             | CrHrs | Prerequisites                       |
| 0402203                         | Circuit Analysis I Lab            | 1     | Pre/Co: 0402202                     |
| 0405202                         | Manufacturing Processes           | 3     | 0406302                             |
| 0408202                         | Fluid Mechanics for Mech. Eng.    | 3     | 0408200                             |
| 0408203                         | Strength of Materials             | 3     | 0401201                             |
| 0408220                         | Kinematics                        | 3     | 1440261, 0408200<br>Pre/Co: 0408150 |
| 0408300                         | Analytical Methods in Engineering | 3     | 1440261                             |

| Year 3, Semester 5 (16 Credits) |                                    |       |                           |
|---------------------------------|------------------------------------|-------|---------------------------|
| Course #                        | Title                              | CrHrs | Prerequisites             |
| 0202207                         | Technical Writing                  | 3     | 0202112                   |
| 0402340                         | Eng. Comp. & Linear Algebra        | 3     | 1411113, 1440261          |
| 0402348                         | Signals & Control System           | 3     | 1440261, 0402202, 0408200 |
| 0406300                         | Heat Transfer                      | 3     | 0408201, 0408202          |
| 0406301                         | Heat Transfer Lab                  | 1     | Pre/Co: 0406300           |
| 0302200                         | Fund. of Innovation & Entrepreneur | 3     | 30 Credit Hours           |

| Year 3, Semester 6 (17 Credits) |                                      |       |                                     |
|---------------------------------|--------------------------------------|-------|-------------------------------------|
| Course #                        | Title                                | CrHrs | Prerequisites                       |
| 1502300                         | Prof. & Social Issues in Engineering | 1     | 3 <sup>rd</sup> year standing       |
| 0405221                         | Eng. Probability & Statistics        | 3     | 1440133                             |
| 0408318                         | Instrumentation & Measurements       | 3     | 0402348, 0408202                    |
| 0408330                         | Machine Elements & Design            | 3     | 0408203, 0408220<br>Pre/Co: 0405202 |
| 0408340                         | Advanced Thermodynamics              | 3     | 0408201                             |
| 0408341                         | Thermo-Fluids Lab                    | 3     | 0408202, Pre/Co: 0408340            |
| 0204102                         | UAE Society                          | 3     |                                     |

| Year 3, Summer Training (0 Credits) |                                |       |                 |
|-------------------------------------|--------------------------------|-------|-----------------|
| Course #                            | Title                          | CrHrs | Prerequisites   |
| 0408490                             | Practical Training for 8 weeks | 3     | 90 credit hours |



| Year 4, Semester 7 (16 Credits) |                          |       |                               |
|---------------------------------|--------------------------|-------|-------------------------------|
| Course #                        | Title                    | CrHrs | Prerequisites                 |
| 0401301                         | Engineering Economics    | 3     | 3 <sup>rd</sup> year standing |
| 0408420                         | Thermal System Design    | 3     | 0406300, 0408202              |
| 0408432                         | Advanced Fluid Mechanics | 3     | 0408202                       |
| 0408xxx                         | Technical Elective 1     | 3     |                               |
| 0408491                         | Senior Design Project I  | 1     | Senior standing               |
| xxxxxxx                         | University Elective 1    | 3     |                               |

| Year 4, Semester 7 (15 Credits) |                          |       |                           |
|---------------------------------|--------------------------|-------|---------------------------|
| Course #                        | Title                    | CrHrs | Prerequisites             |
| 0408440                         | Mechanical System Design | 3     | 0408202, 0408300, 0408330 |
| 0408xxx                         | Technical Elective 2     | 3     |                           |
| 0408492                         | Senior Design Project II | 3     | 0408491                   |
| 0104100                         | Islamic Culture          | 3     |                           |
| xxxxxxx                         | University Elective 2    | 3     |                           |

### Course Coding

The courses offered in the Mechanical Engineering program are designated code numbers in the form of (0408ABC) where:

- A      Year (level)  
BC     Course sequence in the area

### Course Description

#### A. Mandatory Courses

Descriptions of the core courses are given below.

|   |                           |         |
|---|---------------------------|---------|
| 1501113   | Programming for Engineers | (2-3:3) |
| <p>This course introduces the basic principles and concepts of programming techniques in a high-level language to the engineering students to solve engineering problems. Subjects include programming concepts, pseudo code, algorithms, user-defined data types, formatted input/output, selection structures, repetition structures, functions and procedures, text files, static and dynamic memory allocation, and introduction to object-oriented programming. Weekly laboratory assignments are an integral part of this course.</p> <p><b>Prerequisite:</b> None.</p> |                           |         |

|   |                       |         |
|---|-----------------------|---------|
| 1430118   | Physics II Laboratory | (0-3:1) |
| <p>Ten experiments in electricity and magnetism, covering topics in the Physics (II) course. The experiments are DC Measurements, Ohm's Law, Wheatstone Bridge, Capacitors Bridge, Kirchhoff's Laws, Resistance and resistivity, RC-Circuit, Oscilloscope, Magnetic Force I, and II, Magnetic field, Electromagnetic Induction (manual experiment), Electromagnetic induction II (computerized experiment).</p> <p><b>Prerequisite:</b> 1430116 – Physics I Laboratory.</p> <p><b>Pre/Co-requisite:</b> 1430117 – Physics II.</p> |                       |         |

|  |  |         |
|--|--|---------|
| 1502300  | Professional. & Social Issues in Engineering | (1-0:1) |
| <p>An examination of the social impact of engineering and technology and its relationship to ethics, with the objective of identifying and clarifying obligations that might arise in technological research and its applications. The course will survey a variety of moral theories, as well as engineering codes of ethics. The case study method will be used: the source will include the history of science and technology and reports from professional societies. Topics covered include whistle-blowing, environmental, safety, and privacy issues.</p> <p><b>Prerequisite:</b> 3<sup>rd</sup> year standing.</p> |  |         |

|   |         |         |
|---|---------|---------|
| 0401201   | Statics | (3-0:3) |
| <p>Knowledge and understanding of vector resultant of forces in two and three dimensions; type of structural supports; equilibrium of particles and rigid bodies; analysis of internal forces in beams and trusses; static and kinetic friction; centroids of lines, areas, and volumes; moments of inertia.</p> <p><b>Prerequisite:</b> 1430115 – Physics I.</p> |         |         |

|   |                    |         |
|---|--------------------|---------|
| 0402202   | Circuit Analysis I | (3-0:3) |
| <p>Fundamentals of DC and AC circuit laws; Mathematical models for circuit elements; Techniques for circuit analysis and for writing and solving circuit equations; Circuit theorems; Introduction to Op-Amps; Transient analysis of first-order circuits; Phasor technique for a steady-state sinusoidal response.</p> <p><b>Pre/Co-requisite:</b> 1430117 – Physics II; 1440261 – Differential Equations for Engineers.</p> |                    |         |

|  |                               |         |
|--|-------------------------------|---------|
| 0402203  | Circuit Analysis I Laboratory | (0-3:1) |
| <p>Fundamentals of DC circuits. Experiments revolve around DC networks and their behavior under transient and steady-state conditions. SPICE modeling circuits, test, and measurement equipment such as function generators and oscilloscopes.</p> <p><b>Pre/Co-requisite:</b> 0402202 – Circuit Analysis I.</p> |                               |         |

|   |  |         |
|---|--|---------|
| 0402340   | Engineering Computation and Linear Algebra | (3-0:3) |
| <p>Basic linear algebra: LU decomposition, normal equations, least squares solutions, eigenvalues, and eigenvectors decomposition of matrices. Numerical solution of linear and nonlinear equations, eigenvalues, and eigenvectors, curve fitting, numerical differentiation and integration of functions, numerical solution of ordinary differential equations, and use of MATLAB to solve complex engineering problems.</p> <p><b>Prerequisite:</b> 1501113 - Programming for Engineers; 1440261 – Differential Equations for Engineers.</p> |  |         |

|  |                             |         |
|--|-----------------------------|---------|
| 0402348  | Signals and Control Systems | (3-0:3) |
| <p>Representation and analysis of signals. Fourier transforms. Linear time-invariant systems, impulse response, frequency response, and transfer function. Introduction to linear feedback control. Analysis and design of classical control systems. Control system components and industrial process automation.</p> <p><b>Prerequisite:</b> 1440261 – Differential Equations for Engineers; 0402202 – Circuits Analysis I; 0408200 – Dynamics for Mechanical Engineering.</p> |                             |         |

|   |  |         |
|---|--|---------|
| 0405202   | Manufacturing Processes                | (2-3:3) |
| Introduction and classification of engineering materials and their properties. Traditional manufacturing processing of materials (ferrous and non-ferrous), including metal cutting, casting, rolling, forging, and drawing. Modern manufacturing processes and related topics include ceramics, composites, powder metallurgy, property enhancing and surface processing operations, and rapid prototyping. The course includes lab and visits to different manufacturing facilities.<br><b>Prerequisite:</b> 0406302 – Engineering Materials. |  |         |
| 0405221   | Engineering Probability and Statistics | (3-0:3) |
| Descriptive statistics and sampling, sample space and events, axioms of probability, conditional probability, statistical independence, Bayes theorem, discrete probability distributions (uniform, binomial, geometric, Poisson), continuous probability distributions (normal, exponential, gamma and Weibull), joint probability distribution, point estimation, central limit theorem, interval estimation, use of statistical software.<br><b>Prerequisite:</b> 1440133 – Calculus I for Engineers.  |  |         |
| 0406300   | Heat Transfer                          | (3-0:3) |
| Mechanisms of heat transfer: conduction, convection, and radiation. Steady heat conduction, insulation, cooling. Transient heat conduction. Forced convection; natural convection. Heat exchangers. Applications to energy systems.<br><b>Prerequisite:</b> 0408201 – Engineering Thermodynamics; 0408202 – Fluid Mechanics for Mechanical Engineers.   |  |         |
| 0406301   | Heat Transfer Lab                      | (0-3:1) |
| Experiments on measurement techniques heat transfer principles of linear and radial conduction; unsteady state heat conduction; natural and forced convection; parallel and counter flow exchangers; thermal radiation; temperature measurement.<br><b>Pre/Co-requisite:</b> 0406300 – Heat Transfer.   |  |         |
| 0406302   | Engineering Materials                  | (3-0:3) |
| The course covers atomic bonding, crystal structure and defect structure, and their relationship with material properties. It also includes phase diagrams and alloys, mechanical properties, material failure, corrosion, and an introduction to the structures of polymers and ceramics.<br><b>Prerequisite:</b> 1420101 – General Chemistry I.   |  |         |
| 0408100   | Introduction to Mechanical Engineering | (2-0:2) |
| Introduction to the mechanical engineering profession, ethics, and disciplines; development of skills in teamwork, problem-solving, and design; other topics include computer applications and programming; introduction to mechanical systems emphasizing system approach, Newton's law, unit conversions, statistics, Excel.<br><b>Pre/Co-requisite:</b> 1440133 – Calculus I for Engineers.  |  |         |
| 0408150   | Engineering Graphics Design            | (1-3:2) |
| Topics include basic graphics skills. Emphasis on fundamentals of engineering science and computer applications, programming using CAD tools or other software; visualization, orthographic drawings, and advanced graphic skills.<br><b>Pre-requisite:</b> 0408100 – Introduction to Mechanical Engineering.   |  |         |

|   |  |         |
|---|--|---------|
| 0408200   | Dynamics for Mechanical Engineering      | (3-0:3) |
| Introduction and Fundamental Principles, Kinematics of a particle: Rectilinear and curvilinear motion of a particle with normal and tangential components, Force and acceleration, Work and energy, Impulse and momentum<br><b>Prerequisite:</b> 0401201 – Statics.   |  |         |
| 0408201   | Engineering Thermodynamics               | (3-0:3) |
| Basic concepts of thermodynamics: temperature, work, heat, internal energy, and enthalpy. The first law of thermodynamics for closed and steady-flow open systems. Thermodynamic properties of pure substances; changes of phase; equation of state. The second law of thermodynamics: the concept of entropy. Power and refrigeration cycles.<br><b>Pre/Co-requisite:</b> 0408200 – Dynamics for Mechanical Engineering.   |  |         |
| 0408202   | Fluid Mechanics for Mechanical Engineers | (2-3:3) |
| Fluid properties; Units; Pressure and fluid statics: pressure distribution in fluid at rest, hydrostatic forces on plane and curved surfaces, buoyancy, and stability, Fluids in rigid body motion; Fluid Kinematics, dynamics of fluid motion: concepts of streamline, control volume, steady and one-dimensional flows; continuity, Euler, Bernoulli, steady flow energy, linear and angular momentum equations; flow in pipes and losses.<br><b>Prerequisite:</b> 0408200 – Dynamics for Mechanical Engineering. |  |         |
| 0408203   | Strength of Materials                    | (2-3:3) |
| Simple states of stress and strain; Hook's law; torsional stresses; axial deformation; internal forces in beams; bending and shearing diagrams and stresses; beam design; stress transformation; thin-walled pressure vessels; beam deflection, lab session, and experiments.<br><b>Prerequisite:</b> 0401201 – Statics.  |  |         |
| 0408220   | Kinematics                               | (3-0:3) |
| Applications and design of mechanisms; use of graphical and analytical techniques for the kinematic analysis of machines. Analysis and design of linkages, cams, gears, and gear trains. Emphasis is placed more on machines as systems rather than on individual components.<br><b>Prerequisite:</b> 1440261 – Differential Equations for Engineers; 0408200 – Dynamics for Mechanical Engineering.<br><b>Pre/Co-requisite:</b> 0408150 – Engineering Graphics Design.   |  |         |
| 0408300   | Analytical Methods in Engineering        | (3-0:3) |
| Analytical Methods in Engineering cover Vector Differential Calculus, line, surface, and volume integrals, vector field, velocity and acceleration, curvature and torsion, mean value theorem, directional derivative, divergence, curl, curvilinear coordinates, Stokes's theorem, complex analysis, power series, residue integration method and Fourier analysis.<br><b>Pre-requisite:</b> 1440261 – Differential Equations for Engineers.   |  |         |

|  |   |                |
|--|---|----------------|
| <b>0408318</b>   | <b>Instrumentation and Measurements</b> | <b>(3-0:3)</b> |
| <p>Review of electric circuits, Measurement process, errors and sources of errors, signal and noise in instrumentation, filtering, display, and recording systems, elements of signal processing in instrumentation, transducers, sensors, data logging, interfaces, and data processing.</p> <p><b>Prerequisite:</b> 0402348 – Signals and Control Systems; 0408202 – Fluid Mechanics for Mechanical Engineers.</p>   |   |                |
| <b>0408330</b>   | <b>Machine Elements and Design</b>      | <b>(3-0:3)</b> |
| <p>This course covers static failure theories, fatigue failure theories, design of machine elements including the design of columns, shafts, tolerances, fits, fasteners, and bolted connections and gears.</p> <p><b>Prerequisite:</b> 0408203 - Strength of Materials; 0408220 – Kinematics.</p> <p><b>Pre/Co-requisite:</b> 0405202 – Manufacturing Processes.</p>  |   |                |
| <b>0408340</b>   | <b>Advanced Thermodynamics</b>          | <b>(3-0:3)</b> |
| <p>Thermodynamic principles are applied to analyze power, vapor cycles, and air-conditioning systems. Thermodynamics of state, gas mixtures and gas-vapor mixtures, irreversibility and combustion, chemical reactions, Thermodynamics of high-speed gas flow, and fuel cells.</p> <p><b>Prerequisite:</b> 0408201 – Engineering Thermodynamics.</p>   |   |                |
| <b>0408341</b>   | <b>Thermo-Fluids Lab</b>                | <b>(0-3:1)</b> |
| <p>Introduction to basic thermo-fluid principles, instrumentation, experimental verification, and reinforcement of analytical concepts introduced.</p> <p><b>Prerequisite:</b> 0408202 – Fluid Mechanics for Mechanical Engineers.</p> <p><b>Pre/Co-requisite:</b> 0408340 – Advanced Thermodynamics.</p>  |   |                |
| <b>0408420</b>   | <b>Thermal System Design</b>            | <b>(3-0:3)</b> |
| <p>Analysis, management and cost, optimal design, and computer simulation of thermal systems and components; Application in fluid flow and heat transfer. Selected course topics are included as computer programming projects.</p> <p><b>Prerequisite:</b> 0406300 – Heat Transfer.</p> <p><b>Pre/Co-requisite:</b> 0408202 – Fluid Mechanics for Mechanical Engineers.</p>   |   |                |
| <b>0408432</b>   | <b>Advanced Fluid Mechanics</b>         | <b>(3-0:3)</b> |
| <p>This course introduces students to additional topics in fluid dynamics: control volume analysis. Dimensional analysis and similitude. Compressible flow: isentropic flow relations, flow in ducts and nozzles, effects of friction and heat transfer, normal and oblique shocks, two-dimensional isentropic expansion. Viscous flow theory: hydrodynamic lubrication and introduction to boundary layers.</p> <p><b>Prerequisite:</b> 0408202 – Fluid Mechanics for Mechanical Engineers.</p> |   |                |
| <b>0408440</b>   | <b>Mechanical System Design</b>         | <b>(3-0:3)</b> |
| <p>This course covers the detailed design and selection of mechanical elements, including the different types of gears (spur, helical, bevel, and worm gears), lubrication and journal bearings, springs, clutches, and brakes, flexible mechanical elements, and welding. The course also includes team project(s).</p> <p><b>Pre-requisite:</b> 0408202 – Fluid Mechanics for Mechanical Engineers; 0408300 - Analytical Methods in Engineering; 0408330 – Machine Elements and Design.</p>    |   |                |

|   |                         |         |
|---|-------------------------|---------|
| 0408491   | Senior Design Project I | (1-0:1) |
| <p>Student teams develop professional-level experience by applying, integrating, and extending previously acquired knowledge in a major design project. Lectures are devoted to discussing project-related issues and student presentations. A project proposal, oral presentations, and a comprehensive final report are required. Students are introduced to the basic elements of modern engineering design methods. Groups of students investigate a research topic in some area of Mechanical Engineering from the current literature under the supervision of the course instructor.</p> <p><b>Prerequisite:</b> Senior standing.</p> |                         |         |

|   |                          |         |
|---|--------------------------|---------|
| 0408492   | Senior Design Project II | (3-6:3) |
| <p>Student teams develop professional-level experience by applying, integrating, and extending previously acquired knowledge in a major design project. Lectures are devoted to discussing project-related issues and student presentations. A project progress proposal, report, oral presentations, and a comprehensive final report are required. Students apply modern engineering design methods to choose from alternative designs subject to realistic constraints. Groups of students work together to design, build, refine and test complete hardware or/and software systems to meet specifications.</p> <p><b>Prerequisite:</b> 040891 - Senior Design Project I.</p> |                          |         |

## B. Elective Courses

Descriptions of the technical elective courses are given below.

|   |                       |         |
|---|-----------------------|---------|
| 0408345   | Mechanical Vibrations | (3-0:3) |
| <p>This course covers the response of discrete single, two- and multi-degree of freedom systems to vibration. Cases of free and forced vibration, and damped and undamped systems will be covered. Base excitation, rotating imbalance, vibration Isolation, introduction to human responses to vibration.</p> <p><b>Prerequisite:</b> 1440261 – Differential Equations for Engineers; 0408200 – Dynamics for Mechanical Engineering.</p> |                       |         |

|  |                             |         |
|--|-----------------------------|---------|
| 0408349  | Internal Combustion Engines | (3-0:3) |
| <p>This course introduces the fundamentals of how the design and operation of automobile engines affect their performance and environmental impact. The fluid flow, thermodynamics, combustion, and fuel properties are studied with reference to engine power, efficiency, and pollutant formation. Students examine the design features and operating characteristics of different types of automobile engines: conventional gasoline, diesel engines, and the next-generation combustion engines, including direct injection (DI), low-temperature-combustion (LTC) diesel, homogeneous-charge compression-ignition (HCCI) engines. The key features of alternative fuel, hybrid, and fuel cell-powered engines are also discussed. The course includes a term project of literature review and presentation performed by 3~4 students as a project team.</p> <p><b>Prerequisite:</b> 0406300 – Heat transfer.</p> <p><b>Pre/Co-requisite:</b> 0408340 – Advanced Thermodynamics.</p> |                             |         |

|  |  |         |
|--|--|---------|
| 0408410  | Introduction to Finite Element Analysis        | (3-0:3) |
| <p>Introduces students to the finite element method's mathematical foundation and its use in engineering through a commercially available FEA software package. Finite element theory covered includes the derivation of element stiffness matrices, interpolation functions, the use and limitation of different types of elements, and interpretation of finite element solutions. Skills developed using the software include selecting and using elements, modeling strategies, appropriate use of boundary conditions, and methodology for checking solutions.</p> <p><b>Prerequisite:</b> 0408330 – Machine Elements and Design.</p> |  |         |
| 0408430  | Numerical Simulations of Thermo-Fluids Systems | (3-0:3) |
| <p>Numerical simulation of fluid flow and heat transfer, discretization techniques for elliptic, parabolic, and hyperbolic equations, stability, and accuracy of numerical solutions, diffusion equation, linear convection equation, nonlinear convection dominated problems, numerical solution of the Navier-Stokes equations, grid generation, writing/modifying computer codes, and commercial software demonstration.</p> <p><b>Prerequisite:</b> 0402340 – Engineering Computation and Linear Algebra; 0406300 – Heat Transfer.</p>   |  |         |
| 0408460  | Reliability Engineering                        | (3-0:3) |
| <p>The course introduces the basic reliability concepts and tools. It enables the students to apply the reliability theory at different phases of an asset's life cycle: at the acquisition phase model and predict equipment reliability and make cost effective decision; at the utilization, phase understand how maintenance can improve the availability and how to reduce downtime through proper design of dependability (reliability, maintainability and supportability) of mechanical systems.</p> <p><b>Prerequisite:</b> 0405202 – Manufacturing Processes; 0405221 – Engineering Probability and Statistics.</p>              |  |         |
| 0408465  | Robotics and Automation                        | (3-0:3) |
| <p>This course provides an introduction to the theory of robotics. It covers the fundamentals of the field, including rigid motions, homogeneous transformations, forward and inverse kinematics, velocity kinematics, motion planning, trajectory generation, sensing, actuation, stability analysis, and control.</p> <p><b>Prerequisite:</b> 0402348 – Signals and Control Systems; 0408220 – Kinematics</p>  |  |         |
| 0408466  | Energy Conversion                              | (3-0:3) |
| <p>Introduction to global energy concerns; sustainability, fossil, and nuclear fuels; energy consumption analysis; energy management and conservation techniques; renewable and alternative energy sources. Modern energy conversion methods, fuel cells, photovoltaic cells, and hybrid systems.</p> <p><b>Prerequisite:</b> 0406201 – Engineering Thermodynamics; 0406202 – Fluid Mechanics for Mechanical Engineers.</p>  |  |         |

|  |  |         |
|--|--|---------|
| 0408467  | Heating, Ventilating, and Air-Conditioning | (3-0:3) |
| <p>An integrated approach to the application of engineering principles to HVAC systems. Topics include moist air properties, air psychometrics, indoor air quality, inside and outside design conditions, and heating and cooling loads calculations. Design and selection of HVAC systems.</p> <p><b>Pre-requisites:</b> 0406300 – Heat Transfer; 0408201 – Engineering Thermodynamics; 0408202 – Fluid Mechanics for Mechanical Engineers.</p> |  |         |

|   |                         |         |
|---|-------------------------|---------|
| 0408468   | Power Generation Plants | (3-0:3) |
| <p>The course introduces students to the various types, working principles, and performance of different kinds of conventional and non-conventional power plants, operation and performance analysis of multiple components of power plants (e.g., Turbines, Condensers, Cooling Towers, Fuel, and Air Handling Systems, Boilers, Superheaters, Intercoolers, Reheaters, and Regenerator. The course also covers power plant economics and the impact of power plants on the environment.</p> <p><b>Pre-requisite:</b> 0408340 – Advanced Thermodynamics.</p> |                         |         |

|  |                       |         |
|--|-----------------------|---------|
| 0408475  | Mechanical Metallurgy | (3-0:3) |
| <p>The central point of this course is to provide knowledge of the microstructure and mechanical properties of metals. The course covers equilibrium phase diagrams, solid transformation, strengthening mechanisms, and ferrous and non-ferrous materials. The concepts of alloy design and microstructural engineering are also discussed, linking processing and thermodynamics to the structure and properties of metals.</p> <p><b>Prerequisite:</b> 0406302 – Engineering Materials.</p> |                       |         |

|   |  |         |
|---|--|---------|
| 0408480   | Special Topics in Mechanical Engineering | (3-0:3) |
| <p>This course covers emerging and advanced topics in the field of nuclear engineering. The contents will vary depending on the topic.</p> <p><b>Prerequisite:</b> Senior Standing.</p> |  |         |



## Nuclear Engineering (NE) Program

The Nuclear Engineering Program graduates are expected to have a broad background in several areas of sciences and engineering related to pacific uses of nuclear technology. Areas of expertise where they should be capable of delivering understanding, have practical experience, or be capable of design and research are:

- Radiation Detection
- Dosimetry
- Technological Applications of Radiation
- Imaging, diagnosing, and therapy based on radiation applications.
- Energy Production through Fission or Fusion Reactors.
- Applications of Radiations to research in condensed matter.
- Radiation production mechanisms.
- Materials of interest for the production of nuclear energy.
- Neutron and radiation transport, heat transfer, and fluid dynamics simulations.
- Nuclear Safety, Safeguards, and Security
- Nuclear Fuel Cycle, Proliferation, waste management, and remediation.

Energy is a crucial value for any developed society, and understanding its generation and the impact it causes on society and the environment is central for sustainability programs. Evolution and innovation in these and other related knowledge areas of expertise are endless and need new requirements to be satisfied.

### Objectives

The bachelor's degree in nuclear engineering program has the following program educational objectives:

1. Graduates will have the opportunity to pursue a productive career in nuclear engineering or related fields, either in industrial, governmental, research, or academic institutions.
2. Graduates will continue to develop their knowledge through lifelong learning opportunities and/or advanced degrees.
3. Graduates will be responsible for contributing to society through engagement in professional organizations and/or community services.

### Program Outcomes

Upon successful completion of the BS program in Nuclear Engineering, graduates will have:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to conclude.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

## Career Opportunities

Nuclear engineers work in the areas of nuclear regulation and enforcement, nuclear reactor design, plant licensing and operation, radioactive waste disposal, radiation protection, and applications of radioisotopes in industry, medicine, and research. Examples of applications in industry and medicine are:

- Imaging devices
- Radiation therapy
- Oil well-logging
- Thickness and density gauges
- Radiation detectors
- Food irradiation

## Program Overview

- The Nuclear Engineering Program is a four-year study that provides students with a solid knowledge of nuclear engineering. Students spend the first segment of their study acquiring skills that serve as the foundation for later courses.
- In the second segment, students learn the fundamentals of nuclear engineering and gain knowledge in multiple related engineering topics, including electronics, materials, and fluid mechanics.
- In the third and final segment of their study, students take advanced courses in nuclear engineering, undergo an eight-week practical training, and complete senior design projects.
- The Nuclear Engineering Program is the only program in the UAE that offers a BSc degree in nuclear engineering. The program is committed to producing competent and highly-skilled engineers who are well prepared to work in nuclear engineering.
- To obtain a Bachelor of Science degree in Nuclear Engineering, the student must complete a total of 131 credit hours. These hours include University Requirements (UR), College Requirements (CR), and Program Requirements (PR). The allocation of the credit hours is shown in the following table:

| BSc in Nuclear Engineering (131) |    |    |    |       |
|----------------------------------|----|----|----|-------|
|                                  | UR | CR | PR | Total |
| Mandatory Credits                | 18 | 26 | 75 | 119   |
| Elective Credits                 | 6  | -  | 6  | 12    |
| Total                            | 24 | 26 | 81 | 131   |

### I. University Requirements (UR)

Every student must take 24 credit hours of general education courses distributed over seven domains. Eighteen (18) mandatory credit hours are selected from domains 1, 2, 3, and 4, and (6) elective credit hours selected from domains 5, 6, and 7 as indicated in the University section (General Education).

### II. College Requirements (CR)

The list of the College required courses and their descriptions are presented in the introductory pages of the College of Engineering section in this catalog.

### III. Program Requirements (PR)

#### A. Mandatory requirements

The NE program core courses are listed in the table below.

| Course #                          | Title  | CrHrs     | Prerequisites                                   |
|-----------------------------------|--|-----------|---|
| 1501116                           | Programming I  | 4         | None  |
| 1430118                           | Physics II Lab   | 1         | 1430116<br>Pre/Co: 1430117                      |
| 0402202                           | Circuit Analysis I   | 3         | Pre/Co: 1430117,<br>1440261                     |
| 0402255                           | Applied Electronics for SREE                                 | 3         | 0402202   |
| 0402256                           | Applied Electronics for SREE Lab                             | 1         | Pre/Co: 0402255                                 |
| 0402340                           | Engineering Computations and Linear Algebra                  | 3         | 1411116, 1440261                                |
| 0402348                           | Signals and Control Systems                                  | 3         | 0402255, 0406101                                |
| 0405221                           | Engineering Probability and Statistics                       | 3         | Pre/Co: 0402202                                 |
| 0406100                           | Introduction to Energy Science and Technology                | 3         | Pre/Co: 1430117                                 |
| 0406101                           | Statics and Dynamics   | 3         | 1430115, 1440133                                |
| 0406200                           | Thermodynamics   | 3         | 0406101   |
| 0406201                           | Fluid Mechanics  | 3         | 0406101   |
| 0406202                           | Fluid Mechanics Lab  | 1         | Pre/Co: 0406201                                 |
| 0406300                           | Heat Transfer  | 3         | 0406200, 0406201                                |
| 0406301                           | Heat Transfer Lab  | 1         | Pre/Co: 0406300                                 |
| 0407200                           | Introduction to Nuclear Engineering and Radiological Science | 3         | 1430117, 1440161<br>Pre/Co: 0406100             |
| 0407202                           | Fundamentals of Nuclear Engineering and Radiological Science | 3         | 0407200   |
| 0407204                           | Nuclear Instrumentation and Measurement                      | 3         | 0405221, 0407202                                |
| 0407300                           | Elements of Nuclear Engineering and Radiological Sciences    | 3         | 0407202<br>Pre/Co: 0407304                      |
| 0407302                           | Reactor Thermal Hydraulics                                   | 3         | 0406300, 0407300                                |
| 0407304                           | Analytical Methods for Nuclear Engineers                     | 3         | 1440261   |
| 0407305                           | Nuclear Engineering Materials                                | 3         | 1420101, 0407202                                |
| 0407306                           | Nuclear Science and Engineering Lab I                        | 1         | 0402255, 0407204                                |
| 0407307                           | Nuclear Science and Engineering Lab II                       | 1         | 0407306   |
| 0407308                           | Nuclear Reactor Theory                                       | 3         | 0402340, 0407300                                |
| 0407401                           | Nuclear Power Reactors                                       | 3         | 0407302, 0407308                                |
| 0407402                           | Reactor Safety Analysis                                      | 3         | 0407302, 0407308<br>Pre/Co: 0407401             |
| 0407403                           | Advanced Nuclear Lab   | 1         | 0402348<br>Pre/Co: 0407401,<br>0407402          |
| 0407491                           | Senior Design Project I                                      | 1         | Senior Standing,<br>Pre/Co: 0407302,<br>0407308 |
| 0407492                           | Senior Design Project II                                     | 3         | 0407491   |
| 04074XX                           | NE Technical Elective 1                                      | 3         | Depending on the<br>selected courses            |
| 04074XX                           | NE Technical Elective 2                                      | 3         |   |
| <b>Total Program Requirements</b> |  | <b>81</b> | <b>Credit-hours</b>                             |

## B. Technical Electives

As part of the program for the Bachelor of Science in Nuclear Engineering, the student is required to study 6 credit hours of technical elective courses. These courses allow the student to focus on a specific area for in-depth knowledge and understanding. The student can also mix and match elective courses from the different areas to get more broad exposure to the various nuclear science and engineering disciplines. In cooperation with the academic advisor, the student should select the list of electives that best meet their needs and aspirations.

It is highly recommended that the student registers for these courses after completing the program requirements.

| Course # | Title  | CrHrs | Prerequisites    |
|----------|--|-------|------------------|
| 0407450  | Applications of Radiation                    | 3     | 0407300          |
| 0407453  | Engineering Principles of Radiation Imaging  | 3     | 0407450          |
| 0407454  | Radiological Health Engineering Fundamentals | 3     | 0407300          |
| 0407455  | Quantum Mechanics for Nuclear Engineering    | 3     | 0407300, 0407304 |
| 0407456  | Nuclear Reactor Dynamics                     | 3     | 0407302, 0407308 |
| 0407457  | Nuclear Safeguards and Technology            | 3     | 0407401          |
| 0407458  | Nuclear Security                             | 3     | 0407402          |
| 0407459  | Nuclear Fuel Cycle                           | 3     | 0407401          |
| 0407470  | Special topics in Nuclear Engineering        | 3     | 0407300          |

## C. Senior Design Project

Students will have a Senior Design Project during their senior year of study over two semesters:

- Senior Design Project I (1 credit).
- Senior Design Project II (3 credits).

## Study Plan

The Bachelor of Science in Nuclear Engineering encompasses 131 credit hours spread over 8 semesters plus a summer training period normally completed in four years. The following study plan serves as a roadmap for a smooth progression toward graduation:

| Year 1, Semester 1 (17 Credits) |                               |       |                                     |
|---------------------------------|-------------------------------|-------|-------------------------------------|
| Course #                        | Title                         | CrHrs | Prerequisites                       |
| 1420101                         | General Chemistry I           | 3     |                                     |
| 1420102                         | General Chemistry I Lab       | 1     | Pre/Co: 1420101                     |
| 1430115                         | Physics I                     | 3     | EmSat or 1430106<br>Pre/Co: 1440133 |
| 1430116                         | Physics I Lab                 | 1     | Pre/Co: 1430115                     |
| 1440133                         | Calculus I for Engineering    | 3     | EmSat or 1440098                    |
| 0201102                         | Arabic Language               | 3     |                                     |
| 0202112                         | English for Academic Purposes | 3     |                                     |

| Year 1, Semester 2 (17 Credits) |                               |       |                            |
|---------------------------------|-------------------------------|-------|----------------------------|
| Course #                        | Title                         | CrHrs | Prerequisites              |
| 1501116                         | Programming I                 | 4     |                            |
| 1430117                         | Physics II                    | 3     | 1430115<br>Pre/Co: 1430161 |
| 1430118                         | Physics II Lab                | 1     | 1430116<br>Pre/Co: 1430117 |
| 1440161                         | Calculus II for Engineering   | 3     | 1440133                    |
| 0406100                         | Intro. to Energy Sci. & Tech. | 3     | Pre/Co: 1430117            |
| 0406101                         | Statics & Dynamics            | 3     | 1430115, 1440133           |

| Year 2, Semester 3 (18 Credits) |   |       |                                     |
|---------------------------------|---|-------|-------------------------------------|
| Course #                        | Title   | CrHrs | Prerequisites                       |
| 1440261                         | Differential Equations for Eng.                     | 3     | 1440161                             |
| 0402202                         | Circuit Analysis I                                  | 3     | Pre/Co: 1430117,<br>1440261         |
| 0405221                         | Engineering Probability & Statistics                | 3     | Pre/Co: 0402202                     |
| 0406200                         | Thermodynamics                                      | 3     | 0406101                             |
| 0407200                         | Introduction to Nuclear Eng. &<br>Radiological Sci. | 3     | 1430117, 1440161<br>Pre/Co: 0406100 |
| 0104100                         | Islamic Culture                                     | 3     |                                     |

| Year 2, Semester 4 (17 Credits) |   |       |                  |
|---------------------------------|---|-------|------------------|
| Course #                        | Title   | CrHrs | Prerequisites    |
| 0402255                         | Applied Electronics for SREE                        | 3     | 0402202          |
| 0402256                         | Applied Electronics Lab for SREE                    | 1     | Pre/Co: 0402255  |
| 0406201                         | Fluid Mechanics                                     | 3     | 0406101          |
| 0406202                         | Fluid Mechanics Lab                                 | 1     | Pre/Co: 0406201  |
| 0407202                         | Fundamentals of Nuclear Eng. &<br>Radiological Sci. | 3     | 0407200          |
| 0407204                         | Nuclear Instrumentation &<br>Measurement            | 3     | 0405221, 0407202 |
| 0407304                         | Analytical Method for NE                            | 3     | 1440261          |

| Year 3, Semester 5 (17 Credits) |   |       |                            |
|---------------------------------|---|-------|----------------------------|
| Course #                        | Title   | CrHrs | Prerequisites              |
| 0402340                         | Eng. Comp. & Linear Algebra                     | 3     | 1411116, 1440261           |
| 0402348                         | Signals & Control System                        | 3     | 0402202, 0406101           |
| 0406300                         | Heat Transfer                                   | 3     | 0406200, 0406201           |
| 0406301                         | Heat Transfer Lab                               | 1     | Pre/Co: 0406300            |
| 0407300                         | Elements of Nuclear Eng. &<br>Radiological Sci. | 3     | 0407202<br>Pre/Co: 0407304 |
| 0407306                         | Nuclear Sci. Eng. Lab I                         | 1     | 0402255, 0407204           |
| 0302200                         | Fund. of Innovation & Entrepreneur              | 3     |                            |

| Year 3, Semester 6 (16 Credits) |                               |       |                  |
|---------------------------------|-------------------------------|-------|------------------|
| Course #                        | Title                         | CrHrs | Prerequisites    |
| 1501100                         | Intro to IT                   | 3     |                  |
| 0407302                         | Reactor Thermal Hydraulics    | 3     | 0406300, 0407300 |
| 0407305                         | Nuclear Engineering Materials | 3     | 1420101, 0407202 |
| 0407307                         | Nuclear Sci. Eng. Lab II      | 1     | 0407306          |
| 0407308                         | Nuclear Reactor Theory        | 3     | 0402340, 0407300 |
|                                 | University Elective 1         | 3     |                  |

| Year 3, Summer Training (0 Credits) |                                |       |                 |
|-------------------------------------|--------------------------------|-------|-----------------|
| Course #                            | Title                          | CrHrs | Prerequisites   |
| 0407490                             | Practical Training for 8 weeks | 0     | 90 Credit Hours |

| Year 4, Semester 7 (14 Credits) |                         |       |   |
|---------------------------------|-------------------------|-------|---|
| Course #                        | Title                   | CrHrs | Prerequisites                                   |
| 0202207                         | Technical Writing       | 3     | 0202112   |
| 0407401                         | Nuclear Power Reactors  | 3     | 0407302, 0407308                                |
| 0407402                         | Reactor Safety Analysis | 3     | 0407302, 0407308<br>Pre/Co: 0407401             |
| 0407403                         | Advanced Nuclear Lab    | 1     | 0402348<br>Pre/Co: 0407401,<br>0407402          |
| 04074xx                         | NE Technical Elective 1 | 3     |   |
| 0407491                         | Senior Design Project I | 1     | Senior Standing,<br>Pre/Co: 0407302,<br>0407308 |

| Year 4, Semester 8 (15 Credits) |                          |       |                               |
|---------------------------------|--------------------------|-------|-------------------------------|
| Course #                        | Title                    | CrHrs | Prerequisites                 |
| 0401301                         | Engineering Economics    | 3     | 3 <sup>rd</sup> year standing |
| 0407xxx                         | NE Technical Elective 2  | 3     |                               |
| 0407492                         | Senior Design Project II | 3     | 0407491                       |
|                                 | University Elective 2    | 3     |                               |
|                                 | University Elective 3    | 3     |                               |

### Course Coding

The courses offered in the Nuclear Engineering program are designated code numbers in the form of (0407ABC) where:

|    |                             |
|----|-----------------------------|
| A  | Year (level)                |
| BC | Course sequence in the area |

### Course Description

#### A. Mandatory Courses

Descriptions of the core courses are given below.

|   |               |         |
|---|---------------|---------|
| 1501116   | Programming I | (3-2:4) |
| <p>This course covers introductory concepts in computer programming using C++. We assume that students have no programming experience. There is an emphasis on both the concepts and practice of computer programming. This course covers principles of problem-solving and requires many labs and programming assignments. Students should expect to spend at least 8 hours per week on this course.</p> <p><b>Prerequisite:</b> None.</p> |               |         |

|   |  |                |
|---|--|----------------|
| <b>1430118</b>  | <b>Physics II Laboratory</b>                       | <b>(0-3:1)</b> |
| <p>Ten experiments in electricity and magnetism, covering topics in the Physics II course. The experiments are DC Measurements, Ohm's Law, Wheatstone Bridge, Capacitors Bridge, Kirchhoff's Laws, Resistance and resistivity, RC-Circuit, Oscilloscope, Magnetic Force I, and II, Magnetic field, Electromagnetic Induction (manual experiment), Electromagnetic induction II (computerized experiment).</p> <p><b>Prerequisite:</b> 1430116 – Physics I Laboratory.</p> <p><b>Pre/Co-requisite:</b> 1430117 – Physics II.</p>     |  |                |
| <b>0402202</b>  | <b>Circuit Analysis I</b>                          | <b>(3-0:3)</b> |
| <p>Fundamentals of DC and AC circuit laws; Mathematical models for circuit elements; Techniques for circuit analysis and for writing and solving circuit equations; Circuit theorems; Introduction to Op-Amps; Transient analysis of first-order circuits; Phasor technique for a steady-state sinusoidal response.</p> <p><b>Pre/Co-requisite:</b> 1430117 – Physics II; 1440261 – Differential Equations for Engineers.</p>   |  |                |
| <b>0402255</b>  | <b>Applied Electronics for SREE</b>                | <b>(3-0:3)</b> |
| <p>Introduction to semiconductor materials and devices. Analysis of Diodes and applications. Analysis of transistor circuits (BJTs, MOSFETs). Amplifier circuits, bandwidth; feedback. Operational amplifiers and applications, filter and oscillator circuits. Introduction to power electronics, DC-DC converters, and DC-AC inverters.</p> <p><b>Prerequisite:</b> 0402202 – Circuit Analysis I.</p>   |  |                |
| <b>0402256</b>  | <b>Applied Electronics Lab for SREE</b>            | <b>(0-3:1)</b> |
| <p>Diode characteristics, BJT and MOS biasing circuits, Spice simulation, frequency response, op-amp applications, introduction to power electronics lab.</p> <p><b>Pre/Co-requisite:</b> 0402255 – Applied Electronics for SREE.</p>   |  |                |
| <b>0402340</b>  | <b>Engineering Computations and Linear Algebra</b> | <b>(3-0:3)</b> |
| <p>Basic linear algebra: LU decomposition, normal equations, least-squares solutions, eigenvalues, and eigenvectors decomposition of matrices. Numerical solution of linear and nonlinear equations, eigenvalues, and eigenvectors, curve fitting, numerical differentiation and integration of functions, numerical solution of ordinary differential equations, and use of MATLAB to solve complex engineering problems.</p> <p><b>Prerequisite:</b> 1501116 – Programming I; 1440261 – Differential Equations for Engineers.</p> |  |                |
| <b>0402348</b>  | <b>Signals and Control Systems</b>                 | <b>(3-0:3)</b> |
| <p>Representation and analysis of signals. Fourier transforms. Linear time-invariant systems, impulse response, frequency response, and transfer function. Introduction to linear feedback control. Analysis and design of classical control systems. Control system components and industrial process automation.</p> <p><b>Prerequisite:</b> 0402255 – Applied Electronics for SREE; 0406101 – Statics and Dynamics.</p>  |  |                |
| <b>0405221</b>  | <b>Engineering Probability &amp; Statistics</b>    | <b>(3-0:3)</b> |
| <p>Descriptive statistics and sampling, sample space and events, axioms of probability, conditional probability, statistical independence, Bayes theorem, discrete probability distributions (uniform, binomial, geometric, Poisson), continuous probability distributions (normal, exponential, gamma and Weibull), joint probability distribution, point estimation, central limit theorem, interval estimation, use of statistical software.</p> <p><b>Pre/Co-requisite:</b> 0402202 – Circuit Analysis I.</p>                   |  |                |

|  |  |                |
|--|--|----------------|
| <b>0406100</b>   | <b>Introduction to Energy Science and Technology</b> | <b>(3-0:3)</b> |
| Introduction to energy. Survey of energy technologies including steam, hydro, tidal, wave, fossil, geothermal, solar, wind, biofuels, and nuclear. Energy sources and conservation of energy, energy efficiency, energy production and uses, and sources of energy for both conventional and renewable. Climate change and the future of energy. Freehand sketching, isometric drawing, and orthographic projections. Introduction to 3D AutoCAD and MATLAB.<br><b>Pre/Co-requisite:</b> 1430117 – Physics II. |  |                |
| <b>0406101</b>   | <b>Statics and Dynamics</b>                          | <b>(3-0:3)</b> |
| Force and moment vectors, resultants. Principles of statics and free-body diagrams. Properties of areas, second moments. Internal forces in beams. Laws of friction. Principles of particle dynamics. Mechanical systems and rigid-body dynamics. Kinematics and dynamics of plane systems. Energy and momentum of 2-D bodies and systems.<br><b>Prerequisite:</b> 1430115 – Physics I; 1440133 – Calculus I for Engineering.  |  |                |
| <b>0406200</b>   | <b>Thermodynamics</b>                                | <b>(3-0:3)</b> |
| Basic concepts of thermodynamics: temperature, work, heat, internal energy, and enthalpy. The first law of thermodynamics for closed and steady-flow open systems. Thermodynamic properties of pure substances; changes of phase; equation of state. The second law of thermodynamics: is the concept of entropy—power and refrigeration cycles.<br><b>Prerequisite:</b> 0406101 – Statics and Dynamics.   |  |                |
| <b>0406201</b>   | <b>Fluid Mechanics</b>                               | <b>(3-0:3)</b> |
| Fluid properties; Units; Pressure and fluid statics: pressure distribution in fluid at rest, hydrostatic forces on plane and curved surfaces, buoyancy, and stability, Fluids in rigid body motion; Fluid Kinematics, dynamics of fluid motion: concepts of streamline, control volume, steady and one-dimensional flows; continuity, Euler, Bernoulli, steady flow energy, linear and angular momentum equations; flow in pipes and losses.<br><b>Prerequisite:</b> 0406101 – Statics and Dynamics.           |  |                |
| <b>0406202</b>   | <b>Fluid Mechanics Lab</b>                           | <b>(0-3:1)</b> |
| Introduction to basic fluid mechanics instrumentation; experimental verification and reinforcement of analytical concepts introduced in course 0406201.<br><b>Pre/Co-requisite:</b> 0406201 – Fluid Mechanics.   |  |                |
| <b>0406300</b>   | <b>Heat Transfer</b>                                 | <b>(3-0:3)</b> |
| Mechanisms of heat transfer: conduction, convection, and radiation. Steady heat conduction, insulation, cooling. Transient heat conduction. Forced convection; natural convection. Heat exchangers. Applications to energy systems.<br><b>Prerequisite:</b> 0406200 – Thermodynamics; 0406201 – Fluid Mechanics.   |  |                |
| <b>0406301</b>   | <b>Heat Transfer Lab</b>                             | <b>(0-3:1)</b> |
| Experiments on measurement techniques heat transfer principles of linear and radial conduction; unsteady state heat conduction; natural and forced convection; parallel and counter flow exchangers; thermal radiation; temperature measurement.<br><b>Pre/Co-requisite:</b> 0406300 – Heat Transfer.  |  |                |



|   |   |         |
|---|---|---------|
| 0407200   | Introduction to Nuclear Engineering and Radiological Sciences | (3-0:3) |
| <p>This course will discuss different forms of energy, the history of nuclear energy, the fundamentals of fission and fusion nuclear power, radiological health applications and electromagnetic radiation in the environment, environmental effects of nuclear power and radioactive waste management, and the code of practices in nuclear engineering.</p> <p><b>Prerequisites:</b> 1430117 – Physics I; 1440161 – Calculus II for Engineering.</p> <p><b>Pre/Co-requisite:</b> 0406100 – Introduction to Energy Science and Technology.</p>   |   |         |
| 0407202   | Fundamentals of Nuclear Engineering and Radiological Sciences | (3-0:3) |
| <p>The course will cover modern and atomic physics, including special relativity, quantum physics, and atomic model and physics. Nuclear physics, including nuclear energetics, radioactive decay, binary nuclear reactions, and interaction of radiation with matter, will also be discussed.</p> <p><b>Prerequisite:</b> 0407200 – Introduction to Nuclear Engineering and Radiological Sciences.</p>   |   |         |
| 0407204   | Nuclear Instrumentation and Measurement                       | (3-0:3) |
| <p>An introduction to the devices and techniques most common in nuclear measurements. Topics include the radiation sources and interactions, counting statistics and error propagation, principles of operation of gas-filled, solid-state, and scintillation detectors for charged particles, gamma-ray, and neutron radiations. Techniques of pulse shaping, counting, and analysis for radiation spectroscopy. Timing and coincidence measurements.</p> <p><b>Prerequisite:</b> 0405221 – Engineering Probability &amp; Statistics; 0407202 – Fundamentals of Nuclear Engineering and Radiological Science.</p>  |   |         |
| 0407300   | Elements of Nuclear Engineering and Radiological Sciences     | (3-0:3) |
| <p>This course will discuss Nuclear Reactor Physics basics, introducing concepts like infinite homogeneous reactor, reactivity, criticality, reactor kinetics, and feedback coefficients. General characteristics of reactors design will be presented.</p> <p><b>Prerequisite:</b> 0407202 – Fundamentals of Nuclear Engineering and Radiological Science.</p> <p><b>Pre/Co-requisite:</b> 0407304 – Analytical Methods for Nuclear Engineers.</p>   |   |         |
| 0407302   | Reactor Thermal Hydraulics                                    | (3-0:3) |
| <p>This course will cover the thermal-hydraulic fundamentals of nuclear power reactors, including principles of single-phase flow, two-phase flow, and heat transfer. The applications of convection heat transfer, boiling heat transfer, condensation, thermosiphon, and modeling of two-phase flows in nuclear power reactors are discussed in detail. The course covers the overall thermal-hydraulic characteristics of the reactor core, including core heat generation, thermodynamics of nuclear energy, and thermal analysis of fuel elements.</p> <p><b>Prerequisite:</b> 0406300 – Heat Transfer; 0407300 – Elements of Nuclear Engineering and Radiological Sciences.</p> |   |         |
| 0407304   | Analytical Methods for Nuclear Engineers                      | (3-0:3) |
| <p>Expanding functions in power series; Complex numbers, Multiple Integrals; Special functions; Vector analysis; Fourier series; Partial differential equations Introduction and application to Nuclear Engineering field.</p> <p><b>Prerequisite:</b> 1440261 – Differential Equations for Engineers.</p>  |   |         |

|   |  |                |
|---|--|----------------|
| 0407305   | <b>Nuclear Engineering Materials</b>                 | <b>(3-0:3)</b> |
| <p>The course consists of two parts: introductory, which introduces students to crystal structures and crystal defects (point, line, surface, and volume) and mechanical properties and failure forms (stress, strain, hardness, fracture, creep, and fatigue). The second part focuses on the fundamentals of radiation damage induced by fast neutrons and radiation effects on materials. Metallic and ceramic fuels have mechanical and thermal properties.</p> <p><b>Prerequisite:</b> 1420101 – General Chemistry I; 0407202 – Fundamentals of Nuclear Engineering and Radiological Sciences.</p>   |  |                |
| 0407306   | <b>Nuclear Science and Engineering Laboratory I</b>  | <b>(0-3:1)</b> |
| <p>An introduction to measurements common in nuclear science. The operation of gas-filled and solid-state detectors; scintillation detectors for gamma, neutron radiation, and charged particles. Counting techniques and nuclear statistics, pulse shaping, and spectroscopic radiation analysis.</p> <p><b>Prerequisite:</b> 0402255 – Applied Electronics for SREE; 0407204 – Nuclear Instrumentation and Measurement.</p>   |  |                |
| 0407307   | <b>Nuclear Science and Engineering Laboratory II</b> | <b>(0-3:1)</b> |
| <p>Enhancement of laboratory skills pertinent to nuclear engineering. Experiments related to Gamma Coincidence, half-life, scattering of alpha particles, x-ray fluorescence, and neutron activation.</p> <p><b>Prerequisite:</b> 0407306 – Nuclear Science and Engineering Lab I.</p>  |  |                |
| 0407308   | <b>Nuclear Reactor Theory</b>                        | <b>(3-0:3)</b> |
| <p>Neutron Transport Equation: neutron angular flux, neutron current. Neutron Diffusion: Fick's law, diffusion in homogeneous non-multiplying and reactor media, criticality, heterogeneous reactor, multi-group, and two-group. Numerical solutions of 2-group diffusion equation. Using transport code CASMO.</p> <p><b>Prerequisite:</b> 0402340 – Engineering Computation &amp; Linear Algebra; 0407300 – Elements of Nuclear Engineering and Radiological Sciences.</p>  |  |                |
| 0407401   | <b>Nuclear Power Reactors</b>                        | <b>(3-0:3)</b> |
| <p>The course discusses the performance of nuclear power plant systems and their role in power production. The course focuses mainly on power reactor performance under normal operating conditions and generally discusses reactor behavior under design-based accidents. The course emphasizes analyzing reactor thermodynamic cycles, components of different power reactor types (PWR, BWR, Gas Reactors, and Fast Breeding Reactors), design synthesis, reactor overall performance, load curves, environmental impacts of the nuclear power plant, and nuclear plant economics.</p> <p><b>Prerequisite:</b> 0407302 – Reactor Thermal Hydraulics; 0407308 - Nuclear Reactor Theory.</p> |  |                |
| 0407402   | <b>Reactor Safety Analysis</b>                       | <b>(3-0:3)</b> |
| <p>The course will cover the safety systems used in a nuclear reactor, deterministic and probabilistic models, design-basis accidents and severe accident analysis, the role of engineered safety systems, radiological consequences and risk assessment, and ethical issues of misuse of nuclear technology.</p> <p><b>Prerequisite:</b> 0407302 – Reactor Thermal Hydraulics; 0407308 – Nuclear Reactor Theory.<br/><b>Pre/Co-requisite:</b> 0407401 – Nuclear Power Reactors.</p>  |  |                |

|  |                             |         |
|--|-----------------------------|---------|
| 0407403  | Advanced Nuclear Energy Lab | (0-3:1) |
| Measurement of nuclear performance, control rod worth, critical rod location, and feedback coefficients of reactivity.<br><b>Prerequisite:</b> 0402348 – Signals and Control Systems.<br><b>Pre/Co-requisite:</b> 0407401 – Nuclear Power Reactors; 0407402 – Reactor Safety Analysis. |                             |         |

|  |                         |         |
|--|-------------------------|---------|
| 0407491  | Senior Design Project I | (1-0:1) |
| The course provides Nuclear Engineering students the ability to formulate the problem statement and apply it to engineering design. From this course, students learn to work in a team, and it will improve the student's communication skills and ability to share technical ideas. During this course, the students develop a preliminary design of the proposed project as outlined in the report produced and give a presentation at the end of the semester.<br><b>Prerequisite:</b> Senior standing.<br><b>Pre/Co-requisite:</b> 0407302 – Reactor Thermal Hydraulics, 0407308 – Nuclear Reactor Theory. |                         |         |

|  |                          |         |
|--|--------------------------|---------|
| 0407492  | Senior Design Project II | (3-6:3) |
| Students apply modern engineering design methods to choose from alternative designs subject to realistic constraints. Groups of students work together to design, build, refine and test complete hardware or /and software systems to meet specifications. Students analyze their results keeping in view safety and ethical implications.<br><b>Prerequisite:</b> 0407491 – Senior Design Project I. |                          |         |

## B. Elective Courses

Descriptions of the technical elective courses are given below.

|  |                          |         |
|--|--------------------------|---------|
| 0407450  | Application of Radiation | (3-0:3) |
| Applications of radiation interaction with matter using various forms (neutrons, ions, electrons, photons) of radiation, including radiotracers, radio gauges, activation analysis, X-ray fluorescence, neutron radiography, and nuclear reaction analysis.<br><b>Prerequisite:</b> 0407300 – Elements of Nuclear Engineering and Radiological Sciences. |                          |         |

|   |   |         |
|---|---|---------|
| 0407453   | Engineering Principles of Radiation Imaging | (3-0:3) |
| Analytic description of radiation production, transport, and detection in radiation imaging systems. Measurements methods for image quality and statistical performance of observers. For radiographic and radioisotope imaging, including film/screen, storage phosphor, electronic radiography, fluoroscopy, computed tomography, Anger camera, and PET systems. Emphasis on the impact of the random process on observer detection.<br><b>Prerequisite:</b> 0407300 – Elements of Nuclear Engineering and Radiological Sciences. |   |         |

|   |  |         |
|---|--|---------|
| 0407454   | Radiological Health Engineering Fundamentals | (3-0:3) |
| The course will cover the physical and biological aspects of the use of ionizing radiation in industrial and academic institutions, physical principles underlying shielding instrumentation, waste disposal, and the biological effects of low levels of ionizing radiation. Biological effects of ionizing radiation at the molecular, cellular, and organism levels. External and internal dose estimation, nonionizing radiation safety methods.<br><b>Prerequisite:</b> 0407300 – Elements of Nuclear Engineering and Radiological Sciences. |  |         |

|  |  |                |
|--|--|----------------|
| <b>0407455</b>   | <b>Quantum Mechanics for Nuclear Engineering</b> | <b>(3-0:3)</b> |
| <p>Basics of quantum mechanics, wave-particle duality, the semi-classical theory, Schrodinger's equation, and its solution in one dimension. Tunneling effects and radioactive decay, the deuteron, neutron-proton scattering. Models of the nuclear interaction, the Jellium, and nuclear shell theory.</p> <p><b>Prerequisite:</b> 0407300 – Elements of Nuclear Engineering and Radiological Sciences; 0407304 – Analytical Methods for Nuclear Engineers.</p>  |  |                |
| <b>0407456</b>   | <b>Nuclear Reactor Dynamics</b>                  | <b>(3-0:3)</b> |
| <p>Basic equations and physical parameters of point reactor kinetics without feedback effects; the nuclear reactor as a total system; reactor excursions, Fuchs-Nordheim and Bethe-Tait models; space-time reactor dynamics; synthesis methods.</p> <p><b>Prerequisite:</b> 0407302 – Reactor Thermal Hydraulics; 0407308 – Nuclear Reactor Theory</p>   |  |                |
| <b>0407457</b>   | <b>Nuclear Safeguards and Technology</b>         | <b>(3-0:3)</b> |
| <p>The course provides nuclear engineering students with a background and overview of critical topics important to nuclear materials safeguards, accountability, and non-proliferation. This course will introduce the concepts behind nuclear materials controls and accountability, the State System of Accounting Systems, and various NDA equipment used for verification of nuclear material and systems for Containment and surveillance.</p> <p><b>Prerequisite:</b> 0407401 – Nuclear Power Reactors.</p>  |  |                |
| <b>0407458</b>   | <b>Nuclear Security</b>                          | <b>(3-0:3)</b> |
| <p>Introduction to nuclear security, Knowledge of national/international nuclear laws, security of radioactive materials and facilities, Basics of nuclear materials accounting and control, Overview of an export control system, National/International control lists, border monitoring systems, types, assessment, localization and identification, verification of alarms, Illicit trafficking of nuclear materials, nuclear security emergency.</p> <p><b>Prerequisite:</b> 0407402 – Reactor Safety Analysis.</p>   |  |                |
| <b>0407459</b>   | <b>Nuclear Fuel Cycle</b>                        | <b>(3-0:3)</b> |
| <p>This course is intended for nuclear engineering students interested in acquiring a foundation in the nuclear fuel cycle with topics ranging from nuclear-fuel reprocessing to waste treatment and final disposal. The topics include uranium nuclear fuel cycle: mining, conversion, enrichment, fuel manufacturing, in-core fuel management, and refueling, spent fuel storage, reprocessing/recycling, and final disposition as waste in a geologic repository. The concepts of nuclear safeguards and nonproliferation are discussed in each cycle step.</p> <p><b>Prerequisite:</b> 0407401 – Nuclear Power Reactors.</p> |  |                |
| <b>0407470</b>   | <b>Special Topics in Nuclear Engineering</b>     | <b>(3-0:3)</b> |
| <p>This course covers emerging and advanced topics in the field of nuclear engineering. The contents will vary depending on the topic.</p> <p><b>Prerequisite:</b> 0407300 – Elements of Nuclear Engineering and Radiological Sciences.</p>  |  |                |

## Chemical and Water Desalination Engineering (CWDE) Program

### Objectives

The goals of the Chemical and Water Desalination Engineering Program are:

1. Produce highly qualified and competent graduates in chemical and water desalination engineering.
2. Promote quality research and disseminate knowledge.
3. The Graduated are expected to participate effectively in the community services related to the chemical and water sectors.

### Program Outcomes

Upon successful completion of the BS program in Chemical and Water Desalination Engineering, graduates will have:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to conclude.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

### Career Opportunities

The Chemical and Water industry in UAE is one of the most advanced systems in the world, and the United Arab Emirates ranks second after Saudi Arabia in terms of the amount of producing desalinated water. Many specialized seawater desalination plants are built on the territory of the UAE. Thus, the desalination plant is a vivid example of implementing advanced and environmentally responsive high technologies. For instance, desalination plants need high qualified specialized engineers. However, there are no qualified engineers or specialists in chemicals related to Water Desalination Engineering. The proposed undergraduate program addresses the local and regional needs triggered by rapid water engineering industry expansion and the current plans for Chemical and Water Desalination Engineering in the UAE and globally. Therefore, graduates from the program will have promising futures and better job opportunities. There is a real need for expert and quality personnel recruitment to safeguard and continue the technological edge in the chemical engineering-related water technology fields. In the years, UoS has developed strong links with government and private businesses and industries in the UAE and overseas.

### Program Overview

In Spring Semester 2020/2021, the University of Sharjah (UoS) launched the first in the region and the world new, unique, and niche undergraduate program in Chemical and Water Desalination Engineering (CWDE). This program is designed to suit students interested in working in Chemical Engineering with a specialty in water desalination. Chemical engineering is a multidisciplinary branch of engineering that

combines natural and experimental engineering, sciences along with life sciences plus mathematics and economics to design, develop, produce, transform, transport, operate, and manage the industrial processes that turn raw materials into valuable products. The Chemical and Water Desalination Engineering (CWDE) Program is a four-year study that provides students with a broad scientific and technical background in this field. During the first two semesters, there is a focus on mathematics, basic sciences, physics, and chemistry. The following two semesters include courses and labs that are more specialized and closely related to chemical engineering, water engineering, and desalination including applied fluid mechanics, heat transfer and thermodynamics, water chemistry, introduction to membrane science, and thermal desalination. In the final four semesters of their study, students take advanced courses in chemical and water desalination engineering, undergo an eight-week practical training, and complete senior design projects. The chemical and water desalination Engineering Program at the University of Sharjah puts what is in the best interest of students first and foremost. Every little experience the student attains represents a block in building a competent, confident, purposeful, problem solving, competitive, responsible, and conscientious individual. This is accomplished by means of a curriculum and facilities that conform to the highest of standards, faculty members committed to the academic and personal growth of the student, and an environment that inspires learning and drives creativity.

To obtain a Bachelor of Science degree in CWDE, the student must complete a total of 131 credit hours. These hours are University Requirements (UR), College Requirements (CR), and Program Requirements (PR). The allocation of the credit hours is shown in the following table:

| BS in Chemical and Water Desalination Engineering (131) |    |    |    |       |
|---|----|----|----|-------|
|   | UR | CR | PR | Total |
| Mandatory Credits                                       | 18 | 26 | 72 | 116   |
| Elective Credits  | 6  | -  | 9  | 15    |
| Total   | 24 | 26 | 81 | 131   |

### I. University Requirements (UR)

Every student must take 24 credit hours of general education courses distributed over seven domains. Eighteen (18) mandatory credit hours are selected from domains 1, 2, 3, and 4, and (6) elective credit hours are selected from domains 5, 6, and 7 as indicated in the University section (General Education).

### II. College Requirements (CR)

The list of the College required courses and their descriptions are presented in the introductory pages of the College of Engineering section in this catalog.

### III. Program Requirements (PR)

#### A. Mandatory requirements

The CWDE program core courses are listed in the table below:

| Course # | Title                               | CrHrs | Prerequisites                |
|----------|-------------------------------------|-------|------------------------------|
| 0408170  | Intro. to Environmental Sci. & Eng. | 2     |                              |
| 0408270  | Water Resources and Management      | 3     | 0408170                      |
| 0408271  | Water Chemistry and Analysis        | 3     | 1420101                      |
| 0408272  | Chemical Thermodynamics             | 3     | 1440133, 1440161,<br>1420101 |

|                            |   |                 |                           |
|----------------------------|---|-----------------|---------------------------|
| 0408273                    | Applied Fluid Mechanics                   | 3               | 1440133, 1440161, 1420101 |
| 0408274                    | Membrane I                                | 2               | 0408170                   |
| 0408275                    | Fund. of Thermal Desalination Proc.       | 2               | 0408170                   |
| 0408276                    | Material Processing Engineering           | 3               | 1420101 , 1430115         |
| 0408277                    | Principles of Heat Transfer               | 3               | 0408272                   |
| 0408278                    | Mass Transfer                             | 3               |                           |
| 0408279                    | Polymer Engineering                       | 3               | 0408274                   |
| 0408280                    | Principles of Water Treatment Tech.       | 3               | 0408170, 0408270          |
| 0408281                    | Chemical Thermodynamics (Lab)             | 1               | 0408272                   |
| 0408282                    | Applied Fluid Mechanics (Lab)             | 1               | 0408273                   |
| 0408370                    | Thermal Sys. Design and Analysis          | 3               | 0408272, 0408277          |
| 0408371                    | Membrane II                               | 3               | 0408274, 0408276, 0408279 |
| 0408372                    | Pre & Post Treat. for Desal. Plants       | 3               | 0408280                   |
| 0408373                    | Polymer engineering lab                   | 1               | 0408279                   |
| 0403300                    | Prof. & Social Issues in Engineering      | 1               |                           |
| 0408374                    | Thermal Desal. Proc. Design & Analysis    | 3               | 0408370                   |
| 0408375                    | Membrane III                              | 3               | 0408371                   |
| 0408376                    | Sea Wat. Desal. using Non-Conv. Methods   | 3               | 0408374, 0408274          |
| 0408377                    | Principles of Water Treatment Tech. (Lab) | 1               | 0408280, 0408372          |
| 0408378                    | Heat and mass Transfer (Lab)              | 1               | 0408277, 0408278, 0408370 |
| 0408470                    | Process Control and Simulation            | 3               | 1440261                   |
| 0408471                    | Plant Design and Cost Analysis            | 3               | 0408372, 0408371, 0401301 |
| 0408472                    | Membrane (Lab)                            | 1               | 0408371                   |
| 0408473                    | Water Desalination Lab                    | 1               | 0408374                   |
| 0408474                    | Water and Energy                          | 3               | 0408374, 0408375          |
| 0408478                    | Senior Design Project I                   | 1               | Senior Standing           |
| 0408479                    | Senior Design Project II                  | 3               | Senior Standing           |
| 0408xxx                    | Technical Elective I                      | 3               |                           |
| 0408xxx                    | Technical Elective II                     | 3               |                           |
| 0408xxx                    | Technical Elective III                    | 3               |                           |
| Total Program Requirements |   | 81 credit-hours |                           |

## B. Technical Electives

As part of the Bachelor of Science in Chemical and Water Desalination Engineering program, the student is required to study 9 credit hours of technical elective courses. In cooperation with the academic advisor, the student should select the list of electives that best meet their needs and aspirations.

It is highly recommended that the student registers for these courses after completing the program requirements.

| Course # | Title   | CrHrs | Prerequisites |
|----------|---|-------|---------------|
| 0408480  | Renewable Energy Desalination                           | 3     | -             |
| 0408481  | Hybrid Desalination Processes                           | 3     | -             |
| 0408482  | Modeling & Simulation of Multi-Stage Flash Desalination | 3     | -             |
| 0408483  | Membrane Distillation                                   | 3     | -             |



|         |  |   |   |
|---------|--|---|---|
| 0408484 | Pressure Retarded Osmoses (PRO) Membranes            | 3 | - |
| 0408485 | Nanotechnology for Water Treatments and Desalination | 3 | - |
| 0408486 | Nuclear Desalination                                 | 3 | - |
| 0408487 | Special Topic  | 3 | - |

### C. Senior Design Project

Students will have a Senior Design Project during their senior year of study over two semesters:

- Senior Design Project I (1 credit)
- Senior Design Project II (3 credits)

### Study Plan

The Bachelor of Science in Mechanical Engineering encompasses 132 credit hours spread over 8 semesters plus a summer training period typically completed in four years. The following study plan serves as a roadmap for a smooth progression toward graduation.

| Year 1, Semester 1 (17 Credits) |                               |       |                                     |
|---------------------------------|-------------------------------|-------|-------------------------------------|
| Course #                        | Title                         | CrHrs | Prerequisites                       |
| 0104100                         | Islamic Culture               | 3     |                                     |
| 0202112                         | English for Academic Purposes | 3     |                                     |
| 1430115                         | Physics I                     | 3     | EmSat or 1430106<br>Pre/Co: 1440133 |
| 1430116                         | Physics I Lab                 | 1     | Pre/Co: 1430115                     |
| 1420101                         | General Chemistry I           | 3     | Pass placement Test or<br>1440098   |
| 1440133                         | Calculus I for Engineering    | 3     | EmSat or 1440098                    |
| 1420102                         | General Chemistry I Lab       | 1     | Pre/Co: 1420101                     |

| Year 1, Semester 2 (17 Credits) |                                     |       |                            |
|---------------------------------|-------------------------------------|-------|----------------------------|
| Course #                        | Title                               | CrHrs | Prerequisites              |
| 0202102                         | Arabic Language                     | 3     |                            |
| 1501100                         | Introduction to I.T.                | 3     |                            |
| 1440161                         | Calculus II for Engineering         | 3     | 1440133                    |
| 0202207                         | Technical Writing                   | 3     | 0202112                    |
| 1430117                         | Physics II                          | 3     | 1430115<br>Pre/Co: 1440161 |
| 0408170                         | Intro. to Environmental Sci. & Eng. | 2     |                            |

| Year 2, Semester 3 (16 Credits) |                                     |       |                              |
|---------------------------------|-------------------------------------|-------|------------------------------|
| Course #                        | Title                               | CrHrs | Prerequisites                |
| 0408270                         | Water Resources and Management      | 3     | 0408170                      |
| 0408271                         | Water Chemistry and Analysis        | 3     | 1420101                      |
| 0408272                         | Chemical Thermodynamics             | 3     | 1440133, 1440161,<br>1420101 |
| 0408273                         | Applied Fluid Mechanics             | 3     | 1440133, 1440161,<br>1420101 |
| 0408274                         | Membrane I                          | 2     | 0408170                      |
| 0408275                         | Fund. of Thermal Desalination Proc. | 2     | 0408170                      |



| Year 2, Semester 4 (17 Credits) |                                     |       |                   |
|---------------------------------|-------------------------------------|-------|-------------------|
| Course #                        | Title                               | CrHrs | Prerequisites     |
| 0408276                         | Material Processing Engineering     | 3     | 1420101 , 1430115 |
| 0408277                         | Principles of Heat Transfer         | 3     | 0408272           |
| 0408278                         | Mass Transfer                       | 3     |                   |
| 0408279                         | Polymer Engineering                 | 3     | 0408274           |
| 0408280                         | Principles of Water Treatment Tech. | 3     | 0408170, 0408270  |
| 0408281                         | Chemical Thermodynamics (Lab)       | 1     | 0408272           |
| 0408282                         | Applied Fluid Mechanics (Lab)       | 1     | 0408273           |

| Year 3, Semester 5 (17 Credits) |                                      |       |                           |
|---------------------------------|--------------------------------------|-------|---------------------------|
| Course #                        | Title                                | CrHrs | Prerequisites             |
| 0204102                         | UAE Society                          | 3     | 0202112                   |
| 1440261                         | Differential Equations for Eng.      | 3     | 1411113, 1440261          |
| 0408370                         | Thermal Sys. Design and Analysis     | 3     | 0408272, 0408277          |
| 0408371                         | Membrane II                          | 3     | 0408274, 0408276, 0408279 |
| 0408372                         | Pre & Post Treat. for Desal. Plants  | 3     | 0408280                   |
| 0408373                         | Polymer engineering lab              | 1     | 0408279                   |
| 1502300                         | Prof. & Social Issues in Engineering | 1     |                           |

| Year 3, Semester 6 (17 Credits) |   |       |                               |
|---------------------------------|---|-------|-------------------------------|
| Course #                        | Title                                     | CrHrs | Prerequisites                 |
| xxxxxxx                         | University Elective I                     | 3     | 3 <sup>rd</sup> year standing |
| 0401301                         | Engineering Economics                     | 3     | 1440133                       |
| 0408374                         | Thermal Desal. Proc. Design & Analysis    | 3     | 0408370                       |
| 0408375                         | Membrane III                              | 3     | 0408371                       |
| 0408376                         | Sea Wat. Desal. using Non-Conv. Methods   | 3     | 0408374, 0408274              |
| 0408377                         | Principles of Water Treatment Tech. (Lab) | 1     | 0408280, 0408372              |
| 0408378                         | Heat and mass Transfer (Lab)              | 1     | 0408277, 0408278, 0408370     |

| Year 3, Summer Training (0 Credits) |   |       |                 |
|-------------------------------------|---|-------|-----------------|
| Course #                            | Title   | CrHrs | Prerequisites   |
| 0408477                             | Practical Training (240 working hours in 6 - 8 weeks) | 0     | 90 credit hours |

| Year 4, Semester 7 (15 Credits) |                                |       |                           |
|---------------------------------|--------------------------------|-------|---------------------------|
| Course #                        | Title                          | CrHrs | Prerequisites             |
| 0408470                         | Process Control and Simulation | 3     | 1440261                   |
| 0408471                         | Plant Design and Cost Analysis | 3     | 0408372, 0408371, 0401301 |
| 0408472                         | Membrane (Lab)                 | 1     | 0408371                   |
| 0408473                         | Water Desalination Lab         | 1     | 0408374                   |
| 0408474                         | Water and Energy               | 3     | 0408374, 0408375          |
| 0408478                         | Senior Design Project I        | 1     | Senior Standing           |

|         |                      |   |  |
|---------|----------------------|---|--|
| 0408xxx | Technical Elective I | 3 |  |
|---------|----------------------|---|--|

| Year 4, Semester 8 (15 Credits) |                                      |       |                 |
|---------------------------------|--------------------------------------|-------|-----------------|
| Course #                        | Title                                | CrHrs | Prerequisites   |
| 0408479                         | Senior Design Project II             | 3     | Senior Standing |
| 0408xxx                         | Technical Elective II                | 3     |                 |
| 0408xxx                         | Technical Elective III               | 3     |                 |
| 0302200                         | Fund. of Innovations & Entrepreneurs | 3     |                 |
| xxxxxxx                         | University Elective II               | 3     |                 |

### Course Coding

The courses offered in the Chemical and Water Desalination Engineering program are designated code numbers in the form of (0408ABC) where:

|    |                             |
|----|-----------------------------|
| A  | Year (level)                |
| BC | Course sequence in the area |

### Course Description

#### A. Mandatory Courses

Descriptions of the core courses are given below:

|  |   |         |
|--|---|---------|
| 0408170  | Introduction to Environmental Science and Engineering | (2-0:2) |
| Covers principles and methods for the analysis of environmental science and engineering issues. Includes such topics as greenhouse gas effects, surface and groundwater pollution, drinking and wastewater treatment, environmental risk assessment, and environmental air pollution.<br><b>Pre-requisite:</b> None. |   |         |

|  |                                |         |
|--|--------------------------------|---------|
| 0408270  | Water Resources and Management | (3-0:3) |
| Assessment of surface and groundwater resources, water resources planning, water resources management, water demand management, integrated water resources management, water resource systems, and water engineering.<br><b>Pre-requisite:</b> 0408170 |                                |         |

|  |                              |         |
|--|------------------------------|---------|
| 0408271  | Water Chemistry and Analysis | (3-0:3) |
| Apply chemical equilibrium principles for acids-bases reactions, dissolution-precipitation reactions, oxidation-reduction reactions, and complexation reactions to understand the chemistry of surface waters, ground waters, and water and wastewater treatment.<br><b>Pre-requisite:</b> 1420101 |                              |         |

|   |                         |         |
|---|-------------------------|---------|
| 0408272   | Chemical Thermodynamics | (3-0:3) |
| Basic concepts of thermodynamics: temperature, work, heat, internal energy, and enthalpy. The first law of thermodynamics for closed and steady-flow open systems. Thermodynamic properties of pure substances; changes of phase; equation of state. The second law of thermodynamics: is the concept of entropy—power and refrigeration cycles.<br><b>Pre-requisite:</b> 1440133, 1440161, 1420101 |                         |         |

|  |  |                |
|--|--|----------------|
| <b>0408273</b>   | <b>Applied Fluid Mechanics</b>                                     | <b>(3-0:3)</b> |
| <p>This course will cover the basic concepts of the Fluid properties; Units; Pressure, and fluid statics: pressure distribution in fluid at rest, hydrostatic forces on plane and curved surfaces, buoyancy, and stability, Fluids in rigid body motion; Fluid Kinematics, dynamics of fluid motion: concepts of streamline, control volume, steady and one-dimensional flows; continuity, Euler, Bernoulli, steady flow energy, linear and angular momentum equations; flow in pipes and losses, Flow-through porous media and membranes.</p> <p><b>Pre-requisite:</b> 1440133, 1440161, 1420101</p>                            |  |                |
| <b>0408274</b>   | <b>Membrane I: Introduction to Membrane Science and Technology</b> | <b>(2-0:2)</b> |
| <p>The course covers a comprehensive introduction to membrane science and technology to gain a basic understanding of membrane types, properties, preparation, and applications and their present and future technical relevance and economic impact. The course is concentrated on the discussion of selected fundamental and application-related aspects. Following a comprehensive introduction, some fundamental thermodynamic and mathematical relations necessary for an understanding of the membrane functions in the various processes and their applications will be covered.</p> <p><b>Pre-requisite:</b> 0408170</p> |  |                |
| <b>0408275</b>   | <b>Fundamental of Thermal Desalination Processes</b>               | <b>(2-0:2)</b> |
| <p>The course covers a comprehensive introduction to thermal desalination to gain a basic understanding of different types of thermal technologies as well as their present and future technical relevance and economic impact. The course is concentrated on the discussion of selected fundamental and application-related aspects. Following to a comprehensive introduction, some fundamental thermodynamic and mathematical relations necessary for an understanding of the thermal desalination in the various processes and their applications will be covered.</p> <p><b>Pre-requisite:</b> 0408170</p>                  |  |                |
| <b>0408276</b>   | <b>Material Processing Engineering</b>                             | <b>(3-0:3)</b> |
| <p>This course will provide general background about fundamental characteristics of various materials, including metals, ceramics, and polymers, for graduate-level students. The course will present a broad multidisciplinary approach to understanding the chemical bonding in materials, crystal structure and defects, diffusion and phase diagrams, and manipulating materials' mechanical, electrical, optical, and magnetic properties.</p> <p><b>Pre-requisite:</b> 1420101, 1430115</p>  |  |                |
| <b>0408277</b>   | <b>Principles of Heat Transfer</b>                                 | <b>(3-0:3)</b> |
| <p>The course covers the mechanisms of heat transfer: conduction, convection, and radiation; Steady heat conduction, insulation, cooling, Transient heat conduction, Forced convection, natural convection. Heat exchangers and Applications to energy systems.</p> <p><b>Pre-requisite:</b> 0408272</p>   |  |                |

|  |  |         |
|--|--|---------|
| 0408278  | Mass Transfer                              | (3-0:3) |
| <p>The course will cover basic principles of mass transfer and its application to separation processes: The quantitative description of mass transport (convection and diffusion). Application of mass transfer principles to model and quantify the different systems such as humidification and drying. Understand the analogies between momentum, heat, and mass transfer.</p> <p><b>Pre-requisite:</b></p>   |  |         |
| 0408279  | Polymers Engineering                       | (3-0:3) |
| <p>This course introduces polymer science and engineering, and it covers the following topics: Properties of polymers, Polymer characterization techniques, Polymer reactions kinetics, and reactors design, Polymer synthesis and production processes, and Composite Materials.</p> <p><b>Pre-requisite:</b> 0408274</p>   |  |         |
| 0408280  | Principles of Water Treatment Technologies | (3-0:3) |
| <p>The course aims to provide the students with a background in the theory, operation, and design of various advanced physical and chemical water treatment processes for controlling water quality which has not been discussed in the Fundamentals of Water Treatment course, including adsorption, centrifugation, ion exchange, chemical oxidation, and advanced oxidation, UV technology, disinfection, and an introduction for membrane separation processes.</p> <p><b>Pre-requisite:</b> 0408170, 0408270</p>  |  |         |
| 0408281  | Chemical Thermodynamics Lab                | (0-3:1) |
| <p>This course covers the basics of the different Chemical Thermodynamics fundamental concepts and experiments that will help the student study the other desalination processes. These experiments include: relation between pressure and temperature of Marcet Boiler, study of different temperature measuring devices, measuring the air humidity and changes the state of the gases as well as the phase change, measurement of heat capacity and thermal conductivity of solid, liquid and gas determine the power input, heat output and coefficient of a vapor compression cycle in Mechanical Heat Pump, Study of a gas turbine operation demonstration of its different components.</p> <p><b>Pre-requisite:</b> 0408272</p> |  |         |
| 0408282  | Applied Fluid Mechanics Lab                | (0-3:1) |
| <p>This lab course demonstrates the basic concepts of flow behavior, fluid forces, and analysis tools through different systems. The experiments include Measurement of Viscosity, Density, and Specific Gravity of Fluids, Calibration of Pressure Gages, Hydrostatic Forces Experiment, Reynolds pipe flow: laminar flow, transition to turbulence, and turbulence, Verification of Bernoulli's theorem, Fluid Flow Visualizations/ Cavitation, Water Hammer, Determination of Friction Loss along Straight Pipes, bends and elbows, Packed Bed, Fluidized Bed, Pelton turbine.</p> <p><b>Pre-requisite:</b> 0408273</p>   |  |         |

|   |                                    |         |
|---|------------------------------------|---------|
| 0408370   | Thermal System Design and Analysis | (3-0:3) |
| <p>In this course, the principles of heat transfer, fluid mechanics, and thermodynamics will be combined to study the design of the thermal system. At the end of the course, the student will be able to step-by-step design different types of heat exchangers and evaporators that is related to the thermal desalination process. Topics covered include Heat transfer in Boiling and condensation, design of Heat exchangers and evaporators, and simulation of thermal system and optimization.</p> <p><b>Pre-requisite:</b> 0408272, 0408277</p> |                                    |         |

|   |  |         |
|---|--|---------|
| 0408371   | Membrane II: Membrane Preparation, Characterization, Performance and Fouling Testing | (3-0:3) |
| <p>Introduction to Membrane Synthesis, Fabrication Processes for Polymeric Membrane, Fabrication Processes for Inorganic Membrane, Fabrication of Polymeric and Composite Membranes, Surface Modification of Inorganic Materials for Membrane Preparation, Fabrication of Low-Fouling Composite Membranes for Water Treatment, Introduction to Membrane Characterization, Spectroscopy Methods for Membrane Characterization, Microscopy Methods for Membrane Characterization, Physical and Chemical Characterization Methods for Membrane Characterization, Mechanical Properties Characterization of Membranes. The synthesis and characterization of the polymer used for the membrane preparation are covered in detail in course 409209.</p> <p><b>Pre-requisite:</b> 0408274, 0408276, 0408279</p> |  |         |

|  |  |         |
|--|--|---------|
| 0408372  | Pre and Post Treatment for Desalination Plants | (3-0:3) |
| <p>The course aims to provide the students with a background in the theory, operation, and design of various advanced physical and chemical seawater Pre and Post-treatment technologies used for desalination.</p> <p><b>Pre-requisite:</b> 0408280</p> |  |         |

|  |                          |         |
|--|--------------------------|---------|
| 0408373  | Polymers Engineering Lab | (0-3:1) |
| <p>This lab gives a practical experiment on polymer science and engineering. It covers the following topics: Properties of polymers, Polymer characterization techniques, Polymer reactions kinetics and reactors design, Polymer synthesis and production processes, and Composite Materials. This course provides detailed information on the synthesis and characterization of the polymers used for the membranes fabrications.</p> <p><b>Pre-requisite:</b> 0408279</p> |                          |         |

|  |  |         |
|--|--|---------|
| 0408374  | Thermal Desalination Process Design and Analysis | (3-0:3) |
| <p>The course describes the science and technology of thermal desalination processes. It addresses the technical and economic parameters of both commercial operating and new technologies. It covers the recent developments and areas to enhance efficiencies and reduce water production costs and CO<sub>2</sub> emissions. The course also covers the conventional thermal technologies; MSF, MED and VC, Hybrid, tri Hybrid, and Integrated Technologies, New Technologies Analysis (H-DH, MD), Power-Desalination Cogeneration Analysis, Solar and Nuclear Desalination, and Related issues; scale, corrosion, a material used and Brine Management and Environmental Impact and Enhancing Desalination Processes Performance.</p> <p><b>Pre-requisite:</b> 0408370</p> |  |         |

|   |   |         |
|---|---|---------|
| 0408375   | Membrane III: Applied Membrane Separation Processes   | (3-0:3) |
| <p>The course will cover basic principles of Membranes (Membrane Classifications and Membrane Configurations) and Membrane Processes (Operation Modes and Membrane Fouling). Principles of membrane-based desalination processes such as (Microfiltration, Ultra-filtration) for pretreatment, reverse osmosis, Forward Osmosis, and Membrane distillation. Performance degradation (membrane fouling, scaling, concentration polarization, and compaction), and Membrane cleaning and regeneration. Industrial membrane-based desalination units. Energy consumption using different membrane-based.</p> <p><b>Pre-requisite:</b> 0408371</p>  |   |         |
| 0408376   | Sea Water Desalination using Non-Conventional Methods | (3-0:3) |
| <p>The course describes the science and technology of non-conventional desalination processes. It addresses the technical and economic parameters of the new technologies. It covers the recent developments and areas to enhance efficiencies and reduce water production costs and CO<sub>2</sub> emissions. Hybrid, tri Hybrid, and Integrated Technologies, H-DH, MD, Solar and Nuclear Desalination, electrochemical and electro dialysis.</p> <p><b>Pre-requisite:</b> 0408374, 0408274</p>   |   |         |
| 0408377   | Principle of Water Treatment Technology lab           | (0-3:1) |
| <p>The course covers fundamental experiments for different water and wastewater treatment technologies divided into three main categories: physical, chemical, and biological. Topics covered include Determining total solids (COD and BOD), adsorption, filtration, absorbance, ion exchange, chemical oxidation, jar test, and aerobic and anaerobic digestion.</p> <p><b>Pre-requisite:</b> 0408280, 0408372</p>  |   |         |
| 0408378   | Heat and Mass Transfer Lab                            | (0-3:1) |
| <p>This course covers the basics of the different heat and mass transfer fundamental experiments that will help the student study the different desalination processes. These experiments include heat transfer, mass transfer, and joint heat-mass transfer unit operations.</p> <p><b>Pre-requisite:</b> 0408277, 0408278, 0408370</p>  |   |         |
| 0408470   | Process Control and Simulation                        | (3-0:3) |
| <p>Introduction to process dynamics and control: concepts and incentives, Mathematical modeling principles of typical process systems, Modeling and analysis for process control (solving ODEs by Laplace), Transfer functions and linearization, Empirical model identification (using Control Station), Dynamic behavior of the first and second-order system, The feedback loop and the PID algorithm, PID controller tuning algorithms for dynamic performance, Stability analysis for process control systems, Digital implementation of process control, Practical application of feedback control, Performance of feedback control system, Cascade, feed forward, ratio and override Control.</p> <p><b>Pre-requisite:</b> 1440261</p> |   |         |

|   |  |                |
|---|--|----------------|
| 0408471   | <b>Plant Design and Cost Analysis</b>  | <b>(3-0:3)</b> |
| <p>This course can be termed as the pinnacle of the chemical and desalination-engineering curriculum as it deals with applications of the individual aspects of chemical and desalination engineering such as fluid mechanics, mass transfer, heat transfer, process control, thermodynamics, thermal system design, etc. for designing of an efficient and economical chemical and desalination process. By the end of this course, the students will be able to understand; the concepts of General design considerations, Process design development, Layout of plant items, Flow sheets and PI diagrams, Break-even analysis, Optimum production rates in plant operation, Economic aspects, and Optimum design, Practical considerations in the design and engineering ethics, Degrees of freedom analysis in interconnected systems, Direct and Indirect costs, Factors affecting Investment and production costs, Estimation of capital investment and total product costs, Interest, Time value of money, Taxes and Fixed charges, Salvage value, Methods of calculating depreciation, Profitability, Alternative investments, and replacements.</p> <p><b>Pre-requisite:</b> 0408372, 0408371, 0401301</p> |  |                |
| 0408472   | <b>Membrane Preparation, Characterization, Performance and Fouling Testing Lab</b> | <b>(0-3:1)</b> |
| <p>The course will cover the process manufacturing Process of Ceramic and Polymeric membranes, including Microfiltration, Ultra-filtration, Nanofiltration, Reverse osmosis, Forward Osmosis, and Membrane distillation. In addition, the labs will cover the testing the Performance degradation (membrane fouling, scaling, concentration polarization, and compaction), and Membrane cleaning and regeneration. Industrial membrane-based desalination units. Energy consumption using different membrane-based.</p> <p><b>Pre-requisite:</b> 0408371</p>  |  |                |
| 0408473   | <b>Water Desalination Lab</b>  | <b>(0-3:1)</b> |
| <p>This course covers the basics of the different water desalination technologies divided into main categories, i.e., thermal desalination such as Multi-effect distillation (MED), Multi-stage flash (MSF), and Vacuum desalination VD, electrodialysis, reverse electrodialysis.</p> <p><b>Pre-requisite:</b> 0408374</p>   |  |                |
| 0408474   | <b>Water and Energy</b>  | <b>(3-0:3)</b> |
| <p>This course introduces to the students the concept of the relationship between water and energy (Water-Energy Nexus). Both energy and water represent essential resources for all living systems. Water is used for both conventional and renewable power systems for energy production and electricity generation (hot water, steam power plant, concentrated solar power), and fuel production (fossil fuels and biofuels). Energy is required for water management, transportation, extraction, treatment, purification, and desalination. As the demand for both energy and water is increasing due to population growth and the increasing environmental pressures due to global warming, understanding the water-energy nexus is crucial for political and managerial decisions on the local, regional and international scale (Water-Energy-Food Security). Ethical and professional responsibility will be considered part of a Water/Energy system design.</p> <p><b>Pre-requisite:</b> 0408374, 0408375</p>  |  |                |

|   |                         |         |
|---|-------------------------|---------|
| 0408478   | Senior Design Project I | (1-0:1) |
| <p>Students work on a major design project, applying and integrating the knowledge gained in previous course work to develop solutions to an open-ended problem. Students use the basic elements of the modern engineering design methodology to learn how to plan a project, work on teams, and incorporate standards and constraints to produce the preliminary design. Another alternative, student teams could investigate a research topic in some area of Water Desalination Engineering from the current literature under the supervision of the faculty advisor. The instructor delivers a series of lectures/seminars devoted to discussing design-related issues, such as systematic methods of idea or concept generation of multiple design alternatives (TRIZ and brainstorming) and methods to select the optimal design subject to various constraints (House of Quality). In addition to seminars devoted to project-related issues and student presentations. A project proposal, oral presentations, and a comprehensive final report with a proper literature review and outline of the methodology are required.</p> <p><b>Pre-requisite:</b> Senior Standing</p> |                         |         |

|   |                          |         |
|---|--------------------------|---------|
| 0408479   | Senior Design Project II | (3-6:3) |
| <p>Students work on a major design project, applying the methodology and concepts proposed in a senior design project I (0408478). Students use and integrate the knowledge gained in previous coursework to develop solutions to an open-ended problems. Students apply the modern engineering design methodology to choose alternative designs subject to realistic constraints incorporating standards and constraints. Student teams work together to build upon the proposed senior design project I (0408478) methodology to design, build, refine and test complete hardware or/and software systems to meet specifications. Another alternative, student teams work together to design and run experiments, analyze data, and conclude on research findings based on their senior design project I (0408478). A final project product (prototype, software code, research/experiments findings, etc.), oral presentations, poster presentation, and a comprehensive final report are required.</p> <p><b>Pre-requisite:</b> Senior Standing</p> |                          |         |

## B. Elective Courses

Descriptions of the technical elective courses are given below:

|  |                               |         |
|--|-------------------------------|---------|
| 0408480  | Renewable Energy Desalination | (3-0:3) |
| <p>Applications of sustainable methods such as renewable energy technologies for desalination systems. The course will cover desalination technologies powered by renewable energy systems, including solar PV, thermal, wind, geothermal, fuel cells, and hybrid renewable power systems. Desalination powered with renewable energy systems will help develop sustainable methods and strategies for freshwater production with lower greenhouse gas emissions and at a competitive cost compared to fossil fuel-powered desalination plants.</p> <p><b>Pre-requisite:</b> None.</p> |                               |         |



|  |   |         |
|--|---|---------|
| 0408481  | Hybrid Desalination Processes                           | (3-0:3) |
| <p>Introduction to the concept of a hybrid complex desalination plant consists of several desalination units of different technologies operating in parallel or connected in series. Two or more technologies are usually involved in the hybrid desalination processes, such as RO-MED; RO-MSF, MED-AD. Combining two or more desalination processes will help provide better environmental solutions and lower water costs compared to a single desalination technology plant. Hybridization of desalination systems offers many advantages: an increase in the quality and the amount of desalinated water, a reduction in energy consumption, and minimizing the environmental impacts.</p> <p><b>Pre-requisite:</b> None.</p>   |   |         |
| 0408482  | Modeling & Simulation of Multi-Stage Flash Desalination | (3-0:3) |
| <p>Introduction of Multi-Stage Flash (MSF) Desalination, MSF Desalination Plant Control Systems, Dynamic Model for an MSF Plant, General Linear Static Data Reconciliation Problem, Analysis of the Dynamic Model for Control, Model Reduction Methods, Multiloop Optimization, Adaptive Scheme with Optimally Tuned PID Controller, Application of Artificial Neural Networks, MATLAB® Programs for MSF.</p> <p><b>Pre-requisite:</b> None.</p>   |   |         |
| 0408483  | Membrane Distillation                                   | (3-0:3) |
| <p>Introduction to Membrane Distillation (MD), Membranes Used in MD and Design, Formation of Flat Sheet Phase Inversion MD Membranes, Formation of Hollow Fibre MD Membranes, MD Membrane Modules, Direct Contact Membrane Distillation, Sweeping Gas Membrane Distillation, Vacuum Membrane Distillation, Air Gap Membrane Distillation, Membrane Distillation Hybrid Systems, Economics, Energy Analysis and Costs Evaluation in MD.</p> <p><b>Pre-requisite:</b> None.</p>  |   |         |
| 0408484  | Pressure Retarded Osmoses (PRO) Membranes               | (3-0:3) |
| <p>This course will cover osmotically pressure-retarded osmosis (PRO) in the fields such as desalination, water treatment, and power generation. The course will explain the differences between the pressure-driven membrane processes, e.g., Reverse Osmosis (RO), which typically employs applied high pressure as driving force, and PRO, which takes advantage of naturally generated osmotic pressure as the sole source of driving force. In light of this, PRO possesses many advantages over pressure-driven membrane processes. The benefits include low energy consumption, ease of equipment maintenance, low capital investment, high salt rejection, and high water flux.</p> <p><b>Pre-requisite:</b> 0409301</p>   |   |         |
| 0408485  | Nanotechnology for Water Treatments and Desalination    | (3-0:3) |
| <p>This course introduces the basic science and engineering concepts of nanoscience/nanotechnology and the Environmental impacts and the applications of nanomaterials in water treatment. Students will learn both basic science and technology. They will discuss the opportunities for nanotechnology to improve the quality of life and the potential negative consequences of this emerging science on the environment and human health. The course will cover the following topics: physicochemical characterization of nanoparticles, colloid chemistry for understanding nanoparticle aggregation and mobility in the environment, nanomaterials for environmental remediation and water treatment, methodologies for assessing nanoparticle toxicity, and novel research developments.</p> <p><b>Pre-requisite:</b> None.</p> |   |         |

|   |                      |         |
|---|----------------------|---------|
| 0408486   | Nuclear Desalination | (3-0:3) |
| <p>The course describes the science and technology of interest in using nuclear energy for producing potable water. This course contains three major parts: Part I — Overview of nuclear desalination, Part II — Special aspects and considerations relevant to introducing nuclear desalination, and Part III — Steps to introducing nuclear desalination. In Part I, an overview of appropriate technologies and pertinent experience accumulated in the past is presented. The global situation of the freshwater problem is reviewed, and incentives for utilizing nuclear energy to contribute to solving the problems are briefly set forth. Part II identifies special aspects to be considered in the decision-making process concerning nuclear desalination. There are technical, safety, environmental, and economic aspects and national requirements. In Part, III, the necessary steps to be taken once nuclear desalination has been selected are elaborated. Policy issues are discussed, and project planning is summarized. This point also elaborates on project implementation aspects, which include sitting, feasibility studies, plant acquisition, and, eventually, design, construction, and operation.</p> <p><b>Pre-requisite:</b> None.</p> |                      |         |
| 0408487   | Special Topic        | (3-0:3) |
| <p>The course describes the science and technology of interest in water desalination-related fields. The course will be proposed by an expert instructor in chemical, water treatment, and desalination areas. It will cover the latest technologies developed in this field.</p> <p><b>Pre-requisite:</b> None.</p>  |                      |         |

## Department of Sustainable & Renewable Energy Engineering (SREE) Program

### Personnel

|                             |   |
|-----------------------------|---|
| <b>Chairperson</b>          | Prof. Abdul Hai Al-Alami  |
| <b>Professors</b>           | Prof. Abdul Ghani Olabi, Prof. Mohamed Ali Abdelkareem,<br>Prof. Abdul Hai Al-Alami, Mamdouh El Haj Assad,  |
| <b>Associate Professors</b> | Dr. Bashria Yousef, Dr. Chaouki Ghenai, Dr. Anis Allagui, Dr. Shek Atique Rahman, Dr. Tareq Salameh, Dr. Ahmed Abokhalil, Dr. Ammar Alkhalidi, Dr. Zafar Said, Dr. Abrar Inayat, Dr. Muhammad Tawalbeh, Dr. Ahmed Amine Hachicha, |
| <b>Assistant Professors</b> | Dr. Di Zhang, Dr. Ahmed Al Makky, Dr. Ali Mohammed Hassan Radwan  |

### Vision

Lead the regional capacity-building effort in Sustainable and Renewable Energy through innovative education and research.

### Mission

Deliver education to produce high-quality solution-oriented engineers in the various fields of sustainable and renewable energy, engage in energy research and development of national and regional relevance, and provide expert consultancy on energy issues.

### Objectives

The objectives of the BSc in SREE program are to enable its graduates to:

1. Pursue advanced education, research and development, and other creative and innovative scientific, engineering, and technology efforts.
2. Apply their engineering knowledge, critical thinking, and problem-solving skills in professional Sustainable and Renewable Energy Engineering Practice.
3. Participate as leaders in addressing sustainable and renewable energy technologies' social, economic, and environmental issues.
4. Identify and employ the best modern tools to propose practical solutions in the design of energy systems.

### Core values

The Department of Sustainable and Renewable Energy Engineering seeks to achieve its goals in adherence to a set of core values defining its character:

- Ethical and Civic Responsibility following progressive Arab and Islamic ideals.
- Highest standards of integrity, transparency, and accountability.
- Mutual respect, fairness, and collegiality among all.
- Promotion of creativity and innovation in the pursuit of academic excellence.

## Goals

The Bachelor of Science in Sustainable and Renewable Energy Engineering (BSc SREE) Program at the University of Sharjah will produce graduates who:

1. Prepared to identify and address current and future problems in the field of generation, transmission, distribution, and storage of renewable-based energy systems
2. Skill in critical thinking and problem-solving in sustainable and renewable energy issues.
3. Capable of identifying and employing the best modern tools to propose practical solutions in the design of energy systems.
4. Able to understand, analyze and design the integration between the renewable energy sources and the power grid.
5. Prepared with the knowledge and ability to initiate complete projects in the energy field using sustainable and renewable energy sources.
6. Able to address the social, economic and environmental plates involved in sustainable and renewable energy technologies.

## Program Outcomes

**Upon successful completion of the BS program in SREE, graduates will have:**

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. Function effectively on a team whose members provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to conclude.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

## Career Opportunities

The Bachelor of Science in Sustainable and Renewable Energy Engineering prepares graduates to seek challenging careers in the design, testing, development, manufacturing, and operation of sustainable and renewable energy systems and broader engineering settings. They can also find career opportunities with manufacturers of renewable energy materials and equipment and emerging service industries specializing in energy efficiency.

## Program Overview

To obtain a Bachelor of Science degree in SREE, the student must complete 133 credit hours. These hours are University requirements (UR), College requirements (CR), and Program requirements (PR). The allocation of the credit hours is shown in the following table:

| BSc in Sustainable and Renewable Energy Engineering (133) |    |    |    |       |
|---|----|----|----|-------|
|   | UR | CR | PR | Total |
| Mandatory Courses   | 18 | 26 | 71 | 115   |
| Elective Courses  | 6  | -  | 12 | 18    |
| Total   | 24 | 26 | 83 | 133   |

### I. University Requirements (UR)

Every student must take 24 credit hours of general education courses distributed over seven domains. Fifteen (15) mandatory credit hours are selected from domains 1, 2, 3, and 4, and (9) elective credit hours are selected from domains 5, 6, and 7 as indicated in the University section (General Education).

### II. College Requirements (CR)

The list of the College's required courses and their descriptions are presented in the introductory pages of the College of Engineering section in this bulletin.

### III. Program Requirements (PR)

Program requirements are categorized into core requirements (compulsory) and technical electives, which a student chooses from a list of available courses.

#### A. Mandatory Courses

The BSc in SREE requires the student to complete 66 credit hours of compulsory core courses, as listed in the table below.

| Course # | Course Title  | Cr Hrs | Prerequisites                  |
|----------|---|--------|--------------------------------|
| 1501116  | Programming I   | 4      | None                           |
| 1430118  | Physics II Lab  | 1      | 1430116;<br>Pre /Co 1430117    |
| 1440262  | Math of Engineers                                       | 3      | 1440161                        |
| 0402202  | Circuit Analysis I                                      | 3      | Pre/Co: 1430117<br>and 1440261 |
| 0402216  | Electric Power Engineering                              | 3      | 0402202                        |
| 0402217  | Electric Power Engineering Lab                          | 1      | Pre/Co 0402216                 |
| 0402241  | Random Signal Theory                                    | 3      | Pre/Co 0402202                 |
| 0402255  | Applied Electronics For SREE                            | 3      | 0402202                        |
| 0402256  | Applied Electronics For SREE Lab                        | 1      | Pre/Co 0402255                 |
| 0402340  | Engineering Computation and Linear Algebra              | 3      | 1411116; 1440261               |
| 0402348  | Signals and Control Systems                             | 3      | 0402202; 1440262               |
| 1502300  | Professional, Social, and Ethical Issues in Engineering | 1      | Junior Standing                |
| 0406100  | Introduction to Energy Science and Technology           | 3      | Pre/Co 1430117                 |
| 0406101  | Statics and Dynamics                                    | 3      | 1440133; 1430115               |
| 0406200  | Thermodynamics  | 3      | 0406100                        |
| 0406201  | Fluid Mechanics   | 3      | 0406101                        |
| 0406202  | Fluid Mechanics Lab                                     | 1      | Pre/Co 0406201                 |
| 0406300  | Heat Transfer   | 3      | 0406200; 0406201               |

|         |                                       |   |                                |
|---------|---------------------------------------|---|--------------------------------|
| 0406301 | Heat Transfer Lab                     | 1 | Pre/Co 0406300                 |
| 0406302 | Engineering Materials                 | 3 | 0406101; 1420101               |
| 0406320 | Solar PV Systems                      | 3 | 0402255; 0406100               |
| 0406321 | Solar PV Systems Lab                  | 1 | Pre/Co 0406320                 |
| 0406330 | Wind Energy Systems                   | 3 | 0406201; 0406210;<br>0402241   |
| 0406331 | Wind Energy Systems Lab               | 1 | Pre/Co 0406330                 |
| 0406420 | Solar Thermal Energy Systems          | 3 | 0406300                        |
| 0406451 | Energy Storage                        | 3 | 0406450**                      |
| 0406452 | Energy Storage and Efficiency Lab     | 1 | Pre/Co: 0406451                |
| 0406453 | Energy Management for Sustainability* | 3 | Pre/Co.: 0406300 Heat Transfer |
| 0406490 | Practical Training                    | 0 | 90 Credit Hours                |
| 0406491 | Senior Design Project I               | 1 | Senior Standing                |
| 0406492 | Senior Design Project II              | 3 | 0406491                        |
| 0406450 | Design for Energy Efficiency **       | 3 | 0406300 Heat Transfer          |

\*0406450-Design for Energy Efficiency course will be replaced by 0406453-Energy Management for Sustainability course from Fall 2022/2023.

\*\* Prerequisites of 0406451-Energy Storage will be 0406453-Energy Management for Sustainability course starting from Fall 2022/2023.

## B. Elective Courses

Students in the Bachelor of Science in Sustainable and Renewable Energy Engineering must study 12 credit hours of technical elective courses. Students should select, with the help of their academic advisor from, the technical elective courses best meet their needs and aspirations. The following is a listing of the technical electives available for SREE students:

| Course # | Title  | Cr Hrs | Prerequisites    |
|----------|--|--------|------------------|
| 0406360  | Economics of Energy Systems                    | 3      | 0406100          |
| 0406361  | Engineering Management                         | 3      | Junior Standing  |
| 0406410  | Electronic Materials and Devices               | 3      | 0402255          |
| 0406421  | Advanced Solar Cells and Systems               | 3      | 0406302; 0406320 |
| 0406422  | PV Technology and Manufacturing                | 3      | 0406320          |
| 0406423  | PV in the Built Environment                    | 3      | 0406320          |
| 0406424  | Passive Solar Buildings                        | 3      | 0406320          |
| 0406431  | Design of Wind Turbines                        | 3      | 0406330          |
| 0406432  | Advanced Fluid Mechanics                       | 3      | 0406201          |
| 0406433  | Special Machine for Wind Turbines              | 3      | 0406330          |
| 0406440  | Biomass Energy Systems                         | 3      | 0406200          |
| 0406461  | Special Topics in Solar Energy                 | 3      | Senior Standing  |
| 0406462  | Special Topics in Wind Energy                  | 3      | Senior Standing  |
| 0406463  | Fuel Cells                                     | 3      | 0406200, 0406302 |
| 0406464  | Special Topics in Bio-Energy                   | 3      | Senior Standing  |
| 0406465  | Hydroelectric Energy Systems                   | 3      | 0406201          |
| 0406466  | Geothermal Energy Systems                      | 3      | 0406300          |
| 0406468  | Special Topics in Energy Systems               | 3      | Senior Standing  |
| 0402413  | Electrical Power Distribution Systems for SREE | 3      | 0402310          |
| 0402419  | Power Electronics for SREE                     | 3      | 0402255          |

|          |  |   |         |
|----------|--|---|---------|
| 0402433  | Instrumentation and Measurement for SREE | 3 | 0402353 |
| 0402435  | Digital Control Systems for SREE         | 3 | 0402330 |
| 0402422  | Applied Control Engineering for SREE     | 3 | 0402330 |
| 1502336  | Microcontroller Based Systems for SREE   | 3 | 0402255 |
| 0406456* | Sustainable Engineering and Eco Design   | 3 | 0406302 |

\* The course will be offered from Fall 2022/2023.

### Study Plan

The Bachelor of Science program in Sustainable and Renewable Energy Engineering encompasses 133 credit hours that can normally be completed over 8 semesters plus a summer training period in four years. The following study plan serves as a roadmap for a smooth progression toward graduation.

| Year I, Semester 1 (17 Credits) |                               |       |                |
|---------------------------------|-------------------------------|-------|----------------|
| Course #                        | Title                         | CrHrs | Prerequisites  |
| 0201102                         | Arabic Language               | 3     |                |
| 0202112                         | English for Academic Purposes | 3     |                |
| 1430115                         | Physics I                     | 3     | Pre/Co 1440133 |
| 1430116                         | Physics I Lab                 | 1     | Pre/Co 1430115 |
| 1420101                         | General Chemistry I           | 3     |                |
| 1420102                         | General Chemistry I Lab       | 1     | Pre/Co 1420101 |
| 1440133                         | Calculus I for Engineers      | 3     |                |

| Year 1, Semester 2 (16Credits) |   |       |                            |
|--------------------------------|---|-------|----------------------------|
| Course #                       | Title   | CrHrs | Prerequisites              |
| 1501100                        | Introduction to IT (English)                  | 3     | None                       |
| 1430117                        | Physics II                                    | 3     | 1430115; 1440133           |
| 1430118                        | Physics II Lab                                | 1     | 1430116;<br>Pre/Co 1430117 |
| 1440161                        | Calculus II for Engineers                     | 3     | 1440133                    |
| 0406100                        | Introduction to Energy Science and Technology | 3     | Pre/Co 1430117             |
| 0406101                        | Statics and Dynamics                          | 3     | 1440133; 1430115           |

| Year 2, Semester 3 (16 Credits) |                                      |       |                             |
|---------------------------------|--------------------------------------|-------|-----------------------------|
| Course #                        | Title                                | CrHrs | Prerequisites               |
| 1440261                         | Differential Equations for Engineers | 3     | 1440161                     |
| 0402202                         | Circuit Analysis I                   | 3     | Pre/Co: 1430117 and 1440261 |
| 0402241                         | Random Signal Theory                 | 3     | Pre/Co 0402202              |
| 0406200                         | Thermodynamics                       | 3     | 0406100                     |
| 0406201                         | Fluid Mechanics                      | 3     | 0406101                     |
| 0406202                         | Fluid Mechanics Lab                  | 1     | Pre/Co 0406201              |

| Year 2, Semester 4 (18Credits) |                                  |       |                  |
|--------------------------------|----------------------------------|-------|------------------|
| Course #                       | Title                            | CrHrs | Prerequisites    |
| 1501116                        | Programming I                    | 4     | None             |
| 0104100                        | Islamic Culture                  | 3     | None             |
| 1440262                        | Mathematics for Engineers        | 3     | 1440161          |
| 0406300                        | Heat Transfer                    | 3     | 0406200; 0406201 |
| 0406301                        | Heat Transfer Lab                | 1     | Pre/Co 0406300   |
| 0402255                        | Applied Electronics for SREE     | 3     | 0402202          |
| 0402256                        | Applied Electronics Lab for SREE | 1     | Pre/Co 0402255   |

| Year 3, Semester 5 (17 Credits) |                                  |       |                  |
|---------------------------------|----------------------------------|-------|------------------|
| Course #                        | Title                            | CrHrs | Prerequisites    |
|                                 | University Elective 1            | 3     |                  |
|                                 | University Elective 2            | 3     |                  |
| 0402216                         | Electrical Power Engineering     | 3     | 0402202          |
| 0402217                         | Electrical Power Engineering Lab | 1     | Pre/Co 0402216   |
| 0406302                         | Engineering Materials            | 3     | 0406101; 1420101 |
| 0406320                         | Solar PV Systems                 | 3     | 0402255; 0406100 |
| 0406321                         | Solar PV Systems Lab             | 1     | Pre/Co 0406320   |

| Year 3, Semester 6 (17 Credits) |   |       |                            |
|---------------------------------|---|-------|----------------------------|
| Course #                        | Title   | CrHrs | Prerequisites              |
| 0202207                         | Technical Writing   | 3     | 0202112                    |
| 0402348                         | Signals and Control Systems                               | 3     | 0402202; 1440262           |
| 0406450                         | Design for Energy Efficiency                              | 3     | Pre: 0406300 Heat Transfer |
| 1502300                         | Professional, Societal, and Ethical Issues in Engineering | 1     | 3rd Year Standing          |
| 0406330                         | Wind Energy Systems                                       | 3     | 0406201; 0406210; 0402241  |
| 0406331                         | Wind Energy Systems Lab                                   | 1     | Pre/Co: 0406330            |
| 0302200                         | Fund. Of Innovation & Entrep.                             | 3     | 3rd Year Standing          |

| Year 3, Summer Training (0 Credits) |                    |       |                 |
|-------------------------------------|--------------------|-------|-----------------|
| Course #                            | Title              | CrHrs | Prerequisites   |
| 0406490                             | Practical Training | 0     | 90 Credit Hours |

| Year 4, Semester 7 (17 Credits) |  |       |                  |
|---------------------------------|--|-------|------------------|
| Course #                        | Title                                      | CrHrs | Prerequisites    |
| 0406420                         | Solar Thermal Energy Systems               | 3     | 406300           |
| 0401301                         | Engineering Economics                      | 3     |                  |
| 0402340                         | Engineering Computation and Linear Algebra | 3     | 1411116; 1440261 |
| 0406451                         | Energy Storage                             | 3     | 0406450 *        |
| 0406452                         | Energy Storage and Efficiency Lab          | 1     | Pre/Co: 0406451  |
| 0406xxx                         | SREE Technical Elective (1)                | 3     |                  |
| 0406491                         | Senior Design Project I                    | 1     | Senior Standing  |



| Year 4, Semester 8 (15 Credits) |                             |        |               |
|---------------------------------|-----------------------------|--------|---------------|
| Course #                        | Title                       | Cr Hrs | Prerequisites |
|                                 | University Elective 3       | 3      |               |
| 0406xxx                         | SREE Technical Elective (2) | 3      |               |
| 0406xxx                         | SREE Technical Elective (3) | 3      |               |
| 0406xxx                         | SREE Technical Elective (4) | 3      |               |
| 0406492                         | Senior Design Project II    | 3      | 0406491       |

### Course Coding

The courses offered in the SREE program are designated code numbers in the form of (0406ABC) where:

|   |  |
|---|--|
| A | Year (level)   |
| B | Areas (as follows) 0:<br>General<br>2: Solar Energy<br>3: Wind Energy<br>4: Bio, Hydroelectric, and Geothermal Energies 5:<br>Energy Management<br>6: Special Topics<br>9: Projects and Seminars |
| C | Course sequence in the area  |

### Course Description

#### A. Mandatory Courses

Descriptions of the core courses are given below.

|  |                       |         |
|--|-----------------------|---------|
| 1501116  | Programming I         | (3-2:4) |
| This course introduces fundamental programming techniques to Computer Science students in a high-level language. Subjects include computer science fields, general introduction to computers and numbering systems, software development process, a high-level programming language, selection structures, repetition structures, functions and procedures, structured and user-defined data types, text files, arrays, and dynamic memory allocation.<br><b>Prerequisite:</b> None. |                       |         |
| 1430118  | Physics II Laboratory | (0-3:1) |
| Ten experiments in electricity and magnetism, covering topics in the Physics II course.<br><b>Prerequisite:</b> 1430116 Physics I Lab and Pre/Co: 1430117 - Physics II.  |                       |         |

|   |                    |         |
|---|--------------------|---------|
| 0402202   | Circuit Analysis I | (3-0:3) |
| <p>Fundamentals of DC and AC circuit laws; mathematical models for circuit elements; techniques for circuit analysis and for writing and solving circuit equations; circuit theorems; introduction to Op-Amps; transient analysis of first-order circuits; phasor technique for the steady-state sinusoidal response.</p> <p><b>Prerequisite:</b> Pre/Co 1440261 - Differential Equations for Engineers; Pre/Co 1430117 - Physics II.</p> |                    |         |

|   |                            |         |
|---|----------------------------|---------|
| 0402216   | Electric Power Engineering | (3-0:3) |
| <p>An overview of the fundamentals of energy conversion from mechanical form to electrical power is provided. Electrical motors and generators are presented along with the basics of electrical circuits and power transmission lines.</p> <p><b>Prerequisite:</b> 0402202 - Circuit Analysis I.</p> |                            |         |

|  |                                       |         |
|--|---------------------------------------|---------|
| 0402217  | Electric Power Engineering Laboratory | (0-3:1) |
| <p>Operation of single-phase ac circuits: measurement of current, voltage, power factor, active power, reactive power, and apparent power. Connection and operation of 3- phase circuits. Power measurement in three-phase circuits. Measurements and calculation of transformer performance. Torque and speed measurements in rotating electric machines. Operation and voltage characteristics of DC and AC generators. Operation and characteristics of induction motor.</p> <p><b>Prerequisite:</b> Pre/Co: 0402216 - Electric Power Engineering</p> |                                       |         |

|   |                      |         |
|---|----------------------|---------|
| 0402241   | Random Signal Theory | (3-0:3) |
| <p>The role of Statistics in Engineering; Probability Concepts; Discrete Random Variables and Probability Distributions; Continuous Random Variables and Probability Distributions; Joint Probability Distributions; Data Summary and Presentation; Introduction to Parameter Estimation; Computation of Confidence Intervals.</p> <p><b>Prerequisite:</b> Pre/Co 0402202 - Circuit Analysis I.</p> |                      |         |

|   |                              |         |
|---|------------------------------|---------|
| 0402255   | Applied Electronics for SREE | (3-0:3) |
| <p>Introduction to semiconductor materials and devices. Analysis of diodes and applications. Analysis of transistor circuits (BJTs, MOSFETs). Amplifier circuits, bandwidth considerations; Operational amplifier applications. Introduction to power electronics.</p> <p><b>Prerequisite:</b> 0402202 - Circuit Analysis I</p> |                              |         |

|  |                                  |         |
|--|----------------------------------|---------|
| 0402256  | Applied Electronics for SREE Lab | (0-3:1) |
| <p>Diode characteristics, BJT and MOS biasing circuits, Spice simulation, frequency response, op-amp applications, introduction to power electronics lab.</p> <p><b>Prerequisite:</b> Pre/Co 0402255 - Applied Electronics for SREE.</p> |                                  |         |

|   |   |                |
|---|---|----------------|
| <b>0402340</b>  | <b>Engineering Computation and Linear Algebra</b>               | <b>(3-0:3)</b> |
| Basic linear algebra: LU decomposition, normal equations, least squares solutions, eigenvalues, and eigenvectors decomposition of matrices. Numerical solution of linear and nonlinear equations, eigenvalues, and eigenvectors, curve fitting, numerical differentiation and integration of functions, numerical solution of ordinary differential equations, and use of MATLAB to solve complex engineering problems.<br><b>Prerequisite:</b> 1501116, – Programming I; 1440261 - Differential Equations for Engineers  |   |                |
| <b>0402348</b>  | <b>Signals and Control Systems</b>                              | <b>(3-0:3)</b> |
| Representation and analysis of signals. Fourier transforms. Linear time-invariant systems, impulse response, frequency response, and transfer function. Introduction to linear feedback control. Analysis and design of classical control systems. Control system components and industrial process automation.<br><b>Prerequisite:</b> 0402202 - Circuit Analysis I, and 1440262 - Math for Engineers.   |   |                |
| <b>1502300</b>  | <b>Professional, Societal and Ethical Issues in Engineering</b> | <b>(1-0:1)</b> |
| An examination of the social impact of engineering and technology and its relationship to ethics to identify and clarify obligations that might arise in technological research and its applications. The course will survey a variety of moral theories, as well as engineering codes of ethics. The case study method will be used: the source will include the history of science and technology and reports from professional societies. Topics covered include whistle-blowing, environmental, safety, and privacy issues.<br><b>Prerequisite:</b> 3rd year standing |   |                |
| <b>0406100</b>  | <b>Introduction to Energy Science and Technology</b>            | <b>(3-0:3)</b> |
| Introduction to energy. Survey of energy technologies including steam, hydro, tidal, wave, fossil, geothermal, solar, wind, biofuels, and nuclear. Energy sources and conservation of energy, energy efficiency, energy production and uses, and energy sources for both conventional and renewable sources. Climate change and the future of energy. Freehand sketching, isometric drawing, and orthographic projections. Introduction to 3D AutoCAD and Matlab.<br><b>Prerequisite:</b> Pre/Co 1430117 - Physics II.  |   |                |
| <b>0406101</b>  | <b>Statics and Dynamics</b>                                     | <b>(3-0:3)</b> |
| Force and moment vectors, resultants. Principles of statics and free-body diagrams. Properties of areas, second moments. Internal forces in beams. Laws of friction. Principles of particle dynamics. Mechanical systems and rigid-body dynamics. Kinematics and dynamics of plane systems. Energy and momentum of 2-D bodies and systems.<br><b>Prerequisites:</b> 1430115 - Physics I and 1440131 Calculus I for Engineers.   |   |                |
| <b>0406200</b>  | <b>Thermodynamics</b>   | <b>(3-0:3)</b> |
| Basic concepts of thermodynamics: temperature, work, heat, internal energy, and enthalpy. The first law of thermodynamics for closed and steady-flow open systems. Thermodynamic properties of pure substances; changes of phase; equation of state. The second law of thermodynamics: is the concept of entropy—power and refrigeration cycles.<br><b>Prerequisite:</b> 0406100 - Introduction to Energy Science and Technology.   |   |                |

|   |                       |         |
|---|-----------------------|---------|
| 0406201   | Fluid Mechanics       | (3-0:3) |
| Fluid properties; Units; Pressure and fluid statics: pressure distribution in fluid at rest, hydrostatic forces on plane and curved surfaces, buoyancy, and stability, Fluids in rigid body motion; Fluid Kinematics, dynamics of fluid motion: concepts of streamline, control volume, steady and one-dimensional flows; continuity, Euler, Bernoulli, steady flow energy, linear and angular momentum equations; flow in pipes and losses.<br><b>Prerequisite:</b> 0406101 - Statics and Dynamics.                            |                       |         |
| 0406202   | Fluid Mechanics Lab   | (0-3:1) |
| Introduction to basic fluid mechanics instrumentation; experimental verification and reinforcement of analytical concepts introduced in course 0406201.<br><b>Prerequisite:</b> Pre/Co 0406201 - Fluid Mechanics.   |                       |         |
| 0406300   | Heat Transfer         | (3-0:3) |
| Mechanisms of heat transfer: conduction, convection, and radiation. Steady heat conduction, insulation, cooling. Transient heat conduction. Forced convection; natural convection. Heat exchangers. Applications to energy systems.<br><b>Prerequisite:</b> 0406200 - Thermodynamics and 0406201 – Fluid Mechanics  |                       |         |
| 0406301   | Heat Transfer Lab     | (0-3:1) |
| Experiments on measurement techniques heat transfer principles of linear and radial conduction; unsteady state heat conduction; natural and forced convection; parallel and counter flow exchangers; thermal radiation; temperature measurement.<br><b>Prerequisite:</b> 0406300 - Heat Transfer.   |                       |         |
| 0406302   | Engineering Materials | (3-0:3) |
| The course covers atomic bonding, crystal structure and defect structure, and their relationship with material properties. It also includes phase diagrams and alloys, mechanical properties, material failure, corrosion, and an introduction to the structures of polymers and ceramics.<br><b>Prerequisite:</b> 1420101 – General Chemistry I and 0406101 - Statics and Dynamics.  |                       |         |
| 0406320   | Solar PV Systems      | (3-0:3) |
| Properties of sunlight and solar irradiation; Overview of semiconductors physics and PN junctions; The operation principle, materials, design, and efficiency limits of PV solar cells. The design and degradation mechanisms of solar PV modules and panels. Examination of the different types of solar PV systems and their components. The design and installation of solar PV systems with examples.<br><b>Prerequisite:</b> 0402255 Applied Electronics for SREE; 0406100 Introduction to Energy Sciences and Technology. |                       |         |
| 0406321   | Solar PV Systems Lab  | (0-3:1) |
| Basic physics of solar energy and PV devices; PV module and panel characterization; solar PV systems and components; Effects of shading and temperature on PV system performance.<br><b>Prerequisite:</b> Pre/Co 0406320 - Solar PV Systems   |                       |         |

|   |                                   |         |
|---|-----------------------------------|---------|
| 0406330   | Wind Energy Systems               | (3-0:3) |
| <p>The material in this course will cover the principles of wind energy and wind power and the design and operation of different types of wind energy systems. Design and economic analysis of wind energy systems will be examined, including site selection, monitoring, and analysis of wind data, estimating output from wind generators and their integration into hybrid power systems or grids.</p> <p><b>Prerequisites:</b> 0406210 - Electrical Power Engineering; 0406201 - Fluid Mechanics and 0402241-Random Signal Theory.</p> |                                   |         |
| 0406331   | Wind Energy Systems Lab           | (0-3:1) |
| <p>This laboratory course investigates the basic characteristics of aerodynamics load for wind turbine blades, the dynamic behavior of wind turbine systems, and the generated power of wind energy conversion systems.</p> <p><b>Prerequisite:</b> Pre/Co 0406330 - Wind Energy Systems.</p>   |                                   |         |
| 0406420   | Solar Thermal Energy Systems      | (3-0:3) |
| <p>Characteristics of solar radiation and solar collectors. Collector efficiency evaluation and prediction of long-term performance. System modeling, thermal storage, concentrated solar power systems, computer simulation, and performance and economic worth modeling.</p> <p><b>Prerequisite:</b> 0406300 - Heat Transfer.</p>   |                                   |         |
| 0406450   | Design for Energy Efficiency      | (3-0:3) |
| <p>Analysis to achieve a comprehensive understanding of the efficiency of systems that involve energy generation is presented. The material targets core areas of efficiency in space heating and cooling design. Design examples will be discussed in detail for applications in combustion engines and space heating and cooling load. Computer simulation tools will be used to calculate the efficiency of energy consumption.</p> <p><b>Prerequisites:</b> 0406300 - Heat Transfer.</p>  |                                   |         |
| 0406451   | Energy Storage and Transmission   | (3-0:3) |
| <p>Examine and compare the working principles and power/energy storage characteristics of current energy storage technologies, including batteries, electric-double-layer capacitors and pseudo capacitors, thermal energy storage (latent/latent energy storage), and mechanical energy storage (flywheel, pumped hydroelectric storage, and compressed air energy storage).</p> <p><b>Prerequisites:</b> 0406450 – Design for Energy Efficiency</p>   |                                   |         |
| 0406452   | Energy Storage and Efficiency Lab | (0-3:1) |
| <p>Investigate the working principle and thermodynamic characteristics (energy, power, efficiency, cyclability, etc.) of different energy storage technologies involving chemical, electrochemical, thermal, and mechanical processes.</p> <p><b>Prerequisites:</b> Pre/Co 0406451 - Energy Storage and Transmission.</p>   |                                   |         |
| 0406490   | Practical Training                | (0-0:0) |
| <p>All students must take 240 hours of practical field training. The purpose of this training is to introduce students firsthand to local and regional practices in the area of specialization. Further, it exposes students to possible career opportunities. Upon completion, students are required to submit a technical report to the training supervisor.</p> <p><b>Prerequisite:</b> Completion of at least 90 credit hours</p>   |                                   |         |

|   |                         |         |
|---|-------------------------|---------|
| 0406491   | Senior Design Project I | (0-1:1) |
| <p>Student teams develop professional-level experience by applying, integrating, and extending previously acquired knowledge in a major design project. Lectures are devoted to discussing project-related issues and student presentations. A project proposal, oral presentations, and a final report are required. Students are introduced to the essential elements of modern engineering design methods, including concept generation techniques. Groups of students investigate a research topic in some area of Sustainable/Renewable Energy Engineering from the current literature under the supervision of the course instructor.</p> <p><b>Prerequisite:</b> Senior standing</p> |                         |         |

|  |                          |         |
|--|--------------------------|---------|
| 0406492  | Senior Design Project II | (0-3:3) |
| <p>Student teams develop professional-level experience by applying, integrating, and extending previously acquired knowledge in a major design project. Lectures are devoted to discussing project-related issues and student presentations. A project progress proposal, report, oral presentations, and a comprehensive final report are required. Students apply modern engineering design methods to choose from alternative designs subject to realistic constraints. Groups of students work together to design, build, refine and test complete hardware or /and software systems to meet specifications.</p> <p><b>Prerequisite:</b> 0406491 - Senior Design Project I</p> |                          |         |

|   |                                      |         |
|---|--------------------------------------|---------|
| 0406453   | Energy Management for Sustainability | (3-0:3) |
| <p>This course is designed for student to learn and understand the general principles and methods of energy management. The topics covered in this course include the general principles of energy management; planning for energy management; energy analysis methods and tools (engineering algorithms, simulation and system modeling, and load analysis with metered data); energy audits; energy management for buildings (passive design, thermal insulation, heating and cooling, lighting, integration of renewable energy); energy management in transport (engines, drag reduction, electric and hybrid vehicles, and alternative fuels for vehicles); energy management for industry (reduce thermal losses, energy recovery, electric motors and drives, pumps and fans); economic and environmental evaluation of energy management solutions; and the general principles for implementing and assessing the energy management programs.</p> <p><b>Prerequisites:</b> 0406300 - Heat Transfer.</p> |                                      |         |

## B. Elective Courses

The SREE program requires students to take 12 credits of elective courses chosen from the list given below.

|  |                             |         |
|--|-----------------------------|---------|
| 0406360  | Economics of Energy Systems | (3-0:3) |
| <p>This course reviews the objectives, strategies, and economic factors of renewable energy policies worldwide. The course examines policy drivers, including environmental impact, community service obligations, and industrial/technological developments, as well as policy and financial instruments. The policies, economic analysis, and strategies are illustrated with international case studies for renewable energy programs.</p> <p><b>Prerequisite:</b> 0406100 - Introduction to Energy Science and Technology.</p> |                             |         |

|  |                        |         |
|--|------------------------|---------|
| 0406361  | Engineering Management | (3-0:3) |
| <p>Introduction to engineering management of new products, management of manufacturing processes, and management of the linkages between new products and manufacturing processes. Current theories, concepts, and techniques are stressed, using a combination of readings, cases, and guest speakers.</p> <p><b>Prerequisite:</b> Junior Standing.</p> |                        |         |

|  |                                  |         |
|--|----------------------------------|---------|
| 0406410  | Electronic Materials and Devices | (3-0:3) |
| Review of solid-state theory, conductors, semiconductors, superconductors, insulators, and optical and magnetic properties. Devices used in modern high-speed electronic and communication systems: transistors, lasers, photodiodes, fiber optics, and Josephson junctions. Implications of material properties on fabrication and operation of devices and circuits.<br><b>Prerequisite:</b> 0402255 - Applied Electronics for SREE. |                                  |         |

|  |                                  |         |
|--|----------------------------------|---------|
| 0406421  | Advanced Solar Cells and systems | (3-0:3) |
| Overview of Emerging PV technology. Solar cells detailed device physics and operation principles; Characterization and measurement techniques for solar cells. Three generations of solar cells and their applications; Tandem solar cells, concentrators (CPV and HCPV), and hybrid solar PV systems.<br><b>Prerequisite:</b> 0406320 - Solar PV Systems and 0406302- Engineering Materials |                                  |         |

|  |                                 |         |
|--|---------------------------------|---------|
| 0406422  | PV Technology and Manufacturing | (3-0:3) |
| The operating principles of solar cells. The strengths and weaknesses of the dominant commercial cell technologies. Different trends in commercial cell technology and the corresponding manufacturing processes and environment. The impact of various processing and device parameters on performance and product reliability. Insight is given into the complete production processes of silicon-based solar cells, third-generation solar cells, and heterojunction solar cells. These cells are studied in terms of materials, manufacturing technology, and suitability for the application.<br><b>Prerequisite:</b> 0406320 - Solar PV Systems. |                                 |         |

|   |                             |         |
|---|-----------------------------|---------|
| 0406423   | PV in the Built Environment | (3-0:3) |
| This course will examine the use of PV in the urban environment, focusing on integrating PV modules into the building envelope. The design of -efficient buildings, building thermal and lighting performance, and solar access will be introduced as a proper context for using PV. Competency in the use of building energy simulation software will be developed. Technical issues associated with the use of PV in buildings and the urban environment, such as heat transfer processes and the inclusion of solar energy sources within the power grid.<br><b>Prerequisite:</b> 0406320 - Solar PV Systems |                             |         |

|   |                        |         |
|---|------------------------|---------|
| 0406424   | Passive Solar Building | (3-0:3) |
| The passive solar building explores the use of solar energy to passively heat and cool buildings. Topics include solar radiation, building heating and cooling loads, energy-efficient design and construction, passive solar heating, proper implementation of thermal mass, and passive cooling.<br><b>Prerequisite:</b> 0406300-Heat Transfer. |                        |         |

|   |                                    |         |
|---|------------------------------------|---------|
| 0406431   | Design of Wind Turbines            | (3-0:3) |
| Introductory issues related to electricity production from wind power. The study of atmospheric science is necessary to locate wind turbines for electricity production. Interpretation and understanding of experimental data. The study of design and control will allow for comprehensive knowledge of all sub-components of a wind turbine. Sizing and citing of wind turbines. The connection between wind turbines and smart grids.<br><b>Prerequisite:</b> 0406330 - Wind Energy Systems.                          |                                    |         |
| 0406432   | Advanced Fluid Mechanics           | (3-0:3) |
| Review of control volume analysis. Dimensional analysis and similitude. Compressible flow: isentropic flow relations, flow in ducts and nozzles, effects of friction and heat transfer, normal and oblique shocks, two-dimensional isentropic expansion. Viscous flow theory: hydrodynamic lubrication and introduction to boundary layers.<br><b>Prerequisite:</b> 0406201 - Fluid Mechanics.  |                                    |         |
| 0406433   | Special Machines for Wind Turbines | (3-0:3) |
| Review of different structures for wind farm generators. Characteristics of constant-speed and variable-speed wind turbine generators. Mechanical interface system between the generators and wind turbines. Operational characteristics of wind generators with variable-angle of turbine blades. Advanced power electronics for wind generation and different structures of cycle converter circuits. Connection of wind generators to power grids, smart grids.<br><b>Prerequisite:</b> 0406330 - Wind Energy Systems. |                                    |         |
| 0406440   | Biomass Energy Systems             | (3-0:3) |
| This course will introduce (1) a range of biomass energy sources (forestry, wastes, and crops), and details of biomass characterization techniques, and (2) the biochemical and thermochemical conversion processes: direct combustion, biomass co-firing, gasification, pyrolysis, anaerobic digestion, fermentation, landfill gas, and cogeneration, (3) Chemical Reactors and basic process design, and (4) Biofuels from Biomass (Biodiesel, Syngas, Biogas, etc.).<br><b>Prerequisite:</b> 0406200 - Thermodynamics. |                                    |         |
| 0406461   | Special Topics in Solar Energy     | (3-0:3) |
| This course covers emerging and advanced topics in the field of solar energy. The contents will vary depending on the topic.<br><b>Prerequisite:</b> Senior Standing.   |                                    |         |
| 0406462   | Special Topics in Wind Energy      | (3-0:3) |
| This course covers emerging and advanced topics in the field of wind energy. The contents will vary depending on the topic.<br><b>Prerequisite:</b> Senior Standing.  |                                    |         |



|  |  |         |
|--|--|---------|
| 0406463  | Fuel Cells                                     | (3-0:3) |
| <p>The course will cover basic principles of thermodynamics of fuel cells, chemical reaction engineering, electrochemical engineering, and the development/design of major fuel cell types: Polymer electrolyte membrane fuel cell (PEMFC), Direct methanol fuel cell (DMFC), Alkaline fuel cell (AFC), Urea Fuel Cells, molten carbonate fuel cell (MCFC), solid oxide fuel cell (SOFC), metal-air fuel cells (MAFCs), and microbial fuel cells(MFCs). The electrodes and membrane materials will also be included for each type.</p> <p><b>Prerequisite:</b> 0406200 – Thermodynamics and 0406302 – Engineering materials</p>                          |  |         |
| 0406464  | Special Topics in Bio-energy                   | (3-0:3) |
| <p>This course covers emerging and advanced topics in the bio-energy field. The contents will vary depending on the topic.</p> <p><b>Prerequisite:</b> Senior Standing.</p>  |  |         |
| 0406465  | Hydroelectric Energy Systems                   | (3-0:3) |
| <p>Introduction to hydro-resource power production. Hydropower in history. Physics of hydrology. Power, head, flow rate. Turbine hydrodynamics; Francis, Kaplan, Pelton, Turgo, cross-flow. System components; generators, governors, penstocks, spillways, valves, gates, and trash racks. Large-scale and micro-hydroelectric systems. Pumped storage. Economic and environmental considerations.</p> <p><b>Prerequisite:</b> 0406201 - Fluid Mechanics.</p>   |  |         |
| 0406466  | Geothermal Energy Systems                      | (3-0:3) |
| <p>Overview of geothermal energy, Geothermal exploration, and heat mapping, Geothermal reservoir characterization, Analysis of temperature and heat transfer in a borehole, Dry steam, flash steam, and binary cycle power plants, Geothermal well test analysis for electricity generation, Ground source heat pumps, District heating, and cooling, Financial appraisal of geothermal projects.</p> <p><b>Prerequisite:</b> 0406300 – Heat Transfer.</p>   |  |         |
| 0406468  | Special Topics in Energy Systems               | (3-0:3) |
| <p>This course covers emerging and advanced topics in the field of energy systems. The contents will vary depending on the topic.</p> <p><b>Prerequisite:</b> Senior Standing.</p>   |  |         |
| 0402413  | Electrical Power Distribution Systems for SREE | (3-0:3) |
| <p>Introduction to electric distribution systems, distribution system indices and load characteristics, different topologies and configurations of distribution systems, distribution system equipment, single-phase and three-phase distribution transformers, overhead distribution lines, underground cables, protective distribution systems, protective equipment and devices, voltage drop over distribution feeders, voltage regulation, distribution system compensation, distribution generation units, power quality issues and electric distribution within the buildings.</p> <p><b>Prerequisite:</b> 0402310-Electromechanical Systems.</p> |  |         |
| 0402419  | Power Electronics for SREE                     | (3-0:3) |
| <p>Applications of power diodes and silicon-controlled rectifiers. Static converters. AC voltage controllers. DC power supplies. Choppers, Inverters in power systems.</p> <p><b>Prerequisite:</b> 0402255 – Applied Electronics for SREE.</p>   |  |         |

|  |   |         |
|--|---|---------|
| 0402433  | Instrumentation and Measurements for SREE | (3-0:3) |
| <p>The measurement process. Error and sources of errors, signals, noise in instrumentation, and filtering. Display and recording systems. Elements of signal processing in instrumentation. Transducers. Sensors. Microprocessor-based instrumentation systems, data logging, interfaces, and data processing</p> <p><b>Prerequisite:</b> 0402348 - Signals and Control Systems; 0402255 – Applied Electronics for SREE.</p> |   |         |

|   |                                  |         |
|---|----------------------------------|---------|
| 0402435   | Digital Control Systems for SREE | (3-0:3) |
| <p>Discrete-time systems and the Z-transform. Sampling and reconstruction. Open-loop and closed-loop discrete-time Systems. System time-response characteristics. Stability analysis techniques. Digital controller design. State-space representations of discrete-time Systems. Pole-assignment design and state estimation. Linear quadratic optimal control.</p> <p><b>Prerequisite:</b> 0402330 - Feedback Control Systems</p> |                                  |         |

|   |                                      |         |
|---|--------------------------------------|---------|
| 0402422   | Applied Control Engineering for SREE | (3-0:3) |
| <p>Introduction to process control, feedback and feed-forward control configurations, modeling of dynamic systems: time delays, high-order systems, multivariable systems, process identification, analysis and controller design performances, PID controller tuning, Intelligent controller tuning, advanced control techniques, process interaction and decoupling control, introduction to distributed control systems and digital control issues.</p> <p><b>Prerequisite:</b> 0402330 - Feedback Control Systems</p> |                                      |         |

|  |                                  |         |
|--|----------------------------------|---------|
| 1502336  | Microcontroller Systems for SREE | (3-0:3) |
| <p>Study the basic architecture of a microcontroller, including its applications in a microcontroller system. Implement the principles of microprocessing, interfacing, and total system design by implementing projects. Application of top-down design to microcontroller software development in C language. Introduction to the evaluation of hardware and software trade-offs.</p> <p><b>Prerequisite:</b> 0402255 - Applied Electronics for SREE</p> |                                  |         |

|  |  |         |
|--|--|---------|
| 0406456  | Sustainable Engineering and Eco Design | (3-0:3) |
| <p>This course will introduce to undergraduate students the methods and tools that will guide their analysis of the role of materials and process selection in terms of embodied energy, carbon foot print, recycle fraction, toxicity and sustainability criteria. Topics covered in this course include: resource consumption and its drivers, engineering materials, material property charts, the material life cycle, eco-informed material selection, eco audits/life cycle analysis, sustainable energy and sustainable materials. The students will use CES EduPack software for better understanding of the issues, create material charts, perform materials and processes selection, and eco audit or life cycle analysis allowing alternative design choices to meet the engineering requirements and reduce the environmental burden.</p> <p><b>Prerequisite:</b> 0406302-Engineering Materials</p> |  |         |

# College of Health Sciences (CHS)

**University Administration**

Prof. Hamid M.K. Al Nayimi  
Professor Qutayba Hamid

Chancellor  
Vice Chancellor of M & HSs Affairs

**Officers of the College**

Dr. Amina Al-Marzouqi  
Prof. Tareq A. H. Osaili

Acting Dean  
Vice Dean

**Administrative Support Staff**

|                       |  |
|-----------------------|--|
| Shaikha Al-Shamsi     | Administrative Assistant-Dean's office |
| Amel Yousif Al Raeesi | Administrative Assistant-Dean's office |
| Noura Omran           | Administrative Assistant-CND & MLS     |
| Nawal Al-Saadi        | Administrative Assistant-PT            |
| Ahlam Al Ali          | Administrative Assistant- HSA & EH     |
| Hessa Al-Mudharreb    | Administrative Assistant- NSG          |
| Zeinab Ibrahim        | Administrative Assistant - MDI         |

College of Health Sciences (CHS) is one of the pioneer colleges that launched by His Highness Sheikh Dr. Sultan Bin Mohammed AlQasimi, Member of the Supreme Council, Ruler of Sharjah, and President of the University of Sharjah, on September 6, 1997, in affiliation with McMaster University Canada. The College is recognized for offering comprehensive academic and professional programs of the highest quality in health education in the UAE and the region. The location of the College within the Medical and Health Sciences campus provides an ideal multi-professional and interdisciplinary learning environment for Medical and Health Sciences students. Today, the College enrolls approximately 1300 + students in its seven accredited undergraduate bachelor programs, namely: Medical Laboratory Sciences, Medical Diagnostic Imaging, Nursing, Health Services Administration, Physiotherapy, Environmental Health Sciences, and finally Clinical Nutrition and Dietetics. The College currently employs 34 faculty and 26 staff members of international standing from many countries, including the UAE. The College has graduated 14 cohorts (approximately 3000 graduates), some of whom have already assumed leadership roles in the UAE and abroad. With substantial growth evident in the past and our resources strengths, the CHS has a bright future as it progresses to start Master Programs in Physiotherapy, Medical Laboratory Sciences, and Nursing Departments, and getting the approval of the BOTs for Masters in Public health, Applied Clinical Nutrition, and Medical Diagnostic Imaging Programs.

**Vision**

The College of Health Sciences at the University of Sharjah aspires to become a leading academic institution at the national, regional and international levels for quality education, research, and community service.

## Mission

The College of Health Sciences at the University of Sharjah prepares competent, culturally sensitive and safe professionals, through educational programs that emphasize evidence-based practices; foster self-directed learning; encourage research and community services; promote interdisciplinary collaboration; and build professional leadership and commitment.

## Values

**Excellence:** The College community pursues excellence in a spirit of cooperation and mutual assistance.

**Professionalism:** The College community respects and adheres to the standards of performance, practice and behavior required of the professions of which it is comprised

**Innovation and creativity:** The College community fosters an environment that encourages individuals to pursue opportunities and challenges with innovation and creativity.

**Cultural respect and sensitivity:** The College community supports an environment that recognizes, encourages and respects cultural diversity and differences in thinking and culture to enhance and enrich academic endeavor.

**Integrity:** The College community respects and adopts the fundamental ethical and moral principles of honesty, dignity, fairness, justice, respect and accountability.

## Goals

The Goals of the college of Health Sciences are to

- 1) Prepare qualified, knowledgeable and skilled health care professionals to assume their roles effectively as practitioners, administrators, educators, and researchers in different fields of the health care system
- 2) Advance scientific knowledge through providing opportunities and support for faculty and students to engage in health-related research, especially research focused on local and regional needs
- 3) Promote the health and wellbeing of populations and environments by actively addressing health related issues, particularly those having local and regional impact.
- 4) Maintain an academic environment that is intellectually stimulating, culture-preserving, supportive, and facilitates learning, research, and community service.
- 5) Provide programs of study that match students aspirations and abilities while fostering the pursuit of personal, social, academic and career objectives of the students.
- 6) Provide programs of study that fulfill the human resource needs of local and regional health care

industry, especially the needs of the Emirate of Sharjah and the wider UAE.

- 7) Promote the quality of higher education in the UAE by adhering to the mandates of excellence in all college undertakings and through collaboration with other institutions

### **Academic Programs**

The College of Health Sciences offers seven accredited undergraduate programs leading to a Bachelor of Science (B.Sc.) degree namely:

**1) Medical Laboratory Sciences**

Bachelor of Science in Medical Laboratory Sciences

**2) Medical Diagnostic Imaging**

Bachelor of Science in Medical Diagnostic Imaging

**3) Nursing**

Bachelor of Science in Nursing

**4) Health Service Administration**

Bachelor of Science in Health Services Administration

**5) Physiotherapy**

Bachelor of Science in Physiotherapy

**6) Environmental Health Sciences**

Bachelor of Science in Environmental Health Sciences

**7) Clinical Nutrition and Dietetics**

Bachelor of Science in Clinical Nutrition and Dietetics

The Departments of Medical Diagnostic Imaging, Nursing, and Environmental Health offer also Bridging / Post Diploma Programs.

### **Admission Requirements**

Student with a minimum overall average of 75% on the UAE Secondary School Scientific Certificate or its equivalent, as approved by the Ministry of Education, may apply for admission to the College of Health Sciences. All new students applying to the College of Health Sciences are required to obtain a passing score on one of the English language proficiency exams recognized by the University of Sharjah or obtain a minimum of 5.0 on the academic IELTS Exam provided that the student's test score certificate is still in effect. Students may take the institutional TOFEL exam at the University of Sharjah upon registration and must achieve a minimum score of 500.

## Graduation Requirements

Each degree program comprises University requirements (UR), college requirements (CR) and Program requirements (PR). The university and college requirements are common to all departments in the college of Health Sciences. Each program has its own required and elective courses. The credit hours allocations for each program are shown in the following table:

| BSc. in Medical Laboratory Sciences (134 Credits Hours) |           |           |           |            |
|---|-----------|-----------|-----------|------------|
|   | UR        | CR        | PR        | Total      |
| Mandatory Credits                                       | 15        | 24        | 86        | 125        |
| Elective credits  | 9         | -         | -         | 9          |
| <b>Total</b>  | <b>24</b> | <b>24</b> | <b>86</b> | <b>134</b> |

| BSc. in Medical Diagnostic Imaging (137 Credits Hours) |           |           |           |            |
|--|-----------|-----------|-----------|------------|
|  | UR        | CR        | PR        | Total      |
| Mandatory Credits                                      | 15        | 24        | 86        | 125        |
| Elective credits                                       | 9         | -         | 3         | 12         |
| <b>Total</b>   | <b>24</b> | <b>24</b> | <b>89</b> | <b>137</b> |

| Medical Diagnostic Imaging Bridging Plan - Track A (73 Credits Hours) |          |          |           |           |
|---|----------|----------|-----------|-----------|
|   | UR       | CR       | PR        | Total     |
| Mandatory Credits   | 0        | 6        | 55        | 61        |
| Elective credits  | 9        | -        | 3         | 12        |
| <b>Total</b>  | <b>9</b> | <b>6</b> | <b>58</b> | <b>73</b> |

| Medical Diagnostic Imaging Bridging Plan - Track B (99 Credit Hours) |           |           |           |           |
|--|-----------|-----------|-----------|-----------|
|  | UR        | CR        | PR        | Total     |
| Mandatory Credits  | 6         | 10        | 71        | 87        |
| Elective credits   | 9         | -         | 3         | 12        |
| <b>Total</b>   | <b>15</b> | <b>10</b> | <b>74</b> | <b>99</b> |

| BSc. in Nursing ( 137 Credit Hours) |           |           |           |            |
|-------------------------------------|-----------|-----------|-----------|------------|
|                                     | UR        | CR        | PR        | Total      |
| Mandatory Credits                   | 15        | 24        | 89        | 128        |
| Elective credits                    | 9         | -         | -         | 9          |
| <b>Total</b>                        | <b>24</b> | <b>24</b> | <b>89</b> | <b>137</b> |

| Bridging in Nursing (RN-BSN) (72 Credits Hours) |          |          |           |           |
|---|----------|----------|-----------|-----------|
|   | UR       | CR       | PR        | Total     |
| Mandatory Credits                               | 3        | 6        | 54        | 63        |
| Elective credits                                | 9        | -        | -         | 9         |
| <b>Total</b>                                    | <b>9</b> | <b>6</b> | <b>54</b> | <b>72</b> |

| BSc. in Health Services Administration (134 Credits Hours) |           |           |           |            |
|--|-----------|-----------|-----------|------------|
|  | UR        | CR        | PR        | Total      |
| Mandatory Credits  | 15        | 24        | 80        | 119        |
| Elective credits   | 9         | -         | 6         | 15         |
| <b>Total</b>   | <b>24</b> | <b>24</b> | <b>86</b> | <b>134</b> |

| BSc. in Physiotherapy (138 Credit Hours) |           |           |           |            |
|--|-----------|-----------|-----------|------------|
|  | UR        | CR        | PR        | Total      |
| Mandatory Credits                        | 15        | 24        | 90        | 129        |
| Elective credits                         | 9         | -         | -         | 9          |
| <b>Total</b>                             | <b>24</b> | <b>24</b> | <b>90</b> | <b>138</b> |

| BSc. in Environmental Health Sciences (134 Credit Hours) |           |           |           |            |
|--|-----------|-----------|-----------|------------|
|  | UR        | CR        | PR        | Total      |
| Mandatory Credits  | 15        | 24        | 80        | 119        |
| Elective credits   | 9         | -         | 6         | 15         |
| <b>Total</b>   | <b>24</b> | <b>24</b> | <b>86</b> | <b>134</b> |

| BSc. in Clinical Nutrition and Dietetics (134 Credit Hours) |           |           |           |            |
|---|-----------|-----------|-----------|------------|
|   | UR        | CR        | PR        | Total      |
| Mandatory Credits   | 15        | 24        | 80        | 116        |
| Elective credits  | 9         | -         | 6         | 18         |
| <b>Total</b>  | <b>24</b> | <b>24</b> | <b>86</b> | <b>134</b> |



## I. University Requirements

Every student is required to take 24 credit hours of general education courses distributed over seven domains. Fifteen (15) mandatory credit hours are selected from domains 1, 2, 3 and 4 and (9) elective credit hours selected from domains 5, 6 and 7 as indicated in the University section (General Education).

## II. College Requirements

### Mandatory Courses

In addition to 12 credit hours of University mandatory courses and 12 credit hours of University Elective course, the College of Health Sciences requires all students in the College to study 24 credit hours of College mandatory courses. Much of this requirement is fulfilled during the first year of study.

| Course # | Title                                 | CrHrs | Prerequisite |
|----------|---------------------------------------|-------|--------------|
| 1430107  | General Physics for Health Sciences   | 4     |              |
| 1426155  | General Chemistry for Health Sciences | 4     |              |
| 0504252  | Biostatistics                         | 3     |              |
| 0500150  | Biology                               | 4     |              |
| 0500160  | Human Anatomy and Physiology          | 4     | 0500150      |
| 0500161  | Introduction to Health Sciences       | 2     |              |
| 0500450  | Introduction to Research              | 3     | 0504252      |

Descriptions of the required College Health Science courses are given below.

#### **1430107 General Physics for Health Sciences 3-3-0:4**

The contents of the course will focus on introducing the basic principles of physics with special focus on health and medical problems. Moreover, instructions of the topics will be achieved through lectures, notes and research papers. The course should explain the following: Vectors and Units, kinematics Equations, Forces and laws of Motion, Work and Energy, Fluids, Temperature, Heat and Heat Transfer, Waves and Sound, Electric Forces, Electric Fields and Electrical Potential Energy, Electric Circuits, Magnetic Forces and Magnetic Field. The Practical sessions of the course focus on the application of the above concepts.

#### **1426155 General Chemistry for Health Sciences 3-3-0:4**

Topics in this course include: measurements in chemistry; atoms and elements; nuclear radiation; compounds and their bonds; energy and state of matter; chemical reactions; chemical quantities; gases; solutions; and acids and bases. The practical sessions of the course focus on the application of the above concepts.

#### **0504252 Biostatistics 3-0-0:3**

This course provides students with an understanding of the principles of biostatistics as related to medical sciences. It helps students to understand the nature of data, data sources, data presentation methods, sampling distributions, data transformations, statistical inference, correlation and regression analyses. It also give the student an idea about the concept of hypothesis testing and tests of significance.

#### **0500150 Biology 3-3-0:4**

This course in human biology will introduce students to basic concepts in Biology followed by study of the cellular structures, types of tissues and organ systems in humans. Health- related issues such as cancer and genetic dis- eases are also included in addition to examining the relationship of man with

his environment and finally the concept of evolution. The practical sessions of the course focus on the use of the light microscope, chemical composition of the cell, cells structure and function and human body tissues, organs and systems.

**0500160 Human Anatomy and Physiology 3-3-0:4**

The course focuses on the fundamentals of human anatomy and physiology, with emphasis on functional and gross anatomical aspects of skeletal system, respiration, kidney function, circulation digestive system, nervous, hormonal coordination, water balance and metabolism. In the laboratory part, the students will be exposed to the gross anatomy and practice different techniques of the functions of different systems of the human body like blood cell counting, ECG, respiratory function tests, etc.

**0500161 Introduction to Health Sciences 2-0-0:2**

This course introduces students to the various CHS disciplines as well as university regulations governing the admission and registration process. The course also provides general view about health and illness and health care delivery system in the UAE. The course will help students to begin using learning resources and develops skills for self-directed learning.

**0500450 Introduction to Research 3-0-0:3**

This course is an introduction to the fundamentals and principles of the research process and their application to practice. Emphasis is placed on steps in research process, including formulation of research problem/hypothesis/ question, literature search, study design, sampling and data collection methods, interpretation of findings and research ethics. Application of the research process will be demonstrated through writing a research proposal based on students' interests.

**Interdepartmental Courses**

The following list of courses are invariably shared among the College of Health Sciences programs. The courses are mandatory in some programs and may be chosen as electives in others. Refer to the specific program for the list of mandatory and elective courses.

| Course # | Course Title                                    | CrHrs | Prerequisite |
|----------|---|-------|--------------|
| 0501257  | General Microbiology                            | 3     | 0500150      |
| 0501260  | Biochemistry                                    | 3     | 1426155      |
| 0502265  | Introduction to Radiology                       | 2     |              |
| 0503253  | Pathophysiology                                 | 3     | 0202121      |
| 0503261  | Psychosocial Aspects in Health Professions      | 3     |              |
| 0503262  | Clinical Pharmacology                           | 3     | 0503253      |
| 0503263  | Health Education and Health Promotion           | 3     |              |
| 0503462  | Ethical and Legal Issues in Health Professions  | 3     |              |
| 0504260  | Leadership and Management in Health Professions | 2     |              |
| 0504362  | Epidemiology and Population Health              | 3     | 0504252      |
| 0505254  | Anatomy (1)                                     | 4     | 0500160      |
| 0505265  | Anatomy (2)                                     | 4     | 0505254      |
| 1426217  | Organic Chemistry                               | 4     | 1426155      |
| 1440163  | Calculus for HS                                 | 3     |              |
| 0506362  | Food Safety and Quality                         | 3     | 0501257      |
| 0506352  | Occupational Health and Safety                  | 3     |              |
| 0504250  | Introduction to Health Services Administration  | 3     |              |
| 0507250  | Introduction to Nutrition                       | 3     | 0500160      |

**Descriptions of the above courses are given below.**

**0501257                      General Microbiology                      2-3-0:3**

Introduces the students to the basic microbiology with emphasis on the general characteristics and general proper- ties of microorganisms, bacteria, fungi, viruses and protozoa. Requirement and control of microbial growth in the lab and the hospital, microbial genetic and metabolisms and drug resistance. The impact of microorganisms on the health and wellbeing of humans and of all life forms. Practical sessions will cover media preparation for isolation and identification of microorganisms, sterilization and antiseptic techniques and antibiotic sensitivity test.

**0501260                      Biochemistry                      2-3-0:3**

This is an introductory course for students of allied health sciences. The course focuses on the general structural and functional properties of biomolecules such as proteins, enzymes, carbohydrates, lipids and nucleic acids. Major metabolic processes and pathways related to these biomolecules are described, with emphasis on relevant clinical situations. The practical part of this course focuses on basic biochemistry experiments in relation to buffers and enzymes behavior, amino acid titration curves, and qualitative and quantitative assays of various substances.

**0502265                      Introduction to Radiology                      2-0-0:2**

This course provides an insight into the field of Radiology, including Radiography, Computed Tomography, Ultra- sound, MRI, and Radionuclide imaging. Medical images of different body systems will be introduced and discussed.

**0503253                      Pathophysiology                      3-0-0:3**

This course provides an introduction to the fundamentals of pathophysiology for students in a variety of College of Health Sciences programs. The course focuses on essential concepts of disease processes such as inflammation, tumors and immunopathology...etc. It includes major disorders as well as selected additional diseases with intention of providing information on a board spectrum of diseases with one or more distinguishing features each. Understanding this course enables the students to apply that knowledge to other disorders that will be encountered in subsequent courses and in clinical practice.

**0503261                      Psychosocial Aspects in Health Professions                      (3-0-0:3)**

This course presents concepts and principles of psychosocial, cultural and environmental aspects of individuals, families and communities. It focuses on relationship between culture and human behavior and social control of the individual in society. The effect of psychosocial variables such as a client's cultural, religious, gender, socio-economic, genetic, family, education, and communal on the holistic care shall be examined. Group interaction within the class setting is directed toward development of the professional role in providing holistic care in different settings and de- scribes recommended intervention strategies as members of health care team. Prerequisite: None.

**0503262                      Clinical Pharmacology                      3-0-0:3**

Clinical Pharmacology course will address the application of the biological and biochemical principles essentials to the management of health care problems, with particular emphasis on the principles of pharmacology and mechanisms of drug actions.

**0503263                      Health Education and Health Promotion                      3-0-0:3**

This course provides the theory and relevant skills that enable the student to participate in activities directed towards health education, prevention of illness and injury, and promotion of positive healthy

behaviors throughout the life span. The course also explores various theories related to health education and health promotion of the individual, family, and community.

**0503462 Ethical and Legal Issues in Health Professions 3-0-0:3**

The course explores the different ethical principles governing decision making in health care systems and provides an overview of the prevailing laws and regulations that pertain to health care systems, particularly in UAE. IT will orient the students to understand the distinct, yet integral, relationships between multidisciplinary professions involved in providing health care. Patient safety, professional licensure, continuing education, and scope of practice will be emphasized.

**0504250 Introduction to Health Services Administration 3-0-0:3**

A course that aims to describe the health services system and understand the components of the system. Multiple administrative approaches to integrate the various components of the health services system and hospitals, and management of the human and non-human factors to produce safe, effective and efficient health services will be studied.

**0504260 Leadership and Management in Health Profession 2-0-0:2**

This course explores selected theories and concepts that shape the leadership and management practices to foster effective, efficient principles and responsive health systems. The principles and concepts of systems theory will be explored and will be used as a framework to analyze and understand health systems. The course introduces students to management concepts, principles and practices, Contemporary issues such as quality, patient safety, and technology are integrated with traditional management functions of planning, organizing, leading and controlling.

**0504362 Epidemiology and Population Health 3-0-0:3**

The course covers the principles and methods of epidemiology. IT studies trends and patterns of diseases and its impact on public health as illustrated using specific examples of infectious and non-infectious diseases. Measurements of disease burden in populations will be discussed. Special emphasis will be given to determinants of health and health policies that impact determinants of health.

**0505254 Anatomy (1) 3-3-0:4**

Anatomy is the study of the shape and structure of the human body and its parts. We use a system of reference to aid in the rapid and accurate identification of the part or area of the body to be described or discussed. This course includes the study of upper and lower limbs, thorax and abdomen using lecture notes, text and computer software. The practical part will be covered in the laboratory which contains a variety of practice exercises that correlate directly with the text including labeling exercises that correspond to illustrations, charts and different high quality human plastic models.

**0505265 Anatomy (2) 3-3-0:4**

This course focuses on the study of human body structure and parts. The essential aspects of this course include study of the pelvis and perineum, head and neck including central nervous system and vertebral column. Again, illustrations and software computer materials are prepared to complement the text materials. The practical sessions will present the essential aspects of anatomy of pelvis, perineum, head and neck including central nervous system. The illustrations, charts and models are carefully prepared and complement the text materials. An important supplementary learning tool for the student is also available in the form of computer software.

**1426217                      Organic Chemistry                      3-3-0:4**

This course covers the classification of organic compounds; the chemical bonds; nomenclature of aliphatic and aromatic compounds; saturated hydrocarbons; unsaturated hydrocarbons; alcohols, phenols, ethers and thiols; aldehydes and ketones; carboxylic acids and their derivatives; amines and amides; and introduction to carbohydrates and proteins. The practical part includes laboratory techniques; synthesis and identification of various organic compounds.

**1440163                      Calculus for Health Sciences                      3-0-0:3**

Elementary Functions, Graphing, Exponential Growth and Decay, Sequences, Limits and Continuity, Differentiation, the Mean-Value Theorem, Optimization, L’hopital’s Rule, Definite Integral, the Fundamental Theorem of Calculus.

**0506352                      Occupational Health and Safety                      3-0-0:3**

This course presents an overview of the concepts of occupational health and safety with emphasis on the identification, assessment, measurement and control of hazards and risks found in the working environment. Workplace design, protective equipment, safety auditing and management systems are also discussed.

**0506362                      Food Safety and Quality                      2-0-3:3**

This course enables students to understand the basic knowledge about food poisoning, food borne infectious diseases. Food production, preservation, and processing are also discussed. Concepts of food hygiene and safety and their application through the practical training enable in ensuring a safe food supply will be covered. Special emphasis is operational hygiene controls and systems, including HACCP. Basic laboratory procedures to determine contaminants in food are included in this course.

**0507250                      Introduction to Nutrition                      3-0-0:3**

This course is a preface to food and nutrition as a healthy life style component as well as acknowledges the student about the basic principles of essential nutrients, including, their sources, absorption, functions, and their requirements. Issues of food safety as part of nutritional concern will also be exposed.

**Program Requirements**

Requirements for the Bachelor of Science degree are program-specific. They encompass three categories: college mandatory courses, Department shared courses, and program courses. The program requirements for the bachelor degrees in the different Health Sciences majors are given hereafter. Details and titles of relevant courses are included in the Student’s Study Plan (SSP) that is availed to every Health Sciences student.

**Course Coding**

The courses offered by the College of Health Science programs are designated according to the following coding System (050XABC):

|     |   |   |
|-----|---|---|
| 05  | College of Health Science Code  |   |
| 0X  | Program as follows  |   |
|     | 01: medical laboratory sciences<br>02: Medical Diagnostic Imaging<br>03: Nursing  | 04: Health Service Administration<br>05: Physiotherapy<br>06: Environmental Health Sciences<br>07: Clinical Nutrition and Dietetics |
| ABC | “A” designate the Year or level 1, 2, 3, 4 (); “B” designate the term (fall or spring); “C” designate the course sequence - 0, 1, 2, 3, 4, 5, 6 |   |

The designation used to represent credit hours breakdown (t-p-c: s) of a course is as follows: “t” stands for theoretical component of the course; “p” practical or laboratory component; “c” stands for clinical practice; and “s” the total credit hours. For example, (3-3-0:4) represents a 4 credit hour course with three contact lecture hours, three laboratory hours and 0 clinical practice hours.

## Department of Medical Laboratory Sciences

### Personnel

**Chairperson:** Gianfranco Pintus

**Professors:** Gianfranco Pintus, Samir M. Awadallah, Mawieh Hamad, Raed Abu Odeh, Wael Abdel-Rahman Hassan

**Associate Professors:**

**Assistant Professors:** Mohammad Ghaleb Mohammad, Mohamad Hamad

**Lecturers:** Omar Chebbo, Ali ElBakri, Sondos Harfil, Hilda Allam, Mohamed Ibrahim Madkour, Dana Faraj Salahat

**Clinical Tutors:** Gayathri Arumugan

**Lab Supervisor:** Maen Al Asaad, Nabila Hussein, Said Shahwan, Zeinab Abdullah Ibrahim

**Administrative Assistant:** Noura Ali Omran

### Vision

Be a recognized professional program at the national, regional, and international levels in providing superior medical laboratory science education, scientific research, and community services.

### Mission

The mission of the department of Medical Laboratory Sciences at the University of Sharjah is to develop and maintain superior educational program in the field of medical laboratory sciences. Graduates of the program will be well-trained professionals, knowledgeable, highly skilled and ethical, prepared to practice as competent professional and capable to grow with the future of laboratory medicine.

### Values

In line with the values of the College of Health Sciences, the Medical Laboratory Sciences (MLS) department will strive towards excellence, professionalism, innovation and creativity, and cultural respect and sensitivity.

### Goals

The objectives of the medical laboratory sciences program at the University of Sharjah are to:

- 1) To provide students a superior and comprehensive educational program in medical laboratory sciences.
- 2) To graduate professionally competent medical laboratory scientists prepared to meet the workforce needs of Sharjah, the Emirates, and the region.
- 3) To graduate individuals exhibiting sense of commitment to the ethical and humane aspects of patient care, and recognizing the role in assuring quality health care.
- 4) To prepare students for successful completion of international certification exams in medical laboratory sciences.

## Graduate Profile

### 1. Knowledge and understanding

- 1.1 Discuss basic life sciences processes pertinent to the field of specialization (Hematology, Microbiology, etc.)
- 1.2 Operate common lab equipment ranging from simple pipetting to the operation of available lab equipment (e.g. cell counter)
- 1.3 Identify quality assurance measures and participate in performance improvement activities in the clinical laboratory

### 2. Patient and population care

- 2.1 Perform clinical laboratory tests commonly encountered in a hospital laboratory in the areas of Clinical Chemistry, Hematology/Hemostasis, Immunohematology, Immunology/Serology, Microbiology, Histopathology and, to a lesser extent, Molecular Diagnostics
- 2.2 Examine the acceptability of patient samples for testing and decide on which samples to use or reject for particular test(s)
- 2.3 Utilize controls and standards and the application of QA/QC standards to assure the accuracy and precision of test results through
- 2.4 Periodically perform and assess quality control results in concerned labs and verify test results
- 2.5 Identify and resolve commonly encountered equipment problems
- 2.6 Perform preventive maintenance measures and comply with acceptable safety procedures
- 2.7 Assume responsibilities in analysis and clinical decision-making such as recognizing and resolving issues related to pre-analytical, analytical, and post-analytical steps of the testing process

### 3. Communication

- 3.1 Demonstrate oral and written effective communication skills
- 3.2 Consult with other members of the health care team

### 4. Management and leadership

- 4.1 Use basic knowledge of laboratory financial, operational, marketing and human resource management
- 4.2 Recognize the need for cost-effective, high-quality, laboratory services in today's health care systems
- 4.3 Utilize a laboratory information system
- 4.4 Recognize the significance of information technology in providing timely and accurate laboratory services.
- 4.5 Make decisions, prioritize tasks, and work on multiple tasks simultaneously 4,6 Work independently and in cooperation with others

### 5. Health education and community services

- 5.1 Educate the general public and to assist patients via acceptable customer service interactions

### 6. Professionalism

- 6.1 Recognize applicable regulations (MOH, DHA, ADHA) and participate in laboratory compliance efforts
- 6.2 Use accreditation standards (ASCP) and recognizes the laboratory's role in meeting these standards
- 6.3 Maintain emotions under pressure and time constraints in a socially acceptable manner



- 6.4 Maintain professional attitude and composure in a wide variety of situations
- 6.5 Follow directions, guidance, and instruction
- 6.6 Willing to work with potential biologic, chemical, radiological, mechanical, and electrical hazards
- 6.7 Maintain confidentiality

## 7. Critical and creative thinking

- 7.1 Apply critical thinking skills in variety of settings
- 7.2 Develop critical thinking competencies

## 8. Lifelong learning

- 8.1 Apply acquired learned skills and knowledge to new situations.

## Program Learning Outcomes (PLO)

- 1) Acquired broad base of knowledge and technical skills in medical laboratory sciences and how laboratory data related to clinical medicine and patient care.
- 2) Integrate and interpret test results, recognize errors, and establish a course of action to solve problems
- 3) Developed a range of skills including technical and practical knowledge of information technology, independent learning, critical thinking, verbal and written communication, time management, presentation skills and team work.
- 4) Demonstrate a high degree of professionalism in understanding and practicing ethical and social issues related to human health and care.
- 5) Utilize administrative skills and knowledge consistent with the principles and standards of quality assurance, continuous quality improvement, and laboratory continuing education.
- 6) Advocate for safe laboratory practice including maintenance of working environment, adherence to safety rules and regulations, and appropriate handling and processing of test samples.
- 7) Evaluate published scientific research results and appreciate technological development and advancement in the field of medical laboratory sciences.

## National Qualifications Framework (NQF)

The following matrix depicts the Program Learning Outcomes (PLO) with the National Qualifications Framework strands.

| NQF outcome   | PLO     |
|---|---------|
| <b>Strand 1: Knowledge</b>  |         |
| specialized factual and theoretical knowledge and an understanding of the boundaries in a field of work or discipline, encompassing a broad and coherent body of knowledge and concepts, with substantive depth in the underlying principles and theoretical concepts | 1,2,3   |
| an understanding of allied knowledge and theories in related fields of work or disciplines and in the case of professional disciplines including related regulations, standards, codes, conventions   | 1,2,5,7 |
| understanding of critical approach to the creation and compilation of a systematic and coherent body of knowledge and concepts gained from a range of sources   | 2,3,4   |
| a comprehensive understanding of critical analysis, research systems and methods and evaluative problem-solving techniques  | 2,3,4,6 |
| familiarity with sources of current and new research and knowledge with integration of concepts from outside fields   | 4,6     |
| <b>Strand 2: Skills</b>   |         |

|   |         |
|---|---------|
| technical, creative and analytical skills appropriate to solving specialized problems using evidentiary and procedural based processes in predictable and new contexts that include devising and sustaining arguments associated with a field of work or discipline | 1,3,6   |
| evaluating, selecting and applying appropriate methods, procedures or techniques in processes of investigation towards identified solutions   | 1,2,3,6 |
| evaluating and implementing appropriate research tools and strategies associated with the field of work or discipline   | 2,4     |
| highly developed advanced communication and information technology skills to present, explain and/ or critique complex and unpredictable matters  | 1,3,6   |
| <b>Strand 3: Autonomy and Responsibility</b>  |         |
| can take responsibility for developing innovative and advanced approaches to evaluating and managing complex and unpredictable work procedures and processes, resources or learning   | 2,3     |
| can manage technical, supervisory or design processes in unpredictable, unfamiliar and varying contexts   | 2,3     |
| can work creatively and/or effectively as an individual, in team leadership, managing contexts, across technical or professional activities   | 4,5,6   |
| can express an internalized, personal view, and accept responsibility to society at large and to socio- cultural norms and relationships  | 5,6,7   |
| <b>Strand 4: Role in Context</b>  |         |
| can function with full autonomy in technical and supervisory contexts and adopt para-professional roles with little guidance  | 2,3,6,7 |
| can take responsibility for the setting and achievement of group or individual outcomes and for the management and supervision of the work of others or self in the case of a specialization in field of work or discipline   | 2,3,6,7 |
| can participate in peer relationships with qualified practitioners and lead multiple, complex groups  | 2,3,4,5 |
| can take responsibility for managing the professional development and direct mentoring of individuals and groups  | 2,5,7   |
| <b>Strand 5: Self-development</b>   |         |
| can self-evaluate and take responsibility for contributing to professional practice, and undertake regular professional development and/ or further learning  | 2,4,5,7 |
| can manage learning tasks independently and professionally, in complex and sometimes unfamiliar learning contexts   | 2,5,6,7 |
| can contribute to and observe ethical standards   | 5,7     |

### Career Opportunities

Graduates from the Medical Lab Sciences program will be prepared to pursue a wide range of careers opportunities in many fields including:

- Clinical laboratory generalists in hospitals, clinics or private laboratories.
- Clinical laboratory specialists working in areas such as microbiology, hematology, blood bank, chemistry, molecular biology/DNA, histocompatibility, immunology, and stem cell/bone marrow labs.
- Clinical laboratory supervisors or managers.
- Quality assurance and quality specialists in hospitals or industry (e.g. pharmaceutical quality operations).
- Technical representatives, sales representatives or research and development specialists in laboratory industries.

### Program Overview

The program is designed to meet the objectives of the Department of Medical Laboratory Sciences. A student undertaking this program should complete a total of 134 credit hours distributed as follows:

| BSc. in Medical Laboratory Sciences |           |           |           |            |
|-------------------------------------|-----------|-----------|-----------|------------|
|                                     | UR        | CR        | PR        | Total      |
| Mandatory Credits                   | 15        | 24        | 86        | 125        |
| Elective Credits                    | 9         | -         | 0         | 9          |
| <b>Total</b>                        | <b>24</b> | <b>24</b> | <b>86</b> | <b>134</b> |

#### I. University Requirements

The list of the University required courses and their descriptions are presented in the introductory pages in this bulletin.

#### II. College Requirements

The 24 credit hours of mandatory college requirement courses are listed in the College section of the Bulletin.

#### III. Program Requirements

The MLS requires the 86 credit hours of mandatory courses listed in the table below.

| Course # | Title                        | CrHrs | Pre-requisite |
|----------|------------------------------|-------|---------------|
| 0501258  | Molecular Genetics           | 4     | 0500150       |
| 0501253  | Medical Microbiology         | 4     | 0500150       |
| 0501254  | Histology                    | 3     | 0500150       |
| 0501260  | Biochemistry                 | 3     | 1426155       |
| 0501262  | Immunology and Serology      | 4     | 0500160       |
| 0501264  | Histopathological Techniques | 3     | 0501254       |
| 0501265  | Diagnostic Microbiology      | 4     | 0501253       |
| 0501372  | Clinical Parasitology        | 3     | 0500150       |
| 0501359  | Clinical Chemistry (1)       | 4     | 0501260       |
| 0501370  | Hematology (1)               | 4     | 0500160       |
| 0501371  | Phlebotomy Lab               | 1     | Co: 0501370   |

|         |                                      |   |          |
|---------|--------------------------------------|---|----------|
| 0501362 | Hematology (2) and Coagulation       | 4 | 0501370  |
| 0501363 | Pathology                            | 3 | 0501254  |
| 0501364 | Clinical Chemistry (2)               | 4 | 0501359  |
| 0501365 | Blood Banking                        | 3 | 0501262  |
| 0501366 | Urinalysis and Body Fluids           | 2 | 0501359  |
| 0501454 | Practicum in Hematology              | 3 | 0501370  |
| 0501451 | Practicum in Microbiology            | 3 | 0501265) |
| 0501452 | Practicum in Serology                | 2 | 0501262  |
| 0501453 | Lab Management and Quality Assurance | 3 | 0501364  |
| 0501460 | Practicum in Clinical Chemistry      | 3 | 0501359  |
| 0501461 | Practicum in Histopathology          | 2 | 0501264  |
| 0501462 | Practicum in Blood Banking           | 3 | 0501365  |
| 0501463 | Medical Virology                     | 2 | 0501253  |
| 0501464 | Medical Mycology                     | 2 | 0501253  |
| 0501465 | Student Project                      | 3 | 0500450  |
| 1426217 | Organic Chemistry                    | 4 | 1426155  |
| 1440163 | Calculus for HS                      | 3 |          |

### Study Plan

The MLS program encompasses 134 credits hours that are spread over eight semesters and could be completed in four years. The following distribution of courses by semester facilitates student's normal progression through the study plan.

| Year I, Level 1 (Freshman), Semester 1 , Fall (16 Credits) |                                       |       |               |
|--|---------------------------------------|-------|---------------|
| Course #   | Title                                 | CrHrs | Prerequisites |
| 0201102  | Arabic Language                       | 3     |               |
| 0202121  | English for Medical Sciences I        | 3     |               |
| 0500150  | Biology                               | 4     |               |
| 0500161  | Introduction to Health Sciences       | 2     |               |
| 1426155  | General Chemistry for Health Sciences | 4     |               |

| Year 2, Level 2 (Sophomore), Semester 3, Fall (18 Credits) |                      |       |               |
|--|----------------------|-------|---------------|
| Course #   | Title                | CrHrs | Prerequisites |
| 1440163  | Calculus for HS      | 3     |               |
| 0501258  | Molecular Genetics   | 4     | 0500150       |
| 0501253  | Medical Microbiology | 4     | 0500150       |
| 0501254  | Histology            | 3     | 0500150       |
| 1426217  | Organic Chemistry    | 4     | 1426155       |

| Year 1, Level 1 (Freshman), Semester 2, Spring (17 Credits) |                                     |       |               |
|---|-------------------------------------|-------|---------------|
| Course #  | Title                               | CrHrs | Prerequisites |
| 0104100   | Islamic Culture                     | 3     |               |
| 1411100   | Introduction to IT (English)        | 3     |               |
| 0500160   | Human Anatomy and Physiology        | 4     | 0500150       |
| 1430107   | General Physics for Health Sciences | 4     |               |
|   | University Elective (1)             | 3     |               |

| Year 2, Level 2 (Sophomore), Semester 4, Spring (17 Credits) |                               |       |                        |
|--|-------------------------------|-------|------------------------|
| Course #   | Title                         | CrHrs | Prerequisites          |
| 0302200  | Fund. of Innovation & Entrep. | 3     | 30 Credit Hrs required |
| 0501260  | Biochemistry                  | 3     | 1426155                |
| 0501262  | Immunology and Serology       | 4     | 0500150                |
| 0501265  | Diagnostic Microbiology       | 4     | 0501253                |
| 0501264  | Histopathological Techniques  | 3     | 0501254                |

| Year 3, Level 3 (Junior), Semester 5 , Fall (18 Credits) |                        |       |               |
|--|------------------------|-------|---------------|
| Course #   | Title                  | CrHrs | Prerequisites |
| 0501372  | Clinical Parasitology  | 3     | 0500150       |
| 0501359  | Clinical Chemistry (1) | 4     | 0501260       |
| 0501370  | Hematology (1)         | 4     | 0500160       |
| 0501371  | Phlebotomy Lab         | 1     | Co: 0501370   |
| 0504252  | Biostatistics          | 3     |               |

| Year 3, Level 3 (Junior), Semester 6, Spring (19 Credits) |                                |       |               |
|---|--------------------------------|-------|---------------|
| Course #  | Title                          | CrHrs | Prerequisites |
| 0501362   | Hematology (2) and Coagulation | 4     | 0501370       |
| 0501363   | Pathology                      | 3     | 0501254       |
| 0501364   | Clinical Chemistry (2)         | 4     | 0501359       |
| 0501365   | Blood Banking                  | 3     | 0501262       |
| 0501366   | Urinalysis and Body Fluids     | 2     | 0501359       |
|   | University Elective (3)        | 3     |               |

| Year 4, Level 4 (Senior), Semester 7, Fall (14 Credits) |                                      |       |               |
|---|--------------------------------------|-------|---------------|
| Course #  | Title                                | CrHrs | Prerequisites |
| 0500450   | Introduction to Research             | 3     | 0504252       |
| 0501454   | Practicum in Hematology              | 3     | 0501370       |
| 0501451   | Practicum in Microbiology            | 3     | 0501265       |
| 0501452   | Practicum in Serology                | 2     | 0501262       |
| 0501453   | Lab Management and Quality Assurance | 3     | 0501364       |

| Year 4, S Level 4 (Senior), Semester 8, Spring (15 Credits) |                                 |       |               |
|---|---------------------------------|-------|---------------|
| Course #  | Title                           | CrHrs | Prerequisites |
| 0501460   | Practicum in Clinical Chemistry | 3     | 0501359       |
| 0501461   | Practicum in Histopathology     | 2     | 0501264       |
| 0501462   | Practicum in Blood Banking      | 3     | 0501365       |
| 0501463   | Medical Virology                | 2     | 0501253       |
| 0501464   | Medical Mycology                | 2     | 0501253       |
| 0501465   | Student Project                 | 3     | 0500450       |

### Course Description

The courses offered by the Medical Laboratory Sciences program are designated as (0501ABC), where ABC represents the year, term and sequence as described in the College Section.

### **Mandatory Core Courses**

The required core courses offered by the Medical Laboratory Sciences program are described below.

**0501253                      Medical Microbiology                      3-3-0:4**

**Prerequisite: 0500150 - Biology.**

This course focuses on the basic microbiology concepts to MLT, with emphasis on the general characteristics of prokaryotic cell, general properties of microorganisms, bacteria, fungi, viruses, and protozoa. Methods of antiseptic and microbial growth and antibiotic sensitivity. Students in practical sessions will experience preparation of bacterial culture media, sterilization and antiseptic techniques and an antibiotic sensitivity test.

**0501254                      Histology                      2-3-0:3**

**Prerequisite: 0500150- Biology.**

This course focuses on the study of microscopic structure of the human body. The course will introduce the structure of human cells, basic tissues types and organization including epithelial, connective, muscular and nervous tissues. This is followed by the study of the microscopic structure of major organs and systems of the human body. The relationship between structure and function is addressed. The practical part of this course focuses on the microscopic examination of tissues within different organs of the human body.

**0501258                      Molecular Genetics                      3-3-4:0**

**Prerequisite: 0500150 – Biology**

This course will examine the molecular basis of cellular processes, with emphasis on gene structure and function, DNA replication, transcription and translation, gene expression and regulation, genetic engineering and genetic diseases which will be studied in theory and in the practical laboratory sessions. Laboratory experiments are designed for the student to become familiar with micro pipettes and reagent preparation for use in the preparation of agarose gels to identify human DNA and RNA, plasmids after bacterial cell transformation, PCR products and DNA that has been manipulated by restriction enzymes and ligase for use in Southern blots.

**0501262                      Immunology and Serology                      3-3-0:4**

**Prerequisite: 0500160 - Human Anatomy and Physiology.**

Introduction to the basic concepts of immunology, types of immunity, the immune response, the immune system, structure and function of antigens and antibodies, immunopathology and clinical applications of the immunological techniques in the modern diagnostic serology laboratory. Serologic laboratory sessions will focus on principles of antigen-antibody reaction, and the principles of serological procedures. Clinical serological analyses include examples of basic techniques and correlation with disease and immunity.

**0501264                      Histopathological Techniques                      2-3-0:3**

**Prerequisite: 0501254 – Histology.**

Introducing the concepts and basics of different techniques used in tissue preparation and staining procedures essential for microscopic detection, recording and quantification of human cells and tissues in the histology/pathology work. The practical part includes a thorough grounding in all aspects of histological techniques used in tissue preparation for microscopic examination. These include fixation, processing, embedding, using microtome to cut tissue slices and then staining and examination of samples. Alternative methods in tissue preparation such as frozen sections are also introduced.

**0501265 Diagnostic Microbiology 3-3-0:4**

**Prerequisite: 0501253 - Medical Microbiology.**

This course focuses on the principle of different methods of Lab diagnosis of microorganisms as smear and wet methods, culture, biochemical, serological molecular diagnostic methods. Practical sessions will cover laboratory methods of isolation and identification of pathogenic microorganisms. Major emphasis is on the collection and preparation of specimens and using rich, selective and differential media. Other biochemical and serological methods for lab diagnosis will also be used. General investigations will be carried out for urine, stool and body fluids.

**0501372 Clinical Parasitology 2-3-0:3**

**Prerequisite: 0500150 – Biology.**

The course aims at familiarizing students with the basic concepts of Parasitology, types of animal associations, adaptations to parasitic mode of life and evolution of parasitism. Parasites life – cycles, infection, transmission, pathology, symptoms, diagnosis, treatment and control of medically and economically important parasites are the main emphasis of this course. The laboratory sessions are designed to expose the students to the morphology of the different developmental stages of medically and economically important parasites as well as introducing the skills of proper laboratory procedures for collecting, handling, diagnosing and identifying parasitic organisms.

**0501359 Clinical Chemistry (1) 3-3-0:4**

**Prerequisite: 0501260 – Biochemistry.**

This course is designed to introduce the student to the various analytical techniques and methods used in the measurement of various parameters in the blood and other body fluids, and to gain technical skills and knowledge of interpretation of test results in health and disease states. The course mostly covers routine laboratory investigations related to disorders of plasma proteins and amino acids, kidney function, liver function, carbohydrate disorders, lipids and lipoprotein abnormalities, pancreatic function, and gastrointestinal disorders.

**0501370 Hematology (1) 3-3-0:4**

**Prerequisite: 0500160 - Human Anatomy and Physiology.**

Blood composition, hematopoiesis and its requirement, erythrocytes and their disorders, hemoglobin and leukocytes structure and function are closely examined. Students are expected to gain sufficient skills and knowledge in performing procedures and laboratory techniques (manual and automated) used in the investigation and diagnosis of various blood disorders.

**0501371 Phlebotomy Lab 0-3-0:1**

**Co-requisite: 0501370 - Hematology (1).**

The aim of this course is for students to gain sufficient technical skills in blood collection. Students will be exposed to the different techniques and different tools used in blood collection, and to the various types of containers used in the clinical laboratory. Specimen handling, safety measures, and blood collection complication are closely introduced.

**0501362 Hematology (2) and Coagulation 3-3-0:4**

**Prerequisite: 0501370 - Hematology (1).**

Introduces the student to malignant and non-malignant disorders of leukocytes with emphasis on etiology, classification, and lab investigation of leukemias. Major emphasis will also be on the mechanisms of hemostasis, coagulation, and fibrinolysis in health and disease states. Routine and special procedures in hematology and coagulation will be described and applied during the practical part of the course.

**0501363 Pathology 3-0-0:3**

**Prerequisite: 0501254 – Histology.**

The goal of this course is to develop an understanding of the causes and mechanisms of human diseases and associated alterations of structure and function of tissues. This involves first, the general pathology during which cell injury, adaptation, cell death, repair, inflammation, and neoplasia are introduced. Then, diseases and tumors of general interest affecting different body systems such as digestive, respiratory and female genital system and breast are studied.

**0501364 Clinical Chemistry (2) 3-3-0:4**

**Prerequisite: 0501359 - Clinical Chemistry (1).**

This course, which is a continuation of Clinical Chemistry (1), is designed to introduce the student to more advanced topics in clinical chemistry, including blood gases and acid-base balance, electrolytes, clinical endocrinology, tumor markers, porphyrins, therapeutic drug monitoring (TDM) and other subjects. Students are expected to gain sufficient skills and knowledge in performing and interpreting test results related to subjects covered in this course.

**0501365 Blood Banking 2-3-0:3**

**Pre-requisite: 0501262 - Immunology and Serology.**

The ABO, Rh, and other blood group systems and their clinical significance in relation to blood donor's selection and in preparation of blood components are closely described. Technical procedures and investigations conducted in blood banks such as blood donor selection, blood group typing, antibody screening, cross matching and other procedures will be described fully in the practical session of the course.

**0501366 Urinalysis and Body Fluids 1-3-0:2**

**Prerequisite: 0501359 - Clinical Chemistry (1).**

This course deals with the various types of body fluids and their composition in health and disease states. Emphasis will be focused on sample collection, processing and preservation as well as on routine and special tests performed on these fluids for the diagnosis of many diseases. Body fluids studied in this course include urine, CSF, synovial, serous, amniotic and others.

**0501454 Practicum in Hematology 0-0-9:3**

**Prerequisite: 0501370 - Hematology (1).**

Students in affiliated hospital laboratories in order to acquire technical and practical experience in the various disciplines of Hematology and Coagulation. Student activities and training performance will be evaluated by academic and training supervisors.

**0501460 Practicum in Clinical Chemistry 0-0-9:3**

**Prerequisite: 0501359 - Clinical Chemistry (1).**

Allocated time of clinical hours will be spent by students in affiliated hospital laboratories in order to acquire technical and practical experience in the various disciplines of Clinical Chemistry. Student activities and training performance will be evaluated by academic and training supervisors.

**0501461 Practicum in Histopathology 0-0-6:2**

**Prerequisite: 0501264 - Histopathological Techniques.**

Allocated time of clinical hours will be spent by students in affiliated hospital laboratories in order to acquire technical and practical experience in the field of Histopathology. Student activities and training performance will be evaluated by academic and training supervisors.



**0501451                      Practicum in Microbiology                      0-0-9:3**

**Prerequisite: 0501265 - Diagnostic Microbiology.**

Students in affiliated hospital laboratories in order to acquire technical and practical experience in the various disciplines of Microbiology. Student activities and training performance will be evaluated by academic and training supervisors.

**0501452                      Practicum in Serology                      0-0-6:2**

**Prerequisite: 0501262 - Immunology and Serology.**

Allocated time of clinical hours will be spent by students in affiliated hospital laboratories in order to acquire technical and practical experience in the field of diagnostic Serology. Student activities and training performance will be evaluated by academic and training supervisors.

**0501453                      Lab Management and Quality Assurance                      3-0-0:3**

**Prerequisite: 0501364 - Clinical Chemistry (2).**

This is an integrated course of both laboratory management and quality assurance in the clinical lab. The course describes the fundamental principles and practices of management and supervision of clinical laboratory including management of organizations, human resources, financial resources, and laboratory operations. Concerning quality assurance, the course covers subjects related to quality concepts and terminology, tools of quality monitoring and assessment, data interpretation, and appropriate actions in response to QC results.

**0501462                      Practicum in Blood Banking                      0-0-9:3**

**Prerequisite: 0501365 - Blood Banking.**

Allocated time of clinical hours will be spent by students in affiliated hospital laboratories in order to acquire technical and practical experience in the various field of Blood Banking. Student activities and training performance will be evaluated by academic and training supervisors.

**0501463                      Medical Virology                      2-0-0:2**

**Prerequisite: 0501253 - Medical Microbiology.**

The course introduces the basic principles of virology including definitions, structure, nomenclature, classifications, modes of viral infection, viral diseases and viral vaccines.

**0501464                      Medical Mycology                      2-0-0:2**

**Prerequisite: 0501253 - Medical Microbiology.**

Survey of infectious diseases caused by fungi including their etiology, epidemiology, histopathology, diagnosis, and treatment. Host-parasite interactions and the environmental and molecular factors that contribute to establishment of fungal disease in humans and animals will also be discussed.

**0501465                      Student Project                      3-0:3**

**Prerequisite: 0500450 - Introduction to Research.**

Introducing students to the instructions and guidelines used when a research project is conducted, and exposing them to the proper methods used in writing and presenting a scientific paper. Research projects in the field of clinical laboratory will be carried out independently by students under the guidance and supervision of faculty members.

## Department of Medical Diagnostic Imaging

### Personnel

**Chairperson** Professor Bashar Issa

**Associate Professors** Huseyin Ozan Tekin

**Assistant Professor** Mohamed M Abdelfatah Abuzaid, Wiam Elshami,

**Lecturer** Leena R. David, Muna N Kadhom

**Clinical Tutors** Sura Majid, Mawadah Mubarak, Zarmeena Noorajan, Asma Mohamed Abdi, Wijdan Attia Hamad

### Vision

The Department of Medical Diagnostic Imaging (MDI) aims to become a focal point in providing the highest quality of education, research, and consultation in the field of Medical Diagnostic Imaging at the national and regional levels.

### Mission

The Department of Medical Diagnostic Imaging mission is to provide high-quality education; to prepare Medical Diagnostic Imaging graduates to participate in and contribute professionally to their societies, in healthcare and medical imaging profession.

### Values

**Excellence:** College community pursues excellence, bonded by a spirit of cooperation and mutual assistance.

**Professionalism:** College community respects and adheres to the standards of professional performance, practice and behavior.

**Innovation and Creativity:** College community supports an environment that encourages individuals to address opportunities and threats through innovative and creative avenues.

**Cultural Respect and Sensitivity:** College community supports an environment that recognizes, encourages and respects cultural diversity and differences in thought and culture to enhance the richness of the academic environment.

### Goals

- 1) Graduate students with knowledge base required to practice Medical Diagnostic Imaging effectively and safely.
- 2) Graduate students with effective communication, management, and leadership, problem-solving/ critical thinking skills that provide compassionate patient care.
- 3) Graduate students who value the importance of professional development to patient care and medical imaging field through life-long learning and meet the needs of the Medical Imaging community.

## Graduate Profile

### 1) Knowledge and understanding

- a) Evaluate routine procedures to assess the performance of radiographic and fluoroscopic imaging modalities and initiate corrective action as necessary
- b) Apply the knowledge of basic life sciences (Anatomy, Physiology, Pathology, and Image Interpretation)
- c) Assess the performance of the CT, BMD, and mammographic units and initiate corrective action as necessary
- d) Appraise the digital image receptors and initiate corrective action as necessary
- e) Assess the performance of accessory equipment and initiate corrective action as necessary
- f) Evaluate the integrity of protective apparel and devices and initiate corrective action as necessary
- g) Determine and select parameters for performing procedures on a radiographic unit
- h) Examine the performance of film processing equipment and initiate corrective action as necessary
- i) Apply radiation safety practices to patients, technologists, staff, care givers and the general public
- j) Analyze image for quality and diagnostic purposes and adjust parameters for additional images
- k) Examine the routine procedures that support continuous quality improvement (Quality Assurance and Quality Control)

### 2) Patient and Population Care

- a) Operate imaging modality for digital-analog image acquisition consistent with the procedure and the patient's condition
- b) Provide a safe environment to minimize the risk of adverse events to patient and staff
- c) Transport patient safely using equipment based on patient's physical and cognitive status and resources available
- d) Implement immobilization techniques based on age, physical and cognitive status of patient and type of procedure
- e) Assess, monitor and respond to the patient's therapeutic and supportive devices to ensure patient safety and comfort
- f) Ensure the patient's needs are met prior to release from the technologist's care
- g) Follow established protocols when handling and disposing of contaminated and bio-hazardous materials
- h) Adhere to protective environmental protocols for patients with compromised immunity and/or antibiotic resistant organisms
- i) Adhere to transmission-based precautions for airborne, droplet and contact modes of transmission

### 3) Communication

- a) Establish patient rapport
- b) Use various forms of communication to provide/obtain relevant, accurate and complete information
- c) Exchange information regarding details of the procedure with patients and their support persons to enable them to make informed decisions
- d) Assess and respond to cultural, ethnic, linguistic, religious, and socio-economic variables affecting communication

- e) Utilize Picture Archiving Communication System (PACS) for purposes of image display, networking, archival and retrieval

#### **4) Management and Leadership**

- a) Prioritize workflow to optimize patient outcomes
- b) Monitor inventory of materials and supplies
- c) Manage change within the evolving healthcare system

#### **5) Health Education and Community Services**

- a) Educate individuals on radiation risks
- b) Consult with medical radiation personnel as required
- c) Exchange knowledge/skills with other members of healthcare teams to promote collaborative practice
- d) Provide clinical instruction guidance and evaluation for students

#### **6) Professionalism**

- a) Practice patient care in a manner that protects the patient's legal rights
- b) Practice in accordance with national association and provincial regulatory body's legislation requirements
- c) Provide a diagnostic / therapeutic impression to health care professionals to assist in patient care management
- d) Demonstrate respect and sensitivity in both patient and professional interactions
- e) Present a professional appearance and manner

#### **7) Critical and Creative Thinking**

- a) Apply critical thinking and problem-solving strategies to ensure best practices
- b) Participate in research for the purpose of evidence-based decision making

#### **8) Lifelong learning**

- a) Participate in professional development

#### **9) Clinical Skills**

- 1) Perform imaging procedure of the Skeletal System
  - Upper limb (finger, hand, wrist, forearm, elbow, humerus, shoulder, clavicle, ACJ, scapula)
  - Lower limb (toe, foot, ankle, calcaneus, leg, knee, femur, hip, pelvis)
  - Vertebral column (CS, DS, LS, sacrum, coccyx, SIJ, scoliosis series)
  - Axial skeleton, sternum, ribs
  - Head, skull, sinuses, facial bones, orbits, nasal bone, TMJ
  - Bone age
- 2) Perform imaging procedure of the digestive system
  - Non-contrast procedure of the abdomen
  - Esophagus, small bowel, large bowel
  - ERCP
- 3) Perform imaging procedure of the respiratory system
  - Respiratory system
  - Soft tissue neck
  - Chest
- 4) Perform imaging procedure of the urinary system
  - Non-contrast of the KUB

- Intravenous Urography
- Ascending Urethrogram, Micturition Cystography
  - 5) Perform imaging procedure of the reproductive system
- Male and female reproductive system
- Hysterosalpingography (HSG)
- Participate in mammographic imaging procedure
  - 6) Imaging procedure for dental studies
    - Participate in dental imaging procedures
  - 7) Imaging procedure for bone mineral density
- Perform bone mineral density imaging procedures
  - 8) Perform imaging procedure in computed tomography
- Computed tomographic imaging procedures
  - 9) Imaging procedure for vascular/interventional studies
- Participate in vascular/interventional imaging procedures
- 10) Imaging procedures in Magnetic Resonance Imaging
- 11) Imaging procedures in Nuclear Medicine

#### Program Learning Outcomes (PLO)

- 1) Acquire a broad base of health sciences knowledge, understanding, and skills, as well as depth in Medical Diagnostic Imaging related sciences.
- 2) Experience appropriate modern methods of teaching, learning, and assessment.
- 3) Be able to apply knowledge and understanding in careers in Medical Diagnostic Imaging.
- 4) Be able to demonstrate competent Medical Diagnostic Imaging skills in a variety of settings.
- 5) Develop a range of skills including knowledge of information technology, independent learning, critical thinking, problem solving, verbal and written communication, time management, presentation skills and teamwork.
- 6) Be able to participate effectively in research activities in the community.
- 7) Be able to demonstrate leadership to provide effective and efficient Medical Diagnostic Imaging service to patients based on latest knowledge and changing needs of the Medical Imaging community.
- 8) Develop an appreciation and understanding of the ethical and social issues important to the health sciences and Medical Diagnostic Imaging.

#### National Qualifications Framework (NQF)

Alignment of National Qualifications Framework strands with the Program Learning Outcomes

| NQF Outcomes  | PLO |
|---|-----|
| Knowledge   |     |
| specialized factual and theoretical knowledge and an understanding of the boundaries in a field of work or discipline, encompassing a broad and coherent body of knowledge and concepts, with substantive depth in the underlying principles and theoretical concepts | 1   |
| an understanding of allied knowledge and theories in related fields of work or disciplines and in the the case of professional disciplines including related regulations, standards, codes, conventions   | 1   |
| understanding of the critical approach to the creation and compilation of a systematic and coherent body of knowledge and concepts gained from a range of sources   | 2   |

|  |     |
|--|-----|
| a comprehensive understanding of critical analysis, research systems and methods and evaluative problem-solving techniques.  | 5   |
| Familiarity with sources of current research and knowledge with the integration of concepts from related fields.   | 6   |
| <b>Skill</b>   |     |
| Technical, creative and analytical skills appropriate to solving specialized problems using evidentiary and procedural-based processes in predictable and new contexts that include devising and sustaining arguments associated with a field of work or discipline. | 3   |
| Evaluating, selecting and applying appropriate methods, procedures or techniques in processes of investigation towards identified solutions.   | 4   |
| evaluating and implementing appropriate research tools and strategies associated with the field of work or discipline  | 5,6 |
| Highly developed advanced communication and information technology skills to present, explain and / or critique complex and unpredictable matters.   | 5   |
| <b>Autonomy and responsibility</b>   |     |
| can take responsibility for developing innovative and advanced approaches to evaluating and managing complex and unpredictable work procedures and processes, resources or learning  | 2   |
| can manage technical, supervisory or design processes in unpredictable, unfamiliar and varying contexts  | 4   |
| can work creatively and/or effectively as an individual, in team leadership, managing contexts, across technical or professional activities  | 5   |
| can express an internalized, personal view, and accept responsibility to society at large and to socio-cultural norms and relationships  | 7   |
| <b>Role in context</b>   |     |
| can function with full autonomy in technical and supervisory contexts and adopt para-professional roles with little guidance   | 5   |
| can take responsibility for the setting and achievement of group or individual outcomes and for the management and supervision of the work of others or self in the case of specialization in the field of work or discipline  | 7   |
| can participate in peer relationships with qualified practitioners and lead multiple, complex groups   | 7   |
| can take responsibility for managing the professional development and direct mentoring of individuals and groups   | 7   |
| <b>Self-development</b>  |     |
| can self-evaluate and take responsibility for contributing to  | 5   |

|   |   |
|---|---|
| professional practice, and undertake regular professional development and/ or further learning                    |   |
| can manage learning tasks independently and professionally, in complex and sometimes unfamiliar learning contexts | 2 |
| can contribute to and observe ethical standards   | 4 |

### Career Opportunities

Graduates from the Medical Diagnostic Imaging programme may work as:

- Radiologic Technologist/ Radiographers.
- Medical diagnostic imaging department managers
- Application specialists in medical equipment companies
- Educators in the academic institute
- Administrators
- Researchers

The Bachelor of Science in Medical Diagnostic Imaging (BSc) program prepares the graduate to pursue masters and Doctoral degrees in the field.

### Program Overview

The Medical Diagnostic Imaging program is designed to satisfy the mission of the Department of MDI in order to produce qualified and competent health professionals. The program of BSc consists of three plans: four-year basic program, two-year bridging program - track A and three-year bridging program - track B.

### Basic Program

The requirements of the BSc program in MDI is summarized in the table below and described in detail thereafter.

| BSc. in Medical Diagnostic Imaging (BSc MDI) |           |           |           |            |
|--|-----------|-----------|-----------|------------|
|  | UR        | CR        | PR        | Total      |
| Mandatory Courses                            | 15        | 24        | 86        | 125        |
| Elective Courses                             | 9         | -         | 3         | 12         |
|  | <b>24</b> | <b>24</b> | <b>89</b> | <b>137</b> |

### I. University Requirements (UR)

Every student is required to take 24 credit hours of general education courses distributed over seven domains. Fifteen (15) mandatory credit hours are selected from domains 1, 2, 3 and 4 and (9) elective credit hours selected from domains 5, 6 and 7 as indicated in the University section (General Education).

### II. College Requirements (CR)

The 24 mandatory credit hours college Mandatory courses are listed in the College section of the Bulletin.

### III. Program Requirements (PR)

The basic MDI program requires 89 credit hours of coursework distributed into two categories, 86 credits program requirements and 3 credits electives.

### A. Core courses

The table below lists the courses that encompass 86 credits hours of MDI program core requirements.

| Course # | Title   | CH | Prerequisites/<br>Co. requisite                        |
|----------|---|----|--|
| 0505254  | Anatomy (1)                                       | 4  | Pre: 0500160   |
| 1430281  | Physics for Medical Diagnostic Imaging            | 4  | Pre: 1430107<br>Co: 0502256                            |
| 0502256  | Introduction to Medical Diagnostic Imaging        | 3  | Pre: 0500161, 1430107, 0500160<br>Co: 0502254, 1430281 |
| 0502254  | Patient Care and Management (1)                   | 2  | Pre: 0500160<br>Co: 0502256, 1430281                   |
| 0502264  | Patient Care and Management (2)                   | 3  | Pre: 0502254   |
| 0502266  | Skeletal Radiography                              | 4  | Pre: 0502256, 0505254<br>Co: 0502269, 0502258          |
| 0505265  | Anatomy (2)                                       | 4  | Pre: 0505254   |
| 0502258  | Skeletal Radiography Clinical Practice            | 3  | Pre: 0502256, 0505254<br>Co: 0502266, 0502269          |
| 0502269  | Radiobiology and Radiation Protection             | 2  | Pre: 0502256, 1430281                                  |
| 0502358  | Medical Imaging Equipment                         | 3  | Pre: 0502256   |
| 0502356  | Radiographic Technique                            | 4  | Pre: 0502266, 0502258<br>Co: 0502372                   |
| 0502372  | Radiographic Techniques Clinical Practice         | 5  | Pre: 0502266, 0502258<br>Co: 0502356                   |
| 0502359  | Radiographic & Cross-Sectional Anatomy            | 2  | Pre: 0505265   |
| 0502362  | Computed Tomography                               | 3  | Pre: 0502269   |
| 0502369  | Digital Imaging                                   | 3  | Pre: 0502256   |
| 0502366  | Special Radiographic Technique                    | 3  | Pre: 0502356, 0502372<br>Co: 0502367                   |
| 0502367  | Special Radiographic Techniques Clinical Practice | 5  | Pre: 0502372<br>Co: 0502366                            |
| 0502473  | Radiologic Pathology and Image Interpretation     | 2  | Pre: 0502359   |



|         |  |   |              |
|---------|--|---|--------------|
| 0502455 | Picture Archiving and Communication System   | 3 | Pre: 0502369 |
| 0504260 | Leadership & Management in Health Profession | 2 |              |
| 0502457 | Medical Imaging Clinical Practice (1)        | 5 | Pre: 0502362 |
| 0502472 | Nuclear Medicine                             | 3 | Pre: 0502269 |
| 0502452 | Magnetic Resonance Imaging                   | 3 | Pre: 0502356 |
| 0502459 | Ultrasonography                              | 3 | Pre: 0502356 |
| 0502466 | Research Project                             | 2 | Pre: 0500450 |
| 0502467 | Medical Imaging Clinical Practice (2)        | 6 | Pre: 0502457 |

### B. Elective courses

The following courses are offered by the MDI program and other departments as electives. Students must be aware that not all courses on the list will be available every semester. More courses may be proposed in the future, based on demand. Students are required to choose 3 credit hours from this list.

| Course # | Title  | CrHrs |
|----------|--|-------|
| 0502265  | Introduction to Radiology                      | 2     |
| 0502268  | Seminar in Medical Diagnostic Imaging          | 1     |
| 0507101  | Health Awareness and Nutrition                 | 3     |
| 0504100  | Introduction to Health Services Administration | 3     |

### Study Plan (Basic)

The MDI program encompasses 137 credits hours that are spread over eight semesters and could be completed in four years. The following distribution of courses by semester facilitates student's normal progression through the study plan.

| Year I, Semester 1 Fall semester (16 Credits) |                                 |        |               |
|---|---------------------------------|--------|---------------|
| Course #                                      | Title                           | Cr.Hrs | Prerequisites |
| 0201102                                       | Arabic Language                 | 3      |               |
| 0202121                                       | English for Medical Sciences 1  | 3      |               |
| 0500150                                       | Biology                         | 4      |               |
| 0500161                                       | Introduction to Health Sciences | 2      |               |
| 1426105                                       | Chemistry for Health Sciences   | 4      |               |

| Year I, Semester 2 Spring semester (17 Credits) |                             |        |               |
|---|-----------------------------|--------|---------------|
| Course #  | Title                       | Cr.Hrs | Prerequisites |
| 0104100   | Islamic Culture             | 3      |               |
| 1411100   | Introduction to Information | 3      |               |

|         |                              |   |         |
|---------|------------------------------|---|---------|
|         | Technology (English)         |   |         |
| 0500160 | Human Anatomy and Physiology | 4 | 0500150 |
| 1430107 | Physics for Health Sciences  | 4 |         |
|         | University Elective (1)      | 3 |         |

| Year 2, Semester 3 Fall semester (19 Credits) |  |       |                            |
|---|--|-------|----------------------------|
| Course #                                      | Title                                      | CrHrs | Prerequisites              |
| 0505254                                       | Anatomy (1)                                | 4     | 0500160                    |
| 0502256                                       | Introduction to Medical Diagnostic Imaging | 3     | 0500160 0500161<br>1430107 |
| 0502254                                       | Patient Care and Management (1)            | 2     | 0500160                    |
| 0504252                                       | Biostatistics                              | 3     |                            |
| 1430281                                       | Physics for Medical Imaging                | 4     | 1430107                    |
|   | University Elective (2)                    | 3     |                            |

| Year 2, Semester 4 Spring semester (19 Credits) |  |       |                   |
|---|--|-------|-------------------|
| Course #  | Title                                  | CrHrs | Prerequisites     |
| 0505265   | Anatomy (2)                            | 4     | 0505254           |
| 0502264   | Patient Care and Management (2)        | 3     | 0502254           |
| 0502266   | Skeletal Radiography                   | 4     | 0502256 , 0505254 |
| 0502258   | Skeletal Radiography Clinical Practice | 3     | 0502256, 0505254  |
| 0502269   | Radiobiology and Radiation Protection  | 2     | 0502256, 1430281  |
|   | University Elective (3)                | 3     |                   |

### Year 3

| Year 3, Semester 5 Fall semester (18 Credits) |   |       |                   |
|---|---|-------|-------------------|
| Course #                                      | Title   | CrHrs | Prerequisites     |
| 0502358                                       | Medical Imaging Equipment                     | 3     | 0502256           |
| 0502369                                       | Digital Imaging                               | 3     | 0502256           |
| 0502356                                       | Radiographic Techniques                       | 4     | 0502266 , 0502258 |
| 0502372                                       | Radiographic Techniques Clinical Practice     | 5     | 0502266 , 0502258 |
| 0302200                                       | Fundamentals of Innovation & Entrepreneurship | 3     |                   |

### Year 2, Se

| Year 3, Semester 6 Spring semester (16 Credits) |   |       |                   |
|---|---|-------|-------------------|
| Course #  | Title   | CrHrs | Prerequisites     |
| 0502359   | Radiographic & Cross Sectional Anatomy            | 2     | 0505265           |
| 0502362   | Computed Tomography                               | 3     | 0502269           |
| 0502366   | Special Radiographic Techniques                   | 3     | 0502356 , 0502372 |
| 0502367   | Special Radiographic Techniques Clinical Practice | 5     | 0502372           |
|   | Department Elective                               | 3     |                   |

| Year 4, Semester 7 Fall semester (17 Credits) |  |       |               |
|---|--|-------|---------------|
| Course #                                      | Title                                      | CrHrs | Prerequisites |
| 0500450                                       | Introduction to Research                   | 3     | 0504252       |
| 0502452                                       | Magnetic Resonance Imaging                 | 3     | 0502356       |
| 0502455                                       | Picture Archiving and Communication System | 3     | 0502369       |
| 0502459                                       | Ultrasonography                            | 3     | 0502356       |
| 0502457                                       | Medical Imaging Clinical Practice (1)      | 5     | 0502362       |

| Year 4, Semester 8 Spring semester (15 Credits) |   |       |               |
|---|---|-------|---------------|
| Course #  | Title   | CrHrs | Prerequisites |
| 0502472   | Nuclear Medicine                              | 3     | 0502269       |
| 0504260   | Leadership & Management in Health Profession  | 2     |               |
| 0502473   | Radiologic Pathology and Image Interpretation | 2     | 0502359       |
| 0502466   | Research Project                              | 2     | 0500450       |
| 0502467   | Medical Imaging Clinical Practice (2)         | 6     | 0502457       |

### Bridging Plan - Track A

This track is designed to meet the needs of Professionals with 3-year Diploma who wish to build on their previous education and experience. It addresses the pressing need for advanced education resulting from the significant technical and clinical advances that have occurred in medical imaging in recent years. Students will gain education in digital imaging, Computed Tomography, Magnetic Resonance Imaging, Ultrasound, Nuclear Medicine, and in research. A bachelor level education prepares them for professional challenges. Completion of this plan will expand the options available to professionals in their career.

Students in this plan may study full-time or part-time. Track A is designed for students entering the program with a 3-year diploma. A total of 73 credit hours must be completed at the University of Sharjah which takes 2 years. The study plan is developed for full-time students. Students studying part-time should plan their course of study in consultation with their academic advisor.

| Bridging Plan - Track A |          |          |           |           |
|-------------------------|----------|----------|-----------|-----------|
|                         | UR       | CR       | PR        | Total     |
| Mandatory Credits       | 0        | 6        | 55        | 61        |
| Elective Credits        | 9        | -        | 3         | 12        |
| <b>Total</b>            | <b>9</b> | <b>6</b> | <b>58</b> | <b>73</b> |

### I. University Requirements (UR)

Each student must successfully complete 9 credit hours of University required courses encompassing: three elective courses selected one from each of domains 4, 5 and 6. Refer to the College of Health Sciences Section in this Bulletin for the list of courses in these domains.

### II. College Requirements (CR)

This category consists of two Mandatory courses encompassing 6 credit hours listed in the table below.

| Course # | Title                    | CrHrs | Prerequisites |
|----------|--------------------------|-------|---------------|
| 0504252  | Biostatistics            | 3     |               |
| 0500450  | Introduction to Research | 3     | 0504252       |

### III. Program Requirements (PR)

The MDI Bridging program – Track A requires 58 credit hours of program courses distributed into two categories, 58 credits requirements and 3 credits electives.

#### A. Core courses

The following table lists the 58 credit hours encompassing the required core courses.

| Course # | Title   | CrHrs | Prerequisites     |
|----------|---|-------|-------------------|
| 0502269  | Radiobiology and Radiation Protection             | 2     | No pre-requisites |
| 0502267  | Skeletal Radiography Clinical Practice            | 5     |                   |
| 0502372  | Radiographic Techniques Clinical Practice         | 5     |                   |
| 0502359  | Radiographic and Cross Sectional anatomy          | 2     |                   |
| 0502366  | Special Radiographic Techniques                   | 3     |                   |
| 0502369  | Digital Imaging                                   | 3     |                   |
| 0502367  | Special Radiographic Techniques Clinical Practice | 5     |                   |
| 0502264  | Patient Care and Management (2)                   | 3     |                   |
| 0502455  | Picture Archiving and Communication System        | 3     |                   |
| 0502473  | Radiologic Pathology and Image Interpretation     | 2     |                   |
| 0502362  | Computed Tomography                               | 3     |                   |
| 0502457  | Medical Imaging Clinical Practice (1)             | 5     |                   |
| 0502466  | Research Project                                  | 2     |                   |
| 0502472  | Nuclear Medicine                                  | 3     |                   |
| 0502467  | Medical Imaging Clinical Practice (2)             | 6     |                   |
| 0502452  | Magnetic Resonance Imaging                        | 3     |                   |
| 0502459  | Ultrasonography                                   | 3     |                   |

#### B. Elective courses

The MDI Bridging program – Track A requires one elective, three credit hours course to be chosen from the list presented in the elective course section of the basic MDI program requirements.

### Study Plan

The MDI Bridging program – Track A encompasses 73 credits hours that are spread over four semesters and could be completed in two years. The following distribution of courses by semester facilitates student's normal progression through the study plan.

#### Year 1 (Junior), Semester 1, Fall semester (19 Credits)

| Course # | Title                                     | CrHrs | Prerequisites |
|----------|---|-------|---------------|
| 0502267  | Skeletal Radiography Clinical Practice    | 5     |               |
| 0502372  | Radiographic Techniques Clinical Practice | 5     |               |
| 0504252  | Biostatistics                             | 3     |               |
|          | University Elective (1)                   | 3     |               |
|          | University Elective (2)                   | 3     |               |

#### Year 1 (Junior), Semester 2, Spring semester (18 Credits)

| Course # | Title   | CrHrs | Prerequisites |
|----------|---|-------|---------------|
| 0502359  | Radiographic & Cross Sectional Anatomy            | 2     |               |
| 0502269  | Radiobiology and Radiation Protection             | 2     |               |
| 0502362  | Computed Tomography                               | 3     |               |
| 0502366  | Special Radiographic Techniques                   | 3     |               |
| 0502367  | Special Radiographic Techniques Clinical Practice | 5     |               |
| 0502264  | Patient Care and Management (2)                   | 3     |               |

#### Year 2 (Senior), Semester 3 Fall semester (17 Credits) Year Two (Senior)

| Course # | Title                                      | CrHrs | Prerequisites |
|----------|--|-------|---------------|
| 0500450  | Introduction to Research                   | 3     | 0504252       |
| 0502452  | Magnetic Resonance Imaging                 | 3     |               |
| 0502455  | Picture Archiving and Communication System | 3     |               |
| 0502459  | Ultrasonography                            | 3     |               |
| 0502457  | Medical Imaging Clinical Practice (1)      | 5     |               |

#### Year 2 (Senior), Semester 4, Spring semester (19 Credits)

| Course # | Title   | CrHrs | Prerequisites |
|----------|---|-------|---------------|
|          | University Elective (3)                       | 3     |               |
| 0502472  | Nuclear Medicine                              | 3     |               |
| 0502473  | Radiologic Pathology and Image Interpretation | 2     |               |
| 0502466  | Research Project                              | 2     |               |
| 0502467  | Medical Imaging Clinical Practice (2)         | 6     |               |
|          | Department Elective                           | 3     |               |

### Bridging Plan - Track B

This track is designed to meet the needs of professionals with less than 3-year Diploma who wish to build on their previous education and experience. It addresses the pressing need for advanced education resulting from the significant technical and clinical advances that have occurred in medical imaging in recent years. Students will gain further education in digital imaging, Computed Tomography, Magnetic Resonance Imaging, Ultrasound, Nuclear Medicine, and research.

A bachelor level education prepares radiographers for professional challenges. Completion of this plan will expand the options available to professionals in their career

Students in this track may study full-time or part-time. Track B is designed for students entering the program with less than 3-year diploma. A total of 99 credit hours must be completed at University of Sharjah which takes 3 years. The study plan is developed for full-time students. Students studying part-time should plan their course of study in consultation with their academic advisor.

#### Bridging Plan - Track B

|                   | UR        | CR        | PR        | Total     |
|-------------------|-----------|-----------|-----------|-----------|
| Mandatory Credits | 6         | 10        | 71        | 87        |
| Elective Credits  | 9         | -         | 3         | 12        |
| <b>Total</b>      | <b>15</b> | <b>10</b> | <b>74</b> | <b>99</b> |

### I. University Requirements (UR)

The BSc. Program in MDI requires 15 credits of University requirements distributed as follows.

#### A. Mandatory courses

This category consists of the following 6 credit hour courses:

| Course # | Title   | CrHrs | Prerequisites |
|----------|---|-------|---------------|
| 0202121  | English for Medical Sciences                  | 3     |               |
| 0302200  | Fundamentals of Innovation & Entrepreneurship | 3     |               |

#### B. Elective courses

Each student must successfully complete 9 credit hours of University electives encompassing three courses, one from each of domains 4, 5 and 6. Refer to the College of Health Sciences Section in this Bulletin for the list of courses in these domains.

### II. College Requirements (CR)

The 10 credit hours courses listed in the following table are required for all students in the Bridging Plan - Track B.

| Course # | Title                        | CrHrs | Prerequisites |
|----------|------------------------------|-------|---------------|
| 0504252  | Biostatistics                | 3     |               |
| 0500450  | Introduction to Research     | 3     | 0504252       |
| 0500160  | Human Anatomy and Physiology | 4     |               |

### III. Program Requirements (PR)

This category consists of 74 credit hours in two components: Mandatory, and Electives.

#### A. Mandatory courses

This component consists of 71 credit hours encompassing the courses listed in the following table.

| Course  | Title   | CrHrs | Prerequisites       |
|---------|---|-------|---------------------|
| 0502254 | Patient Care and Management (1)                   | 2     | No Pre<br>requisite |
| 0502264 | Patient Care and Management (2)                   | 3     |                     |
| 0502358 | Medical Imaging Equipment                         | 3     |                     |
| 0502258 | Skeletal Radiography Clinical Practice            | 3     |                     |
| 0504260 | Leadership & Management in health profession      | 2     |                     |
| 0502369 | Digital Imaging                                   | 3     |                     |
| 0505254 | Anatomy (1)                                       | 4     |                     |
| 0502269 | Radiobiology and Radiation Protection             | 2     |                     |
| 0502372 | Radiographic Techniques Clinical Practice         | 5     |                     |
| 0505265 | Anatomy (2)                                       | 4     |                     |
| 0502359 | Radiologic & Cross Sectional Anatomy              | 2     |                     |
| 0502366 | Special Radiographic Techniques                   | 3     |                     |
| 0502367 | Special Radiographic Techniques Clinical Practice | 5     |                     |
| 0502473 | Radiologic Pathology and Image Interpretation     | 2     |                     |
| 0502455 | Picture Archiving and Communication System        | 3     |                     |
| 0502362 | Computed Tomography                               | 3     |                     |
| 0502457 | Medical Imaging Clinical Practice (1)             | 5     |                     |
| 0502472 | Nuclear Medicine                                  | 3     |                     |
| 0502452 | Magnetic Resonance Imaging                        | 3     |                     |
| 0502459 | Ultrasonography                                   | 3     |                     |
| 0502466 | Research Project                                  | 2     |                     |
| 0502467 | Medical Imaging Clinical Practice (2)             | 6     |                     |

#### B. Elective courses

The MDI Bridging program – track B requires one elective course with three credit hours need to be chosen from the list presented in the elective course section of the basic MDI program requirements.

#### Study Plan

The study plan consists of 99 credit hours distributed over six semesters that may normally be completed in three years. The following distribution of courses by semester facilitates student's normal progression through the study plan.

| Year 1, Semester 1, Fall semester (19 Credits) |                                 |       |               |
|--|---------------------------------|-------|---------------|
| Course #                                       | Title                           | CrHrs | Prerequisites |
| 0202121  | English for Medical Sciences    | 3     |               |
| 0502254  | Patient Care and Management (1) | 2     |               |
| 0505254  | Anatomy (1)                     | 4     |               |
| 0504252  | Biostatistics                   | 3     |               |
|  | University Elective (1)         | 3     |               |
| 0500160  | Human Anatomy & Physiology      | 4     |               |

| Year 1, Semester 2, Spring semester (15 Credits) |  |       |               |
|--|--|-------|---------------|
| Course #   | Title                                  | CrHrs | Prerequisites |
| 0505265  | Anatomy (2)                            | 4     |               |
| 0502264  | Patient Care and Management (2)        | 3     |               |
| 0502258  | Skeletal Radiography Clinical Practice | 3     |               |
| 0502269  | Radiobiology and Radiation Protection  | 2     |               |
|  | University Elective (3)                | 3     |               |

| Year 2, Semester 3, Fall semester (17 Credits) |   |       |               |
|--|---|-------|---------------|
| Course #                                       | Title   | CrHrs | Prerequisites |
| 0502358  | Medical Imaging Equipment                     | 3     |               |
| 0502369  | Digital Imaging                               | 3     |               |
| 0502372  | Radiographic Techniques Clinical Practice     | 5     |               |
| 0302200  | Fundamentals of Innovation & Entrepreneurship | 3     |               |
|  | University Elective (2)                       | 3     |               |

| Year 2, Semester 4, Spring semester (16 Credits) |   |       |               |
|--|---|-------|---------------|
| Course #   | Title   | CrHrs | Prerequisites |
| 0502359  | Radiologic & Cross Sectional Anatomy              | 2     |               |
| 0502362  | Computed Tomography                               | 3     |               |
| 0502366  | Special Radiographic Techniques                   | 3     |               |
| 0502367  | Special Radiographic Techniques Clinical Practice | 5     |               |
|  | Department Elective                               | 3     |               |

| Year 3, Semester 5, Fall semester (17 Credits) |  |       |               |
|--|--|-------|---------------|
| Course #                                       | Title                                    | CrHrs | Prerequisites |
| 0500450  | Introduction to Research                 | 3     |               |
| 0502455  | Picture Archiving & Communication System | 3     |               |
| 0502459  | Ultrasonography                          | 3     |               |
| 0502452  | Magnetic Resonance Imaging               | 3     |               |
| 0502457  | Medical Imaging Clinical Practice (1)    | 5     |               |



| Year 3, Semester 6, Spring semester (15 Credits) |   |       |               |
|--|---|-------|---------------|
| Course #   | Title   | CrHrs | Prerequisites |
| 0502472  | Nuclear Medicine                              | 3     |               |
| 0502473  | Radiologic Pathology and Image Interpretation | 2     |               |
| 0504260  | Leadership & Management in health profession  | 2     |               |
| 0502466  | Research Project                              | 2     |               |
| 0502467  | Medical Imaging Clinical Practice (2)         | 6     |               |

### Course Descriptions

Courses that are offered by the Medical Diagnostic Imaging program are designated (0502ABC) where ABC represents the year, term and sequence as described in the College Section.

### Core Courses

Descriptions of the core courses are given below.

#### **0502256 Introduction to Medical Diagnostic Imaging (2-3-0:3)**

This course provides the foundation for all following Medical Diagnostic Imaging courses. It covers the field of Medical Diagnostic Imaging Technology, and it will provide the student with an understanding of the role of diagnostic imaging in health care. Content is also designed to provide an overview of the practitioner's role in the healthcare delivery system. Principles, practices, and policies of the healthcare organization(s) are examined and discussed in addition to the professional responsibilities of the Medical Imaging Specialist (MIS).

#### **0502254 Patient Care and Management (1) (2-0-0:2)**

This course forms basics to acquire interpersonal skills, knowledge to provide quality patient care by understanding the varying physical and psychological needs of patients and their family. Students also will be introduced to the standards in radiographic practice, ethical principles, medical laws, safety in the imaging department that provide a theoretical base for students' subsequent Clinical Practicum

#### **0502264 Patient Care and Management (2) 2-3-0:3)**

This course deals with the care of the patient in the Medical Imaging Department, including intravenous techniques, contrast agents and nursing procedures common to the radiology department. Departmental organization and issues of practice in an imaging department will be examined, together with medico-legal issues and local rules of regulation governing practice.

#### **0502266 Skeletal Radiography (2-6-0:4)**

This course begins the theoretical and practical experience in the fundamentals of practical radiography. It develops the skills necessary for the examination of patients and for producing actual radiographs. This course provides practical experience of the theory of Skeletal Radiography. It teaches the skills necessary for the examination of patients, and for producing actual radiographs.

#### **0502258 Skeletal Radiography Clinical Practice (0-0-9:3)**

The student will be introduced to practical radiography, initially under close supervision, progressing to more independent operation under the supervision of clinical instructors, to provide the opportunity to discover how to image various anatomical areas utilizing different types of radiographic equipment. The student will be introduced to practical radiography, initially under close supervision, in order to be prepared to function clinically as a radiologic technologist and to give the student the

opportunity to practice patient care techniques, principles of film storage in the darkroom and to provide the patient the optimum of protection.

**0502269 Radiobiology and Radiation Protection (2-0-0:2)**

This course provides information on radiation protection, including hazards and biological effects of ionizing radiation. The information on radiation protection will enable the student to ensure safe practice of radiological technology, for both patient and operator.

**0502358 Medical Imaging Equipment (2-3-0:3)**

This course provides a review of the basic concepts of the construction and operation of modern medical imaging apparatus. A simple x-ray machine will be examined in details to provide an understanding of the basic components of the system as well as construction and design of modern x-ray tubes, special radiographic procedures, mobile radiographic equipment, and fluoroscopy. Also, this course provides practical exercises and laboratory experiments, which will demonstrate the features of radiographic x-ray systems and introduce the student to the concept of quality control to ensure that the equipment is functioning safely and correctly.

**0502369 Digital Imaging (2-3-0:3)**

This course introduces students to quality control issues, components, principles and operation of conventional, computed radiography, digital radiography, and digital dynamic imaging systems found in diagnostic radiology. The course involves practical work, where film processor and accessory equipment, film screen combination and cassettes, computer radiography and image plate, and digital dynamic radiography will be utilized and examined.

**0502356 Radiographic Techniques (2-6-0:4)**

This course completes the theoretical studies of the fundamentals of practical radiography. It continues to develop the foundations of the skills necessary for the examination of patients, and for producing diagnostic quality radiographs. This course provides practical experience of the theory of the axial skeleton and skull.

**0502372 Radiographic Techniques Clinical Practice (0-0-15:5)**

The student will be at this stage progressing to more independent operation under the supervision of clinical instructors, oriented into different areas of radiology. It allows the students to clinically practice theoretical knowledge gained related to general X-ray procedures, patient care and radiation protection techniques.

**0502359 Radiologic & Cross Sectional Anatomy (0-6-0:2)**

This course relates images on radiographs, and from other imaging modalities to basic anatomical knowledge. It develops a fundamental understanding related to radiographic positioning and techniques. The course also provides an awareness of common anomalies, which may be encountered in general radiographic practice.

**0502366 Special Radiographic Techniques (3-0-0:3)**

This course covers special procedures in the medical imaging department for urinary system and gastrointestinal system, dental radiography, Operation Theatre and Mammography.

**0502367 Special Radiographic Technique Clinical Practice (0-0-15:5)**

Progresses to more independent clinical practice under the supervision of clinical instructors, the student will be oriented to different areas in the radiology department including special radiographic imaging procedures.

**0502473 Radiologic Pathology and Image Interpretation (0-6-0:2)**

This course is a survey of medical and surgical diseases with emphasis placed on radiographic manifestations of diseases processes, alteration of radiographic techniques to compensate for the presence of disease.

**0502455 Picture Archiving and Communication System (2-3-0:3)**

This course introduces to Picture Archiving and Communication System (PACS) and its role in medical diagnostic imaging. Also it covers the fundamentals of computing, networking, DICOM, image acquisition, workflow, RIS, HIS, Image Compression, Digital Image visualization and Voice recognition. In the practical sessions, students will practice on PACS to fully grasp the theoretical part. A small project of developing PACS and Tele-radiology will be carried out.

**0502362 Computed Tomography (2-3-0:3)**

This course provides the knowledge of CT as it relates to physics, image display, quality control and radiation protection, CT scanner components and operating principles. The course provides the students with the theory for image reconstruction techniques and examination planning. Skill development in the operation of computed tomographic equipment, focusing on routine protocols, image quality, and quality assurance and radiation protection. The course schedule will be designed so the students will spend time to practice the techniques and protocols at the lab.

**0502457 Medical Imaging Clinical Practice (1) (0-0-15:5)**

Progressing to more independent operation under the supervision of clinical instructors, the student will be oriented to different areas in the radiology department including special imaging procedures and Computed Tomography.

**0502472 Nuclear Medicine (2-3-0:3)**

This course provides information about radionuclide imaging. It includes all aspects of nuclear medicine such as Instrumentation, Radiochemistry, Radiopharmacology, and the Clinical applications for Central Nervous System, Endocrine System, Respiratory System, Cardiovascular System. This course will provide the student an essential requirement to begin working in a Nuclear Medicine department. It offers the basis for further advancement in the field.

**0502452 Magnetic Resonance Imaging (2-3-0:3)**

This course provides the student with a complete theoretical knowledge of Magnetic Resonance Imaging (MRI), where the student will be familiar with MRI image acquisition, analysis and manipulation as well as performing basic routine MRI procedures, It will also prepare the student so that with the further study will be ready to acquire international recognition as registered MRI technologists.

**0502459 Ultrasonography (2-3-0:3)**

This course provides the students with basic concepts and terminology, as well as scanning protocols and techniques for the ultrasound examination of different body parts, together with sufficient practice (Medical Imaging Clinical Practice (2) course) to enable them to play a useful role in the health system, and to prepare them, so that with further study they will be ready to acquire international recognition as registered ultrasound technologist.

**0502466                      Research Project                      (2-0-0:2)**

This course encourages the MDI students to search for questions related to their field, it will provide them with experience on writing, presenting and publishing a research paper and it would facilitate the development of radiological research both at the University and within the community. A research project will be undertaken.

**0502467                      Medical Imaging Clinical Practice (2)                      (0-0-18:6)**

Students are expected to progress to the more independent operation and function as a clinically competent Medical Imaging Specialist. In this course, the student will spend most of the clinical practice in the advanced imaging modalities such as MRI, Ultrasound and Nuclear Medicine

**Elective Courses**

The elective courses offered by the MDI program are described below.

**0502265                      Introduction to Radiology                      (2-0-0:2)**

This course provides an insight into the field of Radiology, including Radiography, Computed Tomography, Ultrasound, MRI, and Radionuclide imaging. Further, medical images of different body systems will be introduced and discussed.

**0502268                      Seminar in Medical Diagnostic Imaging (1-0-0:1)**

This course simulates real seminar environment. It consists of a variety of presentations on Medical Diagnostic Imaging topics. This course will enable students to acquire communications and critiques skills as well as it will allow them to build self-confidence to formulate and ask scientific questions.

## Department of Nursing

### Personnel

|                            |  |
|----------------------------|--|
| <b>Chairperson</b>         | Jacqueline Maria Dias  |
| <b>Associate Professor</b> | Wegdan Bani Issa, Nabeel Al Yateem, Jacqueline Maria Dias                                  |
| <b>Assistant Professor</b> | Muhammad Arsyad Subu,<br>Maha Salah Ismail (Visiting)                                      |
| <b>Lecturers</b>           | Randa Fakhry, Mini Sarah Abraham   |
| <b>Clinical Tutors</b>     | Hanan Zekri Al Tawil, Mona Al Tamimi, Amina Al Boloshi, Janisha Kavumpurath, Sarah Hatahet |

### Vision

The Department of Nursing aspires to become an influential and distinguished academic institution through education, scholarly activity and research that advances the nursing profession and promotes the health of the community.

### Mission

The mission of the Department of Nursing is to prepare competent graduates and future leaders of the profession and to actively promote the health and well-being of the society.

### Goals

The goals of the Department of Nursing are to:

- 1) Provide quality nursing education with a strong emphasis on providing culturally competent care and fostering critical thinking skills.
- 2) Prepare competent nurse graduates to meet the needs of the healthcare sector.
- 3) Foster community engagement through collaborative activities.
- 4) Develop the nursing profession through scholarly research activities.

### Graduate Profile

#### 1) Knowledge and understanding

1. Recognizes the importance of health, behavioral, social, and basic sciences in the nursing profession.
2. Uses theories of communication, counseling, interpersonal relationship, and teamwork in clinical practice.
3. Develops an awareness of the central role of information technology and its applications in nursing and health care.
4. Distinguishes between different health care delivery systems within the UAE, regionally and globally.
5. Relates the basic concepts in nursing to the paradigm of the nursing profession.
6. Describes various diseases, pathophysiological changes, and various treatment modalities.
7. Recognizes the importance of developments in nursing and related disciplines.
8. Demonstrates ability to utilize research findings in various clinical settings.
9. Discusses the importance of and application of nursing theories and other related theories.

10. Recognizes the importance of evidence-based practice as applied to the nursing profession.
11. Recognizes and responds to ethical dilemmas and issues as they relate to the nursing profession.
12. Demonstrates an awareness of legislations, laws, and regulations of nursing practice.

## **2) Patient and population care**

1. Assesses the health needs of individuals, groups, families, and communities using an integrated assessment approach.
2. Manages physical, mental, psychosocial and spiritual health through working with clients to implement planned care.

## **3) Communication**

1. Demonstrates accurate documentation of patient's conditions.
2. Uses appropriate channels of referral.
3. Works effectively with other members of the health care team.
4. Takes appropriate health history from the patient.
5. Communicates with patients and families effectively.

## **4) Management and leadership**

1. Demonstrates effective managerial and leadership skills in the provision of quality nursing care.
2. Introduces changes that contribute to the improvement of health care services.
3. Applies management theories in various health care settings, such as crises, time, and risk management theories
4. Demonstrates ability to manage human and financial resources.
5. Contributes to the development of policies and procedures related to nursing practice.
6. Demonstrates effective leadership skills, such as motivating employees and self, team building, decision-making, and problem solving.
7. Supervises subordinates and delegates responsibilities as appropriate.
8. Uses critical thinking in the provision of care.

## **5) Health education and community services**

1. Conducts family and community health assessment as well as educational needs assessment.
2. Recognizes factors affecting the health of individuals, families and communities.
3. Takes appropriate action for the promotion of client's health.
4. Coordinates and implements health education effectively.
5. Utilizes information from various resources for planning health promotion and health education activities.
6. Demonstrates the ability to use teaching aids.
7. Develops an awareness of the emerging community health problems.
8. Develops an awareness of multidisciplinary collaboration between various health care disciplines.

## **6) Professionalism**

1. Maintains confidentiality and respects the client's right to privacy.
2. Applies ethical principles in the provision of nursing care.
3. Responds to instances of unsafe practice to safeguard the client's health.
4. Applies the principles of safe practice.

### 7) Critical and creative thinking

1. Develops ability to think analytically, critically and reflectively.
2. Develops ability to integrate professional knowledge into nursing practice.

### 8) Lifelong Learning

1. Maintains healthy lifestyle and health promotion practices.
2. Demonstrates ability to speak in public/presentation skills.
3. Becomes aware of professional organizations and advanced learning opportunities.
4. Develops skills in electronic communication and data processing.

### Program Learning Outcomes (PLOs)

Upon successful completion of the Bachelor of Science Degree in Nursing (BSN), the graduate will have the following competencies and be able to:

- 1) Integrate knowledge, skills and values from the liberal arts, sciences, humanities and nursing theories to provide holistic, competent and safe care for individuals, families and communities within a multicultural society.
- 2) Utilize the nursing process (assess, diagnose, plan, implement, evaluate) as a framework in caring for individuals, families, communities and populations across the health care continuum in diverse settings.
- 3) Appraise and synthesize evidence-based practice guidelines and research findings to improve patient outcomes.
- 4) Demonstrate effective therapeutic and inter-professional communication in the provision of high quality safe nursing care.
- 5) Use health informatics and patient care technology in the management of patient care.
- 6) Collaborate with other healthcare professionals by working dependently, independently and interdependently to deliver patient-centered care to individuals, families, and communities.
- 7) Implement effective leadership and management skills including motivating employees and self-mentoring, conflict management, introducing change, decision-making and delegation responsibilities.
- 8) Demonstrate accountability and responsibility for life-long learning and professional skills.
- 9) Employ ethical principles, legislations, and regulations related to nursing practice in the UAE and globally.

### National Qualifications Frame (NQF)

The following matrix shows the alignment of the Program Learning Outcomes with the Emirates National Qualifications Framework strands.

| Outcomes   | PLO |
|--|-----|
| <b>Knowledge</b>   |     |
| Specialized factual and theoretical knowledge and an understanding of the boundaries in a field of work or discipline, encompassing a broad and coherent body of knowledge and concepts, with substantive depth in the underlying principles and theoretical concepts. | 1   |
| An understanding of allied knowledge and theories in related fields of work or disciplines and in the case of professional disciplines including   | 1   |

|  |           |
|--|-----------|
| related regulations, standards, codes, conventions.  |           |
| Understanding of critical approach to the creation and compilation of a systematic and coherent body of knowledge and concepts gained from a range of sources.   | 2         |
| A comprehensive understanding of critical analysis, research systems and methods and evaluative problem-solving techniques.  | 2         |
| Familiarity with sources of current and new research and knowledge with integration of concepts from outside fields  | 3         |
| <b>Skill</b>   |           |
| Technical, creative and analytical skills appropriate to solving specialized problems using evidentiary and procedural based processes in predictable and new contexts that include devising and sustaining arguments associated with a field of work or discipline. | 2         |
| Evaluating, selecting and applying appropriate methods, procedures or techniques in processes of investigation towards identified solutions.   | 2         |
| Evaluating and implementing appropriate research tools and strategies associated with the field of work or discipline.   | 3         |
| Highly developed advanced communication and information technology skills to present, explain and/ or critique complex and unpredictable matters.  | 4,5       |
| <b>Autonomy and responsibility</b>   |           |
| Can take responsibility for developing innovative and advanced approaches to evaluating and managing complex and unpredictable work procedures and processes, resources or learning.   | 1,3, 7, 8 |
| Can manage technical, supervisory or design processes in unpredictable, unfamiliar and varying contexts  | 1,2, 6, 7 |
| Can work creatively and/or effectively as an individual, in team leadership, managing contexts, across technical or professional activities.   | 4, 6      |
| Can express an internalized, personal view, and accept responsibility to society at large and to socio- cultural norms and relationships.  | 8,9       |
| <b>Role in context</b>   |           |
| Can function with full autonomy in technical and supervisory contexts and adopt para-professional roles with little guidance.  | 4, 6, 7   |
| Can take responsibility for the setting and achievement of group or individual outcomes and for the management and supervision of the work of others or self in the case of a specialization in field of work or discipline.   | 6, 7      |
| Can participate in peer relationships with qualified practitioners and lead multiple, complex groups.  | 6,7       |
| Can take responsibility for managing the professional development and direct mentoring of individuals and groups.  | 7,8       |



| Self-development  |   |
|---|---|
| Can self-evaluate and take responsibility for contributing to professional practice, and undertake regular professional development and/ or further learning. | 8 |
| Can manage learning tasks independently and professionally, in complex and sometimes unfamiliar learning contexts.  | 8 |
| Can contribute to and observe ethical standards.  | 9 |

### Career Opportunities

Employment opportunities abound for graduates with a Bachelor of Science in Nursing (BSN) due to the high demand for nurses in the UAE and worldwide. Graduates from the program are employed as general nurses providing direct healthcare to patients, families, and communities. Graduates may assume various roles in nursing practice, education, leadership and management, and research.

### Program Overview

The Bachelor of Science in Nursing (BSN) program combines theory and practice to prepare nurses to work in a wide variety of settings, including hospitals, clinics, schools and communities.

The nursing program offers two streams leading to the Bachelor of Science in Nursing (BSN): the basic stream (BSN), a four-year stream open to high school graduates and the bridging stream (RN-BSN) open to registered nurses with a diploma degree in nursing; this may be done on a full-time or a part-time basis.

The department of nursing is launching a master's degree in critical care in the near future to satisfy an expressed need for this specialization in the UAE. Following is a description of the program structure for both streams

### Bachelor of Science in Nursing (BSN)

The program is designed to meet the objectives of the Department of Nursing. A student undertaking this program should complete a total of 137 credit hours distributed as follows:

| BSc. in Nursing   |           |           |           |            |
|-------------------|-----------|-----------|-----------|------------|
|                   | UR        | CR        | PR        | Total      |
| Mandatory Credits | 12        | 24        | 89        | 125        |
| Elective Credits  | 12        | -         | -         | 12         |
| <b>Total</b>      | <b>24</b> | <b>24</b> | <b>89</b> | <b>137</b> |

#### I. University Requirements

This component consists of 24 credits hours of university-required courses, 12 mandatory and 12 elective credits. These are described in the introductory pages of this catalogue.

#### II. College Requirements

Students are required to complete 24 mandatory credit hours of college-required courses. Description of these courses appears in the College of Health Sciences section of the catalogue.

#### III. Program Requirements

The current basic BSN program encompasses 89 credit hours of the program requirements listed in the table below.

| Course # | Title  | CrHrs | Prerequisites                 |
|----------|--|-------|-------------------------------|
| 0503251  | Physical Assessment                            | 4     | 0500160; Co: 0503253          |
| 0501257  | General Microbiology                           | 3     | 0500150                       |
| 0503253  | Pathophysiology                                | 3     | 0202121; 0500160              |
| 0503252  | Advanced Communication                         | 3     |                               |
| 0503260  | Fundamentals of Nursing                        | 5     | 0503251                       |
| 0503263  | Health Education and Health Promotion          | 3     |                               |
| 0501260  | Biochemistry                                   | 3     | 1426155                       |
| 0503262  | Clinical Pharmacology                          | 3     | 0503253                       |
| 0503261  | Psychosocial Aspects in Health Professions     | 3     |                               |
| 0503350  | Adult Health Nursing (1)                       | 3     | 0503260; 0503262; Co: 0503351 |
| 0503351  | Adult Health Nursing (1)/Practicum             | 4     | 0503260; Co: 0503350          |
| 0503352  | Maternity and Newborn Health Nursing           | 3     | 0503260; 0503262; Co: 0503353 |
| 0503353  | Maternity and Newborn Health Nursing/Practicum | 2     | 0503260; Co: 0503352          |
| 0503364  | Adult Health Nursing (2)                       | 3     | 0503350; 0503351 Co: 0503361  |
| 0503361  | Adult Health Nursing (2)/Practicum             | 5     | 0503350; 0503351 Co: 0503364  |
| 0503362  | Pediatric Health Nursing                       | 3     | 0503350; 0503351 Co: 0503363  |
| 0503363  | Pediatric Health Nursing/ Practicum            | 2     | 0503350; 0503351 Co: 0503362  |
| 0504362  | Epidemiology and Population Health             | 3     | 0504252                       |
| 0503454  | Critical Care Nursing                          | 3     | 0503364 Co: 0503451           |
| 0503451  | Critical Care Nursing/ Practicum               | 5     | 0503364; 0503363 Co: 0503454  |
| 0503452  | Family and Community Health Nursing            | 3     | 0503263; 0503362; Co: 0503453 |
| 0503453  | Family and Community Health Nursing/Practicum  | 2     | 0503363; Co: 0503452          |
| 0503460  | Mental Health Nursing                          | 3     | 0503261; 0503252; Co: 0503461 |
| 0503461  | Mental Health Nursing/ Practicum               | 2     | 0503252; Co: 0503460          |

|         |   |   |  |
|---------|---|---|--|
| 0503462 | Ethical and Legal Issues in Health Professions  | 3 |  |
| 0504260 | Leadership and Management in Health Professions | 2 |  |
| 0503463 | Consolidation of Nursing Practice               | 5 | 0503351; 0503364;<br>0503352; 0503362;<br>0503453; 0503461 |
| 0503468 | Research Project                                | 3 | 0500450  |

### Study Plan

The updated study plan starting the fall 2019-2020 is as follows:

| Year 1, Fall Semester 1 (16) |                                       |       |              |
|------------------------------|---------------------------------------|-------|--------------|
| Course #                     | Course Title                          | CrHrs | Prerequisite |
| 0201102                      | Arabic Language                       | 3     |              |
| 0202121                      | English for Medical Sciences          | 3     |              |
| 0500150                      | Biology                               | 4     |              |
| 0500161                      | Introduction to Health Sciences       | 2     |              |
| 1426155                      | General Chemistry for Health Sciences | 4     |              |

| Year 1, Spring Semester 2 (17 Credits) |  |       |              |
|--|--|-------|--------------|
| Course #                               | Course Title                           | CrHrs | Prerequisite |
| 0104100                                | Islamic Culture                        | 3     |              |
| 0500160                                | Human Anatomy and Physiology           | 4     | 0500150      |
| 1411100                                | Introduction to Information Technology | 3     |              |
| 1430107                                | General Physics for Health Sciences    | 4     |              |
|  | University Elective (1)                | 3     |              |

| Year 2, Fall Semester 1 (16Credits) |                         |       |                   |
|-------------------------------------|-------------------------|-------|-------------------|
| Course #                            | Course Title            | CrHrs | Prerequisite      |
| 0501257                             | General Microbiology    | 3     | 0500150           |
| 0503251                             | Physical Assessment     | 4     | 0500160           |
| 0503252                             | Advanced Communication  | 3     |                   |
| 0503253                             | Pathophysiology         | 3     | 0500160 + 0202121 |
| 0503250                             | University Elective (2) | 3     |                   |

| Year 2, Spring Semester 2 (17 Credits) |  |       |              |
|--|--|-------|--------------|
| Course #                               | Course Title                               | CrHrs | Prerequisite |
| 0501260                                | Biochemistry                               | 3     | 1426155      |
| 0503260                                | Fundamentals of Nursing                    | 5     | 0503251      |
| 0503261                                | Psychosocial Aspects in Health Professions | 3     |              |
| 0503262                                | Clinical Pharmacology                      | 3     | 0503253      |
| 0503263                                | Health Education and Health Promotion      | 3     |              |

| Year 3, Fall Semester 1 (18 Credits) |   |       |                      |
|--------------------------------------|---|-------|----------------------|
| Course #                             | Course Title  | CrHrs | Prerequisite         |
| 0504252                              | Biostatistics                                       | 3     |                      |
| 0503350                              | Adult Health Nursing (1)                            | 3     | 0503260 +<br>0503262 |
| 0503351                              | Adult Health Nursing Practicum (1)                  | 4     | 0503260              |
| 0503352                              | Maternity and Newborn Health Nursing                | 3     | 0503260 +<br>0503262 |
| 0503353                              | Maternity and Newborn Health Nursing /<br>Practicum | 2     | 0503260              |
|                                      | University Elective (3)                             | 3     |                      |

| Year 3, Spring Semester 2 (19 Credits) |                                      |       |                      |
|--|--------------------------------------|-------|----------------------|
| Course #                               | Course Title                         | CrHrs | Prerequisite         |
| 0503361                                | Adult Health Nursing / Practicum (2) | 5     | 0503350 +<br>0503351 |
| 0504362                                | Epidemiology and Population Health   | 3     | 0504252              |
| 0503362                                | Pediatric Health Nursing             | 3     | 0503350 +<br>0503351 |
| 0503363                                | Pediatric Health Nursing / Practicum | 2     | 0503350 +<br>0503351 |
| 0503364                                | Adult Health Nursing (2)             | 3     | 0503350 +<br>0503351 |
|  | University Elective (4)              | 3     |                      |

| Year 4, Fall Semester 1 (16 Credits) |   |       |                      |
|--------------------------------------|---|-------|----------------------|
| Course #                             | Course Title                                    | CrHrs | Prerequisite         |
| 0500450                              | Introduction to Research                        | 3     | 0504252              |
| 0503451                              | Critical Care Nursing / Practicum               | 5     | 0503364 +<br>0503361 |
| 0503452                              | Family and Community Health Nursing             | 3     | 0503263 +<br>0503362 |
| 0503453                              | Family and Community Health Nursing / Practicum | 2     | 0503363              |
| 0503454                              | Critical Care Nursing                           | 3     | 0503364 +<br>0503361 |

| Year 4, Spring Semester 2 (18 Credits) |   |       |  |
|--|---|-------|--|
| Course #                               | Course Title                                    | CrHrs | Prerequisite   |
| 0504260                                | Leadership and Management in Health Professions | 2     |  |
| 0503460                                | Mental Health Nursing                           | 3     | 0503261 + 0503252                                    |
| 0503461                                | Mental Health Nursing / Practicum               | 2     | 0503252  |
| 0503462                                | Ethical and Legal Issues in Health Professions  | 3     |  |
| 0503468                                | Research Project                                | 3     | 0500450  |
| 0503463                                | Consolidation of Nursing Practice               | 5     | 0503350, 0503352, 0503362, 0503364, 0503453, 0503454 |

### Course Description

Courses offered by the department of nursing are designated (0503ABC) where ABC represents the year, term and sequence as described in the College Section.

### Core Courses

The basic program in nursing includes core courses only. Descriptions of these courses are given below.

#### **0503251 Physical Assessment (3-3-0:4)**

**Prerequisite:** 0500160 - Human Anatomy and Physiology. **Co-requisite:** 0503253 – Pathophysiology

This course is designed to help students learn and apply principles and skills used in the comprehensive health assessment of individual adults. History taking, and physical examination techniques are presented through lectures, seminars, self-instruction modules, and audiovisuals and supervised laboratory practice.

#### **0503350 Adult Health Nursing (1) (3-0-0:3)**

**Prerequisites:** 0503260 - Fundamentals of Nursing and 0503262 - Clinical Pharmacology. **Co-requisite:** 0503351 - Adult Health Nursing (1) / Practicum.

This course examines the actual and/or potential physiological alterations and psychosocial impact on adult/elderly patients. Concepts of illness, illness prevention, health promotion, and rehabilitation are presented in the context of a healing and caring nursing practice. Assessment strategies, diagnostic procedures, and pharmacological principles are integrated into the nursing process using problem-based learning approach.

#### **0503252 Advanced Communication (3-0-0:3)**

**Prerequisite:** None.

In this course, the learner, as a health care professional, studies and understands the role and functions of group process with emphasis on the interpersonal relationships and advanced therapeutic communication techniques, conflict resolution and transcultural communication. This course also addresses communication skills relevant to the assessment of individuals, and families.

#### **0503260 Fundamentals of Nursing (3-6-0:5)**

**Prerequisite:** 0503251 – Physical Assessment.

The course is designed to teach students basic clinical skills to prepare them for the clinical setting. The course includes basic nursing skills such as vital signs, personal hygiene, nutrition, elimination, body mechanics, and patient safety. Students are required to demonstrate the skills in the clinical skills laboratory.

**0503352                      Maternity and Newborn Nursing                      (3-0-0:3)**

**Prerequisite:** 0503260 - Fundamentals of Nursing and 0503262 - Clinical Pharmacology. **Co-requisite:** 0503353 Maternity & Newborn Nursing / Practicum.

This course introduces the students to the physiological and psychosocial aspects of women's health throughout the childbearing age. The healthcare needs of the mother, newborn, and family constitutes the major emphases of this course. Using the problem-based learning approach, the management of normal and high-risk conditions in the pre- natal, labor and delivery, and postpartum stages is explored.

**0503353                      Maternity and Newborn Nursing / Practicum                      (0-0-6:2)**

**Prerequisite:** 0503260 - Fundamentals of Nursing. **Co-requisite:** 0503352 - Maternity and Newborn Nursing.

This course introduces students to the care of pregnant women during antenatal, labor and delivery, and postnatal period. The course enables students to use the nursing process as a framework to assess mothers and newborns, identify actual and potential nursing diagnoses, plan for and implement goal-directed nursing interventions, and critically evaluate the plan's effectiveness. Emphasis is placed on acquisition of skills relevant to the course expected outcomes and competencies.

**0503364                      Adult Health Nursing (2)                      (3-0-0:3)**

**Prerequisite:** 0503350 - Adult Health Nursing (1) and 0503351 - Adult Health Nursing (1) / Practicum. **Co-requisite:** 0503361 - Adult Health Nursing (2) / Practicum.

This course is a continuation of Adult Health Nursing I (0503350). The course focuses on the emergent needs of adult/elderly patients with co-morbidities, acute and chronic health conditions. Using a holistic nursing care approach, disease management and health promotion strategies are incorporated in the care of adult/elderly patients. Assessment strategies, diagnostic procedures, and pharmacological principles are integrated into the nursing process using problem-based learning approach.

**0503361                      Adult Health Nursing (2) / Practicum                      (0-0-15:5)**

**Prerequisite:** 0503350 - Adult Health Nursing (1) and 0503351 - Adult Health Nursing (1) / Practicum. **Co-requisite:** 0503364 - Adult Health Nursing (2).

This course complements 0503364 - Adult Health Nursing (2). The course integrates the holistic care modalities in planning and implementing nursing interventions to meet the healthcare needs of adult/elderly patients in special units. Essential competencies including clinical judgment, teamwork, professional behaviors, therapeutic communication and utilization of the nursing process as a framework for nursing practice are emphasized throughout the course in supervised clinical settings.

**0503362                      Pediatric Health Nursing                      (3-0-0:3)**

**Prerequisites:** 0503350 - Adult Health Nursing (1) and 0503351 - Adult Health Nursing (1) / Practicum. **Co requisites:** 0503364 - Adult Health Nursing (2) and 0503363 - Pediatric Health Nursing / Practicum.

This course focuses on the essentials of nursing management of children with developmental, psychological, environmental and health-related problems. The course introduces students to growth and development, health promotion, and disease prevention as relevant to children. The nursing process, along with problem-finding/solving, and peer persuasion strategies are utilized to analyze selected clinical case studies.

**0503363 Pediatric Health Nursing / Practicum (0-0-6:2)**

**Prerequisites:** 0503350 - Adult Health Nursing (1) and 0503351 - Adult Health Nursing (1) / Practicum. **Co requisite:** 0503362 - Pediatric Health Nursing.

This course provides the opportunity for application of the nursing concepts pertinent to children and their families as they deal with common acute and chronic health problems. The course focuses on the application of the nursing process to assess children, identify actual and potential nursing diagnoses, plan for and implement goal-directed nursing interventions, and evaluate the plan's effectiveness. Emphasis is placed on acquisition of skills relevant to the theoretical component of this course in supervised clinical settings.

**0503454 Critical Care Nursing (3-0-0:3)**

**Prerequisite:** 0503364 - Adult Health Nursing (2) and 0503361 - Adult Health Nursing (2). **Co requisite:** 0503451 - Critical Care Nursing / Practicum.

This course introduces students to the care of patients with life-threatening conditions. The course focuses on the integration of knowledge and skills required to provide holistic and safe nursing care to critically ill adults/elderly patients in critical care settings. The course includes an introduction to critical care nursing with physical assessment skills, diagnostic procedures, pharmacological interventions, and nutritional measures integrated throughout the content areas. The emphasis is on critical thinking and nursing process as a framework for practice.

**0503452 Family and Community Health Nursing (3-0-0: 3)**

**Prerequisite:** 0503263 - Health Education and Health Promotion and 0503362 - Pediatric Health Nursing. **Co requisite:** 0503453 - Family and Community Health Nursing / Practicum.

The course introduces the scope of family and community health nursing including the essentials of family dynamics, family life cycle, developmental tasks, family and community assessment, and factors that influence family health. This course enables the students to assess physical, social, cultural, environments, identify population at risk, implement, and evaluate appropriate primary health care nursing interventions in partnership with community and health agencies. Health promotion, and disease prevention concepts are integrated in the course content through problem- based learning approach.

**0503453 Family and Community Health Nursing / Practicum (0-0-6:2)**

**Prerequisite:** 0503362 - Pediatric Health Nursing. **Co requisite:** 0503452 - Family and Community Health Nursing.

The course applies the basic principles of community health care in the care of family and community. In supervised community healthcare settings. The course focuses on essential topics pertinent to primary health care, schools, industries, Maternal Child Health Centers, and other community resources.

**0503460 Mental Health Nursing (3-0-0:3)**

**Prerequisite:** 0503252 - Advanced Communication. **Co requisite:** 0503461 - Mental Health Nursing / Practicum.

This course presents basic information in psychiatric mental health. It also explores the nature and scope of mental health and illness, treatment and preventive measures. Students will have the opportunity to master these concepts through concurrent clinical rotations. This course of study will build upon the eight threads or competencies: Critical Thinking, Technical Skills, Therapeutic Communication, Leadership/Management, Time Management / Organization, Professional Behavior, Caring, and Utilizing the Nursing Process. The content of the course is delivered through selected clinical cases in a problem-based format.

**0503461 Mental Health Nursing / Practicum (0-0-6:2)**

**Prerequisite:** 0503252 - Advanced Communication. **Co requisite:** 0503460 - Mental Health Nursing.

This course provides the opportunity for nursing practice in the community and in acute and chronic health care institutions with an emphasis on maintenance and restoration of mental health. Students are provided the opportunity to work with individuals and families experiencing stress responses, maladaptive and severe behavioral disorders.

**0503463 Consolidation of Nursing Practice (0-0-15:5)**

**Prerequisites:** 0503350 - Adult Health Nursing (1); 0503364 - Adult Health Nursing (2); 0503352 - Maternity and Newborn Health Nursing; 0503362 - Pediatric Health Nursing; 0503453 - Family and Community Health; and 0503454 - Critical Care Nursing. **Co requisites:** 0503460 - Mental Health Nursing and 0503461 - Mental Health Nursing/Practicum.

The clinical course allows students to consolidate their knowledge and skills in desired/selected clinical settings. Students are supervised by clinical preceptors from the service in areas such as medical, surgical, pediatrics, maternity, and critical care. Students are expected to work independently through preceptor ship model.

**0503468 Research Project (3-0-0:3)**

**Prerequisite:** 0500450 - Introduction to Research.

This course provides students the opportunity to apply knowledge of the research process to the investigation of health-related research question. Students will work with their research advisors to finalize the development of a scientifically sound and feasible research proposal with emphasis on the study design, data collection tools, forms, and procedures. In addition, students will conduct the research project, enter and analyze data, write a research report, and present the findings of their research study. Emphasis is placed on steps of the research process including: literature review, study design, sampling; data collection, and analysis, interpretations and dissemination of research findings.

**RN-BSN Program**

This program is designed to meet the needs of nurses who wish to build on their previous education and experience. Completion of the program will expand the options available to them within the nursing career. Students in this program may study on full-time or part-time basis. The study plan is developed for full-time students. Students studying on part-time basis should plan their course of study in consultation with their department advisor. The three clinical practicum courses could be done in the student's own work place with prior agreement between the two institutions. Students are given advanced credit hours for their nursing diploma program and must then complete a total of 72 credit hours distributed as follows:

| <b>BSc. in Nursing - Bridging / Post Diploma Program (72 Credit Hours)</b> |           |           |           |              |
|--|-----------|-----------|-----------|--------------|
|  | <b>UR</b> | <b>CR</b> | <b>PR</b> | <b>Total</b> |
| Mandatory Credits  | 3         | 6         | 54        | 63           |
| Elective Credits   | 9         | -         |           | 9            |
| <b>Total</b>   | <b>12</b> | <b>6</b>  | <b>54</b> | <b>72</b>    |



## I. University Requirements

### II. Mandatory requirement

This category includes one English course.

| Course no | Course title                 | CrHrs | Prerequisite |
|-----------|------------------------------|-------|--------------|
| 0202121   | English for Medical Sciences | 3     | -            |

#### A. University electives

Each student must successfully complete 9 credit hours of University electives in three courses chosen from each of the three domains 4, 5 and 6. The list of the University required courses and their descriptions is presented in the College of Health Sciences section of this catalogue.

#### B. College Requirements

The six credit hours of College requirements are listed in the table below:

| Course # | Course title             | CrHrs | Prerequisite |
|----------|--------------------------|-------|--------------|
| 0504252  | Biostatistics            | 3     | -            |
| 0500450  | Introduction to Research | 3     | 0504252      |

#### Program Requirements

The current Post Diploma Bridging BSN Program consists of the 54 credit hours of core courses listed in the table below.

| Course # | Title  | CrHrs | Prerequisites       |
|----------|--|-------|---------------------|
| 0501257  | General Microbiology                                   | 3     |                     |
| 0503252  | Advanced Communication                                 | 3     |                     |
| 0503253  | Pathophysiology  | 3     |                     |
| 0503261  | Psychosocial Aspects in Health Professions             | 3     |                     |
| 0503263  | Health Education and Health Promotion                  | 3     |                     |
| 0503365  | Clinical Practicum 1B                                  | 4     | 0503252;<br>0503366 |
| 0503366  | Advanced Health Assessment                             | 4     |                     |
| 0504260  | Leadership and Management in Health Professions        | 2     |                     |
| 0504362  | Epidemiology and Population Health                     | 3     |                     |
| 0503262  | Clinical Pharmacology                                  | 3     |                     |
| 0503455  | Clinical Practicum 2B                                  | 4     | 0503365;<br>0503263 |
| 0503465  | Clinical Practicum 3B                                  | 4     | 0503470             |
| 0503469  | Nursing Theories: Foundation for Professional Practice | 3     |                     |
| 0503462  | Ethical & Legal Issues in Health Professions           | 3     |                     |
| 0503468  | Research Project                                       | 3     | 0500450             |
| 0503472  | Contemporary Issues in Nursing Practice                | 4     |                     |
| 0503473  | Evidence Based Practice                                | 2     | 0500450             |

### Study Plan

The updated study plan for the Post Diploma Bridging Program BSN starting in the fall of 2019-2020 is summarized below.

| Year 1, Level 1, Semester 1 , Fall (19 Credits) |                              |       |              |
|---|------------------------------|-------|--------------|
| Course #  | Course Title                 | CrHrs | Prerequisite |
| 0202121   | English for Medical Sciences | 3     |              |
| 0503252   | Advanced Communication       | 3     |              |
| 0503253   | Pathophysiology              | 3     |              |
| 0503366   | Advanced Health Assessment   | 4     |              |
| 0504252   | Biostatistics                | 3     |              |
|   | University Elective (1)      | 3     |              |

| Year 1, Level 1, Semester 2, Spring (18 Credits) |   |       |              |
|--|---|-------|--------------|
| Course #   | Course Title                                    | CrHrs | Prerequisite |
| 0503261  | Psychosocial Aspects in Health Professions      | 3     |              |
| 0503263  | Health Education and Health Promotion           | 3     |              |
| 0503365  | Clinical Practicum 1B                           | 4     |              |
| 0504260  | Leadership and Management in Health Professions | 2     |              |
| 0504362  | Epidemiology and population Health              | 3     |              |
| 0503262  | Clinical Pharmacology                           | 3     |              |

| Year 2, Level 2, Semester 3, Fall (16 Credits) |  |       |              |
|--|--|-------|--------------|
| Course #                                       | Course Title   | CrHrs | Prerequisite |
| 0501257  | General Microbiology                                   | 3     |              |
| 0500450  | Introduction to Research                               | 3     |              |
| 0503455  | Clinical Practicum 2B                                  | 4     |              |
| 0503469  | Nursing Theories: Foundation for Professional Practice | 3     |              |
|  | University Elective(2)                                 | 3     |              |

| Year 2, Level 2, Semester 4, Spring (19 Credits) |  |       |              |
|--|--|-------|--------------|
| Course #   | Course Title                                   | CrHrs | Prerequisite |
| 0503462  | Ethical and Legal Issues in Health Professions | 3     |              |
| 050-3468   | Research Project                               | 3     |              |
| 0503465  | Clinical Practicum 3B                          | 4     |              |
| 0503472  | Contemporary Issues in Nursing Practice        | 4     |              |
| 0503473  | Evidence Based Practice                        | 2     |              |
|  | University Elective (2)                        | 3     |              |

### Course Description

The post-diploma bridging program toward a BSN requires core courses only. Descriptions of the core courses are given below.

**0503252                      Advanced Communication                      3-0-0:3**

**Prerequisite: None.**

In this course, the learner, as a health care professional, studies and understands the role and functions of group process with emphasis on the interpersonal relationships and advanced therapeutic communication techniques, conflict resolution and trans-cultural communication. This course also addresses communication skills relevant to the assessment of individuals, and families.

**0503366                      Advanced Health Assessment                      3-3-0:4**

**Prerequisite: None.**

This course focuses on the development of health assessment knowledge and skills required to provide care to individuals, families and communities. The skills of physical assessment will be emphasized in this course.

**0503365                      Clinical Practicum 1B                      0-0-12:4**

**Prerequisites: 0503252 - Advanced Communication and 0503366 - Advanced Health Assessment.**

An applied nursing practice course which focuses on the integration of research theory and concepts in a variety of health care settings. This course will promote the development of independent decision-making and allow application of knowledge in an area of particular interest to the student.

**0503469                      Nursing Theories: Foundation for Professional Practice 3-0-0:3**

**Pre-requisites: None.**

This course introduces students to theoretical foundations of nursing as a profession, as well as the process of theory evolution and knowledge development in nursing. Throughout the course, students will be introduced to the main theories relevant to the nursing profession with extra emphasis placed on middle range theories due their relative applicability to clinical practice. Theory analysis to determine its relevance and applicability in nursing practice, education, and management is of main concern to this course. This course will thus empower students with the necessary knowledge and skills to compare, contrast and utilize various theoretical perspectives, and critically apply nursing theories in their settings.

**0503455                      Clinical Practicum 2B                      0-0-12:4**

**Prerequisite: 0503365 - Clinical Practicum 1B.**

This course provides an applied nursing practice experience in a community-based health care setting with an emphasis on skill development in health promotion, health education and community assessment.

**0503465                      Clinical Practicum 3B                      0-0-12:4**

**Prerequisite: 0503455 - Clinical Practicum 2B.**

This nursing course promotes the integration of theory with nursing practice in a variety of health care settings. The selective clinical setting provides the opportunity for students to pursue personal learning objectives and to examine issues and concepts relevant to their role as practitioners, educators, or administrators.

**0503473 Evidence Based Practice 3-0-0:3**

**Prerequisite: 0500450 Introduction to Research**

This course is intended to expand and update students' knowledge of evidence-based practice. This course will layout the foundations for evidence-based practice and outline its process. Students are expected to formulate clinical questions related to their area of practice (PICOT), search the relevant literature, critically appraise the existing evidence, and prepare evidence-based practice guidelines to improve practice. Students are expected to present guidelines for healthcare professionals at clinical sites to allow for feedback.

**0503468 Research Project 3-0-0:3**

**Prerequisites: 0500450 - Introduction to Research.**

This course provides students the opportunity to apply knowledge of the research process to the investigation of health-related research question. Students will work with their research advisors to finalize the development of a scientifically sound and feasible research proposal with emphasis on the study design, data collection tools, forms, and procedures. In addition, students will conduct the research project, enter and analyze data, write a research report, and present the findings of their research study. Emphasis is placed on steps of the research process including: literature review, study design, sampling; data collection, and analysis, interpretations and dissemination of research findings.

**0503472 Contemporary Issues in Nursing Practice 4:0:0:4**

**Prerequisite: None**

This course introduces the students to the status of nursing in the UAE health care system. Perspectives to be explored include social, political, organizational, and legal/ethical factors affecting nursing as a profession. The continuing debate about the essence of nursing including professional issues concerning practice, education, research, management, and health care policy will be examined. Current issues will be critically analyzed in relation to their influence on the nursing profession and nursing practice. The focus is learning the context of nursing to promote professional development and growth. Peer persuasion strategies through debates, are utilized to analyze the content of the course and share their experiences in actual practice.

**Department of Health Services Administration**

**Personnel**

**Chairperson** Syed Azizur Rahman,

**Assistant Professors** Amina Mohammed Al-Marzouki, Michael E. Otim, Syed Azizur Rahman

**Vision**

The Department of Health Services Administration (HSA) aims to be a leader in Health Services Administration in the Gulf region, ensuring high-quality educational, training and research opportunities

**Mission**

The Department of Health Services Administration strives to:

- 1) Offer an internationally recognized program to equip graduates with solid planning, and management skills in health services administration.
- 2) Provide practical knowledge of handling complex health sector, administration, management, organizations and financial issues.
- 3) Prepare graduates to become independent health services researchers, so that they can make

national and global research contributions, while developing international collaborations.

- 4) Seek collaboration with and cooperation of regional and international organizations, in addition to academic institutions affiliated with health services administration.

### Values

The core values of the department of Health Services Administration are to maintain equal opportunity, ensure highest level of professionalism, improving quality, creativity and achieving regional, global leadership in health services administration.

### Goals

- 1) To provide specialized high quality, intellectually challenging education and training that prepares our future graduates as critical thinkers and independent life-long learners in order to effectively integrate into their roles and be prepared for their future responsibilities as health services managers and leaders.
- 2) To equip students with necessary skills to contribute to the growing body of knowledge in health services research observing ethical standards in preparation for higher degrees within a stimulating and supportive environment.
- 3) To familiarize students with the latest advances in their field of work in order to continuously seek out opportunities to advance their competencies in these areas.
- 4) To prepare students for the effective integration into their future roles as health services managers and leaders through access to adequate preparatory training sites in a variety of health care settings and situations.

### Graduate Profile

#### 1) Knowledge and Understanding

1. Apply knowledge about administrative and managerial theories as they relate to problem solving within health care organizations.
2. Utilize new knowledge and skills effectively to health services administration settings.
3. Apply marketing concepts and knowledge to enhance organizational effectiveness.
4. Utilize various technologies to access and manage information in a variety of settings.
5. Apply a firm grasp of the fundamentals of epidemiology and the distribution of disease in the community he/she serves.
6. Utilize the fundamentals of biostatistics to analyze the data available at the healthcare facilities.
7. Apply the relevant tools to identify the site and causes of medical errors at healthcare facilities
8. Assess changes in healthcare and community needs.
9. Discuss different determinants of population health and effective strategies to manage their impact.
10. Describe the roles and responsibilities of managers and supervisors in healthcare organizations.
10. Develop and maintain proper competencies to manage information systems in health care organizations
11. Utilize appropriate strategies/tools for solving complex administrative problems.

2) **Communication**

1. Communicate to peers; clients, and other health staff new developments, changes and department/clinical needs.
2. Utilize communication skills to work enable him/her on multidisciplinary projects.
3. Attain the ability to express fluently utilizing scientifically sound knowledge of the specialty when communicating with higher administrative circles and scientific meetings or health forums.

3) **Management and leadership**

1. Demonstrate leadership skills.
2. Collaborate with interdisciplinary teams to improve health care delivery systems.
3. Plan, implement, and evaluate health programs geared towards pertinent health problems in the community.
4. Use policies, procedures and standards as a guide to professional practice and behavior.
5. Organize and lead quality teams to find to find solutions for problems present at health care facilities.

4) **Health education and community services**

1. Recognize the importance of educated population for better health status
2. Maintain the ability to lead in the community, and a willingness to engage in constructive public discourse and to accept social and civic responsibilities

5) **Professionalism**

1. Contribute to profession by sharing information and knowledge with clients, peers, and health professionals through effective verbal and written communications.
2. Possess high standards of integrity and self-discipline, and a positive attitude to the professional responsibilities.
3. Participate in ongoing educational activities to enhance personal growth and professional practice.
4. Collaborate with interdisciplinary teams to improve health care delivery systems.

6) **Critical and creative thinking**

1. Develop ideas projects that contribute to the enhancement of health care practice.
2. Employ analytical and critical thinking skills to improve effectiveness and quality in the workplace, as well as in
3. the field.
4. Utilize appropriate strategies to contact appraisals and evaluations of recommended programs and projects that serve organizations.
5. Attain the capacity for creativity and originality, intellectual integrity, respect for truth and for the ethics of research and scholarly activity.
6. Apply quantitative methods when examining, describing, analyzing and solving administrative problems
7. Guide teams through evidence-based problem-solving strategies and creative thinking to find alternatives for
8. problems present at health care facilities.
9. Design and implement methodological surveys for needs assessment concerning the health problems present in the community

- 7) **Lifelong learning**
  1. Maintain the desire to be able to continue to learn independently after graduation
  2. Participate in ongoing educational activities to enhance personal growth and professional practice.
- 8) **Patient and population care**
  1. Advocate for health needs of individuals and communities.
  2. Assess changes in health care and community needs.
  3. Plan, implements, and evaluate health programs geared towards pertinent health problems in the community.

### Program Learning Outcomes

- 1) Apply knowledge gained from program allied and core courses to perform the skills required for an entry level position or graduate study.
- 2) Use critical thinking skills and appropriate strategies to gain insights, make informed decisions, and arrive at new solutions to complex care processes in diverse health care settings and situations.
- 3) Lead and manage innovative multidisciplinary efforts for improving the effectiveness of the health care delivery system.
- 4) Develop and maintain proper competencies in use of various technologies and to access and manage information systems in a variety of health care settings.
- 5) Develop scientifically sound knowledge of the specialty and fluency in communicating with higher administrative circles and scientific meetings or health forums.
- 6) Adopts the emerging roles and responsibilities of managers and supervisors in a wide variety of health care settings and situations.
- 7) Demonstrate an understanding of their integral role in the health care system and the organization and interaction of its various components.
- 8) Maintain the desire to be able to continue to learn independently after graduation and a positive attitude to their professional responsibilities.
- 9) Possess high standards of integrity and self-discipline, with the capacity for creativity, originality, and observing ethics principles in their work.

### National Qualification Framework (NQF)

The following matrix shows the alignment of the Program Learning Outcomes with the Emirates National Qualifications Framework strands.

| Outcomes   | PLO |
|--|-----|
| <b>Knowledge</b>   |     |
| specialized factual and theoretical knowledge and an understanding of the boundaries in a field of work or discipline, encompassing a broad and coherent body of knowledge and concepts, with substantive depth in the underlying principles and theoretical | 1   |

|  |      |
|--|------|
| concepts   |      |
| an understanding of allied knowledge and theories in related fields of work or disciplines and in the case of professional disciplines including related regulations, standards, codes, conventions  | 1    |
| understanding of critical approach to the creation and compilation of a systematic and coherent body of knowledge and concepts gained from a range of sources  | 2    |
| a comprehensive understanding of critical analysis, research systems and methods and evaluative problem-solving techniques   | 2    |
| familiarity with sources of current and new research and knowledge with integration of concepts from outside fields  | 2    |
| <b>Skill</b>   |      |
| Technical, creative and analytical skills appropriate to solving specialized problems using evidentiary and procedural based processes in predictable and new contexts that include devising and sustaining arguments associated with a field of work or discipline. | 3, 4 |
| Evaluating, selecting and applying appropriate methods, procedures or techniques in processes of investigation towards identified solutions.   | 3, 4 |
| evaluating and implementing appropriate research tools and strategies associated with the field of work or discipline  | 5    |
| Highly developed advanced communication and information technology skills to present, explain and/ or critique complex and unpredictable matters.  | 4    |
| <b>Autonomy and responsibility</b>   |      |
| can take responsibility for developing innovative and advanced approaches to evaluating and managing complex and unpredictable work procedures and processes, resources or learning  | 6    |
| can manage technical, supervisory or design processes in unpredictable, unfamiliar and varying contexts  | 6    |
| can work creatively and/or effectively as an individual, in team leadership, managing contexts, across technical or professional activities  | 6    |
| can express an internalized, personal view, and accept responsibility to society at large and to socio- cultural norms and relationships   | 6    |
| <b>Role in context</b>   |      |
| can function with full autonomy in technical and supervisory contexts and adopt para-professional roles with little guidance   | 7, 3 |
| can take responsibility for the setting and achievement of group or individual outcomes and for the management and supervision of the work of others or self in the case of a specialization in field of work or discipline  | 7, 3 |
| can participate in peer relationships with qualified practitioners and   | 3    |



|  |      |
|--|------|
| lead multiple, complex groups  |      |
| can take responsibility for managing the professional development and direct mentoring of individuals and groups   | 7, 3 |
| <b>Self-development</b>  |      |
| can self-evaluate and take responsibility for contributing to professional practice, and undertake regular professional development and/ or further learning | 8    |
| can manage learning tasks independently and professionally, in complex and sometimes unfamiliar learning contexts  | 8, 9 |
| can contribute to and observe ethical standards  | 9    |

### Career Opportunities

The HSA program prepares students for entry level managerial positions in a variety of health care settings, including, but not limited to hospitals, health centers, and health insurance organizations. The program emphasizes on the integration of scientific knowledge into the practice of health service administration in a variety of health care settings. The program provides its graduates with knowledge, problem-solving and life-long learning skills, professional competencies and basic principles necessary for success in a constantly evolving industry of healthcare. Additionally, it prepares them for graduate level education in health service administration.

### Program Overview

The (HSA) program is one of the first programs to become initiated in the college. The program started in 1999 being the first undergraduate health services administration program in the Gulf region. So far, 116 students have graduated from the program since its initiation. To obtain a Bachelor of Science degree in Health Service Administration, the student must complete a total of 134 credit hours. These hours span University, College and Department requirements. The allocation of the credit hours is shown in the following table.

| <b>B Sc. In Health Services Administration (134 Credit Hours)</b> |           |           |           |              |
|---|-----------|-----------|-----------|--------------|
|   | <b>UR</b> | <b>CR</b> | <b>PR</b> | <b>Total</b> |
| Mandatory Credits   | 15        | 24        | 80        | 119          |
| Elective Credits  | 9         | 0         | 6         | 15           |
| <b>Total</b>  | <b>24</b> | <b>24</b> | <b>86</b> | <b>134</b>   |

#### I. University Requirements

Every student is required to take 24 credit hours of general education courses distributed over seven domains. Fifteen (15) mandatory credit hours are selected from domains 1, 2, 3 and 4 and (9) elective credit hours selected from domains 5, 6 and 7 as indicated in the University section (General Education).

#### II. College Requirements

The list of the 24 mandatory College required courses and their descriptions are presented in the introductory pages of the College of Health Sciences section in this bulletin.

#### III. Program Requirements

This component consists of 86 credit hours of courses, 80 credit hours of which are mandatory courses and 6 credit hours are elective courses.

### Core requirements

The HSA core courses are listed in the table below.

| Course # | Course Name   | CrHrs | Prerequisites         |
|----------|---|-------|-----------------------|
| 0301210  | Accounting (1)  | 3     |                       |
| 0504250  | Introduction to Health Services Administration                                    | 3     |                       |
| 0504251  | Computer Applications for Healthcare Managers                                     | 3     | 1411100               |
| 0302111  | Business Communication  | 3     |                       |
| 0504260  | Leadership and Management in Health Professions                                   | 2     |                       |
| 0504261  | Health Economics  | 3     | 0504250               |
| 0504262  | Management in Primary Healthcare  | 3     | 0504250               |
| 0504263  | Introduction to Management Information Systems for Health Services Administration | 3     | 1411100               |
| 0302231  | Financial Management  | 3     |                       |
| 0504350  | Healthcare Terminology and Classifications  | 3     | 0504250               |
| 0504351  | Hospital Management   | 3     | 0504250               |
| 0504352  | Healthcare Delivery Systems   | 3     | 0504250               |
| 0504353  | Materials Management  | 3     | 0504261               |
| 0506352  | Occupational Health and Safety  | 3     |                       |
| 0302315  | Introduction to Management Science  | 3     |                       |
| 0504362  | Epidemiology and Population Health  | 3     | 0504252               |
| 0504360  | Health Information systems  | 3     | 0504350               |
| 0504361  | Human Resources Management in Health Organization                                 | 3     | 0504351               |
| 0504450  | Planning in Health Services   | 3     | 0504351               |
| 0504451  | Quality Management in Healthcare  | 3     |                       |
| 0504452  | Seminars in Health Services Administration  | 3     | Co: 0504453           |
| 0504453  | Orientation to Health Service Organizations                                       | 3     | 0504361; Co: Seminars |
| 0503462  | Ethical and Legal Issues in Health Professional                                   | 3     |                       |
| 0504460  | Practicum in Health Services Administration                                       | 7     | 0504453               |
| 0504461  | Marketing in Health Services  | 3     | 0504450               |
| 0504462  | Research Project  | 2     | 0500450               |

## Electives

### Requirements

The student is allowed to choose two elective courses from the list given in the table below.

| Course # | Course Name   | CrHrs | Prerequisites |
|----------|---|-------|---------------|
| 0301130  | Personal Finance  | 3     |               |
| 0301150  | Introduction to Economics                                   | 3     |               |
| 0211321  | Professional, Social and Ethical Issues in Computer Science | 3     |               |
| 0503263  | Health Education and Health Promotion                       | 3     |               |
| 0506200  | Introduction to Environmental Health                        | 3     | 0500160       |

### Study Plan

The study plan for the HSA program requires the completion of 134 credit hours distributed over eight semesters that may be normally completed in four years as follows.

| Year 1, Semester 1 (17 Credits) |                                     |       |              |
|---------------------------------|-------------------------------------|-------|--------------|
| Course #                        | Course Title                        | CrHrs | Prerequisite |
| 0201102                         | Arabic Languages                    | 3     |              |
| 0202121                         | English for Medical Sciences        | 3     |              |
| 0500161                         | Introduction to the Health Sciences | 2     |              |
| 0500150                         | Biology                             | 4     |              |
| 1426105                         | General Chemistry for HS            | 4     |              |

| Year 1, Semester 2 (17 Credits) |  |       |              |
|---------------------------------|--|-------|--------------|
| Course #                        | Course Title                           | CrHrs | Prerequisite |
| 0104100                         | Islamic Culture                        | 3     |              |
| 1411100                         | Introduction to Information Technology | 3     |              |
| 0500160                         | Human Anatomy and Physiology           | 4     |              |
| 1430111                         | General Physics for HS                 | 4     |              |
|                                 | University Elective Requirements E (1) | 3     |              |

| Year 2, Semester 1 (18 Credits) |  |       |              |
|---------------------------------|--|-------|--------------|
| Course #                        | Course Title                                   | CrHrs | Prerequisite |
| 0504252                         | Biostatistics                                  | 3     |              |
| 0301210                         | Accounting (1)                                 | 3     |              |
| 0504250                         | Introduction to Health Services Administration | 3     |              |
| 0504251                         | Computer Applications for Healthcare Managers  | 3     |              |
|                                 | Department Elective                            | 3     |              |
|                                 | University Elective                            | 3     |              |

| Year 2, Semester 2 (18 Credits) |  |       |              |
|---------------------------------|--|-------|--------------|
| Course #                        | Course Title   | CrHrs | Prerequisite |
| 0302111                         | Business Communication   | 3     |              |
| 0504260                         | Leadership and Management in Health Professions                                    | 3     |              |
| 0504261                         | Health Economics   | 3     |              |
| 0504262                         | Management in Primary Healthcare   | 3     |              |
| 0504263                         | Introduction to Management Information Systems for Health Ser- vice Administration | 3     |              |
|                                 | University Elective  | 3     |              |

| Year 3, Semester 1 (18 Credits) |  |       |              |
|---------------------------------|--|-------|--------------|
| Course #                        | Course Title                               | CrHrs | Prerequisite |
| 0302231                         | Financial Management                       | 3     |              |
| 0504350                         | Healthcare Terminology and Classifications | 3     |              |
| 0504351                         | Hospital Management                        | 3     |              |
| 0504352                         | Healthcare Delivery Systems                | 3     |              |
| 0504353                         | Materials Management                       | 3     |              |
| 0506352                         | Occupational Health and Safely             | 3     |              |

| Year 3, Semester 2 (18 Credits) |   |       |              |
|---------------------------------|---|-------|--------------|
| Course #                        | Course Title                                      | CrHrs | Prerequisite |
| 0302315                         | Introduction to Management Science                | 3     |              |
| 0504362                         | Epidemiology and Population Health                | 3     |              |
| 0504360                         | Health Information system                         | 3     |              |
| 0504361                         | Human Resources Management in Health Organization | 3     |              |
|                                 | Department Elective                               | 3     |              |
|                                 | University Elective                               | 3     |              |

| Year 4, Semester 1 (18 Credits) |   |       |              |
|---------------------------------|---|-------|--------------|
| Course #                        | Course Title                                | CrHrs | Prerequisite |
| 0500450                         | Introduction to Research                    | 3     |              |
| 0504450                         | Planning in Health Services                 | 3     |              |
| 0504451                         | Quality Management in Healthcare            | 3     |              |
| 0504452                         | Seminars in Health Services Administrations | 3     |              |
| 0504453                         | Orientation to Health Service Organizations | 3     |              |
|                                 | University Elective                         | 3     |              |

| Year 4, Semester 2 (18 Credits) |  |       |              |
|---------------------------------|--|-------|--------------|
| Course #                        | Course Title                                   | CrHrs | Prerequisite |
| 0503462                         | Ethical and Legal Issues in Health Professions | 3     |              |
| 0504460                         | Practicum in Health Services Administration    | 7     |              |
| 0504461                         | Marketing in Health                            | 3     |              |
| 0504462                         | Research Project                               | 2     |              |

### Course Description

Courses offered by the HSA program start with (0504ABC) where ABC represents the year, term and sequence as described in the College Section.

### Core Courses

Descriptions of the core courses are given below:

#### **0504251 Computer Applications for Healthcare Managers 3-0-:3**

**Prerequisite: 1411100 - Introduction to IT (English).**

This course is designed to give students a basic understanding of the fundamental systems and applications of information technology as it applies to healthcare executives and managers. The course will show managers how to use the power of computer technology to increase their productivity. Focus will be on computer applications that managers will need to enhance their performance.

#### **0504261 Health Economics 3-0-0:3**

**Prerequisite: 0504250 - Introduction to Health Services Administration.**

The course provides students with an understanding of the major economic forces and issues involved in the health care system that are of relevance for health care administrators. This course examines the health care industry, supply and demand for health services, production of health, relationship between health and health care, health insurance, government programs, supply and demand for physicians, nurses, drugs, and technology, hospitals, and the role of insurance, government, professional groups, and for-profit and not-for-profit providers in health care markets. Topics include the supply and demand for health services, markets for health professionals, health insurance, health care costs, cost inflation, uniqueness of health care, and health care markets.

#### **0504262 Management in Primary Healthcare 3-0-0:3**

**Prerequisite: 0504250 - Introduction to Health Services Administration.**

The student examines the different activities performed at the primary healthcare level, team composition, and basic elements offered by all ministries of health. The course also enables students to better plan, develop, manage and evaluate programmes, promote health and prevent disease.

#### **0504263 Introduction to Management Information Systems for Health Service Administration (3-0-0:3)**

**Prerequisite: 1411100 - Introduction to IT.**

The course provides coverage of Management Information Systems and Information Technology. It provides a foundation on how to use, understand and manage Information Technology, their architecture and to support business operations and objectives and improve managerial decision making. <http://www.sharjah.ac.ae/academic/business/mis/courses/index.htm>

Management Information Systems (MIS) Courses.

**0504350 Healthcare Terminology and Classifications (3-0-0:3)**

**Prerequisite: 0504250 - Introduction to Health Services Administration.**

The course introduces students to the structure and components of medical terms: prefixes, suffixes and word roots and how to break down a medical term by simply knowing the meaning of its components. In addition the course introduces students to the structure and use of health care terminologies, classifications, and coding schemes, with special emphasis on International Classification of Diseases (ICD), Healthcare Common Procedure Coding System (HCPCS), Logical Observation Identifiers Names and Codes (LOINC), Current Procedural Terminology (CPT), NANDA's Nursing Diagnoses, Nursing Intervention Classification (NIC), Nursing Outcomes Classification (NOC), National Drug Code (NDC), Common Dental Terminology (CDT), Systematized Nomenclature of Medicine (SNOMED) and other relevant terminologies and classifications.

**0504351 Hospital Management (3-0-0:3)**

**Prerequisite: 0504250 - Introduction to Health Services Administration.**

This course introduces the student to the complex organization of hospitals and to the internal operations, processes, roles, management techniques, information needs and technology utilization in the different components of hospital system. The integration of functions and information of different departments to achieve effectiveness and efficiency is discussed.

**0504352 Health Care Delivery Systems (3-0-0:3)**

**Prerequisite: 0504250 - Introduction to Health Services Administration.**

The course covers the system's approach in health; the resources that comprise the health care system and how they operate. The sociological, historical and organizational factors that influence the development of the health care system as well as the international models of health care systems.

**0504353 Materials Management (3-0-0:3)**

**Prerequisite: 0504261 - Health Economics.**

The course covers the major principles of materials management and organization in healthcare facilities. It will detail the analysis of the basic materials functions such as inventory control, purchasing, storing, and receiving supplies and equipment, with major emphasis on the efficient and economical planning, procuring, scheduling and handling of materials in healthcare facilities.

**0504360 Health Information Systems (3-0-0:3)**

**Prerequisite: 0504350 - Healthcare Terminology and Classifications.**

This course covers information systems in various departments in healthcare organizations. It aims to provide computational skills and basic statistics required by health professionals. The course presents legal aspects of health information and the usage of information technology in health information system.

**0504361 Human Resources Management in Health Organization (3-0-0:3)**

**Prerequisite: 0504351 - Hospital Management.**

This course is emphasizing the concept of human resources in health care settings. It aims to improve the skills and knowledge of students in different aspects of human resources management in health sectors. It will introduce the students to the challenges facing human resources in health such as, cost of health care, increased demanding, shortage and surpluses and increasing dissatisfaction within the health care sectors. It focuses on the major managerial aspects such as recruitment procedures and the performance appraisal of different categories providing health care in the health facilities.

**0504450 Planning in Health Services (3-0-0:3)**

**Prerequisite:** 0504351, Hospital Management.

The course portrays the application of planning theory to health concerns. It allows the student to examine concepts and techniques in planning for health care services. Decision areas covered need assessment, market segmentation, service strategy development, communication, organizational design and evaluation.

**0504451 Quality Management in Healthcare (3-0-0:3)**

**Prerequisite:** None.

This course presents a comprehensive background in health care quality. This includes definitions, dimensions, elements and principles of quality. It covers different methodologies and strategies for improving quality and performance in health care organizations. The course also presents the recent trends for quality improvement processes in health care.

**0504452 Seminars in Health Services Administration (3-0-0:3)**

**Prerequisite:** None. **Co-requisite(s):** Orientation to Health Services Organizations (0504453)

Students will independently research a subject related to issues in health services administration, chosen with the agreement of a faculty supervisor selected by the Departmental Chair. The course includes case studies that illustrate problems in the administration and delivery of healthcare in a wide range of differing facilities are presented, analyzed, and discussed.

**0504453 Orientation to Health Services Organizations (3-0-0:3)**

**Prerequisite:** 0504361 - Human Resource Management in Health Organizations.

The course will expose students to factors influencing the health care delivery at health care facilities. It will also orient students to different residency sites.

## Department of Physiotherapy

### Personnel

|                             |  |
|-----------------------------|--|
| <b>Chairperson</b>          | Ibrahim Moustafa   |
| <b>Associate Professors</b> | Fatma Hegazy Ibrahim Moustafa  |
| <b>Assistant Professors</b> | Tamer Shousha, Kalyana Reddy, Ashokan Arumugam, Gopala Alaparthi, Meeyoung kim |
| <b>Lecturers</b>            | Veena Raigangar  |
| <b>Clinical Tutors</b>      | Sara Atef, Asma Javed, Hanan Yousef, May Tamim, Amal Ahbouch, Noora kalsoom    |

### Vision

The Department of Physiotherapy (PT) is committed to enhancing its standing as a national and international leader in physiotherapy education, research and service delivery with an emphasis on serving the needs of the United Arab Emirates.

### Mission

The Department of Physiotherapy at the University of Sharjah is committed to:

- 1) Providing professional programs of academic excellence.
- 2) Preparing physiotherapists for the practice of Physiotherapy in a variety of settings.
- 3) Contributing to the advancement of health care in general and rehabilitation in particular.
- 4) Collaborating with the community for the enhancement of the health care services.

### Values

- 1) Truth, honesty, integrity and open communication.
- 2) Conforming to the standards of academic and clinical practice with compassion, caring and professionalism incorporating best evidence-based practice.
- 3) Integrated instruction for both research and practice incorporating innovation and discovery to create lifelong clinicians/ scholars.
- 4) Accept and embrace diversity and serve community keeping in mind culture and social responsibility.

### Goals

The PT program is aiming to graduate physiotherapists who:

To provide students with high quality, intellectually challenging physiotherapy education.

- 1) To prepare well trained graduates, capable of effective communication, problem solving, and evidence-based practice.
- 2) To foster stakeholder engagement by providing collaborative community services and resources.
- 3) To graduate students capable of acting responsibly in a highly independent, ethical, legal and culturally competent manner.
- 4) To be recognized nationally and internationally by continuous quality monitoring and engaging in scholarly activities.



## Graduate Profile

### 1) Knowledge and understanding

1. Integrate basic, health, rehabilitation, and physiotherapy sciences.
2. Describe up to date theories and practice related to physiotherapy.
3. Recognize the multidisciplinary nature of the profession.
4. Recognize health care policies, procedures, medico-legal implications, and ethical guide lines in the region.
5. Utilize proper research methods as applied in the health care professions in general and physiotherapy in particular.

### 2) Patient and population care

1. Assess properly the capabilities and deficiencies of the respective client.
2. Document properly assessment finding of the capabilities and deficiencies of the respective client.
3. Develop a plan of care appropriate to the needs of the individual client.
4. Provide evidence based physiotherapy services while observing maximum safety measures.
5. Maintain a standard professional attitude towards the respective client, his/her family, and other professionals engaged in client care.
6. Provide the patients, their families and other relevant parties with the rationale of the interventions and the out- comes expected.

### 3) Communication

1. Demonstrate the ability to effectively communicate both orally and in writing with other professionals in the health
2. care field.
3. Demonstrate language, computer, and IT skills as needed.
4. Utilize the wide range of information provided in the field of health sciences.

### 4) Management and leadership

1. Demonstrate leadership, administrative decision making, crisis management, and problem solving skills.
2. Utilize time management skills.
3. Demonstrate ability to effectively allocate resources.
4. Structure appropriate plan of care taking into consideration the time and cost-effectiveness constraint.

### 5) Health education and community services

1. Recommend appropriate preventive strategies for various clinical conditions within the community.
2. Participate in public education and health promotion strategies adopted in the community and the region by respective authorities.

### 6) Professionalism

1. Demonstrate a caring, moral, and considerate attitude.
2. Observe ethical/moral aspects in the process of decision making.
3. Demonstrate a well-integrated personality in his/her professional relationships.
4. Utilize updated code of ethics and professional standards of practice and promote an advanced model of physiotherapy care in the region.

#### 7) Critical and creative thinking

1. Demonstrate clinical decision making, reasoning and critical thinking capabilities.
2. Identify, plan, assess, and implement age appropriate evidence- based intervention strategies.
3. Document and present the findings in a professional format.

#### 8) Lifelong learning:

1. Use scientific resources to stay up to date with the fast growing scientific and technological aspects of the profession in the world.
2. Utilize the opportunities of continuing education happening in the region and internationally.

### Program Learning Outcomes (PLOs)

Upon completing the program requirements, a Physiotherapy graduates should be able to:

- 1) Integrate knowledge and skills in physiotherapy related sciences to provide competent patient-centered care.
- 2) Use evidence-based practice information to provide effective and efficient healthcare based on the changing needs of the community.
- 3) Employ advanced information technology skills in the classroom and clinical settings.
- 4) Participate efficiently in research activity, including publications, presentations, grants, and disseminate results at local, national, and international levels.
- 5) Communicate effectively with patient, families, and other health care professionals to deliver an integrated plan of care.
- 6) Participate in public education and health promotion strategies adopted in the community and the region by respective authorities.
- 7) Apply relevant ethical, legal and social framework to act responsibly toward clients, oneself, and colleagues.
- 8) Implement leadership skills and autonomy in physiotherapy practice for personal and professional development.

### National Qualifications Frame (NQF)

The following matrix shows the alignment of the Program Learning Outcomes with the Emirates National Qualifications Framework strands.

| Outcomes  | PLO |
|---|-----|
| <b>Knowledge</b>  |     |
| specialized factual and theoretical knowledge and an understanding of the boundaries in a field of work or discipline, encompassing a broad and coherent body of knowledge and concepts, with substantive depth in the underlying principles and theoretical concepts | 1   |
| an understanding of allied knowledge and theories in related fields of work or disciplines and in the case of professional disciplines including related regulations, standards, codes, conventions   | 2   |
| understanding of critical approach to the creation and compilation of a systematic and coherent body of knowledge and concepts gained from a range of sources   | 8   |
| a comprehensive understanding of critical analysis, research systems and methods and evaluative problem-solving techniques  | 8   |

|  |      |
|--|------|
| familiarity with sources of current and new research and knowledge with integration of concepts from outside fields  | 4,8  |
| <b>Skill</b>   |      |
| Technical, creative and analytical skills appropriate to solving specialized problems using evidentiary and procedural based processes in predictable and new contexts that include devising and sustaining arguments associated with a field of work or discipline. | 8    |
| Evaluating, selecting and applying appropriate methods, procedures or techniques in processes of investigation towards identified solutions.   | 2, 8 |
| evaluating and implementing appropriate research tools and strategies associated with the field of work or discipline  | 4    |
| Highly developed advanced communication and information technology skills to present, explain and/ or critique complex and unpredictable matters.  | 3, 7 |
| <b>Autonomy and responsibility</b>   |      |
| can take responsibility for developing innovative and advanced approaches to evaluating and managing complex and unpredictable work procedures and processes, resources or learning  |      |
| can manage technical, supervisory or design processes in unpredictable, unfamiliar and varying contexts  |      |
| can work creatively and/or effectively as an individual, in team leadership, managing contexts, across technical or professional activities  | 5, 6 |
| can express an internalized, personal view, and accept responsibility to society at large and to socio-cultural norms and relationships  | 7,8  |
| <b>Role in context</b>   |      |
| can function with full autonomy in technical and supervisory contexts and adopt para-professional roles with little guidance   | 5, 8 |
| can take responsibility for the setting and achievement of group or individual outcomes and for the management and supervision of the work of others or self in the case of a specialization in field of work or discipline  | 8    |
| can participate in peer relationships with qualified practitioners and lead multiple, complex groups   | 6, 8 |
| can take responsibility for managing the professional development and direct mentoring of individuals and groups   | 7,8  |
| <b>Self-development</b>  |      |
| can self-evaluate and take responsibility for contributing to professional practice, and undertake regular professional development and/ or further learning   | 4    |
| can manage learning tasks independently and professionally, in complex and sometimes unfamiliar learning contexts  | 8    |
| can contribute to and observe ethical standards  | 8    |

### Career Opportunities

Graduates of the B.Sc. Physiotherapy program can work as physiotherapists in a variety of health care settings including hospitals, clinics, rehabilitation centers, child development centers, senior citizens centers, sports and fitness centers, schools/ universities, industries and communities. They may also serve as educators, administrators, researchers and consultants. Graduates have the opportunity to work in the UAE or abroad, to pursue graduate studies, and to become involved in research activities.

### Program Overview

Physiotherapy is a health care profession in the field of rehabilitation that promotes optimal health in individuals of all ages. Physiotherapists are qualified to provide preventive and therapeutic services which aim at restoring function and preventing disability arising from disease, trauma or injury. The University of Sharjah offers a four-year program leading to a Bachelor of Science in physiotherapy (BSc.PT).

The program is designed to meet the goals of the Department of physiotherapy. A student undertaking this program should complete a total of 138 credit hours distributed as follows:

| BSc. in Physiotherapy |           |           |           |            |
|-----------------------|-----------|-----------|-----------|------------|
|                       | UR        | CR        | PR        | Total      |
| Mandatory Credits     | 15        | 24        | 90        | 129        |
| Elective Credits      | 9         | -         | -         | 9          |
| <b>Total</b>          | <b>24</b> | <b>24</b> | <b>90</b> | <b>138</b> |

### I. University Requirements

Every student is required to take 24 credit hours of general education courses distributed over seven domains. Fifteen (15) mandatory credit hours are selected from domains 1, 2, 3 and 4 and (9) elective credit hours selected from domains 5, 6 and 7 as indicated in the University section (General Education).

### II. College Requirements

The list of the College required courses and their descriptions are presented in the introductory pages of the College of Health Sciences section in this bulletin.

### Program Requirements

This component consists of 90 credit hours of mandatory courses listed in the table below.

| Course # | Title                             | CrHrs | Prerequisites        |
|----------|-----------------------------------|-------|----------------------|
| 0502265  | Introduction to Radiology         | 2     | -                    |
| 0503253  | Pathophysiology                   | 3     | 0500160              |
| 0503262  | Clinical Pharmacology             | 3     | 0503253              |
| 0505250  | Therapeutic Modalities            | 3     | 1430107; Co: 0505254 |
| 0505251  | Biomechanics and kinesiology (1)  | 2     | 0500160; Co: 0505254 |
| 0505252  | Histology                         | 1     | 0500150; Co: 0503253 |
| 0505253  | Therapeutic Exercise              | 3     | 0500160; Co: 0505254 |
| 0505254  | Anatomy (1)                       | 4     | 0500160              |
| 0505260  | Physiotherapy for Respiratory and | 4     | 0503253; Co:         |

|         |  |   |  |
|---------|--|---|--|
|         | Cardiovascular Conditions  |   | 0505261<br>and 0505264                 |
| 0505261 | Clinical Practice for Respiratory<br>and Cardiovascular Conditions               | 2 | Co: 0505260,<br>0505262                |
| 0505262 | Assessment in Physiotherapy  | 2 | 0505254; Co:<br>0505265                |
| 0505263 | Biomechanics and kinesiology (2)   | 3 | 0505251; Co:<br>0505265                |
| 0505264 | Exercise Physiology  | 2 | 0503253; Co:<br>0505260                |
| 0505265 | Anatomy (2)  | 4 | 0505254                                |
| 0505350 | Physiotherapy for Musculoskeletal<br>Conditions (1)                              | 4 | 0505265; Co:<br>0505352,<br>0505351    |
| 0505351 | Physiotherapy for Medical and<br>Surgical Conditions                             | 2 | 0505260; Co:<br>0505352,<br>0505350    |
| 0505352 | Clinical Practice for<br>Musculoskeletal (1) and Medical<br>/Surgical Conditions | 5 | Co: 0505350 and<br>0505351             |
| 0505353 | Neurosciences  | 2 | 0505265                                |
| 0505354 | Orthotics and Prosthetics  | 2 | 0505265                                |
| 0505360 | Physiotherapy for Neurological<br>Conditions                                     | 4 | 0505353; Co:<br>0505362                |
| 0505361 | Physiotherapy for Musculoskeletal<br>Conditions (2)                              | 4 | 0505350; Co:<br>0505362                |
| 0505362 | Clinical Practice for Neurological<br>and Musculoskeletal (2) Conditions         | 5 | Co: 0505360                            |
| 0505450 | Physiotherapy for Pediatrics   | 4 | 0505353; Co:<br>0505452                |
| 0505451 | Physiotherapy for Obstetrics and<br>Gynecology                                   | 2 | 0505351; Co:<br>0505452                |
| 0505452 | Clinical Practice for Pediatrics /<br>Obstetrics and Gynecology                  | 4 | Co: 0505450 and<br>0505451             |
| 0505460 | Physiotherapy for Geriatrics   | 2 | 0505360; 0505361;<br>Co: 0505461       |
| 0505461 | Integrated Physiotherapy Clinical<br>Practice                                    | 6 | 0505452; Co:<br>0505460<br>and 0505462 |
| 0505462 | Selected Topics in Physiotherapy   | 3 | Co: 0505461                            |
| 0505463 | Research Project   | 3 | 0500450                                |

### Study Plan

The Bachelor of Science in Physiotherapy encompasses 138 credits hours that are spread over eight semesters and can be completed in four years. The following distribution of courses by semester facilitates student's normal progression through the study plan.

| Year 1, First Level (Freshman), Semester 1 , Fall (16 Credits) |                                       |       |              |
|--|---------------------------------------|-------|--------------|
| Course #   | Course Title                          | CrHrs | Prerequisite |
| 0201102  | Arabic Languages                      | 3     |              |
| 0202121  | English for Medical Sciences          | 3     |              |
| 0500150  | Biology                               | 4     |              |
| 0500161  | Introduction to Health Sciences       | 2     |              |
| 1426155  | General Chemistry for Health Sciences | 4     |              |

| Year 1, First Level (Freshman), Semester 2, Spring (17 Credits) |  |       |              |
|---|--|-------|--------------|
| Course #  | Course Title                           | CrHrs | Prerequisite |
| 0104100   | Islamic Culture                        | 3     |              |
| 1411100   | Introduction to Information Technology | 3     |              |
| 0500160   | Human Anatomy and Physiology           | 4     |              |
| 1430107   | General Physics for Health Sciences    | 4     |              |
|   | University Requirements E (1)          | 3     |              |

| Year 2, Second Level (Sophomore), Semester 3, Fall (19 Credits) |                                  |       |              |
|---|----------------------------------|-------|--------------|
| Course #  | Course Title                     | CrHrs | Prerequisite |
| 0503253   | Pathophysiology                  | 3     |              |
| 0505250   | Therapeutic Modalities           | 3     |              |
| 0505251   | Biomechanics and kinesiology (1) | 2     |              |
| 0505252   | Histology                        | 1     |              |
| 0505253   | Therapeutic Exercise             | 3     |              |
| 0505254   | Anatomy (1)                      | 4     |              |
|   | University Requirements E (2)    | 3     |              |

| Year 2, Second Level (Sophomore), Semester 4 ,Spring (19 Credits) |   |       |              |
|---|---|-------|--------------|
| Course #  | Course Title  | CrHrs | Prerequisite |
| 0502265   | Introduction to Radiology                                       | 2     |              |
| 0505260   | Physiotherapy for Respiratory and Cardiovascular Conditions     | 4     |              |
| 0505261   | Clinical Practice for Respiratory and Cardiovascular Conditions | 2     |              |
| 0505262   | Assessment in Physiotherapy                                     | 2     |              |
| 0505263   | Biomechanics and kinesiology (2)                                | 3     |              |
| 0505264   | Exercise Physiology   | 2     |              |
| 0505265   | Anatomy (2)   | 4     |              |

| Year 3, Level 3 (Junior), Semester 5, Fall (18 Credits) |  |       |              |
|---|--|-------|--------------|
| Course #  | Course Title   | CrHrs | Prerequisite |
| 0505350   | Physiotherapy for Musculoskeletal Conditions (1)                           | 4     |              |
| 0504252   | Biostatistics  | 3     |              |
| 0505351   | Physiotherapy for Medical / Surgical Conditions                            | 2     |              |
| 0505352   | Clinical Practice for Musculoskeletal (1) and Medical /Surgical Conditions | 5     |              |
| 0505353   | Neuroscience   | 2     |              |
| 0505354   | Orthotics and Prosthetics  | 2     |              |

| Year 3, Level 3 (Junior), Semester 6, Spring (16 Credits) |  |       |              |
|---|--|-------|--------------|
| Course #  | Course Title   | CrHrs | Prerequisite |
| 0503262   | Clinical Pharmacology                                      | 3     |              |
| 0505360   | Physiotherapy for Neurological Conditions                  | 4     |              |
| 0505361   | Physiotherapy for Musculoskeletal Conditions (2)           | 4     |              |
| 0505362   | Clinical Practice for Neurological and Musculoskeletal (2) | 5     |              |

| Year 4, Level 4 (Senior), Semester 7, Fall (16 Credits) |  |       |              |
|---|--|-------|--------------|
| Course #  | Course Title   | CrHrs | Prerequisite |
| 0500450   | Introduction to Research                                     | 3     |              |
| 0505450   | Physiotherapy for Pediatrics                                 | 4     |              |
| 0505451   | Physiotherapy for Obstetrics and Gynecology                  | 2     |              |
| 0505452   | Clinical Practice for Pediatrics / Obstetrics and Gynecology | 4     |              |
|   | University Requirements E (3)                                | 3     |              |

| Year 4, Level 4 (Senior), Semester 8, Spring (17 Credits) |  |       |              |
|---|--|-------|--------------|
| Course #  | Course Title                               | CrHrs | Prerequisite |
| 0505460   | Physiotherapy for Geriatrics               | 2     |              |
| 0505461   | Integrated Physiotherapy Clinical Practice | 6     |              |
| 0505462   | Selected Topics in Physiotherapy           | 3     |              |
| 0505463   | Research Project                           | 3     |              |
|   | University Requirements E (4)              | 3     |              |

### Course Description

Courses offered by the Physiotherapy program are designated (0505ABC) where ABC represents the year, term and sequence as described in the College Section.

### Core Courses

Descriptions of the core courses are given below.

|  |   |                  |
|--|---|------------------|
| <b>0505250</b>   | <b>Therapeutic Modalities</b>           | <b>(2-3-0:3)</b> |
| This course is designed to introduce the students to the scientific and clinical principles involved in the use of physical agents (modalities) in client assessment and treatment. The course focuses on thermal, light, sound, electrophysiological, and mechanical agents used by physical therapists to treat clients, and explores the physics, physiology, and clinical aspects of commonly used modalities. The lab component includes practice and working knowledge in the use of therapeutic modalities to ensure the students acquire the skills to be able to safely apply them to clients during their clinical placement. Prerequisite: 1430107 - General Physics for Health Sciences; Co-requisite: 0505254 - Anatomy (1).  |   |                  |
| <b>0505251</b>   | <b>Biomechanics and Kinesiology (1)</b> | <b>(2-0-0:2)</b> |
| This course includes principles of biomechanics and kinesiology as they relate to human motions. Analysis of structure and function of bones, joints, and muscles, and their individual and combined contribution to human movement in general and analysis of the upper limb movements in particular will be presented in this course. Prerequisite: 0500160 - Human Anatomy and Physiology; Co-requisite: 0505254 - Anatomy (1).   |   |                  |
| <b>0505252</b>   | <b>Histology</b>                        | <b>(1-0-0:1)</b> |
| This course examines the structure and function of the human body based on microscopic examination of the tissues. Special emphasis is placed on organ systems most directly impacted by the practice of physiotherapy. The course will cover basic tissues of the body; cell, epithelium, connective tissue, cartilage, bone, muscular tissue, nervous tissue, blood and immune system, circulatory system, lymphoid tissue, skin and its appendages. Prerequisite: 0500150, Biology; Co-requisite: 0503253 – Pathophysiology.  |   |                  |
| <b>0505253</b>   | <b>Therapeutic Exercise</b>             | <b>(2-3-0:3)</b> |
| Students will acquire knowledge of concepts and practice related to therapeutic exercise and interventions, including passive, active and resistive range of motion, strengthening programs, stretching exercises, mobilization techniques for the extremity joints, relaxation exercises and gait training. Students will also learn the proper and safe movement of patients between surfaces, including body mechanics, bed mobility, and transfer training. Students will develop and write home programs, design exercise programs for therapeutic purposes, and critically analyze interventions. It also includes a lab component in which the student will practice skills related to the therapeutic exercise. Prerequisite: 0500160 - Human Anatomy and Physiology; Co-requisite: 0505254 - Anatomy (1). |   |                  |



|   |  |                  |
|---|--|------------------|
| <b>0505260</b>  | <b>Physiotherapy for Respiratory and Cardiovascular Conditions</b>     | <b>(3-3-0:4)</b> |
| Lecture/laboratory course designed to introduce students to the care of clients with cardiovascular/respiratory disorders. Students acquire knowledge on the roles and functions of physiotherapists as related to cardio-respiratory conditions. Topics include clinical exercise testing, exercise prescriptions, and clinical practice guidelines for management of clients who require long term cardiovascular/respiratory care. Prerequisite: 0503253 - Pathophysiology; Co-requisite: 0505261<br>- Clinical practice for Respiratory and Cardiovascular Conditions; 0505264 - Exercise physiology.   |  |                  |
| <b>0505261</b>  | <b>Clinical Practice for Respiratory and Cardiovascular Conditions</b> | <b>(0-0-6:2)</b> |
| Students practice in selected clinical facilities to integrate knowledge, skills and professional behaviors into clinical practice with clients of all ages with cardiovascular and/or respiratory conditions, or general fitness related health issues. Co-requisite: 0505260 - Physiotherapy for Respiratory and Cardiovascular Conditions & Assessment in Physiotherapy - 0505262.   |  |                  |
| <b>0505262</b>  | <b>Assessment in Physiotherapy</b>                                     | <b>(1-3-0:2)</b> |
| This course will introduce the students to basic Assessment in Physiotherapy as related to various body systems, including the use of special equipment (including ROM evaluation, Manual Muscle testing, etc.) Prerequisite: 0505254 - Anatomy (1); Co-requisite: 0505265 - Anatomy (2).   |  |                  |
| <b>0505263</b>  | <b>Biomechanics and Kinesiology (2)</b>                                | <b>(3-0-0:3)</b> |
| This course includes analysis of the spine and lower limb movements in the context of biomechanics, kinesiology and ergonomics. Human posture and gait will be also discussed. Prerequisite: 0505251 - Biomechanics and Kinesiology (1); Co-requisite: 0505265 - Anatomy (2).   |  |                  |
| <b>0505264</b>  | <b>Exercise Physiology</b>   | <b>(1-3-0:2)</b> |
| Lecture / laboratory course provides students with an in-depth understanding of the physiological responses that occur during exercise. Particular attention will be given to the acute and chronic responses of the cardiovascular, respiratory, endocrine and metabolic systems during exercise, their integration and regulation. Prerequisite: 0503253 - Pathophysiology; Co-requisite: 0505260 - Physiotherapy for Respiratory and Cardiovascular Disorders.   |  |                  |
| <b>0505350</b>  | <b>Physiotherapy for Musculoskeletal Conditions (1)</b>                | <b>(3-3-0:4)</b> |
| This course is the first of 2 musculoskeletal courses, and it aims to introduce students to the basic concepts of musculoskeletal dysfunction. At this point students will be introduced to the causes, pathologies and clinical features associated with acute and chronic musculoskeletal conditions of the upper and lower limbs. Using this knowledge, communication skills and clinical reasoning skills, students will be expected to start to develop clinical assessment proficiency and an ability to manage patients/clients with musculoskeletal dysfunction of the upper and lower limbs. Prerequisite: 0505265 - Anatomy (2); Co-requisite: 0505352 - Clinical Practice for Physiotherapy for Musculoskeletal Conditions |  |                  |

(1) and 0505351 - Physiotherapy for Medical and Surgical Conditions.

|  |   |                   |
|--|---|-------------------|
| <b>0505351</b>   | <b>Physiotherapy for Medical and Surgical Conditions</b>  | <b>(1-3-0:2)</b>  |
| Lecture/laboratory course provides an overview of common medical disorders with an emphasis on conditions encountered in physiotherapy. Student understanding of altered structural and physiological adaptation processes and how they apply to physiotherapy assessment and treatment, with special attention to physiotherapy approaches for clients in ICU and following surgeries Topics include: role in common metabolic disorders (diabetes, obesity etc.) post-operative physiotherapy and management for burn clients. Prerequisite: 0505260 - Physiotherapy for Respiratory and Cardiovascular Disorders; Co-requisite: 0505352 - Clinical Practice for Physiotherapy for Musculoskeletal Conditions (1) and 0505350 - Physiotherapy for Medical and Surgical Conditions. |   |                   |
| <b>0505352</b>   | <b>Clinical Practice for Musculoskeletal Conditions (1) and for Medical and Surgical Conditions</b> | <b>(0-0-15:5)</b> |
| Students practice in selected clinical facilities to integrate knowledge, skills and professional behaviors into clinical practice with clients of all ages with acute and chronic musculoskeletal conditions of the upper and lower limbs, common medical and surgical conditions encountered in physiotherapy. Co-requisites: 0505350 - Physiotherapy for Musculoskeletal Conditions (1); 0505351 - Physiotherapy for Medical and Surgical Conditions.   |   |                   |
| <b>0505353</b>   | <b>Neuroscience</b>   | <b>(2-0-0:2)</b>  |
| This course covers concepts in cell and molecular neurosciences, principles of systems neurosciences, and fundamentals of the development of the nervous system. It also gives students a broad appreciation of the various subdivisions, nuclear groups, and axon tracts in the human brain and spinal cord. Functional aspects of neurosciences are explored through examples of common neurological clinical problems in order to provide a solid foundation for planning therapeutic interventions. Students will be introduced to electrodiagnostic techniques. Prerequisite: 0505265 - Anatomy (2).  |   |                   |
| <b>0505354</b>   | <b>Orthotics and Prosthetics</b>  | <b>(1-3-0:2)</b>  |
| This course provides an analysis of contemporary upper and lower-limb orthotic and prosthetic components and trunk orthoses, including the biomechanical principles upon which the designs are based. Topics include the static and dynamic evaluation of clients fitted with orthoses and prostheses. Recent trends in early prosthetic management of clients with amputation will be included. The role of the physiotherapist as part of the rehabilitation team in selecting orthotic and prosthetic devices will be examined briefly. The laboratory will include practical tutorials on splinting, casting and fitting. Prerequisite: 0505265 - Anatomy (2).   |   |                   |

|  |  |                   |
|--|--|-------------------|
| <b>0505360</b>   | <b>Physiotherapy for Neurological Conditions</b>                             | <b>(3-3-0:4)</b>  |
| Students acquire knowledge on the roles and functions of physiotherapists as related to patients/ clients with neurological conditions. This course and its lab focuses on Physiotherapy, assessment diagnosis, and functional intervention for clients with central and peripheral neurological conditions with consideration for acute to rehabilitation management including palliative care. Students also acquire competencies in task analysis of activities of daily living (ADL) and in the application of relevant therapeutic modalities. Prerequisite: 0505353 - Neuroscience; Co-requisite: 0505362 - Clinical Practice for Neurological and Musculoskeletal Conditions (2). |  |                   |
| <b>0505361</b>   | <b>Physiotherapy for Musculoskeletal Conditions (2)</b>                      | <b>(3-3-0:4)</b>  |
| Students will build on their previous musculoskeletal knowledge to include more complex and chronic pathologies as well as vertebral disorders and sports injuries. Students should have the opportunity to perform independent as- assessments and demonstrate the ability to plan treatment. Prerequisite: 0505350 - Physiotherapy for Musculoskeletal Conditions (1); Co-requisite: 0505362 - Clinical Practice for Neurological and Musculoskeletal (2) Conditions.  |  |                   |
| <b>0505362</b>   | <b>Clinical practice for Neurological and Musculoskeletal (2) Conditions</b> | <b>(0-0-15:5)</b> |
| Students practice in selected clinical facilities to integrate knowledge, skills, and professional behaviors into real life clinical situations under supervision for clients with central and peripheral neurological conditions and complex musculoskeletal conditions (vertebral disorders and sports injuries). Prerequisite: None; Co-requisites: 0505360 - Physiotherapy for Neurological Conditions; 0505361 - Physiotherapy for Musculoskeletal Conditions (2).  |  |                   |
| <b>0505450</b>   | <b>Physiotherapy for Pediatrics</b>  | <b>(3-3-0:4)</b>  |
| Students acquire knowledge on the roles and functions of physiotherapists as related to pediatric patient/ client, from the neonate through the school-aged child till adolescence. Congenital, orthopedic, respiratory, and neuromuscular disorders, as well as oncology and burns to be discussed. Special evaluation and treatment techniques will also be included. Practical tutorials and guidance will be given. Prerequisite: 0505353 - Neurosciences; Co-requisite: 0505452 - Clinical Practice for Pediatrics / Obstetrics and Gynecology.   |  |                   |
| <b>0505451</b>   | <b>Physiotherapy for Obstetrics and Gynecology</b>                           | <b>(3-3-0:4)</b>  |
| Students acquire knowledge on physiotherapy evaluation and treatment of the common gynecological and obstetric conditions. Care of pregnant women will be stressed. Practical tutorials and guidance will be given. Prerequisite: 0505352 - Physiotherapy for Medical and Surgical Conditions; Co-requisite: 0505452 - Clinical Practice for Pediatrics/ Obstetrics and Gynecology.  |  |                   |
| <b>0505452</b>   | <b>Clinical Practice for Pediatrics / Obstetrics and Gynecology</b>          | <b>(0-0-12:4)</b> |
| Students practice in selected clinical facilities to integrate knowledge, skills and professional behaviors into clinical practice with clients from the neonate through the school-aged child till adolescence. Physiotherapy evaluation and treatment methods are performed on clients with common pediatric disorders and injuries. Also, students practice physiotherapy   |  |                   |

evaluation and treatment methods of common gynecological conditions, normal and abnormal pregnancy and labor, common obstetric injuries and pre and postnatal care. Prerequisite: None; Co-requisite: 0505451  
- Physiotherapy for Obstetrics and Gynecology; 0505450 - Physiotherapy for Pediatrics.

|  |                                     |                  |
|--|-------------------------------------|------------------|
| <b>0505460</b>   | <b>Physiotherapy for Geriatrics</b> | <b>(1-3-0:2)</b> |
| Students will gain knowledge and skill in applying assessment and treatment principles related to representative conditions common in older adults. Changes in various body systems and psychosocial factors with aging will be included in addition to the theories of aging. Prerequisite: 0505360 - Physiotherapy for Neurological Conditions and 0505361 - Physiotherapy for Musculoskeletal Conditions (2); Co-requisite: 0505461 - Integrated Physiotherapy Clinical Practice. |                                     |                  |

|   |   |                   |
|---|---|-------------------|
| <b>0505461</b>  | <b>Integrated Physiotherapy Clinical practice</b> | <b>(0-0-18:6)</b> |
| Students practice in selected clinical facilities to integrate knowledge, skills, and professional behaviors into real life clinical situations under supervision and deals with clients with a variety of disorders utilizing all the knowledge gained throughout the program. Prerequisite: 0505452 - Clinical Practice for Pediatrics / Obstetrics and Gynecology; Co-requisite: 0505460 - Physiotherapy for Geriatrics; 0505462 - Selected Topics in Physiotherapy. |   |                   |

|  |   |                  |
|--|---|------------------|
| <b>0505462</b>   | <b>Selected Topics in Physiotherapy</b> | <b>(3-0-0:3)</b> |
| The course will cover selected topics of interest within physiotherapy like current trends in physiotherapy, introduction of other allied and alternative therapies, professional and psychosocial issues, physiotherapy administration and management and critical evaluation of physiotherapy literature using an evidence-based approach. Prerequisite: None; Co-requisite: 0505461 - Integrated Physiotherapy clinical practice. |   |                  |

|  |                         |                  |
|--|-------------------------|------------------|
| <b>0505463</b>   | <b>Research Project</b> | <b>(3-0-0:3)</b> |
| This course encourages a systematic understanding of the published literature in a defined subject area of the student's choice within the field of or relevant to physiotherapy. Having critically reviewed the literature the student formulates a research question and produces appropriate and feasible research proposal. Finally, the student will implement that information in performing and reporting a small research. At the end of the course, the students will perform a research poster presentation. Prerequisite: 0500450 Introduction to Research. |                         |                  |

## Department of Environmental Health Sciences

### Personnel

#### Chairperson

Lucy Semerjian

#### Professor

Ioannis Savvaidis

#### Associate Professor

Lucy Semerjian, Hafiz Omer Ahmed, Anthony Ifeanyin Okoh

#### Laboratory Supervisor

Badriah Ibrahim

### Vision

The Department of Environmental Health Sciences (EHS) aspires to be leading and well recognized in environmental health education, research and community service at national and international levels.

### Mission

The Department of Environmental Health Sciences is committed to work with the College of Health Sciences at the University of Sharjah to provide high quality education in the field of environmental health and to develop environmental health disciplines. The department prepares qualified environmental health professionals and engages in environmental health research to participate and contribute to the health and prosperity of the society and the future generations.

### Values

The Department endeavors towards: Integrity, Excellence, Innovation, Diversity, Professionalism, Equity, Cultural Respect and Sensitivity.

### Goals

The bachelor degree in Environmental Health Sciences program has the following goals:

- 1) Acquire a broad base of health sciences knowledge, understanding and skills, as well as depth in Environmental Health.
- 2) Prepare Environmental Health professionals, who can initiate change and adapt to it and who will collaborate within inter-disciplinary teams.
- 3) Provide highly qualified professionals prepared to work in environmental health field and research institutions in the UAE or abroad.
- 4) Enable selected candidates obtain a BS degree in Environmental Health in order to pursue a career in such field in the UAE or abroad.
- 5) Develop a range of skills including knowledge of information technology, independent learning, critical thinking, verbal and written communication, time management, presentation skills and teamwork.
- 6) Gain an appreciation of the needs of industry and awareness of recent developments in the health sciences and Environmental Health.
- 7) Develop an appreciation and understanding of the ethical and social issues important to the Health Sciences and Environmental Health.

## Graduate Profile

### 1) Knowledge and Understanding:

1. Identify agents in the environment and work- place that may affect human health.
2. Describe the health effects of the major air and work-environment pollutants
3. List effective control measures for the major air and work-environment hazards
4. Identify and characterize the common pollutants in water and wastewater.
5. Recognize the impacts of water pollutants on human health.
6. State the principles of water and wastewater treatment.
7. List methods for treatment and disposal of solid, hazardous and toxic wastes.
8. Explain the principles of food poisoning, food borne infections and pest control during production, preparation and presentation of food.
9. Describe the functions and metabolism of microorganisms in marine and fresh water ecosystems, air, soil, food and oil.
10. Outline microbial role in waste disposal, recycling and agriculture.
11. Discuss the basic concepts of environmental and occupational toxicology.
12. Explain the necessary knowledge of research relevant to the practice of environmental 1.15. health and utilization and interpretation of research findings.

### 2) Communication:

1. Communicate with peers, superiors and other effectively

### 3) Management and leadership:

1. Demonstrate management and leadership skills
2. Utilize proper decision making skills
3. Introduce changes that contributes to the improvement of health services
4. Demonstrate ability to manage human and financial resources
5. Contribute to the development of policy and procedure related to environmental health

### 4) Health education and community services:

1. Demonstrate effective presentation skills
2. Develop health promoter and educator skills within the context of their professional work.

### 5) Professionalism

1. Contribute to profession by sharing information and knowledge with peers, and other health professionals through effective verbal and written communications.
  2. Observe the ethical/moral aspects in the process of decision making.
- Participate in ongoing educational activities to enhance personal growth and professionalism

### 6) Critical and creative thinking:

1. Problem solving skills
2. Develop ideas, projects that contribute to the enhancement of environmental health practice.

### 7) Lifelong learning:

1. Use scientific resources to stay up to date with the fast growing scientific and technological aspects of the profession in the world.
2. Utilize the opportunities of continuing education happening in the region and internationally.

### 8) Work force and population care:

1. Operate and handle the following instruments:
  - Sound level meters, Noise dosimeters
  - Heat monitors, Dust monitors, Gases monitors, Radiation monitors, light monitors.
2. Apply techniques and methods of sampling and analysis of environmental and occupational hazards.
3. Operate and handle water and wastewater sanitation instruments to measure:
  - Salinity, Electrical conductivity, Volatile solids, Suspended solids. (pH) Total dissolved Solids.
  - Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD).
  - Color, Turbidity. Dissolved Oxygen (DO), Jar (coagulation flocculation), Temperature.
4. Isolate different micro-organisms from food, soil, air, water.
5. Prepare different selective media.
6. Isolate of molds and bacteria from air by air sampler and Identification of different isolates.
7. Count the number of bacteria in soil.
8. Select proper media for the isolation of pathogens
9. Direct and plate counts of milk and milk products
10. Determinate bacterial loads and indicator microorganisms in water

### Program Learning Outcomes (PLOs)

Upon successful completion of the BS program in EH, graduates will be able to:

- 1) Monitor agents in the environment and work- place that may affect human health.
- 2) Predict the impacts of the major air and work-environment pollutants on human health.
- 3) Conduct effective control measures for the major air and work-environment hazards.
- 4) Characterize the common pollutants in water and wastewater.
- 5) Recognize (Analyze, Explain, Illustrate) the impacts of water pollutants on human health.
- 6) Identify the principles of water and wastewater treatment
- 7) Apply the appropriate methods for treatment and disposal of solid, hazardous and toxic wastes
- 8) Explain the principles of food poisoning and food borne infections.
- 9) Perform food control measures during production, preparation and presentation states.
- 10) Interpret the functions and metabolism of microorganisms in marine and fresh water ecosystems, air, soil, food and oil.
- 11) Explain microbial role in waste disposal, recycling and agriculture.
- 12) Demonstrate principles of leadership and management.
- 13) Identify the basic concepts of environmental and occupational toxicology.
- 14) Formulate the necessary knowledge and steps of research relevant to the practice of environmental health.

### National Qualifications Framework (NQF)

The following matrix shows the alignment of the Program Learning Outcomes with the Emirates National Qualifications Framework strands.

| Outcomes  | PLO         |
|---|-------------|
| <b>Knowledge</b>  |             |
| specialized factual and theoretical knowledge and an understanding of the boundaries in a field of work or discipline, encompassing a broad and coherent body of knowledge and concepts, with substantive depth in the underlying principles and theoretical concepts | 5, 6, 8, 13 |
| an understanding of allied knowledge and theories in related fields of work or  | 12,13       |

|  |               |
|--|---------------|
| disciplines and in the case of professional disciplines including related regulations, standards, codes, conventions   |               |
| understanding of critical approach to the creation and compilation of a systematic and coherent body of knowledge and concepts gained from a range of sources  | 2,4,14        |
| a comprehensive understanding of critical analysis, research systems and methods and evaluative problem-solving techniques   | 2,4,5, 14     |
| familiarity with sources of current and new research and knowledge with integration of concepts from outside fields  | 14            |
| <b>Skill</b>   |               |
| Technical, creative and analytical skills appropriate to solving specialized problems using evidentiary and procedural based processes in predictable and new contexts that include devising and sustaining arguments associated with a field of work or discipline. | 1,4,7,9       |
| Evaluating, selecting and applying appropriate methods, procedures or techniques in processes of Investigation towards identified solutions.   | 1,3,7         |
| evaluating and implementing appropriate research tools and strategies associated with the field of work or discipline  | 5             |
| Highly developed advanced communication and information technology skills to present, explain and/ or critique complex and unpredictable matters.  | 1,14          |
| <b>Autonomy and responsibility</b>   |               |
| can take responsibility for developing innovative and advanced approaches to evaluating and managing complex and unpredictable work procedures and processes, resources or learning  | 12            |
| can manage technical, supervisory or design processes in unpredictable, unfamiliar and varying contexts  | 1, 2 , 7      |
| can work creatively and/or effectively as an individual, in team leadership, managing contexts, across technical or professional activities  | 12            |
| can express an internalized, personal view, and accept responsibility to society at large and to socio- cultural norms and relationships   | 12            |
| <b>Role in context</b>   |               |
| can function with full autonomy in technical and supervisory contexts and adopt para-professional roles with little guidance   | 1, 2, 7,12,14 |
| can take responsibility for the setting and achievement of group or individual outcomes and for the management and supervision of the work of others or self in the case of a specialization in field of work or discipline  | 12            |
| can participate in peer relationships with qualified practitioners and lead multiple, complex groups   | 12            |
| can take responsibility for managing the professional development and direct mentoring of individuals and groups   | 11            |



| Self-development   |            |
|--|------------|
| can self-evaluate and take responsibility for contributing to professional practice, and undertake regular professional development and/ or further learning | 12,14      |
| can manage learning tasks independently and professionally, in complex and sometimes unfamiliar learning contexts  | 2,12,14    |
| can contribute to and observe ethical standards  | 8,12,13,14 |

### Career Opportunities:

Environmental Health Graduates have various employment opportunities in Municipalities; Ministry of Climate Change and Environment; Ministry of Health, Ministry of Labor, Ministry of Education; Universities, Environmental Research Centers and Institutions, Industries, Petroleum companies, Civil Defense, UAE federal Environmental Agency, Environmental Research and Wildlife Development, Consultancy agencies, Non- governmental Organizations (National, Regional and International) related to Environment, Health and safety.

### Program Overview

The program is designed to meet the goals of the Department of Environmental Health Sciences. A student undertaking this program should complete a total of 134 credit hours distributed as shown in the following table:

| BSc. in Environmental Health Program (134 Credits) |    |    |    |       |
|--|----|----|----|-------|
|  | UR | CR | PR | Total |
| Mandatory Credits                                  | 15 | 24 | 80 | 119   |
| Elective Credits                                   | 9  | -  | 6  | 15    |
| Total  | 24 | 24 | 86 | 134   |

### I. University Requirements:

The list of the University required courses and their descriptions are presented in the introductory pages of the College of Health Sciences section in this bulletin.

### II. College Requirements:

The list of the College required courses and their descriptions are presented in the introductory pages of the College of Health Sciences section in this bulletin.

### III. Program Requirements:

The Environmental Health program requires the completion of 86 credit hours, 80 of which are core requirements and 6 are electives as described below.

#### A. Core requirements

The core courses of the Environmental Health program encompass the 80 credit hours listed in the table below.

| Course # | Title  | CrHrs | Pre-requisite           |
|----------|--|-------|-------------------------|
| 0501257  | General Microbiology   | 3     | 0500150                 |
| 0503263  | Health Education and Health Promotion                                  | 3     | -                       |
| 0504362  | Epidemiology and Population Health                                     | 3     | 0504252                 |
| 0506250  | Introduction to Environmental Health                                   | 3     | -                       |
| 0506262  | Environmental Microbiology   | 3     | 0501257                 |
| 0506263  | Water and Wastewater Sanitation  | 4     | 0506250                 |
| 0506264  | Vector Control   | 3     | 0500150                 |
| 0506350  | Integrated Solid Waste Management                                      | 3     | 0506261                 |
| 0506351  | Atmospheric Pollution  | 3     | 0506250;<br>Co: 0506352 |
| 0506352  | Occupational Health and Safety   | 3     | -                       |
| 0506353  | Environmental Pollution and Pesticides                                 | 3     | 1426215                 |
| 0506261  | Management of Hazardous Wastes   | 3     | 0506250                 |
| 0506360  | Physical Hazards Assessment and Control                                | 3     | 0506352;<br>Co: 0506361 |
| 0506361  | Environmental and Occupational Hygiene Measurement and Instrumentation | 3     | 0506352;<br>Co: 0506360 |
| 0506362  | Food Safety and Quality  | 3     | 0501257                 |
| 0506364  | Environmental Health Management and Legislation                        | 3     | -                       |
| 0506365  | Field Training 1   | 2     | 0506263<br>0506352      |
| 0506452  | Local Environmental Issues   | 3     | -                       |
| 0506453  | Building and Human Habitation  | 3     | -                       |
| 0506454  | Risk and Environmental Impact Assessment                               | 3     | 0506250                 |
| 0506455  | Environmental Toxicology   | 3     | 1426215;<br>0506352     |
| 0506456  | Field Training 2   | 2     | 0506365                 |
| 0506461  | Graduation Project   | 3     | 0500450                 |
| 0506464  | Petroleum Pollution and the Environment                                | 3     | 0506352;<br>0506351     |
| 0506469  | Field Training 3   | 2     | 0506456                 |
| 1426215  | Organic Chemistry  | 4     | 1426105                 |
| 1440163  | Calculus for Health Sciences   | 3     | -                       |

## B. Elective Courses

Environmental Health requires 6 credit hours of elective courses chosen from the list given in the table below.

| Course # | Title   | CrHrs | Pre-requisite |
|----------|---|-------|---------------|
| 0506465  | Occupational Accidents                        | 3     | 0506352       |
| 0506467  | Marine Ecology                                | 3     | 0500150       |
| 0503261  | Psychosocial Aspects in Health Professions    | 3     |               |
| 0503462  | Ethical and Legal Issues in Health Profession | 3     |               |
| 0507250  | Introduction to Nutrition                     | 3     | 0500160       |

## Study Plan

The Bachelor of Science in Environmental Health program encompasses 134 credits hours that are spread over eight semesters and could be completed in four years. The following distribution of courses by semester facilitates student's normal progression through the study plan.

| Year I, Level 1 (Freshman), Semester 1 , Fall (16 Credits) |                                       |       |               |
|--|---------------------------------------|-------|---------------|
| Course #   | Title                                 | CrHrs | Pre-requisite |
| 0201102  | Arabic Languages                      | 3     |               |
| 0202121  | English for Medical Sciences          | 3     |               |
| 0500150  | Biology                               | 4     |               |
| 0500161  | Introduction to Health Sciences       | 2     |               |
| 1426155  | General Chemistry for Health Sciences | 4     |               |

| Year I, Level 1 (Freshman), Semester 2 , Spring (17 Credits) |  |       |               |
|--|--|-------|---------------|
| Course #   | Title                                  | CrHrs | Pre-requisite |
| 0104100  | Islamic Culture                        | 3     |               |
| 0500160  | Human Anatomy and Physiology           | 4     |               |
| 1411100  | Introduction to Information Technology | 3     |               |
| 1430107  | General Physics for Health Sciences    | 4     |               |
|  | University Elective (1)                | 3     |               |

| Year 2, Level 2 (Sophomore), Semester 3, Fall (16 Credits) |                                      |       |               |
|--|--------------------------------------|-------|---------------|
| Course #   | Title                                | CrHrs | Pre-requisite |
| 0501257  | General Microbiology                 | 3     | 0500150       |
| 0506250  | Introduction to Environmental Health | 3     | -             |
| 1426215  | Organic Chemistry                    | 4     | 1426217       |
| 1440163  | Calculus for Health Sciences         | 3     | -             |
|  | University Elective (2)              | 3     |               |

| Year 2, Level 2 (sophomore), Semester 4, Spring (19 Credits) |                                       |       |               |
|--|---------------------------------------|-------|---------------|
| Course #   | Title                                 | CrHrs | Pre-requisite |
| 0503263  | Health Education and Health Promotion | 3     |               |
| 0506261  | Management of Hazardous Wastes        | 3     | 0506250       |
| 0506262  | Environmental Microbiology            | 3     | 0501257       |
| 0506263  | Water and Wastewater Sanitation       | 4     | 0506250       |
| 0506264  | Vector Control                        | 3     | 0506250       |
|  | University Elective (3)               | 3     |               |

| Year 3, Level 3 (junior), Semester 5 , Fall (18 Credits) |  |       |                         |
|--|--|-------|-------------------------|
| Course #   | Title                                  | CrHrs | Pre-requisite           |
| 0506350  | Integrated Solid Waste Management      | 3     | 0506261                 |
| 0506351  | Atmospheric Pollution                  | 3     | 0506250;<br>CO: 0506352 |
| 0506352  | Occupational Health and Safety         | 3     |                         |
| 0504252  | Biostatistics                          | 3     |                         |
| 0506353  | Environmental Pollution and Pesticides | 3     | 1426215                 |
|  | University Elective (4)                | 3     |                         |

| Year 3, Level 3 (Junior), Semester 6, Spring (17 Credits) |   |       |                         |
|---|---|-------|-------------------------|
| Course #  | Title   | CrHrs | Pre-requisite           |
| 0503263   | Epidemiology and Population Health              | 3     | 0504252                 |
| 506360  | Physical Hazards Assessment and Control         | 3     | 0506352;<br>Co: 0506361 |
| 0506361   | Environmental and Occupational Hygiene          | 3     | 0506360;<br>0506352     |
| 0506362   | Food Safety and Quality                         | 3     | 0501257                 |
| 0506364   | Environmental Health Management and Legislation | 3     | -                       |
| 0506365   | Field Training 1                                | 2     | 0506263;<br>0506352     |

| Year 4, Level 4 (Senior), Semester 7 , Fall (17 Credits) |  |       |               |
|--|--|-------|---------------|
| Course #   | Title                                    | CrHrs | Pre-requisite |
| 0500450  | Introduction to Research                 | 3     | -             |
| 0506452  | Local Environmental Issues               | 3     | -             |
| 0506454  | Risk and Environmental Impact Assessment | 3     | 0506250       |

|         |                          |   |                     |
|---------|--------------------------|---|---------------------|
| 0506455 | Environmental Toxicology | 3 | 1426215;<br>0506352 |
| 0506456 | Field Training 2         | 2 | 0506365             |
|         | Department Elective (1)  | 3 | -                   |

| Year 4, S Level 4 (Senior), Semester 8, Spring (14 Credits) |   |       |                     |
|---|---|-------|---------------------|
| Course #  | Title                                   | CrHrs | Pre-requisite       |
| 0506464   | Petroleum Pollution and the Environment | 3     | 0506352;<br>0506351 |
| 0506453   | Building and Human Habitation           | 3     | -                   |
| 0506469   | Field Training 3                        | 2     | 0506456             |
| 0506461   | Graduation Project                      | 3     | 0500450             |
|   | Department Elective (2)                 | 3     |                     |

### Course Description

Courses that are offered by the Environmental Health program are designated by the code (0506ABC) where ABC represents the year, term and sequence as described in the College Section.

### Core Courses

Descriptions of the core courses are given below.

#### **0506250 Introduction to Environmental Health 3-0-0:3**

This introductory course focuses on the interdisciplinary nature of environmental health issues. Different topics are covered including: Air and water pollution, food safety, solid and hazardous wastes management, environmental and occupational hazards. Diseases related to air and water pollution will be addressed.

#### **0506350 Integrated Solid Waste Management 3-0-0:3**

This course will enable students to understand the source, types and composition of solid waste. The steps and methods used in the integrated solid waste management will be covered. Major emphasis is placed on the application of integrated pollution control techniques. Prerequisites: Management of Hazardous wastes (0506261).

#### **0506262 Environmental Microbiology 2-3-0:3**

This course focuses on the major roles of microorganisms in the geochemistry of the earth. The students will learn about the functions and metabolism of microorganisms in marine and fresh water ecosystems, air, soil, food, oil, waste disposal, recycling and agriculture. In addition, the course provides the students with the basic laboratory techniques in isolating different micro-organisms from food, air, water and human body. Prerequisites: General Microbiology (0501257).

#### **0506263 Water and Wastewater Sanitation 3-3-0:4**

This course focuses on the physical, chemical and microbial aspects of water and wastewater. Students will understand the importance of water quality to environmental health status and appreciate the administrative framework for the protection of water sources. Water chemistry, demand, measurement techniques, aquifer characteristics and drinking water sources are discussed. It also covers the different treatment systems available for dealing with waste-water, including principles, types, appropriateness, design and loading criteria. In addition, this course enables students to gain a working knowledge of the analytical and quantitative techniques employed in water and wastewater quality monitoring and control. Proper interpretation of result and recommendations for preventive measures are emphasized. Prerequisites: Introduction to Environmental Health (0506250).

**0506264                      Vector Control                      3-0-0:3**

This course introduces vectors of public health significance. The life history, health significance and methods of identification of pests encountered are discussed, in addition to current chemical, physical, and biological control methods. Prerequisites: Introduction to Environmental Health (0506250).

**0506261                      Management of Hazardous Wastes                      3-0-0:3**

This course enables students to understand the types and the sources of the hazardous wastes. Collection, transfer and disposal of the hazardous wastes are discussed, in addition to several hazardous waste management strategies. Prerequisites: Introduction to Environmental Health (0506250).

**0506351                      Atmospheric Pollution                      3-0-0:3**

This course enables students to appreciate the importance of air quality to environmental health status. Major emphasis is placed on emission sources, characteristics of primary and secondary pollutant, ozone depletion and global warming. In addition to air pollution monitoring techniques and air quality management technologies. Prerequisites: Introduction to Environmental Health (0506250). Co- requisite: Occupational Health and Safety (0506352).

**0506352                      Occupational Health and Safety                      3-0-0:3**

This course presents an overview of the concepts of occupational health and safety with emphasis on the identification, assessment, measurement and control of hazards and risks found in the working environment. Workplace design, protective equipment, safety auditing and management systems are also discussed

**0506353                      Environmental Pollution and Pesticides 3-0-0:3**

This course enables the students to gain an appreciation of the uses of different types of pesticides and their effects on the environment and human. Control measures will also be addressed. Prerequisites: Organic Chemistry (1426217).

**0506360                      Physical Hazards Assessment and Control                      3-0-0:3**

This course provides the students with the necessary knowledge, principles and skills that enhance them to assess, evaluate and control physical hazards (Noise, Heat, Radiation, Light) as potential occupational and environmental hazards. Prerequisites: Occupational Health and Safety (0506352); Co- requisite: Environmental and Occupational Hygiene Measurement and Instrumentation (0506361).

**0506361                      Environmental and Occupational Hygiene Measurement and Instrumentation                      2-3-0:3**

This course will enable students to learn the operating principles, advantages and limitations of various types of equipment used to evaluate environmental and occupational hazards. To understand the exposure measurement and statistical error associated with. In addition, the students will be trained to use direct reading instruments. Pre- requisites: Occupational Health and Safety (0506352); Co- requisite: Physical Hazards Assessment and Control (0506360).

**0506364 Environmental Health Management and Legislations 3-0-0:3**

This course helps students to develop an awareness of the procedures of the legal system. Type, origin and purpose of national and international law are discussed. Major emphasis is placed on the framework of environmental and occupational health legislation at sub-national, national and international levels. Food quality legislation systems are thoroughly discussed. Prerequisites: None.

**0506452 Local Environmental Issues 3-0-0:3**

This course exposes the students to the interaction of the different sources of pollutants and their effects on the local ecosystems (including desert, mountains, marine and groundwater). In addition, the impact of industrial development and oil production, processing and transportation on the local environment will be covered. Co-requisite: Risk and Environmental Impact Assessment (0506454).

**0506453 Building and Human Habitation 3-0-0:3**

This course will enable the students to understand the principles of the safety of the buildings and construction and the indoor health problems. Prerequisites: None.

**0506455 Environmental Toxicology 3-0-0:3**

This course assists students to comprehend the basic concepts of environmental and occupational toxicology. It focuses on the exposure routes of pollutants, mechanisms of toxic action, metabolism, storage and excretion, target sites and pathological effects of bio-toxins, and chemical compounds (symptoms and signs). In addition to risk perception and assessment. Prerequisites: Organic Chemistry (1426215) and Occupational Health and Safety (0506352).

**0506454 Risk and Environmental Impact Assessment 3-0-0:3**

This course consists of two parts; part one, addresses the principles of risk assessment, hazards identification, evaluation, and estimation of the levels of risks involved in a situation, their comparison against standards, and determination of an acceptable level of risk. The second part of the course presents an overview of the purpose, principles and process of Environmental Impact Assessment i.e. the impact of the proposal or project on the environment and human and the application of mitigation measures. Prerequisites: 0506250.

**0506464 Petroleum Pollution and the Environment 3-0-0:3**

This course helps the students to understand the impact of petroleum exploration, production, processing, refining and transportation on the human and environment (marine and terrestrial ecosystems). Control measures and safe storage and handling will be covered. Prerequisites: atmospheric Pollution (0506351) and Occupational and safety (0506352).

**0506365 Field Training 1 0-0-6:2**

This course will offer the students the opportunity to utilize and develop competences acquired in the academic courses. The students will also benefit from the expertise of those already engaged in environmental and occupational health services. Emphasis will be placed on water and wastewater sanitation, solid and hazardous waste management, as well as occupational health and safety & atmospheric pollution. Prerequisites: Water and Wastewater Sanitation (0506263), Occupational Health and Safety (0506352)

**0506456****Field Training 2****0-0-6:2**

This course will offer the students the opportunity to utilize and develop competences acquired in the academic courses. The students will also benefit from the expertise of those already engaged in environmental and occupational health services. Emphasis will be placed on food safety and quality, occupational health and safety, and vector control. Prerequisites: Field Training 1 (0506365)

**0506469****Field Training 3****0-0-6:2**

This course will offer the students the opportunity to utilize and develop competences acquired in the academic courses. The students will also benefit from the expertise of those already engaged in environmental and occupational health services. Emphasis will be placed on public health, green buildings and developments, renewable energy, and natural habitats (land and marine). Prerequisites: Field Training 2 (0506456)

**0506461****Graduation Project****1-0-6:3**

This course provides students the opportunity to apply their research knowledge to the investigation of environmental or occupational health problems. Students will develop competence in hypothesis formulation, research methodology and analysis of laboratory or field data. Emphasis will be placed on investigating local environmental or occupational issues. Prerequisites: Introduction to Research (0500450).

**Elective Courses**

The possible elective courses offered by the Environmental Health Sciences department from which a student may choose from to satisfy the 6 credit hours electives requirements are described below.

**0506465****Occupational Accidents****3-0-0:3**

This course will enable the participants to understand the causes of occupational accidents. Emphasis will be placed on methods of investigation, analysis and prevention of occupational accidents. Prerequisites: Occupational and safety (0506352).

**0506467****Marine Ecology****3-0-0:3**

This course provides an overview of the marine environment as a habitat. Classification of the marine environment, some ecological and biological concepts including adaptation to life in the sea, living conditions on the bottom and the intertidal zone will be covered. Major emphasis will be placed on the human intervention in the sea. Prerequisites: Biology (0500150).



## Department of Clinical Nutrition & Dietetics

### Personnel

|                             |   |
|-----------------------------|---|
| <b>Chairperson</b>          | Reyad Shaker Obaid  |
| <b>Professors</b>           | Reyad Shaker Obaid, Tareq (Mohammad Ibrahim) A. H. Osaili |
| <b>Associate Professors</b> | Mo'ez Al-Islam E. Faris, Farah Naja                       |
| <b>Assistant Professors</b> | Hadia Radwan, Leila Cheikh Ismail, Hayder Hasan,          |
| <b>Lecturers</b>            | Mona Hashim   |
| <b>Clinical Tutors</b>      | Salma Abu Qiyas, Hanin Kassem, Radhiya Rashid Al Rajaby   |

### Vision

Aspires to be a recognized program for quality education, research, and community intervention in clinical nutrition and dietetics at the national and international levels.

### Mission

Prepares competent, culturally sensitive graduates with independent learning skills required for their success in the nutrition and dietetics profession that employs evidence based practice in promoting health and quality of life of the community; and fosters an appreciation of interdisciplinary collaboration, professional leadership and commitment.

### Values

Excellence, professionalism, innovation and creativity, and cultural respect and sensitivity in line with the College of Health Sciences values.

### Goals

- 1) Endorse multidisciplinary study of challenges facing society with equal emphasis on the social, human, and cultural dimension of these challenges.
- 2) Facilitate the general higher education and intellectual development within the context of the study of food, nutrition, and dietetics.
- 3) Graduate highly qualified clinical nutritionists and dietitians who will be able to work in different health care settings and collaborate with other health professionals.
- 4) Equip the students with advanced learning tools that will help them improve their life-long knowledge and skills such as self-learning, critical thinking, and evidence-based clinical learning.
- 5) Produce graduates who are capable of being change agents and leaders in society.
- 6) Prepare students to utilize research and pursue higher education to promote career advancement of the profession.

## Graduate Profile

### 1) Knowledge and understanding

1. Integrate the knowledge of food and nutrition with the knowledge of health, social sciences, communications, and management theory.
2. Ascertain food groups with respect to their composition, selection, culinary uses, and principles in preparation.
3. Elaborate the role of food processing and technology in storage, preservation, nutritive value of foods, and nutritional labeling.
4. Delineate cultural, social, psychological, and personal influences of food habits.
5. Identify the nutritional needs of people during their life span and in disease conditions.
6. Understand the principles of diet planning for individuals, groups, and communities in health and disease conditions.
7. Familiarize with the fundamentals of research findings.

### 2) Patient and population care

1. Formulate need-based dietary assessment for restoration of health.
2. Assess the nutritional status of individuals and groups.
3. Design and implement nutrition care plans for patients in line with the guidelines detailed in the international standards of clinical practice in nutrition care process.
4. Implement intervention plans, monitoring, and evaluation to promote positive health outcomes.

### 3) Communication

1. Acquire verbal and written communication skills with patients, other health care team members, and the public.
2. Develop and disseminate nutrition and health related IEC (Information, Education, Communication) appropriate for the needs of individuals or groups.
4. Implement documentation procedures (medical records) including writing and presentation skills.

### 4) Management and leadership

1. Acquire the entrepreneur traits of decision-making and problem solving.
2. Attain the quality of assigning responsibilities and delegation of tasks.
3. Foster the sensitivity towards time management.
4. Develop the characteristics of a good team worker.

### 5) Health education and community services

1. Recognize and appreciate the role of nutrition in community health.
2. Conduct nutrition education programs.
3. Participate in national, state, and/or local activities related to health and nutrition.
4. Appreciate the multidisciplinary approach in Nutrition and healthcare.

### 6) Professionalism

1. Incorporate the expertise of different sectors and their role in service delivery.
2. Apply the professional ethics in practice as Clinical Nutritionists.

### 7) Critical and creative thinking

1. Develop critical thinking competencies.
2. Appraise on the recent advances in food and nutrition

### 8) Lifelong learning:

1. Foster the development of professional consultation skills, written communications, effective patient interactions, and nutrition education for the public.
2. Exhibit traits of independent learning.
3. Interpret and incorporate new scientific knowledge to enhance practice.

### Program Learning Outcomes (PLOs):

- 1) Demonstrate awareness for the social and cultural sensitivity of the Emirate within its Islamic values and advancement.
- 2) Establish a broad understanding of the importance of economic, environmental, and cultural issues influencing food choices and nutritional status.
- 3) Possess strong foundation in health and food science.
- 4) Acquire a broad knowledge base and skills in nutritional sciences and nutrition education.
- 5) Integrate and acquire training and knowledge from fields relevant to food and nutrition sciences, such as food technology, food psychology and sociology, and health promotion and nutrition.
- 6) Develop a range of skills including knowledge of information technology, food analysis, independent learning, critical thinking, and verbal and non-verbal communication.
- 7) Design effective evidence based nutrition care plan for individual clients or patients.
- 8) Demonstrate leadership in providing effective nutritional care to clients based on the latest knowledge and changing needs of the community.
- 9) Apply the principles of nutrition and dietetics in the maintenance of health and prevention of disease in groups and individuals.
- 10) Act responsibly toward clients, self, colleagues, and community.
- 11) Integrate recent developments through research in the field of clinical nutrition.
- 12) Adhere to the ethical and social issues important to nutritional services.

### National Qualifications Framework (NQF)

The following matrix shows the alignment of the Program Learning Outcomes with the Emirates National Qualifications Framework strands.

| Outcomes  | PLO   |
|---|-------|
| <b>Knowledge</b>  |       |
| Specialized factual and theoretical knowledge, and an understanding of the boundaries in a field of work or discipline; encompassing a broad and coherent body of knowledge and concepts with substantive depth in the underlying principles and theoretical concepts | 1, 3  |
| An understanding of knowledge and theories in allied fields of work and professional disciplines including related regulations, standards, codes, and conventions   | 2     |
| Understanding of critical approach to the creation and compilation of a systematic and coherent body of knowledge and concepts gained from a range of sources   | 5     |
| A comprehensive understanding of critical analysis, research systems and methods, and evaluative problem-solving techniques   |       |
| Familiarity with sources of current and new research and knowledge with the   | 7, 11 |

|  |           |
|--|-----------|
| integration of concepts from outside fields  |           |
| <b>Skill</b>   |           |
| Technical, creative, and analytical skills appropriate to solving specific problems using evidentiary and procedural based processes in predictable and new contexts, including devising and sustaining arguments associated with a field of work or discipline. | 4, 6, 7   |
| Evaluating, selecting, and applying appropriate methods, procedures, or techniques in processes of investigation towards identified solutions.   | 8, 9      |
| Evaluating and implementing appropriate research tools and strategies associated with the field of work or discipline  | 6, 7      |
| Highly developed advanced communication and information technology skills to present, explain, and/ or review complex and unpredictable matters.   | 6, 10     |
| <b>Autonomy and responsibility</b>   |           |
| Can take responsibility for developing innovative and advanced approaches to evaluating and managing complex and unpredictable work procedures and processes, resources, or learning   | 8, 9, 11  |
| Can manage technical, supervisory, or design processes in unpredictable, unfamiliar and varying contexts   | 7, 8, 9   |
| Can work creatively and effectively as an individual in team leadership and management contexts across a range of technical and professional activities  | 8         |
| Can express internalized, personal view, accept responsibility to society at large and socio-cultural norms and relationships  | 1, 10, 12 |
| <b>Role in context</b>   |           |
| Can function with full autonomy in technical and supervisory contexts and adopt para-professional roles with little guidance   | 7, 10     |
| Can take responsibility for the setting and achievement of group or individual outcomes, and the management and supervision of the work of others or self in the case of specialization in the field of work or discipline                                       | 8, 9, 12  |
| Can participate in peer relationships with qualified practitioners and lead multiple, complex groups   | 1, 8      |
| Can take responsibility for managing the professional development and direct mentoring of individuals and groups   | 9, 7, 12  |
| <b>Self-development</b>  |           |
| Can self-evaluate, take responsibility for contributing to professional practice, and undertake regular professional development and/ or further learning  | 5, 11, 12 |
| Can manage learning tasks independently and professionally in complex and sometimes unfamiliar learning contexts   | 8, 11     |
| Can contribute to and observe ethical standards  | 10, 12    |

## Career Opportunities

Graduates from the Clinical Nutrition and Dietetics are absorbed in popular careers that include hospitals, primary health care facilities, medical centers, and clinics; food industry, food catering, and nutraceutical companies; educational institutions, research centers, media centers; social welfare organizations; and wellness clinics in public and private sectors.

## Program Overview

The Bachelor of Science degree program in Clinical Nutrition and Dietetics (CN&D) is a full-time four-year comprehensive degree program comprising of 134 credit hours from courses offered at the university, college, and department levels. The allocation of the credit hours is shown in the following table:

| BSc. in Clinical Nutrition and Dietetics (BS-CN&D) |    |    |    |       |
|--|----|----|----|-------|
|  | UR | CR | PR | Total |
| Mandatory Credits                                  | 12 | 24 | 80 | 116   |
| Elective Credits                                   | 12 | -  | 6  | 18    |
| Total  | 24 | 24 | 86 | 134   |

### I. University Requirements

The list of the 24 credit hours of University required courses and their descriptions are presented in the introductory pages of this bulletin.

### II. College Requirements

The 24 credit hours of the College required courses and their descriptions are presented in the introductory pages of the College of Health Sciences section in this bulletin.

### III. Program Requirements

This category consists of 86 credit hours of which are the 80 credit hours of mandatory courses and 6 credits of elective courses.

#### A. Core Courses

The 80 credit hours of required CN&D core courses are listed in the table below.

| Course # | Title  | CrHrs | Pre-requisite |
|----------|--|-------|---------------|
| 0501257  | General Microbiology                           | 3     | 0500150       |
| 0501260  | Biochemistry                                   | 3     | 1426155       |
| 0503263  | Health Education and Health Promotion          | 3     |               |
| 0503462  | Ethical and Legal Issues in Health Professions | 3     |               |
| 0504362  | Epidemiology and Population Health             | 3     | 0504252       |
| 0507250  | Introduction to Nutrition                      | 3     | 0500160       |
| 0507260  | Macro and Micro Nutrients                      | 3     | 0507250       |
| 0507261  | Principles of Food Science                     | 3     | Co: 0501260   |
| 0507262  | Food Psychology and Sociology                  | 3     | 0507250       |
| 0507263  | Food Microbiology                              | 3     | 0501257       |
| 0507350  | Nutrition Assessment                           | 4     | 0507260       |
| 0507351  | Food Processing and Preparation                | 4     | 0507261       |

|         |   |   |                         |
|---------|---|---|-------------------------|
| 0507352 | Nutrition in the Life Cycle                 | 3 | 0507260; 0507250        |
| 0507353 | Pediatric Nutrition                         | 3 | 0507260; Co:<br>0507352 |
| 0507360 | Medical Nutrition Therapy (1)               | 3 | 0507350; 0507352        |
| 0507361 | Diet Planning and Disease (1)               | 3 | Co: 0507260             |
| 0507362 | Clinical Nutrition Practicum 1A             | 3 | 0507350; Co:<br>0507361 |
| 0507450 | Medical Nutrition Therapy (2)               | 3 | 0507360; Co:<br>0507451 |
| 0507451 | Diet Planning and Disease (2)               | 3 | 0507361;<br>Co:0507450  |
| 0507452 | Clinical Nutrition Practicum 2A (Community) | 3 | 0503263                 |
| 0507453 | Practical Food Analysis                     | 2 | 0507351                 |
| 0507460 | Food Service Management                     | 3 | 0507263                 |
| 0507461 | Nutrition Project                           | 3 | 0500450                 |
| 0507462 | Clinical Nutrition Practicum 3A             | 6 | 0507451                 |
| 1426217 | Organic Chemistry for Health Sciences       | 4 | 1426155                 |

### B. Department elective courses

Students may choose two courses encompassing six credit hours as required electives. The list of possible courses to choose from is given in the table below. The list includes courses offered by the CN&D program and other departments. Students should be aware that not all of the courses on the list will be available every semester.

| Course # | Title                                      | CrHrs | Pre-requisite |
|----------|--|-------|---------------|
| 0503261  | Psychosocial Aspects in Health Professions | 3     |               |
| 0506362  | Food Safety and Quality                    | 3     | 0501257       |
| 0507400  | Advanced Human Nutrition and Metabolism    | 3     | 0507352       |
| 0507402  | Nutrition Counseling and Communication     | 3     | 0503263       |
| 0507437  | Sports Nutrition                           | 3     | 0507350       |

### Study Plan

The Bachelor of Science in Clinical Nutrition and Dietetics program encompasses 134 credits hours that are spread over eight semesters and could be completed in four years. The following distribution of courses by semester facilitates student's normal progression through the study plan.

| Year I, Level 1 (Freshman), Semester 1, Fall (16 Credit Hours) |                                       |         |               |
|--|---------------------------------------|---------|---------------|
| Course #   | Course Title                          | Cr-Hrs. | Prerequisites |
| 0201102  | Arabic Languages                      | 3       |               |
| 0202121  | English for Medical Sciences          | 3       |               |
| 0500150  | Biology                               | 4       |               |
| 0500161  | Introduction to Health Sciences       | 2       |               |
| 1426155  | General Chemistry for Health Sciences | 4       |               |

| Year 1, Level 1 (Freshman), Semester 2, Spring (17 Credit Hours) |  |         |               |
|--|--|---------|---------------|
| Course #   | Course Title                           | Cr-Hrs. | Prerequisites |
| 0104100  | Islamic Culture                        | 3       |               |
| 0500160  | Human Anatomy and Physiology           | 4       |               |
| 1411100  | Introduction to Information Technology | 3       |               |
| 1430107  | General Physics for Health Sciences    | 4       |               |
|  | University Elective (1)                | 3       |               |

| Year 2, Level 2 (Sophomore), Semester 3, Fall (16 Credit Hours) |                                       |         |               |
|---|---------------------------------------|---------|---------------|
| Course #  | Course Title                          | Cr-Hrs. | Prerequisites |
| 0504252   | Biostatistics                         | 3       |               |
| 0507250   | Introduction to Nutrition             | 3       | 0500160       |
| 0501257   | General Microbiology                  | 3       | 0500150       |
| 1426217   | Organic Chemistry for Health Sciences | 4       | 1426155       |
|   | University Elective (2)               | 3       |               |

| Year 2, Level 2 (Sophomore), Semester 4, Spring (18 Credit Hours) |                               |         |               |
|---|-------------------------------|---------|---------------|
| Course #  | Course Title                  | Cr-Hrs. | Prerequisites |
| 0501260   | Biochemistry                  | 3       | 1426155       |
| 0507260   | Macro and Micro Nutrients     | 3       | 0507250       |
| 0507261   | Principles of Food Science    | 3       | Co: 0501260   |
| 0507262   | Food Psychology and Sociology | 3       | 0507250       |
| 0507263   | Food Microbiology             | 3       | 0501257       |
|   | University Elective (3)       | 3       |               |

| Year 3, Level 3 (Junior), Semester 5 , Fall (17 Credit Hours) |                                 |         |                      |
|---|---------------------------------|---------|----------------------|
| Course #  | Course Title                    | Cr-Hrs. | Prerequisites        |
| 0507350   | Nutrition Assessment            | 4       | 0507260              |
| 0507351   | Food Processing and Preparation | 4       | 0507261              |
| 0507352   | Nutrition in the Life Cycle     | 3       | 0507250; 0507260     |
| 0507353   | Pediatric Nutrition             | 3       | 0507260; Co: 0507352 |
|   | University Elective (4)         | 3       |                      |

| Year 3, Level 3 (Junior), Semester 6 , Spring (18 Credit Hours) |                                       |         |                  |
|---|---------------------------------------|---------|------------------|
| Course #  | Course Title                          | Cr-Hrs. | Prerequisites    |
| 0503263   | Health Education and Health Promotion | 3       |                  |
| 0504362   | Epidemiology and Population Health    | 3       | 0504252          |
| 0507360   | Medical Nutrition Therapy (1)         | 3       | 0507350; 0507352 |

|         |                                 |   |                         |
|---------|---------------------------------|---|-------------------------|
| 0507361 | Diet Planning and Disease (1)   | 3 | Co: 0507360             |
| 0507362 | Clinical Nutrition Practicum 1A | 3 | 0507350; co:<br>0507361 |
|         | Department Elective (1)         | 3 |                         |

| Year 4, Level 4 (Senior), Semester 7 , Fall (17 Credit Hours) |  |         |                         |
|---|--|---------|-------------------------|
| Course #  | Course Title                                   | Cr-Hrs. | Prerequisites           |
| 0500450   | Introduction to Research                       | 3       | 0504252                 |
| 0507450   | Medical Nutrition Therapy (2)                  | 3       | 0507360; Co:<br>0507451 |
| 0507451   | Diet Planning and Disease (2)                  | 3       | 0507361; Co:<br>0507450 |
| 0507452   | Clinical Nutrition Practicum 2A<br>(Community) | 3       | 0503263                 |
| 0507453   | Practical Food Analysis                        | 2       | 0507351                 |
|   | Department Elective (2)                        | 3       |                         |

| Year 4, S Level 4 (Senior), Semester 8, Spring (15 Credit Hours) |  |         |               |
|--|--|---------|---------------|
| Course #   | Course Title                                   | Cr-Hrs. | Prerequisites |
| 0503462  | Ethical and Legal Issues in Health Professions | 3       |               |
| 0507460  | Food Service Management                        | 3       | 0507263       |
| 0507461  | Nutrition Project                              | 3       | 0500450       |
| 0507462  | Clinical Nutrition Practicum 3A                | 6       | 0507451       |

### Course Descriptions

The courses that are offered by the Department of Clinical Nutrition and Dietetics are designated by the code (0507ABC), where ABC represents the year, term, and sequence as described in the College Section.

### Core Courses

Descriptions of the core courses are given below.

#### 0507250 Introduction to Nutrition 3-0-0:3

This course is a preface to food and nutrition and the role of dietitians in promoting a healthy lifestyle. The students are oriented towards the basic principles of essential nutrients including their sources, digestion, absorption, functions, and requirements. Issues of food safety as part of nutritional concern will also be tackled. Prerequisite: 0500160 - Human Anatomy and Physiology.

#### 0507260 Macro and Micro Nutrients 3-0-0:3

This course offers a study of energy need components, their metabolism and general chemical characteristics as well as the function of proteins, carbohydrates, lipids, vitamins, and minerals. It also addresses other emerging nutritional factors related to human health and diseases. Prerequisite: 0507250 - Introduction to Nutrition.



**0507261 Principles of Food Science 3-0-0:3**

This course deals with current issues associated with food constituents, structure-function relationships of water, proteins, lipids, carbohydrates, minerals in food systems. The study of the various food groups with respect to their classification, quality, physical and chemical characteristics. It emphasizes the food deterioration and spoilage, food law and regulations, methods used to preserve foods, and food additives. Co-requisite: 0501260 - Biochemistry.

**0507262 Food Psychology and Sociology 3-0-0:3**

This course explores the factors that affect attitudes and decisions about food; examines current issues of body image and food marketing. It focuses on the beliefs of different cultures in terms of food and nutritional values. The ways in which physical and social changes as well as public attitudes affect today's patterns of food consumption and food behavior are addressed.

Prerequisite: 0507250 - Introduction to Nutrition

**0507263 Food Microbiology 2-3-0:3**

This course emphasizes the important groups of microorganisms associated with food quality, safety, processing, spoilage, and fermentations; primary sources of microorganisms found in foods; factors (intrinsic and extrinsic) related to microbial growth; and control of food-transmitted pathogens and minimizing public health risks. Practical training is combined to equip the students with the skills of applying the basic procedures for sample preparation and to determine the microbial quality of different food products; Enumeration of different types of microorganisms in food using general and selective culture media. Prerequisite: 0501257 - General Microbiology.

**0507350 Nutrition Assessment 3-3-0:4**

This course provides an introduction to the nutritional assessment as part of the nutrition care process. It orients the students to the basic aspects of nutritional assessment systems. It emphasizes the theoretical knowledge and practical skills in different aspects of nutritional assessment: anthropometric, laboratory, clinical, dietary assessments and includes an evaluation of their strengths and limitations. The laboratory sessions employ the active application of tools and techniques used for the assessment of nutritional status. Prerequisite: 0507260 - Macro and Micronutrients.

**0507351 Food Processing and Preparation 3-3-0:4**

This course covers food technology and processing. It provides information about cooking techniques, including dry methods (roasting, baking, grilling, and frying); wet methods (boiling, poaching, steaming, and stewing) and microwave cooking. It enables students to understand the presented cooking methods of different food groups and the preservation techniques to prevent spoilage of food, including freezing, dehydration, use of sugars, use of acids, heat processing, and canning. Practical training is combined to equip the students with the skills and scientific application of food preparation. Prerequisite: 0507261- Principles of Food Science.

**0507352 Nutrition in the Life Cycle 3-0-0:3**

This course covers basic nutritional issues from preconception throughout life, pregnancy and lactation, infant, adolescent, adulthood, and elderly. It deals with identifying nutrient needs and discusses human nutrition from both physiological and psychosocial perspectives. It considers factors that affect growth and development and the aging process. Prerequisites: 0507250 - Introduction to Nutrition; 0507260 - Macro and Micronutrients.

**0507353                      Pediatric Nutrition                      3-0-0:3**

The course focuses on the interrelationships of growth and development of the infant/child with nutritional status in health and disease. Nutrition for health promotion; effects of malnutrition, nutrient needs, feeding strategies, disease, and demographics on nutritional status and pathophysiology of growth and development along with their effect on organ systems are included. Prerequisite: 0507260 - Macro and Micronutrients; Co-requisite: 0507352 - Nutrition in the Life Cycle.

**0507360                      Medical Nutrition Therapy (1)                      3-0-0:3**

This course orients the students to the Nutrition Care Process in the clinical setting. It focuses on the study of advanced medical nutrition therapy for specific disease conditions such as digestive disorders, liver diseases, diabetes mellitus, obesity, oral health, and metabolic disorders. Prerequisites: 0507350 - Nutrition Assessment -0507352 - Nutrition in Life Cycle.

**0507361                      Diet Planning and Disease (1)                      3-0-0:3**

This course provides advanced study of evidence-based nutrition principles and clinical recommendations for the prevention and treatment of digestive disorders, diabetes mellitus, obesity, oral health, and metabolic disorders. It develops the skills of the students of diet planning in health and disease to practice in clinical settings. Co-requisite: 0507360 - Medical Nutrition Therapy (1).

**0507362                      Clinical Nutrition Practicum 1A                      0-0-9:3**

This course is designed to emphasize the importance of nutrition in maintaining health and wellness. The students are acquainted with the nutrition care process and the application of nutrition assessment tools on individuals in clinical training. The effectiveness of the therapeutic diet as related to specific diseases such as gastroenterological disorders, diabetes, cardiovascular disease, obesity is examined. Students are familiarized with the application of dietary modification by diet writing/menu marking in the clinical setting. Prerequisites: 0507350 - Nutrition Assessment; Co-requisite: 0507361 - Diet Planning and Disease (1).

**0507450                      Medical Nutrition Therapy (2)                      3-0-0:3**

This course covers the pathophysiology as well as the advanced principles of medical nutrition therapy of certain diseases such as cardiovascular diseases, metabolic stress, renal disease, and more complicated medical conditions including, cancer, HIV infection, AIDS, specific disease conditions such as stress and trauma. Prerequisite: 0507360  
- Medical Nutrition Therapy (1); Co-requisite: 0507451 - Diet Planning and Disease (2).

**0507451                      Diet Planning and Disease (2)                      3-0-0:3**

This course focuses on the application of evidence-based nutrition care process in the management of coronary heart diseases, renal diseases, cancer, HIV, and other critical conditions with special emphasis on individualized nutrition support. The advanced course is designed to equip students with professional skills in diet planning for clinical settings. Prerequisite: 0507361 - Diet Planning and Disease (1); Co-requisite: 0507450 - Medical Nutrition Therapy (2).

**0507452                      Clinical Nutrition Practicum 2A (Community)                      0-0-9:3**

This course comprises of application of the principles of nutrition assessment and development of the nutrition education plan as a component of health care for individuals and groups in a community health care setting. It is an introduction to nutrition-related diseases in terms of cause and treatment, prevention, and rehabilitation. The emphasis is on the application of knowledge and skills in the areas

of wellness and healthy eating lifestyles promotion, nutrition education, program planning, and evaluation and client care and support. The aim of this course is to enable students to utilize the knowledge and skills gained through other courses in working with clients, individuals, families, and communities as they assess and intervene to practice health-enhancing activities. Prerequisite: 0503263 - Health Education and Health Promotion.

**0507453                      Practical Food Analysis                      1-3-0:2**

This course introduces the students to the methods of food analysis, their use, and their limitations. Procedures and instruments for the analysis of specific chemicals and food components are described. Practical training focuses on the analysis of various food groups for their major and minor food components. Prerequisite: 0507351 - Food Processing and Preparation.

**0507460                      Food Service Management                      3-0-0:3**

This course illustrates the functions of foodservice operations such as menu planning, purchasing, storage, production, and service. It reviews the principles of cleaning, sanitation, personal hygiene, and safety practices in foodservice facilities like the implementation of HACCP program. It provides students with an insight into the design, operation, management, and evaluation of institutional and commercial foodservice facilities. Applications for menu management and recipe writing are discussed. The course also covers the application of dietary advice by focusing on menu management, design, and recipes in order to ensure that advice about diet is practical. It allows students to reflect on their nutritional knowledge and eating patterns to manage, plan, and analyze a range of meals suitable for the maintenance of good health. Prerequisite: 0507263 - Food Microbiology.

**0507462                      Clinical Nutrition Practicum 3A                      0-0-18:6**

This course provides students with insights into the principles and practices of clinical nutrition. The students are familiarized with the role of nutrients in the pathogenesis of the chronic disease, and nutrition in the management of certain disease state, such as cardiovascular disease, metabolic stress, and renal disease. Students are also introduced to parenteral nutrition support in stress and trauma and the management of specific disease conditions such as cancer, HIV infection, and AIDS. The selective clinical setting provides an opportunity for students to pursue personal learning objectives and concepts relevant to their role as practitioners, educators. Prerequisite: 0507451 - Diet Planning and Disease (2).

**0507461                      Nutrition Project                      3-0-0:3**

This course comprises the application of the knowledge of research methods in a nutrition situation. Each student develops a specific study design on a selected nutrition-related topic under the supervision of a faculty and implements, analyzes, interprets the findings, and submits a project report. Prerequisite: 0500450 - Introduction to Research.

**Elective Courses**

Descriptions of the elective courses are given below.

**0507400                      Advanced Human Nutrition and Metabolism                      3-0-0:3**

This course focuses on the historical perspectives of nutrition, critical evaluation of the methodology of nutrient estimation, and derivation of requirements of specific nutrients. It encompasses the advanced study of macronutrient metabolism in health and disease. It also includes the topics on nutritional management in special conditions like high altitudes, astronauts, stress, extreme temperatures; nutrition and immunity, and updates in current nutrition issues. Prerequisite: 0507352 - Nutrition in the Life Cycle.

**0507405                      Nutrition Counseling and Communication                      3-0-0:3**

This course focuses on the understanding and acquisition of communication skills in interpersonal and counseling contexts. The identification and development of specific communication skills that are essential in clinical practice and professional environment will be emphasized in order to establish a theoretical framework for the application of communication skills in an effective counseling process. Prerequisite: 0503263 - Health Education and Health Promotion

**0507437                      Sports Nutrition                      3-0-0:3**

This course gives knowledge related to food, nutrition, healthy eating, and how to maximize sports performance. Prerequisite: 0507350 - Nutrition Assessment.

# College of Law

## COLLEGE OF LAW

### Officers of the College

|                             |  |
|-----------------------------|--|
| <b>Prof. Adnan Sirhan</b>   | <b>Acting Dean</b>                       |
| <b>Dr. Ahmad Farah</b>      | <b>Vice Dean</b>                         |
| <b>Dr. Simon Badran</b>     | <b>Head of Department of Public Law</b>  |
| <b>Dr. Mourad Benseghir</b> | <b>Head of Department of Private Law</b> |

### Personnel

#### Department of Private Law

|                             |   |
|-----------------------------|---|
| <b>Professors</b>           | Imad Al Din Ahmad, Adnan Sirhan, Ali Al Mehdawe, Sayed Ahmad, Salih Al luhaibi, Rasha Hattab.   |
| <b>Associate Professors</b> | Bakr Al-Serhan, Usama El Rouby, Ali Torki, Ala'a Al naimi, Ahmad Farah, Mudhafar Al Rawi, Mahmoud Fayyad, Mohamed Sadat, Nada Al Fil, Bashar Al Momani, Muayad Obeidat, Mohammed Morsi, Ayman Zain. |
| <b>Assistant Professors</b> | Aouatef Zerara, Mourad Benseghir, Eman Naboush, Philip De Man, Maamar Bentria, Munira Mohd (Visitor), Maryam Al Sandal (Visitor).   |

#### Department of Public Law

|                             |  |
|-----------------------------|--|
| <b>Professors</b>           | Mohammad Shallal Alani, Sam Dalla, Faysal Benhalilou, Wael Allam, Abdullellah Al Nawayseh, Noaman Atallah.   |
| <b>Associate Professors</b> | Manal Monajjed, Zaid Ali, Mustafa Salim, Ahmed Hayajneh, Mohammed Noureldeem, Ahcene Rabhi, Shadi Alshdaifat, Saleh Al Shraideh, Amira Abdallah (Visitor), Ma'moun Abuzeitoun, Esam Al obeidi. |
| <b>Assistant Professors</b> | Khalid Dganni, Ahmed Abdelsabour, Smain labadi, Safwan Maqsood, Simon Badran, Muna Al Wasmi, Nouf Aljasmi, Halima Al-Midfa (Visitor).  |

### Administrative Support Staff

|                    |                                 |
|--------------------|---------------------------------|
| Bahiya Ismail      | Senior Administrative Assistant |
| Hala Mohammed      | Administrative Assistant        |
| Amna Shemal        | Student Service Officer         |
| Safa AbdulKader    | Administrative Assistant        |
| Manal Mirza        | Student Service Officer         |
| Abdulrahman Zainal | Administrative Assistant        |
| Mouza Saif         | Part time                       |
| Safiya Mohamed     | Part Time                       |
| Jamila Ali         | Administrative Assistant        |
| Nora Mousa         | Administrative Assistant        |

#### Contact Information:

College of Law, Building, M2  
University City, Sharjah, UAE

Tel: 00971-6-5050211

Fax: 00971-6-5050212

[www.sharjah.ac.ae/ar/acadimics/colleges/law/pages/default.aspx](http://www.sharjah.ac.ae/ar/acadimics/colleges/law/pages/default.aspx)

## History

The College of Law was established in 2001 to meet the demands of local and regional communities for qualified legal professionals holding bachelor degrees in law. Over time, the College has expanded its programs to offer the master program in private law in the fall of 2004-2005 and the master program in public Law in the spring of 2005-2006.

In view of the increasing demand from those wishing to study law, the University has established a branch in Khorfakkan in the fall of 2007/2008, then another branch in Kalba in the fall of 2010/2011, and a third branch in Al Dhaid fall 2015/2016.

The College of Law continued to expand its programs in order to achieve its objectives in the graduation of professional and specialized academic elements. The PhD program in Law (Public Law and Private Law) was established in Fall 2011/2012 and the Master's Program in Air and Space Law was established in 2018/2019. The number of students enrolled in the college has continued to rise significantly until the beginning of the academic year 2020/2021

## Accreditation

All programs offered at the College of Law are accredited by the UAE's Ministry of Education (MOE).

## Vision

Our vision is to be a prominent scientific and research hub nationally, regionally and internationally, and to offer distinguished legal education and scientific research directed to the community service.

## Mission

Our mission is to prepare legal competencies empowered theoretically and practically to compete in the local, regional and global labor market, and to contribute effectively through scientific research in developing legal sciences and disseminating them to individuals and institutions of the society.

## Goals

The College of Law strives to achieve the following goals:

- 1) Creating a sustainable teaching and learning environment that encourages creativity.
- 2) Meeting the development needs of the country and the region by preparing high caliber legal cadres.
- 3) Supporting scientific research and directing it towards the needs of the community.
- 4) Linking to the movement of legal development at the regional and global levels.
- 5) Gaining an advanced position among law schools in the world.
- 6) Actively participating in the community services and cooperating with community institutions and various business sectors to sustain development.

## Learning outcomes of the program

- 1) Know the basic concepts and rules of law.
- 2) Understand legal concepts and ideas.
- 3) Apply legal rules on facts.
- 4) Balances between legislative, judicial and jurisprudential trends.
- 5) Analyze legal texts, judicial rulings, and jurisprudential trends.
- 6) Prepare legal and research work.
- 7) Evaluate legal texts, judicial and jurisprudential rulings.

### **Job opportunities**

The law is characterized by a wide field of application, as it finds a place for it in all governmental and private agencies of all their diversity, and accordingly, the law graduate enjoys more job opportunities, and we can define the most prominent actors in which the graduate can work as follows:

- 1) State courts as judges, judicial employees, notaries and enforcers.
- 2) The Public Prosecution as prosecutors.
- 3) Legal departments in the various ministries as legal advisors.
- 4) The Central Bank and banks operating in the country and other financial institutions.
- 5) Advocacy.
- 6) Private companies as legal advisors.

### **Academic Programs**

The College of Law offers the following Academic Programs:

- 1) Bachelor in Law.
- 2) Master in Private Law.
- 3) Master in Public Law.
- 4) Master in Air and Space Law.
- 5) Doctor of Philosophy in Law – Private Law.
- 6) Doctor of Philosophy in Law- Public Law.

The Majority of programs offered by the College of Law are taught in Arabic. The Bachelor program are described in the Arabic version of the University undergraduate bulletin. The Master and Ph.D. programs are described in the University Graduate bulletin. The Master in Air and space law is offered in English.

### **Admission Requirements**

Admission to the College of Law is subject to satisfying the requirements described in the Admissions section in the University part of this bulletin. Please refer to that section for more details.



## **Study Plan for the Bachelor of Law 2017-2021**

### **Graduation Requirements**

The Bachelor of Law degree program comprises 126 credits distributed in three categories: University requirements (UR), college requirements (CR), and program requirements (PR). The credit hours allocations in each category are listed in the following table:

| <b>Bachelor of Law (126 Credits Hours)</b> |           |            |              |
|--|-----------|------------|--------------|
|  | <b>UR</b> | <b>CR</b>  | <b>Total</b> |
| <b>Mandatory Credits</b>                   | <b>15</b> | <b>93</b>  | <b>108</b>   |
| <b>Elective Credits</b>                    | <b>9</b>  | <b>9</b>   | <b>18</b>    |
| <b>Total</b>                               | <b>24</b> | <b>102</b> | <b>126</b>   |

The bachelor's degree program comprises (126) credit hours of study including the following:

- (24) credit hours of University requirements that include (12) compulsory credit hours and (12) credit hours of elective courses.
- (102) credit hours of College requirements that include (93) compulsory credit hours and (9) credit hours of elective courses.

### **\* Compulsory University Requirements: (12) Credit Hours**

| <b>Course No</b> | <b>Course Name</b>                        | <b>Credit Hours</b> |
|------------------|---|---------------------|
| 0104100          | Islamic Culture                           | 3                   |
| 0201102          | Arabic Language                           | 3                   |
| 0202111          | Basic English Language                    | 3                   |
| 1411101          | Information Technology in Arabic Language | 3                   |
| 0302200          | Fund. of Innovation & Entrep.             | 3                   |

### **\* Elective University Requirements: (09) Credit Hours**

**\* Important Notice:** The student shall select only one course from each of the following three groups

| Group : UG-UNIVERSITY-LAW-<br>Elective Select 3 Credits |   |   |
|---|---|---|
| 0203100   | Islamic Civilization                                | 3 |
| 0602246   | Human Rights in Islam and International Conventions | 3 |
| 0201140   | Introduction to Arabic Literature                   | 3 |
| 0203200   | History of Sciences among Muslims                   | 3 |
| 0203102   | History of the Arabian Gulf                         | 3 |
| 0900107   | History of Medical & Health Sciences                | 3 |
| 0710109   | Arts & Medicine                                     | 3 |
| Group : UG-UNIVERSITY-LAW-<br>Elective Select 3 Credits |   |   |
| 1430101   | Astronomy and Space Sciences                        | 3 |
| 0401142   | Man and the Environment                             | 3 |
| 0505101   | Fitness and Wellness                                | 3 |
| 0507101   | Health Care and Nutrition                           | 3 |
| Group : UG-UNIVERSITY-LAW-<br>Elective Select 3 Credits |   |   |
| 0206102   | Fundamentals of Islamic Education                   | 3 |
| 0204102   | UAE Society   | 3 |
| 0206103   | Introduction to Psychology                          | 3 |
| 0302120   | Introduction to Business Administration             | 3 |
| 0800107   | Media in Modern Societies                           | 3 |
| 0301131   | Personal Finance                                    | 3 |
| 0104130   | Jurisprudence of the Prophetic Biography            | 3 |

### **Compulsory and Elective Law Requirements:**

#### **First: Compulsory Law Requirements (93 credit hours):**

| Course No. | Course Name                   | Semester | Credit Hours | Theoretical | Practical | Prerequisite                 | Course No. |
|------------|-------------------------------|----------|--------------|-------------|-----------|------------------------------|------------|
| 0601110    | Legal Research Methods        | 1 + 2    | 1            | <b>1</b>    | -         | -                            | -          |
| 0601111    | Introduction to Law           | 1 + 2    | 3            | <b>3</b>    | -         | -                            | -          |
| 0601112    | Sources of Obligation (1)     | 1 + 2    | 3            | <b>3</b>    | -         | Introduction to Law          | 0601111    |
| 0601213    | Sources of Obligation (2)     | 1 + 2    | 3            | <b>2</b>    | <b>2</b>  | Sources of Obligation (1)    | 0601112    |
| 0601214    | Rules of Obligations          | 1 + 2    | 3            | <b>3</b>    | -         | Sources of Obligation (2)    | 0601213    |
| 0601315    | Labor Law and Social Security | 1        | 3            | <b>3</b>    | -         | Sources of Obligation (2)    | 0601213    |
| 0601312    | Nominate Contracts (1)        | 2        | 3            | <b>3</b>    | -         | Rules of Obligation          | 0601214    |
| 0601417    | Real Rights (Right in Rem)    | 2        | 3            | <b>3</b>    | -         | Nominate Contracts (1)       | 0601312    |
| 0601321    | Civil Procedures              | 1        | 3            | <b>2</b>    | <b>2</b>  | Rules of Obligation          | 0601214    |
| 0601422    | Execution Procedures          | 2        | 3            | <b>3</b>    | -         | Law of Civil Procedures      | 0601321    |
| 0601423    | Private International Law     | 2        | 3            | <b>2</b>    | <b>2</b>  | Rules of Obligation          | 0601214    |
| 0601131    | Principles of Commercial Law  | 1 + 2    | 3            | <b>3</b>    | -         | Introduction to Law          | 0601111    |
| 0601232    | Company Law                   | 2        | 3            | <b>2</b>    | <b>2</b>  | Principles of Commercial Law | 0601131    |

|         |  |       |   |   |   |  |                    |
|---------|--|-------|---|---|---|--|--------------------|
| 0601333 | Banking Transactions                     | 1     | 3 | 3 | - | Principles of Commercial Law + Sources of Obligation (1) | 0601131<br>0601112 |
| 0601434 | Maritime Law                             | 1     | 3 | 3 | - | Principles of Commercial Law + Sources of Obligation (2) | 0601131<br>0601213 |
| 0602141 | Constitutional Law and Political Systems | 1 + 2 | 3 | 3 | - | -  | -                  |
| 0602242 | Administrative Law (1)                   | 2     | 3 | 3 | - | Introduction to Law                                      | 0601111            |
| 0602343 | Administrative Law (2)                   | 1     | 3 | 2 | 2 | Administrative law (1)                                   | 0602242            |
| 0602347 | Public Finance and Financial Legislation | 1     | 3 | 3 | - | Introduction to Law                                      | 0601111            |
| 0602245 | Legal Studies in English                 | 2     | 3 | 3 | - | Introduction to Law + Basic English Language             | 0601111<br>0202111 |
| 0602244 | Public International Law                 | 2     | 3 | 3 | - | Legal Studies in English                                 | 0602245            |
| 0602151 | Penal Law: General Part (1)              | 1 + 2 | 3 | 2 | 2 | Introduction to Law                                      | 0601111            |
| 0602252 | Penal Law: General Part (2)              | 1 + 2 | 3 | 3 | - | Penal Law: General Part (1)                              | 0602151            |
| 0602353 | Penal Law: Private Part (1)              | 1     | 3 | 3 | - | Penal Law: General Part (2)                              | 0602252            |
| 0602454 | Criminal Procedures                      | 1     | 3 | 2 | 2 | Penal Law: Private Part (1)                              | 0602353            |
| 0602461 | Graduation Research                      | 2     | 3 | 3 | - | Completion of 105 Credit Hours                           |                    |
| 0602460 | Internal Practical Training              | 1 + 2 | 1 | - | 2 | Civil Procedures or Criminal Procedures                  | 0601321<br>0602454 |

|         |  |                 |   |   |   |   |                    |
|---------|--|-----------------|---|---|---|---|--------------------|
| 0602463 | External Practical Training            | Summer Semester | 1 | - | - | Civil Procedures or Criminal Procedures | 0601321<br>0602454 |
| 0103105 | Introduction to Islamic Jurisprudence  | 1 + 2           | 3 | 3 | - | -                                       | -                  |
| 0103223 | Jurisprudence of Marriage and Divorce  | 1               | 3 | 3 | - | Introduction to Islamic Jurisprudence   | 0103105            |
| 0103325 | Jurisprudence of Inheritance and Wills | 2               | 3 | 3 | - | Introduction to Islamic Jurisprudence   | 0103105            |
| 0103110 | Science of Fundamental Jurisprudence   | 1               | 3 | 3 | - | Introduction to Islamic Jurisprudence   | 0103105            |
| 0308150 | Introduction to Economic Science       | 1               | 3 | 3 | - | -                                       | -                  |

**Second: Elective Courses: (9 Credit Hours):**

- Student should select three courses of the following:

| Course No. | Course Name                                   | Credit hours | Prerequisite                 | Course No. |
|------------|---|--------------|------------------------------|------------|
| 0104120    | Introduction to Sciences of Qur'an and Sunnah | 3            | -                            | -          |
| 0601310    | Consumer Protection Law                       | 3            | Rules of Obligation          | 0601214    |
| 0601313    | Nominate Contracts (2)                        | 3            | Nominate Contracts (1)       | 0601312    |
| 0601318    | Intellectual Property                         | 3            | Sources of obligation(2)     | 0601213    |
| 0601319    | Legal Regulation of E-Commerce                | 3            | Nominate Contracts(1)        | 0601312    |
| 0601335    | Commercial Bankruptcy                         | 3            | Company Law                  | 0601232    |
| 0601336    | Negotiable Instruments                        | 3            | Principles of Commercial Law | 0601131    |
| 0601337    | International Commercial Arbitration          | 3            | Law of Civil Procedures      | 0601321    |

|         |                                  |   |  |                     |
|---------|----------------------------------|---|--|---------------------|
| 0601420 | Aviation Law                     | 3 | Principles of Commercial Law + Sources of Obligation (2) | 0601131+<br>0601213 |
| 0601440 | Commercial Contracts             | 3 | -  | -                   |
| 0602256 | Criminology and Penology         | 3 | -  | -                   |
| 0602320 | Special Penal Legislations       | 3 | Penal Law:<br>General Part (2)                           | 0602252             |
| 0602345 | International Organizations      | 3 | Introduction to Law                                      | 0601111             |
| 0602346 | Environment Protection Law       | 3 | Introduction to Law                                      | 0601111             |
| 0602355 | Penal Law: Private Part (2)      | 3 | Penal Law:<br>General Part (1)                           | 0602151             |
| 0602356 | Selected Topics in Legal Studies | 3 | Introduction to Law                                      | 0601111             |

### Advisory Plan for the Bachelor of Law 2017-2021

#### First Year:

##### Fall Semester

| Course No | Course Name                               | Semester | Prerequisite | Course No. | Credit Hours |
|-----------|---|----------|--------------|------------|--------------|
| 0104100   | Islamic Culture                           | 1+2      | -            | -          | 3            |
| 0201102   | Arabic Language                           | 1+2      | -            | -          | 3            |
| 0202111   | Basic English Language                    | 1+2      | -            | -          | 3            |
| 1411101   | Information Technology in Arabic Language | 1+2      | -            | -          | 3            |
| 0601110   | Legal Research Methods                    | 1+2      | -            | -          | 1            |
| 0601111   | Introduction to Law                       | 1+2      | -            | -          | 3            |
| 0103105   | Introduction to Islamic Jurisprudence     | 1+2      | -            | -          | 3            |

##### Spring Semester

| Course No | Course Name                              | Semester | Prerequisite        | Course No. | Credit Hours |
|-----------|--|----------|---------------------|------------|--------------|
| 0602141   | Constitutional Law and Political Systems | 1+2      | -                   | -          | 3            |
| 0601131   | Principles of Commercial Law             | 1+2      | Introduction to Law | 0601111    | 3            |
| 0601112   | Sources of Obligation (1)                | 1+2      | Introduction to Law | 0601111    | 3            |
| 0602151   | Penal Law: General Part (1)              | 1+2      | Introduction to Law | 0601111    | 3            |

**Second Year:**

**Fall Semester**

| Course No | Course Name                             | Semester | Prerequisite                          | Course No.        | Credit Hours |
|-----------|---|----------|---------------------------------------|-------------------|--------------|
| 0601213   | Sources of Obligation (2)               | 1+2      | Sources of Obligation (1)             | 0601112           | 3            |
| 0602252   | Penal Law: General Part (2)             | 1+2      | Penal Law: General Part (1)           | 0602151           | 3            |
| 0602245   | Legal Studies in English                | 2        | Introduction to Law + Basic English   | 0601111 + 0202111 | 3            |
| 0103223   | Jurisprudence of Marriage and Divorce   | 1        | Introduction to Islamic Jurisprudence | 0103105           | 3            |
| 0301150   | Principles of Economics                 | 1        | -                                     | -                 | 3            |
| -         | Elective University Requirement (First) | -        | -                                     | -                 | -            |

**Spring Semester**

| Course No | Course Name                              | Semester | Prerequisite                      | Course No. | Credit Hours |
|-----------|--|----------|-----------------------------------|------------|--------------|
| 0601214   | Rules of Obligation                      | 1+2      | Sources of Obligation (2)         | 0601213    | 3            |
| 0601232   | Company law                              | 2        | Principles of commercial law      | 0601131    | 3            |
| 0602242   | Administrative Law (1)                   | 2        | Introduction to Law               | 0601111    | 3            |
| 0602244   | Public International Law                 | 2        | Legal Studies in English Language | 0602245    | 3            |
| -         | Elective university requirement (Second) | 2        | -                                 | -          | 3            |
| -         | Elective College Requirement (First)     | 2        | -                                 | -          | 3            |



### Third Year:

#### Fall Semester

| Course No | Course Name                              | Semester | Prerequisite   | Course No.         | Credit Hours |
|-----------|--|----------|--|--------------------|--------------|
| 0601333   | Banking Transactions                     | 1        | Principles of Commercial Law and Sources of Obligation (1) | 0601131<br>0601112 | 3            |
| 0601321   | Civil Procedures                         | 1        | Rules of Obligation  | 0601214            | 3            |
| 0601315   | Labor Law and Social Security            | 1        | Sources of Obligation (2)                                  | 0601213            | 3            |
| 0602343   | Administrative Law (2)                   | 1        | Administrative Law (1)                                     | 0602242            | 3            |
| 0602353   | Penal Law : Private Part (1)             | 1        | Penal Law: General Part (2)                                | 0602252            | 3            |
| 0602347   | Public Finance and Financial Legislation | 1        | Introduction to Law  | 0601111            | 3            |

#### Spring Semester

| Course No | Course Name                              | Semester | Prerequisite                          | Course No. | Credit Hours |
|-----------|--|----------|---------------------------------------|------------|--------------|
| 0601312   | Nominate Contracts (1)                   | 2        | Rules of Obligation                   | 0601214    | 3            |
| 0103325   | Jurisprudence of Inheritance and Wills   | 2        | Introduction to Islamic Jurisprudence | 0103105    | 3            |
| -         | Elective University Requirement (Third)  | 2        | -                                     | -          | 3            |
| -         | Elective university requirement (Fourth) | 2        | -                                     | -          | 3            |
| -         | Elective College Requirement (Second)    | 2        | -                                     | -          | 3            |

#### Fourth Year:

##### Fall Semester

| Course No | Course Name                          | Semester | Prerequisite   | Course No.              | Credit Hours |
|-----------|--------------------------------------|----------|--|-------------------------|--------------|
| 0601434   | Maritime Law                         | 1        | Principles of Commercial Law and Sources of Obligation (1) | 0601131<br>0601213      | 3            |
| 0602454   | Criminal Procedures                  | 1        | Penal Law:<br>Private Part (1)                             | 0602353                 | 3            |
| 0103110   | Science of Fundamental Jurisprudence | 1        | -  | -                       | 3            |
| XXXX      | Elective College Requirement (Third) | 1        | -  | -                       | 3            |
| 0602460   | Internal Practical Training          | 1        | Civil Procedures + Criminal Procedures                     | 0601321<br>+<br>0602454 | 1            |

##### Spring Semester

| Course No | Course Name                           | Semester | Prerequisite                   | Course No. | Credit Hours |
|-----------|---------------------------------------|----------|--------------------------------|------------|--------------|
| 0601422   | Execution Procedures                  | 2        | Law of Civil Procedures        | 0601321    | 3            |
| 0601423   | Private International Law             | 2        | Rules of Obligation            | 0601214    | 3            |
| 0601417   | Real Rights (Right in Rem)            | 2        | Nominate Contract (1)          | 0601312    | 3            |
| 0602461   | Graduation Research                   | 2        | Completion of 105 Credit Hours | -          | 3            |
| XXXX      | Elective College Requirement (Fourth) | 2        | XXXX                           | -          | 3            |

### **Study Plan for the Bachelor of Law 2022-2023**

#### **Graduation Requirements**

The Bachelor of Law degree program comprises 132 credits distributed in three categories: University requirements (UR), college requirements (CR), and program requirements (PR). The credit hours allocations in each category are listed in the following table:

| <b>Bachelor of Law (132 Credits Hours)</b> |           |            |              |
|--|-----------|------------|--------------|
|  | <b>UR</b> | <b>CR</b>  | <b>Total</b> |
| <b>Mandatory Credits</b>                   | <b>15</b> | <b>99</b>  | <b>114</b>   |
| <b>Elective Credits</b>                    | <b>9</b>  | <b>9</b>   | <b>18</b>    |
| <b>Total</b>                               | <b>24</b> | <b>108</b> | <b>132</b>   |

The bachelor's degree program comprises (132) credit hours of study including the following:

- (24) credit hours of University requirements that include (15) compulsory credit hours and (9) credit hours of elective courses.
- (108) credit hours of College requirements that include (99) compulsory credit hours and (9) credit hours of elective courses.

#### **\* Compulsory University Requirements: (12) Credit Hours**

| <b>Course No</b> | <b>Course Name</b>                        | <b>Credit Hours</b> |
|------------------|---|---------------------|
| 0104100          | Islamic Culture                           | 3                   |
| 0201102          | Arabic Language                           | 3                   |
| 0202111          | Basic English Language                    | 3                   |
| 1411101          | Information Technology in Arabic Language | 3                   |
| 0302200          | Fund. of Innovation & Entrep.             | 3                   |

**\*Elective University Requirements: (09) Credit Hours**

**\* Important Notice:** The student shall select only one course from each of the following three groups

| <b>Group : UG-UNIVERSITY-LAW-<br/>Elective Select                      3 Credits</b> |   |   |
|--|---|---|
| 0203100  | Islamic Civilization                                | 3 |
| 0602246  | Human Rights in Islam and International Conventions | 3 |
| 0201140  | Introduction to Arabic Literature                   | 3 |
| 0203200  | History of Sciences among Muslims                   | 3 |
| 0203102  | History of the Arabian Gulf                         | 3 |
| 0900107  | History of Medical & Health Sciences                | 3 |
| 0710109  | Arts & Medicine                                     | 3 |
| <b>Group : UG-UNIVERSITY-LAW-<br/>Elective Select                      3 Credits</b> |   |   |
| 1430101  | Astronomy and Space Sciences                        | 3 |
| 0401142  | Man and the Environment                             | 3 |
| 0505101  | Fitness and Wellness                                | 3 |
| 0507101  | Health Care and Nutrition                           | 3 |
| <b>Group : UG-UNIVERSITY-LAW-<br/>Elective Select                      3 Credits</b> |   |   |
| 0206102  | Fundamentals of Islamic Education                   | 3 |
| 0204102  | UAE Society   | 3 |
| 0206103  | Introduction to Psychology                          | 3 |
| 0302120  | Introduction to Business Administration             | 3 |
| 0800107  | Media in Modern Societies                           | 3 |
| 0301131  | Personal Finance                                    | 3 |
| 0104130  | Jurisprudence of the Prophetic Biography            | 3 |

### **Compulsory and Elective Law Requirements:**

#### **First: Compulsory Law Requirements (99 credit hours):**

| Course No. | Course Name  | Semester | Credit Hours | Theoretical | Practical | Prerequisite                                       | Course No. |
|------------|--|----------|--------------|-------------|-----------|--|------------|
| 0601110    | *Legal Research Methods                            | 1 + 2    | 1            | 1           | -         | -  | -          |
| 0601111    | Introduction to Law                                | 1 + 2    | 3            | 3           | -         | -  | -          |
| 0601114    | Sources of Obligation                              | 1 + 2    | 3            | 3           | -         | Introduction to Law                                | 0601111    |
| 0601215    | Rules of Obligations and Evidence                  | 1 + 2    | 3            | 3           | -         | Sources of Obligation                              | 0601114    |
| 0601315    | Labor Law and Social Security                      | 1        | 3            | 3           | -         | Sources of Obligation                              | 0601114    |
| 0601216    | Nominate Contracts (sales and insurance contracts) | 2        | 3            | 3           | -         | Rules of Obligations and Evidence                  | 0601215    |
| 0601416    | Legal Drafting of Civil Contracts (E)              | 2        | 1            | 1           | -         | Rules of Obligations and Evidence                  | 0601215    |
| 0601417    | Real Rights  | 2        | 3            | 3           | -         | Nominate Contracts (sales and insurance contracts) | 0601312    |
| 0601321    | Civil Procedures                                   | 1        | 3            | 2           | 2         | Rules of Obligations and Evidence                  | 0601215    |

|         |  |       |   |   |   |  |                    |
|---------|--|-------|---|---|---|--|--------------------|
| 0601322 | Procedural Principles of Civil Proceedings (E)       |       | 1 | 1 | - | Civil Procedures                                     | 0601321            |
| 0601422 | Execution Procedures                                 | 2     | 3 | 3 | - | Civil Procedures                                     | 0601321            |
| 0601423 | Private International Law                            | 2     | 3 | 2 | 2 | Rules of Obligations and Evidence                    | 0601215            |
| 0601131 | Principles of Commercial Law                         | 1 + 2 | 3 | 3 | - | Introduction to Law                                  | 0601111            |
| 0601232 | Company Law  | 2     | 3 | 2 | 2 | Principles of Commercial Law                         | 0601131            |
| 0601333 | Banking Transactions                                 | 1     | 3 | 3 | - | Principles of Commercial Law + Sources of Obligation | 0601131<br>0601114 |
| 0601336 | Negotiable Instruments                               |       | 3 | 2 | 2 | Principles of Commercial Law                         | 0601131            |
| 0601338 | Legal Drafting of Commercial Contracts               |       | 1 | 1 | - | Company Law  | 0601232            |
| 0601434 | Maritime Law   | 1     | 3 | 3 | - | Principles of Commercial Law + Sources of Obligation | 0601131<br>0601114 |
| 0602141 | Constitutional Law and Political Systems             | 1 + 2 | 3 | 3 | - | -  | -                  |
| 0602271 | Principles of Administrative Law and Public Function |       | 3 | 3 | - | Introduction to Law                                  | 0601111            |

|         |  |       |   |   |   |  |                    |
|---------|--|-------|---|---|---|--|--------------------|
| 0602372 | Administrative Decisions and Contracts   |       | 3 | 2 | 2 | Principles of Administrative Law and Public Office | 0602242            |
| 0602347 | Public Finance and Financial Legislation | 1     | 3 | 3 | - | Introduction to Law                                | 0601111            |
| 0602373 | Drafting of Administrative Contracts (E) |       | 1 | 1 | - | Administrative Decisions and Contracts             | 0602343            |
| 0602245 | Legal Studies in English                 | 2     | 3 | 3 | - | Introduction to Law + Basic English Language       | 0601111<br>0202111 |
| 0602244 | Public International Law                 | 2     | 3 | 3 | - | Legal Studies in English                           | 0602245            |
| 0602349 | Settlement of International Disputes     |       | 1 | - | 2 | Public International Law                           | 0602244            |
| 0602152 | Penal Law: General Part                  | 1 + 2 | 3 | 2 | 2 | Introduction to Law                                | 0601111            |
| 0602254 | Penal Law - offenses against persons     | 1 + 2 | 3 | 3 | - | Penal Law: General Part                            | 0602152            |
| 0602255 | Penal Code - offenses against money      | 1     | 3 | 3 | - | Penal Law: General Part                            | 0602152            |
| 0602357 | International Criminal Law (E)           |       | 1 | 1 | - | Penal Law: General Part                            | 0602152            |
| 0602454 | Criminal Procedures                      | 1     | 3 | 2 | 2 | Penal Code - Offenses against money                | 0602255            |

|         |  |                 |   |   |   |   |                    |
|---------|--|-----------------|---|---|---|---|--------------------|
| 0602461 | Graduation Research                    | 2               | 3 | 3 | - | Completion of 105 Credit Hours          |                    |
| 0602460 | Internal Practical Training            | 1 + 2           | 1 | - | 2 | Civil Procedures or Criminal Procedures | 0601321<br>0602454 |
| 0602463 | External Practical Training            | Summer Semester | 1 | - | - | Civil Procedures or Criminal Procedures | 0601321<br>0602454 |
| 0103105 | Introduction to Islamic Jurisprudence  | 1 + 2           | 3 | 3 | - | -                                       | -                  |
| 0103223 | Jurisprudence of Marriage and Divorce  | 1               | 3 | 3 | - | Introduction to Islamic Jurisprudence   | 0103105            |
| 0103325 | Jurisprudence of Inheritance and Wills | 2               | 3 | 3 | - | Introduction to Islamic Jurisprudence   | 0103105            |
| 0103110 | Science of Fundamental Jurisprudence   | 1               | 3 | 3 | - | Introduction to Islamic Jurisprudence   | 0103105            |
| 0308150 | Introduction to Economic Science       | 1               | 3 | 3 | - | -                                       | -                  |



**Second: Elective Courses: (9 Credit Hours):**

- Student should select three courses of the following:

| Course No. | Course Name  | Credit hours | Prerequisite                      | Course No. |
|------------|--|--------------|-----------------------------------|------------|
| 0601310    | Consumer Protection Law                              | 3            | Rules of Obligations and Evidence | 0601215    |
| 0601217    | Nominate contracts (lease and contracting contracts) | 3            | Rules of Obligations and Evidence | 0601215    |
| 0601318    | Intellectual Property                                | 3            | Sources of Obligation             | 0601114    |
| 0601335    | Commercial Bankruptcy                                | 3            | Company Law                       | 0601232    |
| 0601440    | Commercial Contracts                                 | 3            | Principles of Commercial Law      | 0601131    |
| 0602256    | Criminology and Penology                             | 3            | -                                 | -          |
| 0602345    | International Organizations                          | 3            | Introduction to Law               | 0601111    |
| 0602346    | Environment Protection Law                           | 3            | Introduction to Law               | 0601111    |
| 0602358    | Special sanctions.                                   | 3            | Penal Law: General Part           | 0602152    |
| 0602320    | Special Penal Legislation                            | 3            | Penal Law: General Part           | 0602152    |

**Advisory Plan for the Bachelor of Law 2022-2023**

**First Year:**

**Fall Semester**

| Course No | Course Name                               | Semester | Prerequisite | Course No. | Credit Hours |
|-----------|---|----------|--------------|------------|--------------|
| 0104100   | Islamic Culture                           | 1+2      | -            | -          | 3            |
| 0201102   | Arabic Language                           | 1+2      | -            | -          | 3            |
| 0202111   | Basic English Language                    | 1+2      | -            | -          | 3            |
| 1411101   | Information Technology in Arabic Language | 1+2      | -            | -          | 3            |
| 0601111   | Introduction to Law                       | 1+2      | -            | -          | 3            |

**Spring Semester**

| Course No | Course Name                              | Semester | Prerequisite        | Course No. | Credit Hours |
|-----------|--|----------|---------------------|------------|--------------|
| 0601110   | *Legal Research Methods                  | 1+2      | -                   | -          | 1            |
| 0103105   | Introduction to Islamic Jurisprudence    | 1+2      | -                   | -          | 3            |
| 0602141   | Constitutional Law and Political Systems | 1+2      | -                   | -          | 3            |
| 0601131   | Principles of Commercial Law             | 1+2      | Introduction to Law | 0601111    | 3            |
| 0601114   | Sources of Obligation                    | 1+2      | Introduction to Law | 0601111    | 3            |
| 0602152   | Penal Law: General Part                  | 1+2      | Introduction to Law | 0601111    | 3            |

## Second Year:

### Fall Semester

| Course No | Course Name                             | Semester | Prerequisite                        | Course No.        | Credit Hours |
|-----------|---|----------|-------------------------------------|-------------------|--------------|
| 0601215   | Rules of Obligations and Evidence       | 1+2      | Sources of Obligation               | 0601114           | 3            |
| 0602254   | Penal Law - offenses against persons    | 1+2      | Penal Law: General Part             | 0602152           | 3            |
| 0602245   | Legal Studies in English                | 2        | Introduction to Law + Basic English | 0601111 + 0202111 | 3            |
| 0301150   | Principles of Economics                 | 1        | -                                   | -                 | 3            |
| 0302200   | Fund. of Innovation & Entrep.           |          |                                     |                   |              |
| -         | Elective University Requirement (First) | -        | -                                   | -                 | 3            |

### Spring Semester

| Course No | Course Name  | Semester | Prerequisite                      | Course No. | Credit Hours |
|-----------|--|----------|-----------------------------------|------------|--------------|
| 0601232   | Company law  | 2        | Principles of commercial law      | 0601131    | 3            |
| 0602271   | Principles of Administrative Law and Public Function | 2        | Introduction to Law               | 0601111    | 3            |
| 0602244   | Public International Law (E)                         | 2        | Legal Studies in English Language | 0602245    | 3            |
| 0602255   | Penal Code - offenses against money                  |          | Penal Law: General Part           | 0602152    | 3            |
| 0601216   | Nominate Contracts (sales and insurance contracts)   | 2        | Rules of Obligations and Evidence | 0601215    | 3            |
| -         | Elective College Requirement (First)                 | 2        | -                                 | -          | 3            |

### Third Year:

#### Fall Semester

| Course No | Course Name                              | Semester | Prerequisite   | Course No.         | Credit Hours |
|-----------|--|----------|--|--------------------|--------------|
| 0601333   | Banking Transactions                     | 1        | Principles of Commercial Law and Sources of Obligation | 0601131<br>0601114 | 3            |
| 0601321   | Civil Procedures                         | 1        | Rules of Obligations and Evidence                      | 0601215            | 3            |
| 0601315   | Labor Law and Social Security            | 1        | Sources of Obligation                                  | 0601114            | 3            |
| 0602372   | Administrative Decisions and Contracts   | 1        | Principles of Administrative Law and Public Function   | 0602242            | 3            |
| 0602349   | Settlement of International Disputes     | 1        | Public International Law                               | 0602244            | 3            |
| 0602357   | International Criminal Law (E)           |          | Penal Law: General Part                                | 0602152            | 3            |
| -         | Elective University Requirement (Second) |          |  |                    | 3            |

### Spring Semester

| Course No | Course Name                                    | Semester | Prerequisite                           | Course No. | Credit Hours |
|-----------|--|----------|--|------------|--------------|
| 0601334   | Legal Drafting of Commercial Contracts (E)     |          | Company Law                            | 0601232    | 3            |
| 0103325   | Jurisprudence of Inheritance and Wills         | 2        | Introduction to Islamic Jurisprudence  | 0103105    | 3            |
| 0601336   | Negotiable Instruments                         |          | Principles of Commercial Law           | 0601131    | 3            |
| 0601322   | Procedural Principles of Civil Proceedings (E) |          | Civil Procedures                       | 0601321    | 3            |
| 0602373   | Drafting of Administrative Contracts (E)       |          | Administrative Decisions and Contracts | 0602343    | 3            |
| 0103223   | Jurisprudence of Marriage and Divorce          | 1        | Introduction to Islamic Jurisprudence  | 0103105    | 3            |
| -         | Elective College Requirement (Second)          | 2        | -                                      | -          | 3            |

#### Fourth Year:

##### Fall Semester

| Course No | Course Name                              | Semester | Prerequisite   | Course No.         | Credit Hours |
|-----------|--|----------|--|--------------------|--------------|
| 0602460   | Internal Practical Training              | 1        | Civil Procedures + Criminal Procedures                 | 0601321 + 0602454  | 1            |
| 0602347   | Public Finance and Financial Legislation |          | Introduction to Law                                    | 0601111            | 3            |
| 0601434   | Maritime Law                             | 1        | Principles of Commercial Law and Sources of Obligation | 0601131<br>0601114 | 3            |
| 0602454   | Criminal Procedures                      | 1        | Penal Code - offenses against money                    | 0602255            | 3            |
| 0103110   | Science of Fundamental Jurisprudence     | 1        | -  | -                  | 3            |
| XXXX      | Elective College Requirement (Third)     | 1        | -  | -                  | 3            |

##### Spring Semester

| Course No | Course Name                             | Semester | Prerequisite                                       | Course No. | Credit Hours |
|-----------|---|----------|--|------------|--------------|
| 0601422   | Execution Procedures                    | 2        | Civil Procedures                                   | 0601321    | 3            |
| 0601416   | Legal Drafting of Civil Contracts (E)   |          | Rules of Obligations and Evidence                  | 0601215    | 3            |
| 0601423   | Private International Law               | 2        | Rules of Obligations and Evidence                  | 0601215    | 3            |
| 0601417   | Real Rights                             | 2        | Nominate Contracts (sales and insurance contracts) | 0601312    | 3            |
| 0602461   | Graduation Research                     | 2        | Completion of 105 Credit Hours                     | -          | 3            |
| XXXX      | Elective University Requirement (Third) | 2        | XXXX   | -          | 3            |

1 Credit hour: External practical training (0602463)

# College of Fine Arts and Design

## COLLEGE OF FINE ARTS AND DESIGN

### Officers of the College

|                             |                        |
|-----------------------------|------------------------|
| Professor Nadia M. Alhasani | Dean                   |
| Dr. Ayman Fathy             | Chair - Applied Design |
| Dr. Izmer Bin Ahmad         | Chair - Fine Arts      |
| Dr. Karima Al Shomely       | Coordinator - Year I   |

### Academic and Administrative Staff

|                       |                              |
|-----------------------|------------------------------|
| Samira Khalil Saba    | Administrative Officer       |
| Marwa Al Hashimi      | Administrative Assistant     |
| Roselie Bayotas       | Administrative Assistant     |
| Joey Abiertas         | Digital Lab Technician       |
| Renji Mathews         | Digital Media Lab Supervisor |
| M. Mazen Al Samman    | Senior Mac Lab Officer       |
| Polite Mangoro        | Fashion Technician           |
| Fatima Bin Ahmed      | Laboratory Officer           |
| Abdulhadi Al Salti    | Workshop Supervisor          |
| Noushad Pandikadavath | Operations Attendant         |

### History

The College of Fine Arts was found in 2002 under the patronage of HH Sheikh Dr. Sultan Bin Mohamed Al Qassimi UAE Supreme Council Member, Ruler of Sharjah, and President of the University of Sharjah. The College started under supervision of the British Royal College of Art to reflect His Highness's vision of making it a leading art institution, to attract talented students who aspire to creativity, artistic sense and skills for the advancement of art in the country. It continues to offer the only degree of its kind in the country, a Bachelor of Fine Arts.

In 2007 the name of the College changed to the College of Fine Art and Design after the following design programs were introduced leading to Bachelor of Arts degrees in:

- Interior Architecture and Design
- Graphic Design and Multimedia
- Fashion Design with Textiles

A second major change took place in Fall 2019 with the institution of two departments, namely Applied Design and Fine Arts. This was an opportunity for the College to align its annual academic plans with the semester-based plans as well as rename its degree offerings in line with international practices:

- Bachelor of Fine Arts
- Bachelor of Design in Fashion Design and Textiles
- Bachelor of Design in Interior Design
- Bachelor of Design in Visual Communication

The first cohort of the College of Fine Arts and Design graduates was in 2006. At the time, the number of graduates was 5, but the number has been steadily increasing since, reaching one hundred in 2019-2020.

### College Overview

The College of Fine Arts and Design is a community that fosters creativity and promotes innovation in partnership with society. We endeavor to engage in art and design within the public realm. Our

uniqueness stems from interacting with various public and semi-public entities, promoting art and design, culture and heritage, the visual and tactile, to enhance and inform our environment, while engaging the community in a meaningful dialog. This discourse exposes our students to the public realm early in their careers while simultaneously allows them the opportunity to interact and share their passion outside campus. Similarly, our partners are eager to interact with our students valuing their inventive spirit while offering them a forum to soar to new artistic heights; a collaboration that is uniquely of and from within Sharjah.

Through the medium of our faculty work and students projects, we communicate our messages in the form of a tangible object or virtual product. Our dialog is inclusive of both each other's inspirations and particular to an individual's aspirations. In responding to our partners' invitations, we are embarking on a journey that allows us the opportunity to show case our students' creations and be an integral part of the daily interactions with the public at large becoming, in the process, involved and effective citizens.

While we employ various scales in our work, from an interior space and jewelry piece to a wall mural and advertisement, our offered degrees are in Fashion Design and Textiles, Fine Arts, Interior Design, and Visual Communication. To realize these degrees, knowledge is attained and skills are honed in dedicated studios and specialized workshops, and CFAD faculty and staff are committed to our students' advancement; all set in a unique environment that allows everyone the luxury of creating a master piece of one's own. The College is uniquely situated and committed to preparing the next generation of creatives.

### College Vision

To become a **leading regional art and design school**, adopting **current global practices**, towards **international visibility**.

### College Mission

To foster **globally aware**, and **technologically versatile creative thinkers**.

### Goals

- Holistic learning environment to develop innovative creative thinking.
- Comprehensive exposure to global trends and practices in art and design.
- Effective integration of technology in the curriculum and extra-curricular activities.
- Strategic and sustainable partnerships to support faculty and students' intellectual growth and graduate employment.

### Objectives

- Introduce opportunities for visiting faculty and professionals to deliver courses, workshops, and lectures.
- Explore opportunities for faculty and students to visit, work, and intern in art and design institutions, regionally and internationally.
- Create non-traditional learning spaces using physical, digital, and virtual environments inside and outside classrooms and studios.
- Foster prospects for students and graduates to display and apply their knowledge and skills in the local, national, and international community.
- Secure global recognition through international accreditation, recruiting of diverse faculty and students.

### Accreditation

All Programs of the College of Fine Arts and Design are accredited by the United Arab Emirates'



Ministry of Education and Scientific Research.

### Academic Programs

The College of Fine Arts and Design offers four programs leading to the following degrees:

1. Bachelor of Fine Arts
2. Bachelor of Design in Fashion Design and Textile
3. Bachelor of Design in Interior Design
4. Bachelor of Design in Visual Communication

### Admission Requirements

The College of Fine Arts and Design accepts applications with the following conditions:

- Completion of secondary education (Literature or Science) or an equivalent level with an average of 70% no earlier than three years prior to joining the University.
- Student must demonstrate a level of English proficiency certificate.
- Should not have been expelled from the UoS or any other institution for academic or disciplinary reasons.

### Graduation Requirements

The College of Fine Arts and Design requires all students to complete the following credit hours towards receiving a bachelor's degree in one of its majors.

| Category                | Credit Hours |          |       |
|-------------------------|--------------|----------|-------|
|                         | Compulsory   | Elective | Total |
| University Requirements | 15           | 9        | 24    |
| College Requirements    | 24           | 3        | 27    |
| Program Requirements    | 72           | 6        | 78    |
| Total                   | 108          | 18       | 129   |

### University Requirements

The University of Sharjah requires all students to complete (24) credit hours, 15 of which are compulsory and 9 are elective courses. The following six domains are covered:

- Islamic Studies, History and Culture
- Arabic and English Languages
- IT or Mathematics (including 1501100-Introduction to Information Technology)
- Humanities or Arts
- Natural Sciences
- Social and Education Sciences

### College Requirements

The College of Fine Arts and Design requires all students to complete a total of the (27) credit hours.

The Compulsory courses include (24) credit hours of the following:

- 0700111 Arts and Design Foundation I
- 0700113 Drawing Fundamentals
- 0700115 History of Art and Design I
- 0700114 Color Theory
- 0700112 Arts and Design Foundation II
- 0700116 History of Art and Design II

- 0700217 Islamic and Emirati Art and Design
- 0700333 Research Methodology in Art and Design

The Elective courses include (3) credit hours from one of the following:

- 0700311 The Global Contemporary in Art and Design
- 0700312 Comparative Aesthetics
- 0700313 Art Market and the Infrastructure of Arts
- 0700314 Contemporary Art and Media Theory
- 0700315 Special Topics in Art, Design and Culture
- 0700316 Film and Philosophy
- 0700317 Design Psychology

### **Common First Semester**

All degree programs follow a four-year full time mode of study and share a common first semester in Art and Design. The first intensive semester introduces students to studio-based learning and conceptual thinking through creative production methods and materials. It is designated to enable students to explore complex inter-relations between ways of seeing, thinking, and making regardless of their selected major. The semester also provides students to confirm their selected major through interactions with peers and be exposed to the work resulting for senior students.

## FINE ARTS

### Teaching Faculty

|                           |                     |
|---------------------------|---------------------|
| Izmer Bin Ahmad           | Assistant Professor |
| Jay Hetrick               | Assistant Professor |
| Karima Al Shomely         | Assistant Professor |
| Mohammad Yousif Alhammadi | Assistant Professor |
| Brian Gonzales            | Lecturer            |
| Tor Seidel                | Lecturer            |
| Moatasem Obaid Alkubaisi  | Senior Tutor        |
| Thaier Helal              | Tutor               |

### Program Overview

The Bachelor in Fine Arts Program emphasizes support of unique creative development with a dynamic and contemporary approach to fine arts, preparing students to become innovative professional artists within the context of the contemporary art industry. The Program fosters a distinctive, experiential learning process providing key knowledge, skills and attitudes in the field of fine arts. The curriculum integrates elements of tradition and heritage yet based on contemporary perspectives on studio practice that embraces cosmopolitanism and the experimental spirit of modernism in its various forms of historical and global manifestation.

### Program Vision

To become a **leading regional art nucleus**, balancing **creative practices and theoretical discourse**.

### Program Mission

To promote **interdisciplinary practice-based**, and **inquisitive creative artists**.

### Career Opportunities

Graduates of the Fine Arts Program lead careers in art, design and cultural institutions and the creative industries. These include full-time artists, freelance art commissions, gallery management, cultural officers, museum curators, exhibition and festival planning and production.

### Study Plan

#### FIRST YEAR

| FALL    |                             |      |           |                | SPRING  |                              |      |           |          |
|---------|-----------------------------|------|-----------|----------------|---------|------------------------------|------|-----------|----------|
| Code    | Course Title                | Type | Cr.       | Pre-Req.       | Code    | Course Title                 | Type | Cr.       | Pre-Req. |
| 0700111 | Art and Design Foundation I | Th/P | 3         | Full Admission | 0700112 | Art and Design Foundation II | Th/P | 3         | 0700111  |
| 0700113 | Drawing Fundamentals        | Th/P | 3         | Full Admission | 0700116 | History of Art and Design II | Th   | 3         | 0700115  |
| 0700115 | History of Art and Design I | Th   | 3         | Full Admission | 0701100 | Introduction to Fine Arts    | Th/P | 3         | 0700111  |
| 0700114 | Color Theory                | Th/P | 3         | Full Admission | 0701105 | Drawing for Fine Arts        | Th/P | 3         | 0700113  |
|         | University Requirement      |      | 3         |                | 0701111 | Photography Studio I         | Th/P | 3         | 0700114  |
|         | <b>Total</b>                |      | <b>15</b> |                |         | <b>Total</b>                 |      | <b>15</b> |          |

## SECOND YEAR

| FALL    |                              |      |           |                                       | SPRING  |                                    |      |           |          |
|---------|------------------------------|------|-----------|---------------------------------------|---------|------------------------------------|------|-----------|----------|
| Code    | Course Title                 | Type | Cr.       | Pre-Req.                              | Code    | Course Title                       | Type | Cr.       | Pre-Req. |
| 0701221 | Printmaking Studio I         | Th/P | 3         | 0701105, pre/co-req. 0700114, 0700112 | 0701232 | Painting Studio II                 | Th/P | 3         | 0701231  |
| 0701231 | Painting Studio I            | Th/P | 3         | 0701105, 0700112                      | 0701242 | Sculpture Studio II                | Th/P | 3         | 0701241  |
| 0701241 | Sculpture Studio I           | Th/P | 3         | 0700112, 0701105                      | 0701222 | Printmaking Studio II              | Th/P | 3         | 0701221  |
| 0701251 | Theories in Contemporary Art | Th   | 3         | 0700116, 0701100                      | 0701313 | Photography Studio III             | Th/P | 3         | 0701212  |
| 0701212 | Photography Studio II        | Th/P | 3         | 0701111                               | 0700217 | Islamic and Emirati Art and Design | Th   | 3         | 0700116  |
|         | University Requirements      |      | 3         |                                       |         | University Requirement             |      | 3         |          |
|         | <b>Total</b>                 |      | <b>18</b> |                                       |         | <b>Total</b>                       |      | <b>18</b> |          |

## THIRD YEAR

| FALL    |                        |      |           |                     | SPRING  |  |      |           |   |
|---------|------------------------|------|-----------|---------------------|---------|--|------|-----------|---|
| Code    | Course Title           | Type | Cr.       | Pre-Req.            | Code    | Course Title                           | Type | Cr.       | Pre-Req.  |
| 0701333 | Painting Studio III    | Th/P | 3         | 0701232             | 0701324 | Printmaking Studio III                 | Th/P | 3         | 0701222   |
| 0701310 | Fine Arts Videography  | Th/P | 3         | pre/co-req. 0701212 | 0701352 | Fine Arts Seminar I                    | Th   | 3         | 0701251   |
| 0701343 | Sculpture Studio III   | Th/P | 3         | 0701242             | 0700333 | Research Methodology in Art and Design | Th   | 3         | 0700217, [0705213 or 0702213 or 0703212 or 0701251] |
| 0700XXX | College Elective       |      | 3         |                     | 0701XXX | Program Elective                       |      | 3         |   |
|         | University Requirement |      | 3         |                     |         | University Requirement                 |      | 3         |   |
|         | <b>Total</b>           |      | <b>15</b> |                     |         | <b>Total</b>                           |      | <b>15</b> |   |

| SUMMER SESSION |   |      |     |                                    |
|----------------|---|------|-----|------------------------------------|
| Code           | Course Title                                  | Type | Cr. | Pre-Req.                           |
| 0701355        | Internship in Fine Arts (240 hours/6-8 weeks) | P    | 3   | 0701333, 0701313, 0701324, 0701343 |

## FOURTH YEAR

| FALL                          |                                |      |           |                           | SPRING  |                                    |      |           |                  |
|-------------------------------|--------------------------------|------|-----------|---------------------------|---------|------------------------------------|------|-----------|------------------|
| Code                          | Course Title                   | Type | Cr.       | Pre-Req.                  | Code    | Course Title                       | Type | Cr.       | Pre-Req.         |
| 0701453                       | Fine Arts Seminar II           | Th   | 3         | 0701352, 0701355          | 0701462 | Fine Arts Graduation Project II    | Th/P | 6         | 0701460, 0701461 |
| 0701460                       | Studio Research Project        | Th/P | 3         | 0701352, 0700333, 0701355 | 0701418 | Professional Practice in Fine Arts | Th   | 3         | 0701460, 0701461 |
| 0701461                       | Fine Arts Graduation Project I | Th/P | 3         | 0701355, 0700333          |         | University Requirement             |      | 3         |                  |
| 0702XXX or 0703XXX or 0705XXX | Interdisciplinary Electives    |      | 3         |                           |         | University Requirement             |      | 3         |                  |
|                               | University Requirement         |      | 3         |                           |         | <b>Total</b>                       |      | <b>15</b> |                  |
|                               | <b>Total</b>                   |      | <b>15</b> |                           |         |                                    |      |           |                  |

## FASHION DESIGN AND TEXTILE

### Teaching Faculty

|              |                                 |
|--------------|---------------------------------|
| Andra Clitan | Assistant Professor             |
| Nazia Nawaz  | Assistant Professor (visiting)  |
| Samer Eska   | Assistant Professor (part time) |

### Program Overview

The Bachelor of Design in Fashion Design and Textile Program emphasizes acquiring knowledge, skills and understanding of professional standards in creative and technical fields of fashion and textile design. The Program adopts learning processes through research, broad experimentation and application of theory through practice, with a focus on sustainable views on traditional practices fused with advanced technology. Combining fashion design with textile design allows students to develop a unique identity, and applies knowledge and skills in imaginative and technically profound ways within and in line with contemporary global industry practices.

### Program Vision

To become a **leading regional design nucleus**, integrating **local traditions with progressive practices**.

### Program Mission

To promote **interdisciplinary practice-based**, and **forward-thinking designers**.

### Career Opportunities

Graduates of the Fashion Design and Textile Program sustain professional careers in fashion and textile design, garment production and technical management, retail buyers and managers, brand development and styling consultancy, and fashion event producers.

### Study Plan

#### FIRST YEAR

| FALL    |                             |      |           |                |
|---------|-----------------------------|------|-----------|----------------|
| Code    | Course Title                | Type | Cr.       | Pre-Req.       |
| 0700111 | Art and Design Foundation I | Th/P | 3         | Full Admission |
| 0700113 | Drawing Fundamentals        | Th/P | 3         | Full Admission |
| 0700115 | History of Art and Design I | Th   | 3         | Full Admission |
| 0700114 | Color Theory                | Th/P | 3         | Full Admission |
|         | University Requirement      |      | 3         |                |
|         | <b>Total</b>                |      | <b>15</b> |                |

| SPRING  |  |      |           |          |
|---------|--|------|-----------|----------|
| Code    | Course Title                               | Type | Cr.       | Pre-Req. |
| 0700112 | Art and Design Foundation II               | Th/P | 3         | 0700111  |
| 0700116 | History of Art and Design II               | Th   | 3         | 0700115  |
| 0702110 | Introduction to Fashion and Textile Design | Th/P | 3         | 0700111  |
| 0702111 | Drawing for Fashion Design                 | Th/P | 3         | 0700113  |
| 0702112 | Textiles for Fashion                       | Th/P | 3         | 0700111  |
|         | <b>Total</b>                               |      | <b>15</b> |          |

#### SECOND YEAR

| FALL    |  |      |           |                  |
|---------|--|------|-----------|------------------|
| Code    | Course Title                               | Type | Cr.       | Pre-Req.         |
| 0702210 | Fashion Design Studio I                    | Th/P | 3         | 0702110, 0700112 |
| 0702211 | Pattern Making and Production Studio I     | Th/P | 3         | 0702111, 0700112 |
| 0702212 | Textile Design Studio I                    | Th/P | 3         | 0702112, 0700112 |
| 0702213 | History and Theory of Fashion and Textiles | Th   | 3         | 0702110, 0700116 |
| 0702214 | CAD for Fashion and Textile Design         | Th/P | 3         | 0702111          |
|         | <b>Total</b>                               |      | <b>15</b> |                  |

| SPRING  |   |      |           |                  |
|---------|---|------|-----------|------------------|
| Code    | Course Title                            | Type | Cr.       | Pre-Req.         |
| 0702215 | Fashion Design Studio II                | Th/P | 3         | 0700114, 0702210 |
| 0702216 | Pattern Making and Production Studio II | Th/P | 3         | 0702211          |
| 0702217 | Textile Printing and Dyeing             | Th/P | 3         | 0702212          |
| 0702218 | Textile Design Studio II                | Th/P | 3         | 0702212          |
| 0700217 | Islamic and Emirati Art and Design      | Th   | 3         | 0700116          |
|         | <b>Total</b>                            |      | <b>15</b> |                  |

### THIRD YEAR

| FALL    |                            |      |           |                           |
|---------|----------------------------|------|-----------|---------------------------|
| Code    | Course Title               | Type | Cr.       | Pre-Req.                  |
| 0702310 | Fashion Design Studio III  | Th/P | 3         | 0702215, 0702214, 0702218 |
| 0702311 | Draping Exploration Studio | Th/P | 3         | 0702215, 0702216          |
| 0702312 | Fashion Digital Portfolio  | Th/P | 3         | 0702214                   |
| 0700XXX | College Elective           |      | 3         |                           |
|         | University Requirement     |      | 3         |                           |
|         | University Requirement     |      | 3         |                           |
|         | <b>Total</b>               |      | <b>18</b> |                           |

| SPRING  |   |      |           |   |
|---------|---|------|-----------|---|
| Code    | Course Title  | Type | Cr.       | Pre-Req.  |
| 0702315 | Fashion Design Studio IV                                  | Th/P | 3         | 0702310, 0702311                                    |
| 0702316 | Pattern Making and Production Studio III                  | Th/P | 3         | 0702216   |
| 0702317 | Interdisciplinary Practices in Fashion and Textile Design | Th/P | 3         | 0702310, 0702311                                    |
| 0700333 | Research Methodology in Art and Design                    | Th   | 3         | 0700217, [0705213 or 0702213 or 0703212 or 0701251] |
| 0702XXX | Program Elective  |      | 3         |   |
|         | University Requirement                                    |      | 3         |   |
|         | <b>Total</b>  |      | <b>18</b> |   |

| SUMMER SESSION |  |      |     |                           |
|----------------|--|------|-----|---------------------------|
| Code           | Course Title   | Type | Cr. | Pre-Req.                  |
| 0702355        | Internship in Fashion Design and Textile (240 hours/6-8 weeks) | P    | 3   | 0702312, 0702315, 0702317 |

### FOURTH YEAR

| FALL                          |   |      |           |                           |
|-------------------------------|---|------|-----------|---------------------------|
| Code                          | Course Title                                | Type | Cr.       | Pre-Req.                  |
| 0702410                       | Fashion Design Graduation Project I         | Th/P | 3         | 0702316, 0702355, 0700333 |
| 0702411                       | Professional Development for Fashion Design | Th   | 3         | 0702355, co-req. 0702410  |
| 0701XXX or 0703XXX or 0705XXX | Interdisciplinary Elective                  |      | 3         |                           |
|                               | University Requirement                      |      | 3         |                           |
|                               | University Requirement                      |      | 3         |                           |
|                               | <b>Total</b>                                |      | <b>15</b> |                           |

| SPRING  |                                      |      |           |                          |
|---------|--------------------------------------|------|-----------|--------------------------|
| Code    | Course Title                         | Type | Cr.       | Pre-Req.                 |
| 0702415 | Fashion Design Graduation Project II | Th/P | 6         | 0702410                  |
| 0702414 | Fashion Collection Market Promotion  | Th/P | 3         | 0702410, co-req. 0702415 |
|         | University Requirement               |      | 3         |                          |
|         | University Requirement               |      | 3         |                          |
|         | <b>Total</b>                         |      | <b>15</b> |                          |

## INTERIOR DESIGN

### Teaching Faculty

|                        |                          |
|------------------------|--------------------------|
| Asem Obeidat           | Associate Professor      |
| Abdul Samad Al Khalidi | Assistant Professor      |
| Ayman Fathy            | Assistant Professor      |
| Dana Amro              | Assistant Professor      |
| Iman Ibrahim           | Assistant Professor      |
| Asil Al Baghdadi       | Lecturer                 |
| Nadia Al Badri         | Lecturer                 |
| Rana Wafi              | Lecturer (part time)     |
| Samar Mousfy           | Senior Tutor (part time) |

### Program Vision

To become a leading **regional design center**, integrating **local traditions with progressive practices**.

### Program Mission

To promote **interdisciplinary practice-based**, and **regionally inspired creative designers**.

### Program Overview

The Bachelor of Design in Interior Design focuses on the development and enrichment of interior environments through interdisciplinary studies and sustainable practices. It is the art and science of creating building interiors and related elements towards improving the quality of human life, their health and welfare. The Program focuses on integrative practice where design concepts and applications are a core component of the learning process. This is achieved by enhancing students' abilities and skills through research-based problem solving coupled with hands-on practice allowing for a smooth transition between theory and practice, academia and professionalism.

### Career Opportunities

Graduates of the Interior Design Program are engaged in diverse creative and design industries. These include freelance design commissions for interiors and furniture design, product and prototype design and production, exhibition and retail installations.

## Study Plan

### FIRST YEAR

| FALL    |                             |      |           |                |
|---------|-----------------------------|------|-----------|----------------|
| Code    | Course Title                | Type | Cr.       | Pre-Req.       |
| 0700111 | Art and Design Foundation I | Th/P | 3         | Full Admission |
| 0700113 | Drawing Fundamentals        | Th/P | 3         | Full Admission |
| 0700115 | History of Art and Design I | Th   | 3         | Full Admission |
| 0700114 | Color Theory                | Th/P | 3         | Full Admission |
|         | University Requirement      |      | 3         |                |
|         | <b>Total</b>                |      | <b>15</b> |                |

| SPRING  |                                 |      |           |          |
|---------|---------------------------------|------|-----------|----------|
| Code    | Course Title                    | Type | Cr.       | Pre-Req. |
| 0700112 | Art and Design Foundation II    | Th/P | 3         | 0700111  |
| 0700116 | History of Art and Design II    | Th   | 3         | 0700115  |
| 0705115 | Introduction to Interior Design | Th/P | 3         | 0700111  |
| 0705116 | Drawing for Interior Design     | Th/P | 3         | 0700113  |
| 0705117 | Interior Drafting               | Th/P | 3         | 0700113  |
|         | <b>Total</b>                    |      | <b>15</b> |          |

### SECOND YEAR

| FALL    |                                       |      |           |                           |
|---------|---------------------------------------|------|-----------|---------------------------|
| Code    | Course Title                          | Type | Cr.       | Pre-Req.                  |
| 0705210 | Interior Design Studio I              | Th/P | 3         | 0705115, 0705116, 0700112 |
| 0705211 | Interior Construction                 | Th/P | 3         | co-req. 0705210, 0700112  |
| 0705212 | Computer Aided Design I               | Th/P | 3         | 0705117                   |
| 0705213 | History and Theory of Interior Design | Th   | 3         | 0705115, 0700116          |
| 0700217 | Islamic and Emirati Art and Design    | Th   | 3         | 0700116                   |
|         | <b>Total</b>                          |      | <b>15</b> |                           |

| SPRING  |                                      |      |           |                                      |
|---------|--------------------------------------|------|-----------|--------------------------------------|
| Code    | Course Title                         | Type | Cr.       | Pre-Req.                             |
| 0705215 | Interior Design Studio II            | Th/P | 3         | 0705210, 0700114                     |
| 0705216 | Building Systems for Interiors       | Th/P | 3         | 0705210, 0705211 pre/co-req. 0705117 |
| 0705217 | Computer Aided Design II             | Th/P | 3         | 0705212                              |
| 0705218 | Lighting Design for Interiors        | Th/P | 3         | co-req. 0705216                      |
| 0705219 | Materials and Finishes for Interiors | Th/P | 3         | 0705211                              |
|         | <b>Total</b>                         |      | <b>15</b> |                                      |

### THIRD YEAR

| FALL    |                               |      |           |                              |
|---------|-------------------------------|------|-----------|------------------------------|
| Code    | Course Title                  | Type | Cr.       | Pre-Req.                     |
| 0705310 | Interior Design Studio III    | Th/P | 3         | 0705215, pre/co-req. 0705211 |
| 0705311 | Textiles for Interior Design  | Th/P | 3         | 0705219                      |
| 0705312 | Working Drawing and Detailing | Th/P | 3         | 0705116, 0705219             |
| 0700XXX | College Elective              |      | 3         |                              |
|         | University Requirement        |      | 3         |                              |
|         | University Requirement        |      | 3         |                              |
|         | <b>Total</b>                  |      | <b>18</b> |                              |

| SPRING  |  |      |           |   |
|---------|--|------|-----------|---|
| Code    | Course Title                           | Type | Cr.       | Pre-Req.  |
| 0705315 | Interior Design Studio IV              | Th/P | 3         | 0705310, pre/co-req. 0705217, pre/co-req. 0705218   |
| 0705316 | Sustainable Environments               | Th/P | 3         | co-req. 0705315, 0705213                            |
| 0705317 | Furniture Design                       | Th/P | 3         | 0705312, 0705213, pre/co-req. 0705219               |
| 0700333 | Research Methodology in Art and Design | Th   | 3         | 0700217, [0705213 or 0702213 or 0703212 or 0701251] |
| 0706XXX | Program Elective                       |      | 3         |   |
|         | University Requirement                 |      | 3         |   |
|         | <b>Total</b>                           |      | <b>18</b> |   |

| SUMMER SESSION |   |      |     |          |
|----------------|---|------|-----|----------|
| Code           | Course Title  | Type | Cr. | Pre-Req. |
| 0705355        | Internship in Interior Design (240 hours/6-8 weeks) | P    | 3   | 0705315  |

### FOURTH YEAR

| FALL                          |                                      |      |           |   |
|-------------------------------|--------------------------------------|------|-----------|---|
| Code                          | Course Title                         | Type | Cr.       | Pre-Req.  |
| 0705410                       | Interior Design Graduation Project I | Th/P | 3         | 0705355, pre/co-req. 0705311, pre/co-req. 0705312 |
| 0705411                       | Environmental Design                 | Th/P | 3         | 0705315, 0705316                                  |
| 0701XXX or 0702XXX or 0703XXX | Interdisciplinary Elective           |      | 3         |   |
|                               | University Requirement               |      | 3         |   |
|                               | University Requirement               |      | 3         |   |
|                               | <b>Total</b>                         |      | <b>15</b> |   |

| SPRING  |   |      |           |                              |
|---------|---|------|-----------|------------------------------|
| Code    | Course Title                              | Type | Cr.       | Pre-Req.                     |
| 0705415 | Interior Design Graduation Project II     | Th/P | 6         | 0705410, pre/co-req. 0705317 |
| 0705414 | Professional Practice for Interior Design | Th   | 3         | 0705355, 0705410             |
|         | University Requirement                    |      | 3         |                              |
|         | University Requirement                    |      | 3         |                              |
|         | <b>Total</b>                              |      | <b>15</b> |                              |



## VISUAL COMMUNICATION

### Teaching Faculty

|                    |                      |
|--------------------|----------------------|
| Shaima El Bardawil | Assistant Professor  |
| Ahmad Manar Laham  | Lecturer             |
| Nada Abdallah      | Lecturer (visiting)  |
| Sama Al Rasheed    | Lecturer (visiting)  |
| Ibtesam Alnahdi    | Lecturer (part time) |

### Program Overview

The Bachelor of Design in Visual Communication advocates for an interdisciplinary learning and teaching experience encouraging critical analysis, inquiry, self-direction and independent learning. It exposes students to the duality of communicative languages coupled with various representational skills, both digital and manual. The Program ensures students' engagement in creative and innovative real and hypothetical projects emphasizing a systematic approach to visual communication. The curriculum is based on a mix of local and global practices with an emphasis on bilingual representation and a theoretical framework stemming from our students' heritage and traditions.

### Program Vision

To become a **leading regional design nucleus, rooted in heritage and aspiring towards internationalization.**

### Program Mission

To promote **interdisciplinary practice-based, and forward-thinking designers.**

### Career Opportunities

Graduates of the Visual Communication Program sustain professional careers in various cultural and design institutions as well as the print and digital media industry. This includes freelance design, publishing and printing, product design, campaigns and advertising, and identity and brand development.

## Study Plan

### FIRST YEAR

| FALL    |                             |      |           |                | SPRING  |                                      |      |           |          |
|---------|-----------------------------|------|-----------|----------------|---------|--------------------------------------|------|-----------|----------|
| Code    | Course Title                | Type | Cr.       | Pre-Req.       | Code    | Course Title                         | Type | Cr.       | Pre-Req. |
| 0700111 | Art and Design Foundation I | Th/P | 3         | Full Admission | 0700112 | Art and Design Foundation II         | Th/P | 3         | 0700111  |
| 0700113 | Drawing Fundamentals        | Th/P | 3         | Full Admission | 0700116 | History of Art and Design II         | Th   | 3         | 0700115  |
| 0700115 | History of Art and Design I | Th   | 3         | Full Admission | 0703101 | Introduction to Visual Communication | Th/P | 3         | 0700111  |
| 0700114 | Color Theory                | Th/P | 3         | Full Admission | 0703102 | Advanced Drawing                     | Th/P | 3         | 0700113  |
|         | University Requirement      |      | 3         |                | 0703103 | Design and Visual Practices          | Th/P | 3         | 0700111  |
|         | <b>Total</b>                |      | <b>15</b> |                |         | <b>Total</b>                         |      | <b>15</b> |          |

### SECOND YEAR

| FALL    |  |      |           |                           | SPRING  |                                    |      |           |                  |
|---------|--|------|-----------|---------------------------|---------|------------------------------------|------|-----------|------------------|
| Code    | Course Title   | Type | Cr.       | Pre-Req.                  | Code    | Course Title                       | Type | Cr.       | Pre-Req.         |
| 0703210 | Visual Communication Studio I                        | Th/P | 3         | 0703101, 0703103, 0700112 | 0703215 | Visual Communication Studio II     | Th/P | 3         | 0700114, 0703210 |
| 0703211 | Typography I   | Th/P | 3         | 0703101, 0703103, 0700112 | 0703216 | Typography II                      | Th/P | 3         | 0703210, 0703211 |
| 0703212 | Photography and Image Making in Visual Communication | Th/P | 3         | 0703101                   | 0703217 | Information Design                 | Th/P | 3         | 0703101          |
| 0703213 | History and Theory of Visual Communication           | Th   | 3         | 0700116                   | 0703218 | Digital Illustration and Painting  | Th/P | 3         | 0703210, 0703212 |
|         | University Requirement                               |      | 3         |                           | 0700217 | Islamic and Emirati Art and Design | Th   | 3         | 0700116          |
|         | <b>Total</b>   |      | <b>15</b> |                           |         | <b>Total</b>                       |      | <b>15</b> |                  |

### THIRD YEAR

| FALL    |                                 |      |           |                  | SPRING  |  |      |           |   |
|---------|---------------------------------|------|-----------|------------------|---------|--|------|-----------|---|
| Code    | Course Title                    | Type | Cr.       | Pre-Req.         | Code    | Course Title                           | Type | Cr.       | Pre-Req.  |
| 0703310 | Visual Communication Studio III | Th/P | 3         | 0703215, 0703216 | 0703315 | Visual Communication Studio IV         | Th/P | 3         | 0703310, 0703311, 0703312                           |
| 0703311 | Typography III                  | Th/P | 3         | 0703216          | 0703316 | Interaction Design I                   | Th/P | 3         | 0703312, 0703313                                    |
| 0703312 | Branding and Identity Design    | Th/P | 3         | 0703215, 0703216 | 0703317 | Narrative and Sequence II              | Th/P | 3         | 0703313   |
| 0703313 | Narrative and Sequence I        | Th/P | 3         | 0703212          | 0700333 | Research Methodology in Art and Design | Th   | 3         | 0700217, [0705213 or 0702213 or 0703212 or 0701251] |
| 0703XXX | Program Elective                |      | 3         |                  | 0700XXX | College Elective                       |      | 3         |   |
|         | University Requirement          |      | 3         |                  |         | University Requirement                 |      | 3         |   |
|         | <b>Total</b>                    |      | <b>18</b> |                  |         | <b>Total</b>                           |      | <b>18</b> |   |

| SUMMER SESSION |  |      |     |          |
|----------------|--|------|-----|----------|
| Code           | Course Title   | Type | Cr. | Pre-Req. |
| 0703355        | Internship in Visual Communication (240 hours/6-8 weeks) | P    | 3   | 0703315  |

### FOURTH YEAR

| FALL                          |   |      |           |                           | SPRING  |  |      |           |                  |
|-------------------------------|---|------|-----------|---------------------------|---------|--|------|-----------|------------------|
| Code                          | Course Title                              | Type | Cr.       | Pre-Req.                  | Code    | Course Title                                   | Type | Cr.       | Pre-Req.         |
| 0703410                       | Visual Communication Graduation Project I | Th/P | 3         | 0703317, 0703355, 0700333 | 0703415 | Visual Communication Graduation Project II     | Th/P | 6         | 0703410, 0703411 |
| 0703411                       | Interaction Design II                     | Th/P | 3         | 0703314                   | 0703412 | Professional Practice for Visual Communication | Th   | 3         | 0703355, 0703410 |
| 0701XXX or 0702XXX or 0705XXX | Interdisciplinary Elective                |      | 3         |                           |         | University Requirement                         |      | 3         |                  |
|                               | University Requirement                    |      | 3         |                           |         | University Requirement                         |      | 3         |                  |
|                               | <b>Total</b>                              |      | <b>15</b> |                           |         | <b>Total</b>                                   |      | <b>15</b> |                  |

## Course Descriptions

### COMMON COURSES

#### **0700111 Arts and Design Foundation I (1-3-3)**

This course will introduce and serve to implement the fundamentals, skills, and concepts of art and design through a variety of discussions and assigned exercises. It explores basic elements of art and design including line, color, shape, texture, space, form, as well as tone and value. Learners will study the basic principles of art and design such as unity, harmony, balance, hierarchy, scale, proportion, emphasis, similarity and contrast, balance, contrast, proportion, pattern, and rhythm. These will be investigated in two-dimensional forms, which will be sought through drawn and constructed methods to develop examples of the fundamental practices and theories of achieving effective solutions to various design problems. Art and Design Foundations I is aimed at preparing each successful student in art and design to further their studies in a specific area through obtaining the appropriate foundations required in solving design problems through an appropriate process. Instructors observe students' progress through individual, class and group tutorials, reflective diary, and student records.

#### **0700112 Arts and Design Foundation II (1-3-3)**

This course is a continuation of Art and Design Foundations I where students learn methods of form generation using the elements of design and the principles of organization taught previously. These will be investigated through a series of projects, in two and three-dimensional formats, with greater emphasis on three-dimensional forms and structures.

#### **0700113 Drawing Fundamentals (1-3-3)**

This course introduces the fundamentals of drawing to develop observational skills and handling of drawing materials and techniques. Students will cultivate abilities to approach drawing and a means of visual organization. Additionally, students will learn to articulate basic art and design concepts and processes using the vocabularies that are specific to the discipline of drawing.

#### **0700114 Color Theory (1-3-3)**

This course introduces students to basic color concepts and its applications in arts and design. The course focus on the basic visual and aesthetic interactions of color, the science and philosophical nature of color perception and use in arts and design. This course presents an inclusive background on color theory, harmony, and aesthetic principles of color in addition to its impact on users of Arts and Design. Concepts include grids and hierarchy, color models and mixing, color interaction, human response to color, etc. Students are required to complete experiments and projects to understand the implications of color within a variety of creative and cultural contexts.

#### **0700115 History of Art and Design I (3-0-3)**

This introductory lecture-based course provides a survey of the history of art and design from Prehistory to 1500 CE. In addition to gaining historical knowledge, students will learn how to interpret works of art and design in their historical, social, and cultural contexts. Study and research skills will also be introduced.

#### **0700116 History of Art and Design II (3-0-3)**

This introductory lecture-based course provides a survey of the history of art and design from 1500 CE to the present. In addition to gaining historical knowledge, students will learn how to interpret works of art and design in their historical, social, and cultural contexts. Study and research skills will also be introduced.

### **0700217 Islamic and Emirati Art and Design (3-0-3)**

This course aims to give an overview of the rich history and tradition of arts, craft, architecture, and design of the Islamic World with a special reference to the United Arab Emirates. After explaining the basic characteristics of Islamic art (the most typical forms, topics, genres, traditions, and regulations concerning ways of expressions in arts and design), the chronological development of the diverse regions is being analyzed. A special focus is given to the appearance of traditional forms in contemporary art and design, to be further discussed in the course.

### **0700311 The Global Contemporary in Art and Design (3-0-3)**

The course serves as a general College Elective in the fields of history and theory of art and design. This course is a comparative approach to non-Western art within the context of post colonialism. Since the turn of the 21<sup>st</sup> century, we have seen a vibrant flourishing of an increasingly “globalized” art market, which reflects a wider shift in culture, economics, and politics. Our aim will be to critically analyze recent art from Asia, the Middle East, Africa, and the Americas to foster expanded definitions of modern and contemporary art.

### **0700312 Comparative Aesthetics (3-0-3)**

The course serves as a general College Elective in the fields of history and theory of art and design. This course will be an introduction to world aesthetics. Through the reading of primary texts (ancient, modern, and contemporary), this course offers a detailed assessment of the development of aesthetic inquiry from not only a Western perspective, but from East Asian, Indian, and Islamic perspectives as well. Emphasis will therefore be placed on critical and comparative thinking.

### **0700313 Art Market and the Infrastructure of Arts (3-0-3)**

This course aims to investigate the thrilling world of art market and the infrastructure of arts. The focus is given on the development of the art commerce, a business segment that is extremely booming in the last decades. The students will thus get an insight in the functioning of the art market, how the economic value of an artwork is constituted, and in what relationship this financial value might be with the aesthetic qualities of the work. Besides that, the lectures will also attempt to explore the infrastructure of the arts, just like the motivations and concepts behind the foundation of public, private, and corporate art collections. Special consideration will also be given to the art scene and art market of the MENASA (Middle East, North Africa, and South Asia) region. The course serves as a general College Elective in the fields of history and theory of art and design.

### **0700314 Contemporary Art and Media Theory (3-0-3)**

The course serves as a general College Elective in the fields of history and theory of art and design. The course is designed to explore contemporary thought within art and new media. Special emphasis will place on current trends and shifts in production, theory, and criticism. The intention is to understand how artists and media producers respond to and are influenced by an increasingly shifting society where rapid cultural change, advances in technology, and the effects of globalization reconfigure how we perceive the world.

### **0700315 Special Topics in Art, Design and Culture (3-0-3)**

The course serves as a general College Elective in the fields of history and theory of art and design. The main purpose of the course is to provide students with important understanding and overview of various aspects of the history and theory of art and design. The offered subjects and topics may change annually, and can include aesthetics, philosophy of art, special thematic surveys of the history of art and design, investigations in the impact of popular culture and globalization on art, theories of post-colonialism and orientalism as well as examination of Islamic and Emirati art, design, architecture and culture.

### **0700316 Film and Philosophy (3-0-3)**

As the “seventh art,” in the past 100 years cinema has been an inspiration for artists and designers of all types in terms of both form and content. This course will explore some of the great works in the history of cinema through the lens of people who have extracted theories or even philosophical ideas from these films. Each week will explore one film as well as texts from major thinkers who have commented upon it.

### **0700317 Design Psychology (3-0-3)**

This course aims to introduce the concept of design psychology, principles, and theories of artistic creativity in the areas of interior design. It is dedicated to understanding the association between the environment and its users (human-environment interactions) and (environment-behavior relations). Students will learn about foundational theories and a variety of research methods for understanding environment-behavior relationships, explore human responses to various types of environmental conditions, and improve their understanding how interior design impact the society.

### **0700318 Regional Practice in Arts and Design (3-0-3)**

This course focuses on contemporary art and design practices of the region given the exponential rise of its artists and designers on the global scene. Discussions shall highlight the established and emerging art and design movements introducing its pioneers and leading professionals and practitioners. The aim is to engage in an in-depth understanding of the various forces influencing its practice, including local history, social and cultural heritage, and available infrastructure, as well as to comprehend the emerging artistic movements gaining recognition.

### **0700333 Research Methodology in Art and Design (3-0-3)**

This course is designed to assist fourth-year arts and design students in their study of a range of humanities theories and methods for academic research and writing. Students who wish to complete research work in the arts may frequently encounter problems when they move from summarizing theories to applying them in practice. Therefore, this course involves intensive scrutiny of a representative range of theories commonly encountered across the humanities and in areas encompassed by CFAD degree programs. These theories are then explored through the examination of research work that illustrates active uses of these ideas to solve specific research problems. Students will complete in-class assignments and a long research paper that will enable them to apply selected theoretical work to problems that they have identified independently.

## **FINE ARTS COURSES**

### **0701100 Introduction to Fine Arts (1-3-3)**

This course introduces students to the discipline of Fine Arts by exploring a wide range of venues, practitioners, organizations and other resources that facilitate research, personal development and professional opportunities for Fine Arts that exists in the United Arab Emirates. Students are introduced to topics, workshops and writing exercises dealing with the relevant local cultural resources and contemporary art infrastructures in the UAE. Visits to artist studios are organized to give students a clear idea of the professional ethics and requirements of contemporary Fine Arts studio practice through direct interaction with professional artists.

### **0701105 Drawing for Fine Arts (1-3-3)**

This course investigates the technical and conceptual issues of drawing within the context of contemporary fine arts practice. Classes and studio projects will be structured to address the articulation of form, space, light, figure/ground relationships, mark making, and pictorial structure. Problems in abstraction will also be introduced. Development of a critical vocabulary and visual analysis shall be nurtured through daily discussions and regular critiques. Students will be expected to

develop an understanding of the language of drawing and to initiate a personal approach to its unique expressive capabilities.

#### **0701111 Photography Studio I (1-3-3)**

The course is an introduction to the photographic techniques, materials, and methods. It will familiarize the students with the fundamental techniques for creative photography. This course will give a comprehensive overview of the basic tools that concern both analog and digital photography. Through lectures and demo in the photo studio, students will have the opportunity to personally experience the creative potential of photography and the languages linked to it.

#### **0701212 Photography Studio II (1-3-3)**

This course emphasizes the development of technical and creative skills and concepts through handling booth, analog and digital photographic practice. The focus will be given on enhancing abilities in the studio practice and the development of the skills previously acquired in Photography I. Creating and developing personal concepts in different genres of photography will be the main objective of the course. Assignments are designed to develop skills in framing, depth of field, shutter speed, editing the print, composition, and representation, focusing on technical and formal abilities.

#### **0701221 Printmaking Studio I (1-3-3)**

This course is an introduction to Fine Arts Printmaking through studio work, lectures, workshops, discussions, and consultations with respective studio faculty. Printmaking 1 introduces students to printmaking techniques and applications, the usage of tools and equipment in the printmaking workshop, and the safe handling of materials utilized in the media. Students acquire abilities through the process of producing studio projects. Emphasis will be on the achievement of technical competence in the techniques introduced, along with image development, visual literacy, and craftsmanship. Critical dialogue is maintained throughout the semester in the form of individual and group discussions/critiques.

#### **0701222 Printmaking Studio II (1-3-3)**

This is an intermediate level Fine Arts Printmaking course that builds on the skills students acquired in Printmaking 1. Projects are designed to further extend their abilities in printmaking processes and techniques as well as introduce students to new techniques and applications, the usage of tools and equipment, and the safe handling of materials utilized in the media. Students acquire abilities through the process of producing studio projects. Emphasis will be on the achievement of technical competence in the techniques introduced, along with image development, visual literacy, craftsmanship and conceptual ability. Critical dialogue is maintained throughout the semester in the form of individual and group discussions/critiques.

#### **0701231 Painting Studio I (1-3-3)**

Painting I is an introduction to the materials and processes of painting. Students will further develop drawing skills within the context of painting. This course aims to develop skills in visual organization, composition, and technical abilities. Studio projects are augmented with lectures and discussions on history, concepts, form, colors, space, and light pertaining to the discipline of painting.

#### **0701232 Painting Studio II (1-3-3)**

This course focuses on the development of technical and expressionistic painting skills and concepts through observational drawing and painting from the live model. Emphasis will be given on figurative painting to further develop the skills previously acquired in Painting I. This course will cover traditional approaches to painting as a foundation that gradually develops into contemporary language of art making.

### **0701241 Sculpture Studio I (1-3-3)**

This course provides a comprehensive introduction to three-dimensional art and the techniques of sculpture. It includes a glimpse into art history and the language of the three-dimensional artworks, understanding proportions of shapes and volumes together with the relation to space and basic anatomy for classical realism as a foundation for sculptural art.

### **0701242 Sculpture Studio II (1-3-3)**

This course is a continuation of Sculpture I focusing on the 3- D aspect of Studio Art with a specialization in sculpture materials and methods. This course offers an intensive introduction to a variety of sculptural techniques to familiarize students with a range of approaches to contemporary art practice. The course aims to bring together thinking and practice that responds to a thematic project. Students will continue their studies with tools and techniques while exploring materials such as wire, rubber, mold making, clay and mixed media. Art history, and contemporary practice subjects will be explored. Students explore a variety of sculptural concepts and approaches.

### **0701251 Theories of Contemporary Art (3-0-3)**

In this course students learn to use theoretical models and concepts through discussion and written assignments, applying them in the interpretation and analysis of artistic practices. Students examine subjects that include art and design in the modern age, the avant-garde, postmodernism, interpretations of Orientalism, post-colonialist theories analyses of the rise of popular media, and the digital revolution. Studying culture in this way enables students to understand how the practice of art in the studio is located in a wider context. In this course, students further enhance discussion, writing, research and communication skills acquired in the Foundation Stage. It also provides students with critical frameworks with which they are able to analyze their own work and the work of other artists. Parallel to the lectures, students will have the chance to advance their academic reading and writing skills through a series of seminar readings and projects on a weekly basis.

### **0701310 Fine Arts Videography (1-3-3)**

This course introduces the fundamentals of videography as an art form. A diverse range of moving image concepts and practices will be discussed. During the course the topic will be unfolded through a variety of activities - watching parts of films by selected artists that provide examples of the style, discussing particular scenes to offer a deeper reading of moving image and its visual language. Students will explore the technical aspects of video shooting and editing software through a series of exercises and demos.

### **0701313 Photography Studio III (1-3-3)**

This advanced level photographic course focuses on complex subjects like architecture, editorial, fashion, portrait, staged photography. Development of elaborated concepts and the use of artistic approaches in photography is the main focus of this course. Students will gain knowledge in the history and key genres of photography. Professional photo-editing will be practiced as well as the professional digital printing and handling of color management.

### **0701324 Printmaking Studio III (1-3-3)**

This is an advanced level Fine Arts Printmaking course that builds on the skills students acquired in Printmaking 1 and 2. Projects are designed to further extend their abilities in printmaking processes and techniques. Students acquire abilities through the process of producing studio projects. Emphasis will be on the achievement of technical competence, along with image development, visual literacy, craftsmanship and conceptual ability. Critical dialogue is maintained throughout the semester in the



form of individual and group discussions/critiques. Course culminates in an end of semester exhibition of works.

### **0701333 Painting Studio III (1-3-3)**

This course emphasizes on the refinement of students' technical and conceptual sensibilities in the development and realization of projects in the context of painting. The emphasis will be on the discourse of contemporary art in relation to the discipline and practice of painting. Through lectures, discussions, critiques and exploration of studio methods and materials, students engage in analysis and reflection broadening their knowledge in studio practice and furthering their individual development. Students will be working on conceptually led project assignments designed to challenge their imagination in the investigation of forms, methods, materials and processes in the development and realization of painting projects.

### **0701343 Sculpture Studio III (1-3-3)**

This course is exploring advanced level of sculptural techniques and concepts emphasizing on and experimental approach in the three-dimensional art. It involves intense sculptural exercises based on the canon of modern and contemporary art that emphasize experimental approach in 3-Dimensional artistic expression.

### **0701352 Fine Arts Seminar I (3-0-3)**

This is a thematic seminar on special topics in theory and history for third-year Fine Arts students which builds upon the work done in Theories of Contemporary Art. Its aim is to give conceptual and contextual tools with which to understand the art world as well as their own work. The themes change annually and can include topics such as: popular culture, globalization and art, orientalism and post-colonialism, media theory, art markets and the institutions of art, and aesthetics.

### **0701453 Fine Arts Seminar II (3-0-3)**

This is a thematic seminar on special topics in theory and history for fourth-year Fine Arts students and, as such, builds upon the work done in FA Seminar I. Its aim is to give conceptual and contextual tools with which to understand the art world as well as their own work. The themes change annually and can include topics such as: popular culture, globalization and art, orientalism and post-colonialism, media theory, art markets and the institutions of art, and aesthetics.

### **0701355 Internship in Fine Arts (0-0-3)**

The internship of the fine arts program gives students an opportunity to apply in a professional environment the knowledge and skills gained through the rest of the curriculum. This component provides students with the opportunity to gain experience in a professional art environment which informs their career decisions and plans for further learning. Students must complete 240 hours.

### **0701418 Professional Practice in Fine Arts (3-0-3)**

This course complements students' Fine Arts studies across the program. This unit is split into two sections, with the first section focusing on particular aspects of subject-based professional practice(s), career development and life-long learning. The second part is structured in a cross-disciplinary way and involves teamwork (mixed discipline) to generate conceptual development to a common brief. The purpose is to provide students with an opportunity to prepare for a professional environment and to reflect on their current skills and abilities, including collaboration, time management, team skills, presentation skills and communication. The objective of the unit is to facilitate knowledge and skills that can support student career paths in the future.



### **0701460 Studio Research Project (1-3-3)**

This course will enable students to define and analyze areas of interest within studio research, reflecting their individual development. In consultation with faculty, students will initiate and develop a focused and self-directed long-term studio research project, articulating their ideas through one medium or forming an interdisciplinary approach. Students will apply critical thinking in relation to art research, construction of meaning and understanding of contemporary art.

### **0701461 Fine Arts Graduation Project I (1-3-3)**

This course aims to develop a focused and effective practice in studio work and research, whereby students are required to produce a major body of studio work that synthesizes theory into practice. Students will be examining discourses in contemporary art to cultivate a coherent line of intellectual inquiry in fine arts practice. Students are required to initiate, plan, develop, research, realize and present a major body of studio work. They will formulate a written project proposal, which will guide their research, studio work and time management. At this stage, students should demonstrate individual growth and independent thinking in research and the making of art.

### **0701462 Fine Arts Graduation Project II (2-6-6)**

This course serves as the framework for producing an exhibition, which prepares students for the challenges of professional fine arts and exhibition practice. Students will be required to initiate, plan, develop, research, realize and present a major body of studio work in the form of a Final Exhibition Project. Students will engage in the realization of body of studio work for an exhibition, curatorial planning, and organization with the particular characteristics of the exhibition space and the dynamics of a large group exhibition. The students' Final Exhibition Project should exemplify their ability to work confidently as a fine arts practitioner.

## **FASHION DESIGN AND TEXTILE**

### **0702110 Introduction to Fashion & Textile Design (1-3-3)**

This course introduces students to the fundamentals of fashion and textile design, correlation to the research process and its role in design projects and industry. The first phase focuses on the research methodology, resources and materials used in developing original concepts and visual presentations for variety of design projects. Research is organized through multiple activities including selection of valid resources, data collection, concepts development, visual diary and mood board composition, design process organization, research-based exercises, and presentations. Second phase focuses on fundamentals of materials used in fashion and textile design including fibers and fabric origins, classification, construction, and manufacturing. Students are also supported to start using professional design terminology. Studio demonstrations introduces students to the organization and operation of the fashion and textile workshops. Students are guided through the variety of practical exercises and utilization of industrial sewing machines and workshop equipment.

### **0702111 Drawing for Fashion Design (1-3-3)**

This course builds on the skills developed in Drawing Fundamentals Course and introduces students into the foundations of the professional fashion design drawing. The focus is on figure drawing, human body proportions analysis, live model drawing and application of various tools and techniques in fashion drawing practice. Throughout variety and extensive drawing exercises students begin to correlate the influence of human body proportions to fashion design process drawing the basic fashion silhouettes and proportional garment forms. The course sets foundation for further progress in figure composition, grouping and drawing interpretation of fabrics and textures. Further practice focuses on stylization in fashion illustration and prepares students for CAD drawing in fashion design.

### **0702112 Textiles for Fashion (2-2-3)**

A comprehensive overview of the textile industry and its relation to fashion. Students develop knowledge of fibers, yarns, textile construction, finishing, and textile specific terminology. Student learn textile fibers characteristics, both natural and man-made and their effects on fabric selection for appropriate end uses. Students recognize the impact of printing, dyeing and finishing on the final product both aesthetically and functionally.

### **0702210 Fashion Design Studio I (1-3-3)**

This course extends building on intermediate fashion design and drawing skills applied in concept-based fashion projects. Students are expected to develop original, creative and research-based idea and apply it in fashion design process to create original basic garment forms defined in the brief. Through the exploration of 2D design elements (lines, shapes) they learn how to combine/transform them into 3D (forms and surface effects) in fashion design. Student's progress is organized around the extensive design, figure and garment drawing practice and documented within the sketchbook, visual diary & mood board composition. The design project is further explored through the supervised garment production (the Pattern Making Studio I) and application of experimental textile work applied in fashion design (the Textile Design Methodology and Techniques Studio Course). The students' course portfolio justifies the completed process of their drawing practice, design development and garment production.

### **0702211 Pattern Making and Production Studio I (1-3-3)**

This studio course introduces students to the fundamental techniques, methodology and practice in flat pattern making and basic garment production. The emphasis is on understanding correlation between the design and production (creative and technical processes.) The focus is on fundamentals of 2D flat pattern making and transition to 3D sample (toile) production. Students are introduced to the precision pattern construction for basic garment forms (bodice, sleeves shirt and skirt.) Through the pattern block construction (sloper) students learn to understand the dart manipulation and fabric manipulation for 3D effects in garment construction, body measurements and proportions, and use size charts. They are expected to construct and produce original basic garment, operating with the industrial sewing machines and workshop equipment. Exam is the practice-based construction of the pattern block related to the course work.

### **0702212 Textile Design Studio I (1-3-3)**

This course introduces students to the design styles, design vocabulary, and research methodologies necessary for creating innovative original textile surface designs. This course aims to equip students with a range of skills needed to create unique textile surface design applied for both experimental and commercial fashion. Students are guided through the textile design process from inspiration and idea development (research & sketchbook) to prototyping (experimentation of different techniques), utilizing the textile lab and workshop materials and equipment.

### **0702213 History and Theory of Fashion and Textiles (3-0-3)**

This course introduces the history of fashion design. The topics include a basic terminology and an analysis of fashion design principles that will enhance the comprehension of visual language forms through a historical survey of modern and post-modern fashion design. Attention is given to the resonances of fine arts in fashion and textile design, as well as to the correspondences between fashion, textile and other design fields, such as interior design and architecture, in their social, cultural, historical and political contexts. Finally, this unit investigates the exceptional role of fashion design/significant fashion designers as a sensitive indicator for socio-cultural change. Parallel to the

lectures, students will have the chance to advance their academic reading and writing skills through a series of seminar readings and projects on a weekly basis.

#### **0702214 CAD for Fashion and Textile Design (1-3-3)**

The objective of the course is to introduce students into the basic application of CAD in Fashion and Textile Design. Throughout extensive lab practice students are trained primarily to the utilization of Adobe Photoshop & Illustrator. Up-to-date professional software programs are to be explored basically, to provide regular information and broaden student's understanding of its creative and technical application for fashion and textile design commercial and industry projects. Fashion CAD practice focuses on figure and garments drawing and design basics including application and composition of colors, fabrics, prints & textures, and technical drawing for fashion (flats). Textile CAD practices introduces students to variety of CAD for textile design focusing on Adobe Photoshop and Illustrator. Students learn how to start with creation of multiple textile patterns and repeat patterns using a combination of colors, blend and filtering, application of scanned fabrics, textures, and images. They will be introduced how to generate some design suggestions for textile and fashion Projects. The CAD digital portfolio of work is included in final presentation at the end of the course.

#### **0702215 Fashion Design Studio II (1-3-3)**

This course extends building on intermediate fashion design and drawing skills applied in concept-based fashion projects. Students are expected to develop original, creative and research-based idea and apply it in fashion design process to create original basic garment forms defined in the brief. Through the exploration of 2D design elements (lines, shapes) they learn how to combine/transform them into 3D (forms and surface effects) in fashion design. Student's progress is organized around the extensive design, figure and garment drawing practice and documented within the sketchbook, visual diary & mood board composition. The design project is further explored through the supervised garment production (the Pattern Making Studio I) and application of experimental textile work applied in fashion design (the Textile Design Methodology and Techniques Studio Course). The students' course portfolio justifies the completed process of their drawing practice, design development and garment production.

#### **0702216 Pattern Making and Production Studio II (1-3-3)**

This course continues with intermediate level studio practice in flat patternmaking and garment construction & production. Students are introduced to more complex flat pattern construction of a garments defined in the brief (e.g. dress & trousers, etc.) including varieties and basic functional details. Garment analysis, fitting techniques and finishing are integral part of the studio practice. The final project focuses on creating the pattern block, toile test and final garment production related to the original garment design (defined in Fashion Design Studio II with CAD course). The sewing practice focuses on finishing techniques in garment production. CAD practice for pattern making focuses on the technical drawings and flats in Adobe Illustrator or related professional CAD. The Final Project presentation includes finished garment, toile, constructed pattern and pattern tests, record of technical files as defined in the brief. The exam is practice based flat pattern construction of the garments related to the course work.

#### **0702217 Textile Printing and Dying (1-3-3)**

This course combines exploration of textile dyeing & printing technologies: digital printing (repeat textile patterns) manual (silk screen printing) and CAD utilization for designing textile patterns. The objective is to improve students' creative and technical skills and artistic approach for design and industrial end use products. The Project work is focused on original textile pattern CAD design and application of dyeing and printing in final production of samples and fabric. Students gain knowledge of the characteristics of dyeing and printing techniques, print materials and principles of application of dyes on various fibers. Students are expected to keep the diary record of their research and

work. CAD practice expands student's skills and creative application of different themes to produce original digital textile patterns including combination of photography, drawings and application of colors. Final portfolio presentation justifies the level of skills achieved through the textile workshop practice.

#### **0702218 Textile Design Studio II (1-3-3)**

This course expands student's skills and creative application of different themes to produce original textile design. Students are expected to create innovative textile designs for specific purposes and applications. References from a variety of sources is researched and analyzed for design inspiration. Based on current trend research, students create designs using a variety of layouts, repeats and seasonal palettes. Technical and design-related aspects of color, texture, repeat and printing according to industry standards is examined and applied. Students produce visualizations of the designs and printed presentations for their portfolio.

#### **0702310 Fashion Design Studio III (1-3-3)**

This course explores the fundamentals and process of designing fashion collection based on original concept development focusing on commerciality. Students research and analyze fashion categories, trends, various fashion collection design and brands specifics, target markets and customer profiles including global and regional scene. The first stage is research-based concept design for one original-experimental outfit that combines textile techniques with traditional handcraft and high-end technologies and (or) sustainable practices. The second design phase is design of the commercial (capsule) collection based on finalized experimental garment design targeting a specific fashion market. Activities include design analysis, collection planning, fabric sourcing and pricing. While experimental design work is directed towards the production the capsule collection is executed within the course CAD lab as the final range plan presentation board.

#### **0702311 Draping Exploration Studio (1-3-3)**

This Course equips students with the skills and understanding of three-dimensional fashion design & garment construction & production process - draping on the dress forms (industry & couture type.) The exploration of fabrics and textile performances is the essential part of the draping practice. Through the variety of draping techniques, styles, and experimentation (moulage technique, origami, sculpting with fabrics), drafting and fitting toiles, students learn to drape, draft, and produce commercial and unique garments. Textile and fabric exploration focus on understanding fabric performances in draping and experimentations with recycled (up-cycled) textile, fusion of various materials with fabrics, and application of embellishments and detailing on draped garments. Exam is practice based related to the basics of draping and fabric performances in fashion design.

#### **0702312 Fashion Digital Portfolio (1-3-3)**

Fashion Digital Portfolio engages graduate students in the production of professionally conceptualized and structured Major Project-Fashion Portfolio that meets the requirements of the contemporary fashion industry standards. Using CAD software for fashion and textile design students are self-directing the creative composition, graphic layout style and full production process of their major project Fashion Portfolio to present their best skills and creative practice adopted and refined through their fashion and textile design studies. Students will also present their final year digital portfolio to the jury panel at the end of the final year semester.

#### **0701315 Fashion Design Studio IV (1-3-3)**

Students are organized in a group to design and produce the unique capsule (commercial) collection with respect to the chosen customer profile, collection style and market. Exploration of fashion trends and forecasting improves further their understanding of the fashion cycles, and terminology related to 'slow/fast' fashion, marketing and retail. The team work includes activities for the market

promotion (fashion photography, social media, fashion blogs, websites, printed promo material.) Students are also allowed to enter fashion design competitions to develop body of work for the Course Project. The final Project presentation includes digital fashion portfolio, promotional material for the capsule collection and evaluation report on the group cooperation experiences.

### **0702316 Pattern Making and Production Studio III (1-3-3)**

The course combines advanced and experimental pattern making methodology and garment production. The studio work focuses on flat pattern construction of complex garments defined in the brief (e.g. the jackets, coats, etc.) including interfacing materials, fitting analysis, function, and pattern alterations. Students are encouraged to experiment with combination of pattern construction methods (e.g. Japanese, zero waste, etc.) to produce original conceptual, experimental outfit in correlation with the Fashion Design Collections Studio project. The garment production process is explored further by visiting the fashion industry studios and organizing workshops with industry professionals to expose students to the professional methodology and up-to-date practice. CAD lab focuses on advanced technical drawing exercises and Portfolio composition. The exam is practice based pattern construction related to the course work.

### **0702317 Interdisciplinary Practices in Fashion and Textile Design (1-3-3)**

The course integrates research and design experimentation through the interdisciplinary practices in fashion and textile design. Students are enabled to experiment and work through the exploration and symbiosis of mediums, materials, processes, working methods and disciplines (e.g. textile sculpting for fashion, conceptual installation & photography, graphic design, illustration, fine arts, and many other.) Students will learn how to improve wide approach to contextual understanding and independent creative practice. Through the interactive and experimental processes in art and design the students combine traditional and explore new methodologies to develop unique design idea for final production and challenge conventional viewpoints in fashion and textile design processes. The aim is to enable students to investigate, develop and refine unique artistic profile and set of creative skills and personal “signature” in art and design of fashion and textile. As the 3D experimental fashion studio the course can offer the additional (scheduled) workshop in accessories and prototyping focusing on experimental “new” textile and fabrics combinations.

### **0702355 Internship in Fashion Design and Textiles (0-0-3)**

Internship in the Fashion Design with Textiles Program gives the student an excellent opportunity to apply their knowledge and skills to professional industry practice. The course requires the students to be trained with a professional body related to Fashion or Textiles Industry or Organization, governmental, private or commercial, for a period of 6-8 weeks. The training helps students to make career decisions and invest further learning paths. Emphasis is on the interaction of fashion design practice to other professions and aspects of the fashion industry. The cooperation process provides exposure to professionalism, code of ethics, teamwork, and opportunity to learn methods and techniques commonly used in industry practice. Experiences will vary depending on the individual student’s practice (including fashion and textile design studios, manufacturing operations, retail-buying offices, events organizing and press relation activities, media and styling related positions, etc.). Students must complete 240 hours.

### **0702410 Fashion Design Graduation Project I (1-3-3)**

The purpose of this course is to provide the students with the opportunity to demonstrate the ability to self-manage the process of their Major Projects concept proposals. The process includes research, fabric sourcing, original concept proposal, design development and garments prototyping targeting specific customer profile and selected market. Throughout the process of research and concept proposal, students begin to define their individual identity as future designer professionals. The course is structured to emphasize the practical interpretation (studio work for collection prototypes) of self-

directed research and concept development that may be based on student's Dissertation work. Students are expected to develop and present the Major Collection Concept Proposal together with prototypes of the original collection and design sketchbook to the external jury - the local and regional industry professionals to confirm the concepts and prepare for the next stage of the Major Project fashion collection production.

#### **0702411 Professional Development for Fashion Design (3-0-3)**

The aim of this course is to enable students to practice a number of creative design and technical skills associated with planning their degree work and an opportunity to develop variety of professional skills prior to determining, through research, the criteria, rationale and the market for their degree collections. The project will take the form of a self-structured learning contract and will allow students to explore a skill area which will complement their research and design base for their degree fashion collection. Students may also enter international design competitions where appropriate and cooperate with external industry professionals to execute short-term project. The final stage of professional development course includes students practice in structuring their professional profile including writing and editing CV, cover letter, artist statement and professional aspiration report to be included in their Degree Project Portfolio.

#### **0702414 Fashion Collection Market Promotion (1-3-3)**

This course prepares graduate students to create, develop and produce concept strategies for their Major Fashion Collection marketing promotion. The Fashion Promotion Portfolio should present the best of their originality and design identity and propose the most appropriate strategies and concepts related to the market promotion of their Major Projects. The focus is on their conceptual Major Project narrative impact on personal brand building, choice of promotional activities e.g. social media, pop up stores, fashion editorials, production of promo materials (catalogues, posters, etc.) Students are expected to create original photo-fashion editorial or fashion video of their graduate project-fashion collection and present ability to professionally cooperate in organizing the final fashion show.

#### **0702415 Fashion Design Graduation Project II (2-6-6)**

This is the final year graduation project course that gives the student the opportunity to construct, produce and complete original Major Project-Fashion Collection based on the completed research concepts presented in Graduation Project I. The senior student should present the ability to manage their project successfully demonstrating both personal and professional skills, including self-commitment, time management and efficient work organization and cooperation. The final product of their overall work is professionally executed capsule fashion collection with finalized folio of work to be presented to the external industry professional jury at the end of the final year semester. Students are expected to professionally apply adopted skills in variety of garment construction methodologies, from pattern cutting to draping, textile design techniques and decoration, and industry standards in garment production and finishing. Students' knowledge and ability to 'stylize' their collection by combining and designing accessories for their collection is a part of their final collection presentation (Graduate Portfolio Fashion Show and Exit Show Exhibition).

### **INTERIOR DESIGN**

#### **0705115 Introduction to Interior Design (1-3-3)**

This course introduces the students to the primary elements and principles of interior design. Through simple functional assignments, students begin to understand the design of interior spaces. Students are also introduced to wall treatments, flooring, ceiling and finishing materials.

#### **0705116 Drawing for Interior Design (1-3-3)**

This course is a continuation of "Drawing 1" and further develops the students' understanding of the fundamental elements of drawing and visual communication. It takes a step further by introducing the



students to quick sketches, shades and shadows and different rendering techniques through still life objects and surrounding environment to assist students in creating images of their ideas about two-dimensional shapes and three-dimensional forms and spaces. The student will learn skills for developing and communicating their design ideas and concepts related to their interior projects. Quick visualization and perspective drawing techniques will be introduced and investigated through in/out-class exercises and sketchbook studies. Students will be encouraged to develop a personal style.

#### **0705117 Interior Drafting (1-3-3)**

This course will introduce students to the fundamentals of drafting and documenting interior concepts through, plans, symbols, models, and designs. Students will become familiar with drafting equipment and methodology used in interior design and architecture. This course will provide basic understanding of drafting techniques necessary to allow students to progress to different drawings in interiors through, sketches, scales, dimensions, lettering, and various drafting techniques to reflecting construction drawings, demonstrating architecture and interiors details.

#### **0705210 Interior Design Studio I (1-3-3)**

This course enables students to develop a level of understanding of the principles and elements of interior design as well as the basics of space planning, and focuses on the study of functional, practical, and aesthetical approaches. Emphasis is placed on the spatial organization and sequencing, human anthropometrics and conceptual problem solving in three-dimensional through small-scale residential spaces. Students re-design residential spaces through necessary illustrations including floor plans, sections, elevations, perspectives and models. Students are also introduced to wall treatments, flooring, ceiling and finishing materials. The course also considers the employments of universal design.

#### **0705211 Interior Construction (2-2-3)**

The course introduces students to basic construction techniques in integration with structural elements and building services. Students will learn how to design and prepare basic construction drawings of interior planes (ceilings, floors, and walls), openings and details of transitions between them.

#### **0705212 Computer Aided Design I (1-3-3)**

Computer Aided Design (CAD) is well-known in the field of interior design, the project can be created in the computer to help designers to outline design projects without drawing up arrangements physically. This course focus on the essentials for 2D CAD drawing, plan, and drafting. Students will demonstrate a comprehensive 2D interior design projects to understand the fundamentals and the capacities in Computer Aided Design drawing.

#### **0705213 History and Theory of Interior Design (3-0-3)**

This course is concerned with the history Interior design development through interpretation of the time-periods. It introduces the history of Interior Architecture and Design from ancient times to the present. Topics include basic terminology and an analysis of the historical Interior Design settings that will enable the comprehension of visual idioms through a historical survey of modern and postmodern interior design.

#### **0705215 Interior Design Studio II (1-3-3)**

This course is introduce the students to commercial interiors through small scale design projects (e.g. cafés, boutique, art gallery, cosmetic shop, jewelry shop, etc.). Students will develop a level of understanding of the principles and the basics of space planning of commercial spaces. An Emphasis will be on the functional, practical, aesthetical approaches, spatial organization and sequencing, human anthropometrics and conceptual problem solving. Students re-design projects through necessary illustrations including floor plans, reflected ceiling plan, sections, elevations, perspectives

and models. Students are also introduced to wall treatments, flooring, ceiling and finishing materials. The course also consider the employments of universal design and sustainability principles.

#### **0705216 Building Systems for Interiors (2-2-3)**

This course introduces students to fundamentals of systems installations in buildings (plumbing, fire egress, electrical networks, communication, HVAC) as well as basic acoustical design, sound transfer and control in interior environments. Students will develop an understanding of the functional elements forming these systems. At the end of the course, students will be able to deliver technical drawings of these systems in an interior space using basic calculations according to building codes and standards

#### **0705217 Computer Aided Design II (1-3-3)**

This course introduces basics of 3D visualization. Students practice hands-on application of modeling techniques of interior components and environment then apply different building materials with their specific color and texture. Lights and shades used adding cameras and changing their locations to create realistic visual images and choose the best visual perspective. Students are required to complete 3D projects to understand the essentials and the capacities in 3D drawing.

#### **0705218 Lighting Design for Interiors (2-2-3)**

Students will study the technical, aesthetic and psychological aspects of lighting in an environment. Natural and artificial lighting methods will be explained and evaluated according to the task, spaces and human requirement. Principles of lighting design and selection of different types of lighting will be applied to the selection of luminaires and lighting sources. Natural and artificial lighting application on interiors spaces will be assess and evaluated through using computer simulation.

#### **0705219 Materials and Finishes for Interiors (2-2-4)**

This course is a survey of materials used by interior designers for architectural elements and finishes. The student will learn to evaluate and select the appropriate materials for a interior design projects, and will be introduced to life safety ratings for finish materials. The student will be introduced to writing specifications for interior design materials.

#### **0705310 Interior Design Studio III (1-3-3)**

The aim of the course is to introduce the students to the design of administrative interiors, in which the emphasis being placed on planning, furniture arrangement, circulation, and design treatments. Students will develop a level of understanding of the principles and the basics of space planning, and focuses on the study of functional, practical, and aesthetical approaches. Emphasis is placed on the design elements and principles, spatial organization and sequencing, human anthropometrics and conceptual problem solving in administrative spaces through necessary illustrations including floor plans, reflected ceiling plan, sections and elevations, perspectives and models. Students are also introduced to wall treatments, flooring, ceiling and finishing materials. Rendering is a vital aspect of this course.

#### **0705311 Textiles for Interior Design (1-3-3)**

This course aims to explore diversity of textiles based on types of, fiber, yarn, fabrication methods, dyeing, printing, finishing, and maintenance required. Students will study fabrics and textiles available for interior applications. Students may design a new fabric for specific functions. The design includes the pattern, texture, color, etc. Students can apply visualization techniques to show selected textile designs in an interior space.



### **0705312 Working Drawing and Detailing (1-3-3)**

This course aims to advance students' ability to prepare detailed technical drawings for different types and styles of interior environments. Students will evaluate, select and specify the appropriate materials and techniques to develop integrated construction solutions for a given interior project.

### **0705315 Interior Design Studio IV (1-3-3)**

The aim of the course is to introduce the students to the design of hospitality interiors (e.g. hotels, fitness clubs, lounges, spas, country clubs, and tourist resorts). Students will develop a level of understanding of the principles and the basics of space planning, and focuses on the study of functional, practical, and aesthetical approaches. Students re-design interior hospitality spaces varied in function and scale through necessary illustrations, floor plans, reflected ceiling plan, sections and elevations, perspectives and models. Students are also introduced to wall treatments, flooring, ceiling and finishing materials. The course also consider the employments of sustainability principles and the natural environment such as lighting and different natural ventilation systems. Rendering is a vital aspect of the course.

### **0705316 Sustainable Environments (2-2-3)**

This course aims to introduce students to basic concepts of sustainability approach. This course is designed to introduce students to the principles, frameworks, and tools of sustainability in interiors and architecture design. Creating solutions throughout sustainable application to increase efficiency and performance of buildings and systems, create value and health for people, and building efficiency at the same time Throughout the course, students use practical tools and techniques for identifying issues, developing solutions, troubleshooting problems, measuring progress, and implementations through using sustainable approach in the design.

### **0705317 Furniture Design (1-3-3)**

The aim of this course is to learn about the history and movements of design related to furniture in theory for use in practical aspects. The course focuses on techniques and stages of furniture design, materials, and measurements, as well as methods of implementation and production. This course covers the basic skills to develop the idea, manufacturing techniques, and applications in interior environments. Application in this course is through design and production of a variety of furniture pieces in real scale to be valid for usage.

### **0705355 Internship in Interior Design (0-0-3)**

The internship of interior design program gives students an opportunity to apply in a professional environment the knowledge and skills gained through the rest of the curriculum. This component provides students with the opportunity to gain experience in a professional interior design environment, which informs their career decisions and plans for further learning. This internship provides an experience of professionalism, code of ethics, teamwork, as well as opportunities for learning methods and techniques commonly used in professional practice. The experience will vary depending on the individual student but could involve a position in interior design studios, design firms, consultancies, design management or communications. Students must complete 240 hours.

### **0705410 Interior Design Graduation Project I (1-3-3)**

This course works to provide advanced studies integrated to the graduation project 2, includes all process of the pre-design stage, and offers studies to a specific project through sequential systematic scientific research. Students expected to identify the graduation project problem and look around and then propose appropriate solutions to be applied in the course of graduation project in the area of interior design. Students are provided the opportunity to explore and develop concepts through an understanding of context, site and function. A key aspect of the course will be an investigation and development of communication formats, skills, and techniques appropriate to the subject.

### **0705411 Environmental Design (2-2-3)**

The course aims to study and solve problems, both interior and exterior (landscape design) of large-scale public spaces including healthcare facilities, health centers, clinics, special care and long-term facilities, mental health facilities, elderly people homes, children facilities, and rehabilitation centers for people with special needs. Students re-design interior healthcare spaces by addressing space planning, furniture arrangement, lighting, colors, and materials suitable for human users and their culture, personal, social, health, and psychological needs. The course also focuses on the employments of sustainability principles and the natural environment such as lighting and different natural ventilation systems. Students will demonstrate a detailed understanding of the design process including research, concept and design development, design documentation and presentation.

### **0705414 Professional Practice for Interior Design (3-0-3)**

The course aims to develop Students professional skills which includes: resume writing, practical aspects of interior design practices including, professional liability, ethics and working within teamwork. Design project management will be discussed including specifications, contract variations, cost estimation sheet, general budget control, and feasibility study.

### **0705415 Interior Design Graduation Project II (2-6-6)**

A capstone studio course, in which emphasis is placed on the student's ability to independently create a large-scale project that successfully demonstrates all aspects of the design process, as well as the skills and knowledge they have learned to this point in their studies in the presentation of an evidence-based creative solution to a self-defined issue or implication. An aspect of the project solution is the use of appropriate methods to effectively communicate research findings as well as effective presentation techniques used to express the proposed design concept. The course also attentions on the employments of sustainability principles and the natural environment such as lighting and different natural ventilation systems. Senior project presentations are evaluated by a multi-disciplinary panel of jurors. Students will demonstrate a detailed understanding of the design process including research, concept and design development, design documentation and presentation.

## **VISUAL COMMUNICATION**

### **0703101 Introduction to Visual Communication (1-3-3)**

This course introduces students to a practice-based, hands-on approach to explore visual communication design. Students will learn the about visual communication basic concepts, principles, and theories. Connections to current and historical context of the graphic arts are woven throughout the course. Students will also share their work and learn to take part in design critiques and discussions, as both designers and peers. Readings and viewings of relevant practices are a required component of the course.

### **0703102 Advanced Drawing (1-3-3)**

This course provides an important opportunity for students to experience projects that emphasize the progressive development of problem solving as these relate to art practice, creative and interpretive abilities and technical and manipulative skills specific to the in depth practice of the drawing tool. Tutors demonstrate new drawing skills, monitor their progress through individual, class, and group tutorials, reflective diary, and student records.

### **0703103 Design and Visual Practices (1-3-3)**

This course consists of an intensive exploration of the fundamental principles and concepts of Graphic Design that govern effective compositions for effective communications. It covers design concepts such as balance, proximity, alignment, repetition, contrast, white space, working with grids. This course also investigates the use of shape, color, hierarchy, and word/ image relationships, as design

communicative tools. Through a series of studio assignments, projects, critiques, readings, and lectures. Learners will explore the manipulation of graphic form to convey meaning, fundamentals of idea generation and development of original design concepts, and the designer's role as visual storyteller. Learners should be able to comprehensively understand the basic communication design concepts and principles, with working knowledge of Adobe InDesign, Adobe Photoshop, and Adobe Illustrator.

### **0703210 Visual Communication Studio I (1-3-3)**

This course focuses on the application of design and typographic principles, and type/ image integration to communication design projects of moderate and increasing complexity. Emphasis is on development of strong concepts, which communicate persuasively and effectively integrate type and image in different layout compositions. Learners should be able to work with type and images in a variety of print design effectively such as posters and editorial applications including magazines, and book designs. This course introduces the field of Visual Communication, the process of problem solving and how to design effective visual communications solutions. Students must focus on strategy, research, and target audience analysis for different design tasks.

### **0703211 Typography I (1-3-3)**

This course covers the applications and fundamental elements and categories of type, basic letterforms, typographic contrast, hierarchy of information, major type families and characteristics, and typographic grids; and how these apply to print media. It discusses the theory, practice, technology, history, and evolution of typography. Students will build skills for the art of typesetting and typographic layout, and for expressive typography and conceptual thinking. Students will combine the theoretical and underlying principles with practical outcomes. The Focus of Typography I is on Latin Script, specifically English.

### **0703212 Photography and Image Making in Visual Communications (1-3-3)**

The course provides a hands-on introduction to the digital photographic practice as it relates to Graphic Design. Students will learn and practice using industry standard processes and tools to create digital and analog outputs. The course covers camera controls, digital and analog image processing as well as digital darkroom techniques. Emphasis is given to the image composition based on aesthetic principles and historic precedent. Students will learn how to work with scanned images and digital photographs in preparation for publication layout and design, Web output and used within digital platforms.

### **0703213 History and Theory of Visual Communication (3-0-3)**

This course introduces the history of visual communication from about 1800 to the present. Furthermore, topics include a basic terminology and an analysis of the visual communication principles that will enhance the comprehension of the visual language forms through a historical survey of the modern and postmodern visual communication. Attention is given to the developments in printmaking, typography, and book design in their social, cultural, historical, and political context. Finally, the course investigates the role of visual communication in advertising and explores the sustainable materials and their application for the visual communicators and their clients.

### **0703215 Visual Communication Studio II (1-3-3)**

This course emphasizes on critical thinking, concept development as a process, and research and marketing methodologies required for various visual systems. It includes an exploration and application of human factors in Visual Communication. Students will learn how to develop their unique design approach in the design process, refine their design, prototyping and presentation skills by working on integrated projects that involve multiple applications. This course main concentration is on advertising real life products and/ or services.

### **0703216 Typography II (1-3-3)**

This course introduces the application of typographic principles to applied communication design projects of moderate complexity. Students strengthen skills in building typographic relationships and details, creating sophisticated typographic layouts, including dynamic use of the grid, and employing type use and choice for creating expressive, conceptually based typographic design for various purposes. Projects will explore advanced grid systems, type design, proportion, legibility, readability, deep study of letterforms, and structures for composition of multiple type and letterform related elements. The Focus of Typography II is on Latin Script, specifically English with a brief introduction to bilingual typographic matchmaking between Latin and English scripts.

### **0703217 Information Design (1-3-3)**

In this course, students will be taught that Information Design is the practice of gathering, filtering, and presenting information in accordance with effective design principles in order to understand – and communicate to others – the essence, the meaning of that information. The field of information design applies design principles to the process of translating complex, unorganized, or unstructured data into valuable, meaningful information for the purpose of practical use. The practice of information design combines skills in graphic design, writing, and editing, instructional design, and human factors, with the electronic delivery of information and the internet, the representation of information is becoming more complex.

### **0703218 Digital Illustration and Painting (1-3-3)**

This Course aims to introduce students to the art of illustration, its practice, importance, and applications. Students will learn basic drawing skills and the traditional drawing concepts of basic composition. This course is to teach students how to use an industry standard package to produce digital illustrations and paintings. This is a comprehensive course that focuses on various traditional and digital computer illustration and painting techniques in order to enable the students to produce 2D and 3D graphics for various design purposes and contexts. In addition to the extensive technical aspect of the course, learners will be introduced to topics such as: concept art, storytelling, rendering and color theory.

### **0703310 Visual Communication Studio III (1-3-3)**

The studio introduces a research-based design process in solving various design problems across varied media including exploration of practical execution of design artifacts in two and three-dimensional formats. This may include storytelling, experiential design, packaging design, 3D graphics, etc. Students will engage critical thinking, visual research, and rigorous production techniques. Students will learn how to develop their unique design approach in the design process, refine their design, prototyping and presentation skills by working on integrated projects that involve multiple applications. Special emphasis is given to developing effective user-centric visual systems for various applications.

### **0703311 Typography III (1-3-3)**

This course builds upon the basic content explored and discussed in Typography I and Typography II with a specific focus on Arabic Modern Typography. Typography III discusses the theory, practice, technology, history and evolution of Arabic calligraphy and typography. Students will apply basic typographic layout principles studied in Typography I and II in bilingual contexts. Students will learn the fundamentals of Arabic typography, letterforms, and structures for composition of multiple type and letterform related elements. The course teaches the students how to work with complex bilingual layouts for print and digital media.

### **0703312 Branding and Identity Design (1-3-3)**

This course consists of an exploration and analysis of brands and visual identity and will equip learners to integrate knowledge and inform creative and functional design solutions. The course will investigate strategic thinking and brand positioning using specific case studies allowing students to gain a new level of understanding and appreciation of how design and communication can not only deliver a design solution, but also help define a company's (product/ service) message. Students will develop their own unique and consistent visual brand identity utilizing their research and creative skills to identify the organization's personality or essence, designing a visual identifier. Students will create the visual elements that support the new brand and develop a visual voice and related message through multiple applications such as print collateral, web, packaging, and environment.

### **0703313 Narrative and Sequence I (1-3-3)**

This course Introduces image sequencing as a bedrock for building motion narrative and explores the relationship between type, image, and motion as they interact to create a narrative. Students will have to conceive, plan, and produce topical narratives, explore digital storytelling in short film format, and master industry standard planning and production tools and formats.

### **0703315 Visual Communication Studio IV (1-3-3)**

The course focuses on visual design as a system. It emphasizes problem-solving skills across varied media and design needs and explores various types of interaction between design and related media vehicles through a research-based process. Learners will use production techniques in different, yet integrated formats and applications and engages design strategies as they relate to promotions and wide printed and multimedia communications.

### **0703316 Interaction Design I (1-3-3)**

The course introduces industry standard process of development of interactive projects. Explores design for web technologies and platforms. Learners will be exposed to the development process follows all standard planning and interaction design tools that engages high fidelity prototyping and deployment. Students will be introduced to issues of usability, web standards, navigation, information design for the web, and overall site management.

### **0703317 Narrative and Sequence II (1-3-3)**

Building on prior students understanding of narrative and sequence the course deepens student understanding in storytelling and visual narratives. The course analyses various forms of digital narratives, contexts and applications. Students develop storytelling forms for various screen formats and delivery platforms. The emphasis is on generation of meaning and audience engagement in various cultural contexts where narratives should be tailored to engage specific audiences.

### **0703355 Internship for Visual Communication (0-0-3)**

The Internship for Visual Communication program gives an opportunity to apply in a professional environment the knowledge and skills gained through the rest of the curriculum. This component provides students with the opportunity to gain experience in a professional art environment, which informs their career decisions and plans for further learning. Students must complete 240 hours.

### **0703410 Visual Communication Graduation Project I (1-3-3)**

This course aims to enable learners to develop a self-initiated major project proposal, integrating learning from all stages in the program. The major project proposal comprehensively describes and justifies the scope, parameters and nature of the major project design and development in Graduation Project II. Learners provide a clear rationale that justifies the chosen strategies and a summary of projected outcomes. The written rationale is supported by extensive background research, case studies exploration and analysis, visual research, and documentation of the chosen area of individual projects. The major project proposal represents student self-reflection, individual learning and

professional direction that will be used in their design practice. The project proposal underpins and informs the development and design of the Graduation Project (II).

#### **0703411 Interaction Design II (1-3-3)**

The course centers on acquiring more advanced knowledge on interactive structures and presentation formats with an emphasis is given to designing for mobile experience. Students practice an industry standard process for developing context specific experiences and forms. The resulting outcomes are optimized for a user centric experience and technical sophistication, which engages digital media and technology as they emerge and gain relevance in our lives.

#### **0703412 Professional Practice for Visual Communication (3-0-3)**

This course focuses on preparing students to enter the professional world of design practice. The course introduces all aspects of design employment including – writing professional documents, setting goals and objectives, assembling, and presenting design portfolios and interviewing and best practice of professional communications. Furthermore, students are required to develop a concept for design related company ready to be deployed. Students engage individual and group projects to simulate diverse set of situations, which they might encounter.

#### **0703415 Visual Communication Graduation Project II (2-6-6)**

This course is the culmination of the breadth of work and learning throughout the program. It enables learners to demonstrate their strengths as professional practitioners. At the start of year four, learners developed a comprehensive project proposal, providing a clear rationale that justifies the chosen strategies and includes a summary of projected outcomes. It provides an entry point for the learner who is embarking into the professional design continuum, either for further development at postgraduate level, or as a distinctive practitioner within a chosen area of design. It is expected that learners will demonstrate advanced skills and knowledge in evaluating ideas and materials, ability to put together a new form with emphasis on creating a new meaning or structure, a systematic organization of priorities and a clear understanding for resolving conflicts and other issues in terms of work across different areas of knowledge and skill.

# College of Communication

## COLLEGE OF COMMUNICATION

### Officers of the College

**Prof. Jairo A. Lugo-Ocando**

**Dean**

**Dr. Thouraya Snoussi**

**Assistant Dean**

### Administrative Support Staff

Thureya Ahmed

Sr. Administrative Assistant

Noora Mezal Majed

Administrative Officer

### Contact Information

College of Communication Building, W7  
University City

Sharjah, UAE

+971-65053611

[www.sharjah.ac.ae](http://www.sharjah.ac.ae)

### Accreditation

All programs offered in the College of Communication are accredited by the Commission for Academic Accreditation, Ministry of Education, UAE.

And all programs offered in the College of Communication have received international accreditation from Accrediting Council on Education in Journalism and Mass Communication ACEJMC.

### History

The College of Communication at the University of Sharjah was launched on September 1, 2002, following a University Board of Trustees (BOT) decision to convert the former Department of Communication at the College of Arts and Sciences into a full-fledged College of Communication. Since then, it has grown into a major college in the university with up-to-date infrastructures (radio and TV studios, desktop publishing and multimedia labs), 21 faculty members and a population of about 1200 students. The college offers four national and international accredited BA programs in Arabic and one BA program in English. The Arabic BA programs are in Journalism, Radio and Television, Graphic Design and Multimedia, and Public Relations. The BA English program is in Mass Communication. Students in the college are effectively trained in theory and practice. They are extensively trained in media production through their practical courses, projects, participation in reporting events in the university, the community and through practicum in the field work.



## Vision

As part of the University of Sharjah, the College of Communication is an innovative world-class teaching, learning and research institution providing a distinctive, inspirational, creative and supportive environment.

## Mission

The College of Communication is committed to providing a world-class educational experience that prepares lifelong learners and leaders with integrated knowledge and skills. We are passionate about building a collaborative and sustainable environment that cultivates twenty-first century skills and fosters pioneering research and scholarship. We seek to serve the current and future needs of our local community and beyond by offering innovative academic and professional programs.

## Goals

The College of Communication strives to achieve the following goals:

- To improve the student learning experience, the College of Communication has developed an innovative and focused plan to enhance and enrich student services and facilities, through providing effective student support services and promote personal development and ultimately employability
- At the College of Communication, we are passionate about our people and fostering a culture of collaboration, happiness, and productivity. To support the development of this type of organizational culture, we strive to achieve several human resource priorities.
- The College of Communication commitment to continued research efforts serves to address the emerging challenges of our times. As an institution of advanced learning, we remain focused on providing innovative world-class teaching, learning and research environments to support new insights and greater understanding of critical issues.
- The College of Communication acknowledges its role in supporting community development and service toward raising awareness and resolving issues of concern in the community. We are committed to providing a unique and supportive campus and building innovative strategic partnerships, which directly contribute to the wellbeing of our community and society on both a local and global scale.
- Given the need for the transformation of higher education to address the range of opportunities and challenges, the College of Communication is committed to providing a collaborative, innovative and sustainable learning environment that cultivates twenty-first century skills amongst its students.

## Academic Programs

The College of Communication has two departments: Mass Communication and Public Relations. The academic programs offered by these departments are:

- 1) Bachelor of Arts in Public Relations (Arabic).
- 2) Bachelor of Arts in Communication – Electronic Journalism (Arabic).
- 3) Bachelor of Arts in Communication – Radio and Television (Arabic).
- 4) Bachelor of Arts in Communication – Digital Media Design (Arabic).
- 5) Bachelor of Arts in Mass Communication (English).
- 6) Master of Arts in Communication (English).
- 7) Ph. D of Arts in Communication (English)

Mass Communication is the only program offered in the College of Communication in which the language of instruction is English. Other programs are taught mainly in Arabic. The Mass Communication program is presented in this English version of the Bulletin. Arabic-based programs are described in the Arabic version of the university bulletin. The Master of Arts in Communication program is described in the University Graduate Bulletin.

### Admission Requirements

Admission to the College of Communication is subject to satisfying the English proficiency requirement and the necessary academic preparation as described in the university admission section in this Bulletin. Applicants should refer to that section for details on the admission requirements. In addition to satisfying the university requirements, applicants aspired to join the College of Communication must submit to a personal interview.

### Graduation Requirements

Each degree program comprises three categories: university requirements (UR), college requirements (CR), and program requirements (PR). The university requirements are common to all departments in the College of Communication. Each program has its own required and elective courses. The credit hours allocations for each program are shown in the following table:

| BA in Public Relations, Arabic (123 Credits Hours) |           |           |           |            |
|--|-----------|-----------|-----------|------------|
|  | UR        | CR        | PR        | Total      |
| <b>Mandatory Credits</b>                           | 15        | 18        | 81        | 114        |
| <b>Elective Credits</b>                            | 9         |           |           | 9          |
| <b>Total</b>                                       | <b>24</b> | <b>18</b> | <b>81</b> | <b>123</b> |

| BA in Mass Communications, English (123 Credits) |           |           |           |            |
|--|-----------|-----------|-----------|------------|
|  | UR        | CR        | PR        | Total      |
| <b>Mandatory Credits</b>                         | 15        | 30        | 42        | 87         |
| <b>Elective Credits</b>                          | 9         | -         | 27        | 36         |
| <b>Total</b>                                     | <b>24</b> | <b>30</b> | <b>69</b> | <b>123</b> |

| BA in Communication - Graphic Design and Multimedia, Arabic (123 Credits) |           |           |           |            |
|---|-----------|-----------|-----------|------------|
|   | UR        | CR        | PR        | Total      |
| <b>Mandatory Credits</b>  | 15        | 18        | 81        | 114        |
| <b>Elective Credits</b>   | 9         |           |           | 9          |
| <b>Total</b>  | <b>24</b> | <b>18</b> | <b>81</b> | <b>123</b> |

| BA in Communication - Electronic Media, Arabic (123 Credits) |           |           |           |            |
|--|-----------|-----------|-----------|------------|
|  | UR        | CR        | PR        | Total      |
| <b>Mandatory Credits</b>                                     | 15        | 18        | 81        | 114        |
| <b>Elective Credits</b>                                      | 9         |           |           | 9          |
| <b>Total</b>   | <b>24</b> | <b>18</b> | <b>81</b> | <b>123</b> |

| BA in Communication – Journalism, Arabic (123 Credits) |           |           |           |            |
|--|-----------|-----------|-----------|------------|
|  | UR        | CR        | PR        | Total      |
| <b>Mandatory Credits</b>                               | 15        | 18        | 81        | 114        |
| <b>Elective Credits</b>                                | 9         |           |           | 9          |
| <b>Total</b>   | <b>24</b> | <b>18</b> | <b>81</b> | <b>123</b> |

#### Course Numbering Scheme

Courses offered in the College of Communication are designated by number codes in the form 08XYABC where:

|     |   |
|-----|---|
| XY  | 00: mandatory College Requirements (in Arabic)<br>06: Bachelor of Arts in Communication (in Arabic)<br>07: Bachelor of Arts in Public Relations (in Arabic)<br>08: Bachelor of Arts in Mass Communication (in English). |
| ABC | Program specific course number described in the respective program sections   |

#### I. University Requirements

Every student is required to take 24 credit hours of general education courses distributed over seven domains. Fifteen (15) mandatory credit hours are selected from domains 1, 2, 3 and 4 and (9) elective credit hours selected from domains 5, 6 and 7 as indicated in the university section (General Education).

#### II. College Requirements

College requirements (In English) consist of the 30 credit hours listed in the table below.

| Course # | Course Title                     | CrHrs    | Prerequisite   |
|----------|----------------------------------|----------|----------------|
| 0808100  | Introduction to Communication    | 3        |                |
| 0808101  | Media Writing                    | 3        |                |
| 0808210  | Introduction to Graphic Design   | <u>3</u> |                |
| 0808211  | Introduction to Journalism       | <u>3</u> |                |
| 0808213  | Introduction to Electronic Media | <u>3</u> |                |
| 0808300  | Communication Theories           | 3        | 0808100        |
| 0808305  | Media Law and Ethics             | 3        | 0808100        |
| 0808306  | Communication Research Methods   | 3        | 0808100        |
| 0808400  | Internship                       | 3        | 84 Credits     |
| 0808412  | Graduation Project               | <u>3</u> | Final Semester |

**Descriptions of the required College courses are given below:**

**0808100                      Introduction to Communication                      (3-0:3)**

**Prerequisite: None**

This course provides an overview of the different fields of communication, including print and electronic journalism, public relations and advertising, multimedia and graphic design. It also sheds light on the communication process and conditions for successful communication.

**0808101                      Media Writing                      (3-0:3)**

**Prerequisite: None**

This course covers writing for a range of media fields: print and electronic journalism, public relations and advertising, etc. Students learn the basics of writing for mass communication including writing news leads, news stories, simple advertisements, broadcast items and press releases.

**0808210                      Introduction to Graphic Design                      (2-2:3)**

**Prerequisite: None**

The course presents survey of contemporary approaches in graphic design, the graphic design process and elements, graphic design from concept to finished artwork, graphic design applications in print, television and interactive media. Digital design software including Photoshop, Illustrator, and others are also offered in this course,

**0808211                      Introduction to Journalism                      (3-0:3)**

**Prerequisite: None**

The course introduces the fundamentals of newspaper production. It is aimed at giving the students hands-on benefits of producing a newspaper through planning, reporting, photographing, editing, computer layout and design, advertising, and circulation. Students will learn to develop responsible attitudes toward meeting deadlines, time management and other workplace skills, which can help with career development.

**0808300                      Communication Theories                      (3-0:3)**

**Prerequisite: 0808100**

The course provides an overview of basic theory definitions, functional and structural theories, mass communication models media effects theories and perspectives, the agenda setting function, two-step-flow hypothesis, bullet theory, selective exposure, diffusion of innovations and Introduction to Communication.

**0808213                      Introduction to Electronic Media                      (3-0:3)**

**Prerequisite: None**

This course covers historical development of radio and television, description of broadcasting characteristics, technical features, programming formats and broadcast systems, the radio studio, television cameras and editing systems as well as practical applications in studio operations.

**0808305                      Media Law and Ethics                      (3-0:3)**

**Prerequisite: 0808100**

The course presents ethical foundations of mass media laws, ethical issues in mass communication and public relations practices, media law, professional and ethical codes of ethics in the Arab World and around the world and case studies.

**0808300                      Communication Research Methods                      (3-0:3)**

**Prerequisite: 0808100**

This course presents an introduction to basic qualitative and quantitative research methodologies in mass communication, public relations and advertising. It also covers the survey, content analysis, the experiment, focus group, historical and different research techniques, as well as practical applications.

**0808400                      Internship                      (3 Credits)**

**Prerequisite: Completing a minimum of 84 credits**

Students must successfully complete an eight-week supervised summer internship that enables them to obtain professional experiences at media organizations, public relations and advertising agencies or multimedia companies.

**0808412                      Graduation Project                      (3-0:3)**

**Prerequisite: Senior standing**

Students produce a research project or a practical strategy or media work under the supervision of the course instructor. Students may work as teams to gather field information on existing media structures or they may produce media work for media purposes. Students may use studio and desktop publishing facilities.

**III. Program Requirements**

Requirements for the Bachelor of Science degree are program-specific. They encompass three categories: Major specific core courses, major specific elective courses, and courses chosen from outside the major. The program requirements for the bachelor degrees in the different science majors are given hereafter. Details and titles of relevant courses are included in the Student's Study Plan (SSP) that is availed to every science student.

## Mass Communication (English)

### Personnel

|                     |  |
|---------------------|--|
| <b>Chairperson</b>  | <b>Dr. Thouraya Snoussi</b>                    |
| Coordinator         | Ogadimma Emenyeonu                             |
| Professor           | Abderrahmane Azzi<br>Tevhide Serra Gope        |
| Associate Professor | Zaid Buzian,                                   |
| Lecturer            | Chinyeaka Ogadimma Emenyeonu<br>Ghinwa Hassash |

### Vision

The BA in Mass Communication aims at providing quality education in the field of mass communication and to be a regional leader in Mass Communication training and education (in English) with an emphasis on meeting growing UAE needs, and gaining international academic accreditation.

### Mission

The mission of the BA in Mass Communication is to provide distinguished education and advanced training skills in Mass Communication field and equip its graduates with the knowledge, tools, and skills to compete at both national and regional levels.

### Objectives

The Mass Communication program supports the following objectives:

- 1) Provide students with a high-quality education in the area of mass communication.
- 2) Introduce students to possible career options in mass media and qualify them to obtain jobs in various mass media.
- 3) Provide students with writing skills for different media outlets.
- 4) Empower students with specialized technical skills in print, multimedia and broadcast media.
- 5) Enable students to cope with and understand the evolving global trends in communication technologies.
- 6) Provide students with critical and analytical skills in handling contemporary social and cultural issues as they are portrayed by media institutions.
- 7) Applying international standards in teaching mass media and obtain academic accreditation.
- 8) Attract distinguished faculty members to teach in the program to strengthen its reputation among other mass media programs in the UAE and the Arab world.
- 9) Meeting the growing national and regional job markets needs for young and bilingual mass media practitioners.

### Program Outcomes

By the end of the program the students will be able to:

- 1) Understand the concepts, functions, and theories of mass and digital media, their role in society, and history.

- 2) Understand the meaning of media social responsibility, professional ethical practices, and laws that organize mass media practice, and principles and laws of freedom of speech and press – and have an interdisciplinary knowledge that links media with social, cultural, economic and historical processes.
- 3) Acquire skills of critical thinking as this relates to concepts, assumptions and approaches of media and their roles in modern diverse and global society.
- 4) Understand and apply research tools and techniques in media research and evaluation of media products.
- 5) Has the ability of use and synthesis information and knowledge from a variety of sources in media production and research.
- 6) Use and operate radio and television equipment and studios and to master videography, editing, and directing for radio and television.
- 7) Conduct communication research and collect data via various methods and being able to interpret data using basic statistics.
- 8) Prepare, design and produce various newspapers and magazines using latest desktop publishing software and photojournalism skills, and produce different media using the latest graphics design and multimedia software.
- 9) Work independently as well as part of a team in various communication and media settings.
- 10) Be creative in designing and producing media contents that impact on the profession and the community.
- 11) Think critically, creatively, and independently, including the ability to critically evaluate own work and that of others.
- 12) Demonstrate an understanding of the diversity of people and cultures and of the significance and impact of mass communications in a global society.
- 13) Work independently in designing and implementing communication/media projects.
- 14) Apply knowledge and skills in real situations in the field through internship and other training settings.
- 15) Interact with professional colleagues in a team in a range of settings
- 16) Appreciate the importance of leadership, team work and decision-making processes in media production.
- 17) Exercise self-evaluations in various educational settings and media practices
- 18) Be able to explore new ways of thinking and doings in a fast-changing media landscape locally and globally.
- 19) Critically discuss and evaluate the role of ethical media practices in contemporary diverse environment.

### **Career Opportunities**

Because of the diverse nature of the program, graduates have many career opportunities in public and private media companies in the UAE or abroad. Program graduates may work in TV and radio stations in careers such as media writing, translation, video shooting and editing, directing, program hosting. They may also work in newspapers, magazines, and advertising agencies in careers such as graphic and layout design or web design. Program graduates may work in public relations sections in any public or private company as well.

### **Program Overview**

The B.A. in Mass Communication (MCE) is taught exclusively in English and involves a broad range of knowledge in Mass Communication. The program allows students to develop interest in certain areas of specializations through their graduation project. The MCE program includes both theoretical and practical/hands-on learning approaches. The program utilizes up-to-date facilities as broadcast studios, desktop publishing labs, iNews and multimedia labs and other instructional facilities that meet international standards in the field. The program empowers students with media knowledge, critical thinking, and most importantly, understanding media issues in their socio-economic and global

contexts, in addition to skills necessary to work and compete in an advanced technological and global environment.

| <b>B.A. in Mass Communication (123 Credits)</b>   |           |           |                 |              |
|---|-----------|-----------|-----------------|--------------|
|   | <b>UR</b> | <b>CR</b> | <b>PR</b>       | <b>Total</b> |
| <b>Mandatory Credits</b>  | 15        | 30        | 42 <sup>1</sup> | <b>87</b>    |
| <b>Electives Credits<sup>2</sup></b>  | 9         | -         | 21              | <b>30</b>    |
| <b>Free Elective Credits</b>  | -         | -         | 6               | <b>6</b>     |
| <b>Total</b>  | <b>24</b> | <b>30</b> | <b>69</b>       | <b>123</b>   |
| <sup>1</sup> Mandatory Liberal Arts and Sciences courses offered by other departments.              |           |           |                 |              |
| <sup>2</sup> Chosen from a list of 12 courses (36 credits) offered by the College of Communication. |           |           |                 |              |

### **I. University Requirements**

Every student is required to take 24 credit hours of general education courses distributed over seven domains. Fifteen (15) mandatory credit hours are selected from domains 1, 2, 3 and 4 and (9) elective credit hours selected from domains 5, 6 and 7 as indicated in the University section (General Education).

### **II. College Requirements**

The list of the 30 credits of College required courses and their descriptions are presented in the introductory pages of the College of Communication section in this bulletin.

### **III. Program Requirements**

The program requirements consists of 69 credit hours of courses divided into four major sets as described below.

#### **A. Elective Core Courses**

This set consists of 21 credit hours selected from the following list:

| <b>Course #</b> | <b>Course Title</b>            | <b>CrHrs</b> | <b>Prerequisite</b> |
|-----------------|--------------------------------|--------------|---------------------|
| 0808201         | Media in the UAE               | 3            |                     |
| 0808212         | Photography                    | 3            |                     |
| 0808231         | Principles of Public Relations | 3            |                     |
| 0808301         | Information Society            | 3            |                     |
| 0808303         | Public Opinion                 | 3            | 0808100             |
| 0808311         | News Reporting                 | 3            | 0808211             |



|         |   |   |         |
|---------|---|---|---------|
| 0808312 | Video Shooting and Editing                    | 3 | 0808213 |
| 0808313 | Layout and Design                             | 3 | 0808211 |
| 0808314 | Radio and TV Directing                        | 3 | 0808213 |
| 0808402 | Integrated Communication                      | 3 | 0808100 |
| 0808403 | International and Intercultural Communication | 3 | 0808100 |
| 0808415 | Online Journalism                             | 3 | 0808211 |

### B. Mandatory Support Courses

This category includes the 42 credit hours of Liberal Arts and Sciences courses as indicated in the table below.

| Course # | Course Title                                       | CrHrs | Prerequisite |
|----------|--|-------|--------------|
| 0202110  | Speech Communication                               | 3     | TOEFL        |
| 0205340  | Diplomacy  | 3     |              |
| 0205111  | Introduction to political science                  | 3     |              |
| 0204202  | Sociological Texts in English                      | 3     |              |
| 0302262  | Organizational Behavior                            | 3     | 0302160      |
| 0302280  | Introduction to Public Administration              | 3     |              |
| 0302370  | Consumer Behavior                                  | 3     |              |
| 0302160  | Principles of Management                           | 3     |              |
| 0302170  | Principles of Marketing                            | 3     |              |
| 0302254  | Business Communication                             | 3     | 0202112      |
| 0302363  | Creative Thinking and Problem Solving for Managers | 3     | 0302160      |
| 0302375  | Marketing and Communication                        | 3     | 0302170      |
| 0503263  | Health Education and Health Promotion              | 3     | None         |
| 1412243  | Interactive Multimedia                             | 3     | 1411100      |

### C. Free Elective Courses

Students are allowed to select 6 credit hours of free electives from outside of the College of Communication.

### Study Plan

The Mass Communication program encompasses 123 credit hours distributed over four years, 8 semesters of study in addition to a practical training that takes place on site at a specified workplace over summer after the student successfully completes 84 credit hours of coursework.

| Year I, Semester 1 (15 Credits) |   |       |               |
|---------------------------------|---|-------|---------------|
| Course                          | Title   | CrHrs | Prerequisites |
| 0201102                         | Arabic Language                               | 3     |               |
| 0201105                         | OR<br>Arabic Language for non-Arabic Speakers |       |               |
| 0202112                         | English for Academic Purposes                 | 3     |               |
| 0104100                         | Islamic Culture                               | 3     |               |
| 0808100                         | Introduction to Communication                 | 3     |               |
| 0808101                         | Media Writing                                 | 3     |               |

| Year 1, Semester 2 (15 Credits) |  |       |               |
|---------------------------------|--|-------|---------------|
| Course #                        | Title  | CrHrs | Prerequisites |
|                                 | University Elective                              | 3     |               |
| 1411100                         | Introduction to Information Technology – English | 3     |               |
| 0808210                         | Introduction to Graphic Design                   | 3     |               |
| 0808211                         | Introduction to Journalism                       | 3     |               |
|                                 | Mandatory Support Course                         | 3     |               |

| Year 2, Semester 3 (15 Credits) |                                  |       |               |
|---------------------------------|----------------------------------|-------|---------------|
| Course #                        | Title                            | CrHrs | Prerequisites |
| 0808213                         | Introduction to Electronic Media | 3     |               |
|                                 | Mandatory Support Course         | 3     |               |
| 0808xxx                         | Elective Core Course             | 3     |               |
| 0808xxx                         | Elective Core Course             | 3     |               |
|                                 | Mandatory Support Course         | 3     |               |

| Year 2, Semester 4 (15 Credits) |                          |       |               |
|---------------------------------|--------------------------|-------|---------------|
| Course #                        | Title                    | CrHrs | Prerequisites |
| 0808xxx                         | Elective Core Course     | 3     |               |
| 0808300                         | Communication Theories   | 3     | 0808100       |
|                                 | Mandatory Support Course | 3     |               |
| 0808305                         | Media Law and Ethics     | 3     | 0808100       |
| 0808xxx                         | Elective Core Course     | 3     |               |

| Year 3, Semester 5 (18 Credits) |                                |       |               |
|---------------------------------|--------------------------------|-------|---------------|
| Course #                        | Title                          | CrHrs | Prerequisites |
| 0808306                         | Communication Research Methods | 3     | 0808100       |
|                                 | Mandatory Support Course       | 3     |               |
|                                 | Free Elective                  | 3     |               |
|                                 | Mandatory Support Course       | 3     |               |
| 0808xxx                         | Elective Core Course           | 3     |               |
|                                 | Mandatory Support Course       | 3     |               |

| Year 3, Semester 6 (18 Credits) |                          |       |               |
|---------------------------------|--------------------------|-------|---------------|
| Course #                        | Title                    | CrHrs | Prerequisites |
|                                 | Mandatory Support Course | 3     |               |
|                                 | Mandatory Support Course | 3     |               |
| 0808xxx                         | Elective Core Course     | 3     |               |
|                                 | Mandatory Support Course | 3     |               |
|                                 | Mandatory Support Course | 3     |               |
|                                 | University Elective      | 3     |               |

| Year 3, Summer Training (3 Credits) |            |       |               |
|-------------------------------------|------------|-------|---------------|
| Course #                            | Title      | CrHrs | Prerequisites |
| 0808400                             | Internship | 3     | 84 credits    |

| Year 4, Semester 7I (12 Credits) |                          |       |               |
|----------------------------------|--------------------------|-------|---------------|
| Course #                         | Title                    | CrHrs | Prerequisites |
| 0808xxx                          | Elective Core Course     | 3     |               |
|                                  | Mandatory Support Course | 3     |               |
|                                  | University Elective      | 3     |               |
|                                  | Free Elective            | 3     |               |

| Year 4, Semester 8 (12 Credits) |                          |       |                 |
|---------------------------------|--------------------------|-------|-----------------|
| Course #                        | Title                    | CrHrs | Prerequisites   |
| 0808412                         | Graduation Project       | 3     | Senior Standing |
|                                 | Mandatory Support Course | 3     |                 |
|                                 | University Elective      | 3     |                 |
|                                 | Mandatory Support Course | 3     |                 |

## Courses Descriptions

The courses offered by the Mass Communication program start with (0808). Description of the courses in the program of study that are offered by other programs within and outside the College are described in the pages of the associated programs.

### Elective Core courses

Description of the elective core courses of which students are required to select 21 credits are given below:

#### **0808201                      Media in the UAE                      (3-0:3)**

##### **Prerequisite: None**

This course covers: historical development and current overview of media of mass communication in the UAE, media role in national development and cultural advancement, media development in the 1990s including: the press, broadcasting, internet communications and advertising in the UAE and media professional orientations. Students also learn about future trends.

#### **0808311                      News Reporting                      (2-2:3)**

##### **Prerequisite: 0808211**

This course presents gathering information and writing articles for print media, using conventional and online news sources, basic reporting and writing of various news stories including: accidents, reviews, profiles, sports, and crimes. News reports may be published in community or student newspapers.

#### **0808312                      Video Shooting and Editing                      (2-2:3)**

##### **Prerequisite: 0808213**

This course introduces the tools, techniques and language of videography, video camera components and operations, camera techniques and operating field video camera and related equipments, tools, techniques and language of digital editing. Final Cut Pro software is used. The class acts as a hands-on production lab and covers the technical fundamentals of shooting and non-linear editing.

#### **0808313                      Layout and design                      (2-2:3)**

##### **Prerequisite: 0808211**

Students learn the fundamentals of newspaper, magazine and other publications layout and design. Through a theoretical study and hands-on experience, students will become familiar with publications design, desktop publishing and graphics software including Photoshop and Illustrator. Practical applications take place in desktop publishing lab.

**0808231 Principles of Public Relations (3-0:3)**

**Prerequisite: None**

The course presents the concepts and process of public relations in modern societies, the role of PR in various organizations, historical development of public relations, public relations models, PR practitioners in modern societies and features of good public relations.

**0808314 Radio and TV Directing (2-2:3)**

**Prerequisite: 0808213**

The course covers the process of radio program directing, directing techniques in pre-recorded and live programs, Audio& Video mixing techniques, indoor and outdoor production, control management, handling Audio& Video matters and Practical applications in the studio. Students also learn about directing thinking and planning techniques.

**0808212 Photography (2-2:3)**

**Prerequisite: None**

The course presents conventional and digital photography, applications in media work, basics of photography, photography as a journalistic practice, the camera and its components, the internet as a source of digital pictures, in addition to practical applications.

**0808301 Information Society (3-0:3)**

**Prerequisite: None**

The course covers the concept of the information society, recent global trends in information technology development, information as a strategic political, economic and cultural resource, features of the information age, the information industry and information society features in the United Arab Emirates and the Arab world. Case studies are also presented in this course.

**0808402 Integrated Communication (3-0:3)**

**Prerequisite: 0808100**

The course presents an introduction to the principles and applications of integrated communication, using integrated communication methods in media campaign, planning, executing and implementing integrated communication campaigns and Case studies.

**0808412                      Online Journalism                      (3-0:3)**

**Prerequisite: 0808211**

The course covers understanding the Internet and its impact on journalism, with special attention to the search for a new style of narrative that can take advantage of the simultaneous use of text, hypertext, photos, images in motion, audio and databases. Students gain practical experience in the production of an electronic information delivery product using computer programs such as HTML, Dreamweaver, and others. The course discusses the business, ethical, and legal implications of online journalism.

**0808303                      Public Opinion                      (3-0:3)**

**Prerequisite: 0808100**

The course covers the concept of public opinion, theories of public opinion, media role in public opinion formation, including the agenda-setting hypothesis, public opinion as a social and political force, public opinion polls and how they relate to media performance, the Internet as a source of public opinion formation and Social responsibility and ethics in advertising and marketing as applied to PR. This course also includes case studies of advertising and marketing use in public relations in the UAE and other countries.

**0808403                      International and Cultural Communication                      (3-0:3)**

**Prerequisite: 0808100**

The course presents the influence of culture on communication processes. It focuses on the impact of values, beliefs and perspectives on intercultural interactions and on issues pertaining to trans-border Information flows in the age of globalization. The course also covers local cultures and national identities, media role in safeguarding indigenous cultures and modes of expression.

**Mandatory Support Courses**

Description of the 42 credits of mandatory courses supported by other programs are described in the bulletin. Refer to the section of the specific programs that offer them.

# College of Medicine

## College of Medicine

### Officers of the College

|                                       |   |
|---------------------------------------|---|
| <b>Professor Qutayba Hamid</b>        | Vice Chancellor & Dean of College of Medicine, Office of Vice Chancellor for Medical & Health Sciences Colleges |
| <b>Professor Salman Yousuf Guraya</b> | Vice-Dean, College of Medicine  |
| <b>Professor Azzam Maghazachi</b>     | Assistant Dean for Graduate Studies   |

### Persnnel

|                             |  |
|-----------------------------|--|
| <b>Professors</b>           | Prof. Qutayba Hamid, Prof. Salman Yousuf Guraya, Prof. Azzam Maghazachi, Prof. Mohammad Saleh Al Hajjaj, Prof. Nabil Sulaiman, Prof. Essam Agamy, Prof. Rabih Halwani. Prof. Eman Farouk Mahmoud Abu-Gharbieh, Prof. Rifat Hamoudi, Prof. Saleh Mohamed Ibrahim, Prof. Oktay Irkorucu,   |
| <b>Associate Professors</b> | Dr. Adel Elmoselhi, Dr. Salaheldeen Abusnana (Visiting Academic) Dr. Basema Saddik, Dr. Iman Mamdouh Talaat, Dr. Maha Saber Ayad, Dr. Mohamed Rahmani, Dr. Waseem R .Hasan El-hunedi, Dr. Anu Vinod Ranade. Dr. Mohamed Ahmed Awad Saleh, Dr. Ali Shorbagi (Visiting), Dr. Mohamed Ezzat Elzowalaty Dr. Hamid Al Haj   |
| <b>Assistant Professors</b> | Dr. El Sayed Emad Nosair, Dr. Balsam Qubais Saeed, Dr. Mohammad Tahseen Al Bataineh, Dr. Rabah Al Mahmoud, Dr. Nihar Dash, Dr. Ghada Mohammed (Visiting), Dr. Mohamad Ahmad Eladl, Dr. Bashair Mohammed Mussa, Dr. Samrein Ahmed, Dr. Jibran Muhammad, Dr. Firdos Ahmad, Dr. Jalal Taneera, Dr. Khuloud Ahmed Bajbouj , Dr. Ibrahim Eltayeb Abdel Mahmoud, Dr. Mohamed El Hassan Abdalla, Dr. Saravanan Coumaravelou, Dr. Ibrahim Hachim, Dr. Mohamed Hassan Taha, Dr. Noha Ahmed Mousa, Dr. Asima Karim, Dr. Zainab Mohamed AlShareef, Dr. Rizwan Qaisar, Dr. Mode Ojaimi |
| <b>Lecturers</b>            | Ms. Hiba Barqawi, Mrs. Amal Hussein, Dr. Sarra Shorbagi, Dr. Hiba Rehmet-Allah Mohammed, Dr. Mustafa Habeb.  |

### Academic Non-faculty Staff

|                               |                                     |
|-------------------------------|-------------------------------------|
| Ms. Shaista Manzoor           | Sr. Laboratory Officer-Microbiology |
| Dr. Mona M. Al-Dajani         | Medical Tutor                       |
| Dr. Shomous Abdelwahab Nugud  | Medical Tutor                       |
| Dr. Ahmed Mohammed Hasswan    | Medical Tutor                       |
| Dr. Mada Talal Daghistani     | Medical Tutor                       |
| Dr Rania Adil Yasin ElHussain | Medical Tutor                       |
| Dr. Haithm Mustafa Abdullah   | Medical Tutor                       |

### Administrative Support Staff

|                |                            |
|----------------|----------------------------|
| Joyce D'Souza  | Sr. Administrative Officer |
| Amani Al-Bawab | Administrative Assistance  |
| Amal Alamiri   | Student Services Officer   |



Salama Alkitbi  
Asma Al Falasi  
Nada Othman  
Hilda Rego  
Eman Shaibani  
Rana Khaled Chaker

Sr. Administrative Assistant  
Sr. Administrative Assistant  
Admin Officer  
Student Services Officer  
Sr. Administrative Assistant  
Administrative Assistant

### Contact Information

College of Medicine Building M27, University of Sharjah, University City Sharjah  
United Arab Emirates 27272  
+971 6 5057201  
[www.sharjah.ac.ae](http://www.sharjah.ac.ae)

### Accreditation

The College of Medicine has received Full Accreditation from the Commission for Academic Accreditation (CAA) of the Ministry of Education (MOE) in the U.A.E., in September 2013.

### Vision

The College of Medicine at the University of Sharjah strives for national and international prominence by differentiating itself through excellence in the full spectrum of medical education at the undergraduate, postgraduate and continuing professional development levels.

### Mission

The mission of the College of Medicine is to provide education for medical students and medical professionals through the creation of a scholarly environment that fosters excellence in the lifelong goals of education, research activity and compassionate patient care.

The mission and vision statements have been developed in consultation with a broad group of stakeholders including parents, the Ministry of Health, the World Health Organization, patient support groups, etc.

### Our Mandate

- 1) To provide innovative educational opportunities for medical students, preparing them to pursue postgraduate training and continuous professional development successfully.
- 2) To advance scientific knowledge with important research discoveries.
- 3) To improve primary to quaternary health care for this growing region.
- 4) To emphasize the college's social responsibility in providing and promoting effective health care for different sectors of the community.

### Values

The faculty and staff at the College of Medicine, University of Sharjah are committed to the following cultural values in making decisions and establishing conduct:

#### ***High Standards – In upholding the highest standards, we will:***

- Demonstrate ethical leadership by example
- Conduct ourselves with integrity, avoiding conflict of interest
- Hold our work to the highest academic standards

***Respect for Individuals – In valuing respect for individuals, we pledge to:***

- Treat others with respect and dignity, honoring individual differences
- Promote open communication and listen proactively
- Create a collegial environment based on loyalty to peers and colleagues

***Advancing Knowledge – In expressing our passion for learning, we encourage:***

- Exploration of new ideas in our teaching and research
- Having the strength to meet challenges and assume risk
- Diverse learning opportunities where creativity thrives
- Interdisciplinary teamwork

***Personal Development and Leadership – In recognizing that exceptional quality begins with people, we create:***

- A culture of personal development and professional fulfillment
- A workplace where expectations are matched by our reward system
- An atmosphere where people value the balance between work and family
- A mentor-rich culture where faculty, staff and students can enhance their leadership skills

***Commitment to Health – In supporting our fundamental belief in the doctor/ patient relationship, we are committed to:***

- The highest quality medical care for our patients
- Training the next generation of physicians and healthcare professionals to be capable and compassionate
- Promoting good health and well-being in response to the needs of our community partners who help us achieve excellence in all that we do

**Academic Programs**

The College of Medicine offers:

- 1) Bachelor of Medicine and Bachelor of Surgery (MBBS)
- 2) Master of Leadership in Health Professions Education
- 3) Dual Master in Molecular Medicine and Translational Research, University of Sharjah and Lübeck University Germany
- 4) Dual Doctor of Philosophy in Molecular Medicine and Translational Research, University of Sharjah and Lübeck University Germany

**Admission Requirements**

Applicants to the College of Medicine should refer to the Admissions section of the bulletin for details on the admissions requirements to the University. Admission to the Foundation Year of the MBBS Program is subject to satisfying the English proficiency requirement and the necessary academic preparation as described in the Admissions section.

**Bachelor of Medicine and Bachelor of Surgery (MBBS)**

**Curriculum outcome Competencies**

**Medical Graduate Profile**

The Medical Graduate Profile (MGP) describes the goals as outcome competencies which graduates should have acquired by the end of the six-year medical program. It was reassuring that the goals and

competencies of the MBBS program were in alignment with the National Qualification Framework (NQFW) introduced in 2012. The generic strands of the NQFW were in alignment with the competencies and measurable learning objectives.

### **Program Outcomes**

1. Gather essential and accurate information to aid problem identification, reasoning and management through effective communication with patients and their families.
2. Integrate basic and clinical knowledge necessary for patient and community care.
3. Make informed decisions about diagnostic and therapeutic interventions based on accurate analysis of patient information, evidence-based practice, and good clinical reasoning and judgment.
4. Develop patient management plans with engagement of their families and community as partners in the process.
5. Perform medical procedures considered essential for the management of common health problems.
6. Utilize information technology to achieve patient care decisions and education of patients and families.
7. Promote health care services aimed at preventing health problems and improving community health profile.
8. Work in a multidisciplinary team with other healthcare professionals, as member or leader in order to provide a state of the art patient, family and community care.
9. Integrate research principles and statistical analysis methods in designing and conducting research studies aiming at improving diagnostic and therapeutic measures.
10. Apply ethical principles about provision or withholding of clinical care, research, confidentiality of patient information, informed consent and medico-legal aspects.
11. Practice sensitivity and respect to patients' culture, age, gender, and disabilities.
12. Advocate for quality patient care and assist patients in dealing with healthcare system complexities.

### **Outcome Competencies and Corresponding Curriculum Objectives:**

The competencies are structured around six domains (ACGME) similar to the Accreditation Council of Graduate Medical Education, USA

- A. Patient and Population Care
- B. Knowledge
- C. Evidence-Based Practice and Lifelong Learning
- D. Interpersonal and Communication Skills
- E. Ethics and Professionalism
- F. Health Care Systems and Cost-effective Practice

#### **A: Patient & Population Care Competencies**

- 1) Communicate effectively with patients, families and groups.
- 2) Gather essential and accurate information about patients for the purposes of problem identification and characterization.
- 3) Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment.
- 4) Develop and carry out patient management plans, with the engagement of patients as partners.
- 5) Perform competently medical procedures considered essential for the management of common health problems.
- 6) Counsel and educate patients and their families.
- 7) Use information technology to support patient care decisions and patient education.
- 8) Provide and advocate for health care services aimed at preventing health problems or maintaining health.
- 9) Work with health care professionals, including those from other disciplines and professions, to provide patient, family and community care.

#### **Curriculum Objectives**

- 1) The ability to obtain an accurate holistic medical history that covers all essential aspects of a patient and his/her problem, including issues related to age, gender and socio-economic status.
- 2) The ability to reason deductively in solving clinical problems.
- 3) The ability to perform both a complete and a focused organ system specific examination, including a mental status examination.
- 4) The ability to perform routine technical procedures at a level suitable to medical students.
- 5) The ability to construct appropriate management strategies (both diagnostic and therapeutic) for patients with common conditions related to different age groups and genders, both acute and chronic, including medical, psychiatric, and surgical conditions, and those requiring short- and long-term rehabilitation.
- 6) To formulate a treatment plan, demonstrating the ability to take action by balancing the relative risks and benefits of outcomes and treatment options.
- 7) The ability to recognize patients with immediately life threatening cardiac, pulmonary, or neurological conditions regardless of etiology, and to institute appropriate initial therapy applying Basic Life Support and Advanced Life Support principles.
- 8) The ability to recognize and outline an initial course of management for patients with serious conditions requiring critical care.
- 9) The ability to identify factors that place individuals at risk for disease or injury, to select appropriate tests for detecting patients at risk for specific diseases or in the early stage of disease, and to determine strategies for responding appropriately, i.e. screening.
- 10) To interpret laboratory tests, demonstrating knowledge of the limitations of standard laboratory measurements and to integrate clinical and laboratory findings in the diagnosis and management of a patient problem.
- 11) To document and share patient-specific information, demonstrating the ability to record within information systems any specific findings about a patient, while ordering or directing the further care of the patient.
- 12) The ability to define and describe a population, to include its demography, cultural and socioeconomic constitution, circumstances of living, and health status, and to understand the relevance of these factors to the health and health care of individuals, families and administrators.

## **B: Knowledge Competencies**

- 1) Acquire a core of basic and clinical supportive sciences which are appropriate to the care of a patient and the community.
- 2) Demonstrate a reasoning and analytical thinking approach to clinical situations and applying medical knowledge in patient problem solving.

## **Curriculum Objectives**

- 1) Knowledge of the normal structure and function of the body (as an intact organism) and of each of its major organ systems.
- 2) Knowledge of the molecular, biochemical, and cellular mechanisms that are important in maintaining the body's homeostasis.
- 3) Knowledge of the various causes (genetic, developmental, metabolic, toxic, microbiologic, autoimmune, neo-plastic, degenerative, and traumatic) of illness/disease and the ways in which they operate on the body (pathogenesis).
- 4) Knowledge of the altered structure and function (pathology and pathophysiology) of the body and its major organ systems that are seen in various diseases and conditions.
- 5) Knowledge of the most frequent clinical, laboratory, radiological, and pathologic manifestations of common maladies.
- 6) An understanding of the power of the scientific method in establishing the causation of disease and efficacy of traditional and non-traditional therapies.
- 7) An understanding of the principles of disease prevention and behavior change appropriate for specific populations.
- 8) Knowledge of the important non-biological determinants of (poor) health and of the economic, psychological, social, and cultural factors that contribute to the development and/or continuation of maladies.
- 9) Knowledge of the epidemiology of common diseases within a defined population, and the systematic approaches useful in reducing the incidence and prevalence of those diseases.

## **C: Evidence-Based Practice and Lifelong Learning**

### **Competencies**

- 1) Exhibit good "information habits", making decisions based on evidence, when such is available, rather than opinion.
- 2) Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems.
- 3) Apply knowledge of research designs and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness.
- 4) Demonstrate knowledge of the information resources and tools available to support lifelong learning.
- 5) Understand information technology's impact on basic clinical and biomedical research.

### Curriculum Objectives

- 1) Determine what data exist relative to a clinical question or formal hypothesis, demonstrating knowledge of data sources (including medical records and online data) at one's own institution by identifying how these might be used to address a specific clinical question.
- 2) Execute a plan for data collection and organize data for analysis, demonstrating the ability to properly represent data from a study in a form that is useful and supports computer-based analysis.
- 3) Plan, analyze, interpret and report findings, demonstrating the ability to select the appropriate computer software tool for analysis of data.
- 4) Demonstrate knowledge of the information resources and tools available to support lifelong learning. Knowledge includes awareness of these resources, their content, and the information needs that they can address. Relevant resources include MEDLINE and other bibliographic databases, textbooks and reference sources, diagnostic expert systems, and medical internet resources.
- 5) Retrieve information, demonstrating the ability to refine search strategies to improve relevance and completeness of retrieved items.
- 6) Filter, evaluate, and reconcile information, demonstrating the ability to discriminate between types of information sources in terms of their currency, format (for example a review vs an original article), authority, relevance and availability.

### D: Interpersonal and Communication Skills Competencies

- 1) Create and sustain effective, ethically sound, caring and respectful relationships with patients and families.
- 2) Work effectively with others as a member or leader of a health care team, or other professional group.

### Curriculum Objectives

- 1) Use effective communication skills to elicit and provide information using values and attitudes and effective verbal, nonverbal (explanatory, questioning) writing skills.
- 2) Use effective writing skills to transmit information, express concerns, help etc.
- 3) Listen to and respect the view of patients and their supporters.
- 4) Listen to and respect the view of other members of the team involved in the patient's care.
- 5) Recognize and respect the varying needs of patients for information and explanation.
- 6) Encourage patients to discuss the proposed treatment with their supporter.
- 7) Explain any complications of treatment as they occur and explain the possible solutions.
- 8) Act immediately when patients have suffered harm and apologize when appropriate.
- 9) Work effectively as an individual, in inter-professional groups, and as a member of a complex health care system, demonstrating knowledge of online resources for legislation, political advocacy and local health care policy setting.

### E: Ethics and Professionalism Competencies

- 1) Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and ongoing professional development.
- 2) Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices.
- 3) Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities.

### Curriculum Objectives

- 1) Knowledge of the theories and principles that govern ethical decision making, and of the major ethical dilemmas in medicine, particularly those that arise at the beginning and end of life and those that arise from the rapid expansion of knowledge of genetics.
- 2) Compassionate treatment of patients, and respect for their privacy and dignity.
- 3) Honesty and integrity in all interactions with patients' families, colleagues, and others with whom physicians must interact in their professional lives.
- 4) An understanding of, and respect for, the roles of other health care professionals, and of the need to collaborate with others in caring for individual patients and in promoting the health of defined populations.
- 5) A commitment to advocate at all times the interest of one's patients over one's own interests.
- 6) An understanding of the threats to medical professionalism posed by the conflicts of interest inherent in various financial and organizational arrangements for the practice of medicine.
- 7) The capacity to recognize and accept limitations in one's knowledge and clinical skills, and a commitment to continuously improve one's knowledge and ability.
- 8) Respect patient (and physician) confidentiality, demonstrating knowledge of the legal, ethical, and medical issues surrounding patient documentation, including confidentiality and data security.

### F: Health Care Systems and Cost-Effectiveness Practice Competencies

- 1) Advocate for quality patient care and assist patients in dealing with healthcare system complexities.
- 2) Practice cost-effective health care and resource allocation that does not compromise quality of care.
- 3) Understand how their patient care and other professional practices affect the health care organization and the larger society and how these elements of the system affect their own practice.

### Curriculum Objectives

- 1) Formulate and make decisions for individuals and groups, demonstrating knowledge of cost/benefit issues in health care.
- 2) Knowledge about how local health care systems deliver patient care to different kinds of patients.

### Rationale and Key Attributes of the Curriculum

- **Continuum of Medical Education:** The curriculum will provide an educational experience that ensures continuing development from undergraduate to internship and further postgraduate training.
- **Outcome competency-based curriculum:** Core competencies essential for good medical practice guides the curriculum structure, organization, learning and teaching approaches, student assessment outcome and program evaluation.
- **Integrated curriculum:** The thematic organization of the curriculum allows maximum degree of horizontal integration across the themes and vertical spiral integration within the themes.
- **Systems-based curriculum:** A systems-based approach will replace the traditional discipline-based curriculum.
- **Early introduction of clinical sciences and skills:** This is coordinated with the Organ System organization in the first two years emphasizing the relevance and application of knowledge learned from the Basic Medical Sciences domains.
- **Self-directed learning:** The curriculum and timetable is structured so that students have time to



learn through self-reflection, self-evaluation, clinical reasoning and critical thinking to be lifelong independent learners.

- **Student-centered flexible learning:** The learning environment will be structured to allow more flexibility and choice in time, place and style of learning.
- **Diversity of learning contexts:** The course will be delivered in different settings that provide wide experience in community-based contexts.
- **Learning basic medical sciences in the clinical environment:** Introducing research as an integral part of the PBL sessions to inculcate research culture.
- **Introducing Ultrasound training** starting from Year 1 to supplement radiological anatomy and clinical skills.
- **Generic attributes for effective medical practice:** The new curriculum will promote a culture that recognizes service, teamwork, scientific enquiry and lifelong learning as essential elements in the effective practice of medicine.
- **Medical Humanities:** The two courses “History of Medical and Health Sciences” and “Arts and Medicine” are two unique features of the curriculum which help to produce cultured medical graduates at UOS.
- **Students’ assessment:** Designed to recognize the development of key attributes and qualities rather than to reward short-term superficial learning. Formative, continuous and summative assessments are used to monitor student progress and review curriculum implementation and outcomes.
- **Time and length:** Following the successful completion of the Foundation year, the course will be of five years duration and have around 20-25 contact hours per week. This provides ample opportunity for students to learn through self-directed study.
- **Yearly Assessment System:** As it is an integrated curriculum, the assessment in the curriculum is a continuous process. Scores are reported on a **yearly basis** and the Pass / Fail decisions are made at the end of each year.

### Thematic Organization of the Curriculum

Curriculum competencies and related objectives are organized around four themes/strands.

- Theme I - Personal and Professional Development
- Theme II - Population Health
- Theme III - Foundations of Medicine
- Theme IV - Clinical Skills

#### Theme I: Personal and Professional Development

Students focus on personal ethics, healthy lifestyles, group support and an introduction to communication skills. This will be followed up with a Health Enhancement Program concentrating on self-care (stress management, relaxation training, and coping skills), other aspects of healthy lifestyle and group support, and an introduction to the science of Mind-Body Medicine. This theme will also include an introduction to ethics and medical law. Supporting students in maximizing their learning opportunities in clinical environments is crucial to the success of the curriculum. Key components of Theme I content include medico-legal issues, ethics and health enhancement. Opportunities for inter-professional teaching and learning are also encouraged.

#### Objectives

By the time of graduation, medical graduates of the College of Medicine University of Sharjah will be able to:

- Develop strategies for maintaining mental, physical, and emotional health status and identify ongoing strategies for their own health enhancement.
- Develop skills to become a successful student and lifelong learner.
- Describe strategies for developing personal and professional resilience.
- Appraise personal and professional strengths and weaknesses and articulate self-limitations and



recognize the need to continuously improve one's knowledge and ability.

- Demonstrate ability to work in multi-professional teams understanding and respecting the roles of other health care professionals and appreciating the need to collaborate with others in caring for individual patients and in promoting the health of defined populations.
- Develop and use learning strategies appropriate to clinical contexts.
- Demonstrate how to access 'networks' in order to meet professional and personal needs.
- Articulate professional rights and responsibilities.
- Identify and use strategies for dealing with competing demands in personal and professional life and identify and use strategies for effective time management in both personal life and clinical settings.
- Recognize the similarities and differences between ethical issues in personal and professional life.
- Appreciate the legal framework within which the medical practice operates, the legal basis of the doctor-patient relationship, and describe ethical and legal issues pertinent to clinical contexts. This includes but is not limited to: medical power of attorney, role of guardians and agents in the context of refusal of treatment, transplantation, infertility, and medical research.
- Understand concepts of professional responsibility and public accountability with reference to the role of the courts and common law statutes and professional self-regulation.
- Describe concepts of responsibility and advocacy in relation to patients and their families and be committed to advocate at all times the interest of one's patients over one's own interests.
- Understand the theories, principles and cultural and religious context that govern ethical decision making, and of the major ethical dilemmas in medicine, particularly those that arise at the beginning and end of life and those that arise from the rapid expansion of knowledge of genetics.
- Respect patient (and physician) confidentiality, demonstrating knowledge of the legal, ethical, and medical issues surrounding patient documentation, including confidentiality and data security.

## Theme II: Population Health

The main purpose of this theme is to provide the structure to develop students' abilities in dealing with society and population issues, as compared with issues concerning the individual. Students will learn about the history and philosophy of the scientific approach to medicine and extend this to a consideration of approaches to knowledge, information and an understanding of evidence-based medicine. Students will explore the various roles of the medical practitioner in society. They will learn to consider the social, environmental and behavioral contexts of illness and the practice of medicine. Other elements of this theme will be built around health promotion, epistemology, epidemiology, public health, community diversity, population and a global view of health.

## Objectives

Although this theme has its own learning objectives, it is intended that some of the implementation of the theme will involve building on specific learning experiences that students have in the other themes. By the time of graduation, the University of Sharjah medical graduate will be able to:

### a) **Demonstrate the following professional attitudes:**

- A concern for disadvantaged groups in society.
- Recognition of the beliefs and contributions of health consumers to their care.
- A cost-effective approach to the provision of medical care.
- Awareness of the contribution of population-based health strategies to the care of individuals.
- Awareness of the contributions of research to effective health care practice.
- A capacity to deal with uncertainty.
- Awareness of him/herself as a knowledge worker.

### b) **Demonstrate the following professional abilities:**

- Understand the role of medicine in society from a range of different perspectives:
  - The influences of factors such as age, gender, culture, ethnicity and spiritual beliefs.

- The relationship between “traditional” and other models of health care practice.
- Understand the factors that influence the organization and delivery of health care to populations including how local health care systems deliver patient care to different kinds of patients.
- Understand the contribution of the scientific method to medicine and the nature of evidence.
- Demonstrate the practice of evidence-based medicine with respect to determining what data exist relative to a clinical question or formal hypothesis, demonstrating knowledge of data sources (including medical records and online data) at one’s own institution by identifying how these might be used to address a specific clinical question.
- Executing a plan for data collection and organizing data for analysis, demonstrating the ability to properly represent data from a study in a form that is useful and supports computer-based analysis.
- Demonstrating knowledge of the information resources and tools available to support lifelong learning.
- Retrieving information, demonstrating the ability to refine search strategies to improve relevance and completeness of retrieved items.
- Filtering, evaluating, and reconciling information, demonstrating the ability to discriminate between types of information sources in terms of their currency, format (for example a review vs. and original article), authority, relevance and availability.
- Demonstrate the ability to interpret statistical information presented in medical publications.
- Understand the strengths and weaknesses of different research study designs.
- Understand a range of strategies to promote health and prevent disease.

### Theme III: Foundations of Medicine

This theme encompasses much of the system-based teaching in phase II (years 1, 2, 3) of the course and the core clinical clerkships in the fourth and fifth years. Theme III will represent more than half of the overall course. As the term ‘Foundations’ implies, much of the knowledge and concepts that underpin medicine, both in the basic medical sciences and in the clinical sciences, will be delivered within this theme. Each of the subjects in this theme is organized as an integrated subject with inputs from all relevant departments. In the early semesters, a system-based structure has been adopted, in which the anatomy, biochemistry, microbiology, pathology, pharmacology and physiology of each system will be taught in an integrated manner. Several systems have been combined to be taught either side by side or in a system-integrated approach. Basic medical sciences will be revisited in the latter phase of the curriculum “clerkships” emphasizing the application of knowledge in clinical practice.

### Objectives

By the time of completion of basic medical education, the University of Sharjah medical graduate will have knowledge and understanding of:

- 1) The normal structure and function of mind and of the body (as an intact organism) and of each of its major organ systems at all stages of life and the interactions between body and mind, and the factors which may disturb these.
- 2) The molecular, biochemical, and cellular mechanisms that are important in maintaining the body’s homeostasis.
- 3) The various causes (genetic, developmental, metabolic, toxic, microbiologic, autoimmune, neoplastic, degenerative, and traumatic) of illness/disease and the ways in which they operate on the body (pathogenesis).
- 4) Symptoms, signs, natural history, and prognosis of common mental and physical ailments in children, adolescents, adults and the aged. A more detailed knowledge is required of those conditions which require urgent assessment and treatment.
- 5) The most frequent laboratory and radiological manifestations of common maladies, different diagnostic procedures, their uses and limitations.

- 6) Management of common conditions including pharmacological, physical, nutritional and psychological therapies.
- 7) Principles of health education and behavior change appropriate in specific populations.
- 8) Principles of disease prevention, amelioration of suffering and disability, rehabilitation, and the care of the dying.
- 9) Factors affecting human relationships, the psychological well-being of patients and their families, and the interactions between humans and their social and physical environment.
- 10) Scientific method relevant to biological, behavioral and social sciences at a level adequate to provide a rational basis for present medical practice, and to assimilate the advances in knowledge which will occur over their working life.
- 11) Important non-biological determinants of (poor) health and of the economic, psychological, social, and cultural factors that contribute to the development and/or continuation of maladies.
- 12) The processes by which non-biological determinants influence health, and vice versa.
- 13) Epidemiology of common diseases within a defined population, and the systematic approaches useful in reducing the incidence and prevalence of those diseases.

#### **Theme IV: Clinical Skills**

This theme encompasses the whole range of clinical skills in all years of the course. Clinical and procedural skills are introduced during Phase I that enhances the students' Early Clinical Exposure. The approach in clinical skills development is to develop defined clinical competencies. This begins with clinical aspects of communication skills and continues with history taking, physical examinations, then the more advanced clinical and procedural skills. Included also within this theme is an introduction to the medical workplace in all its diversity, as well as to the healthcare system.

Multi-professional education will be promoted by exploring the possibilities for educational interactions with nurses, paramedics, radiographers and other health care professionals. Elective experience in diverse medical work places, both within and outside the hospital environment are provided.

#### **Objectives**

By the time of graduation, the University of Sharjah medical graduate will be able to:

- 1) Obtain an accurate holistic and focused medical history that covers all essential aspects of a patient and his/her problem, including issues related to age, gender and socio-economic status.
- 2) Perform an accurate physical and mental state examination.
- 3) Choose, from the repertoire of clinical skills, those which are appropriate and practical to apply in a given situation.
- 4) Interpret and integrate the history and physical examination findings to arrive at an appropriate diagnosis or differential diagnosis.
- 5) Formulate a treatment plan, demonstrating the ability to take action by balancing the relative risks and benefits of outcomes and treatment options.
- 6) Perform routine technical procedures at a level suitable to medical students.
- 7) Recognize serious illness and perform common emergency and life-saving procedures such as caring for the unconscious patient and cardiopulmonary resuscitation.
- 8) Identify factors that place individuals at risk for disease or injury, to select appropriate tests for detecting patients at risk for specific diseases or in the early stage of disease, and to determine strategies for responding appropriately (screening).
- 9) Create and sustain effective, ethically sound, caring and respectful relationships with patients and families.
- 10) Communicate clearly, considerately and sensitively with patients, relatives, doctors, nurses, and other health professionals and the general public.
- 11) Counsel sensitively and effectively and provide information in a manner that ensures patients and families can be truly informed when consenting to any procedure.

- 12) Work in a multi-disciplinary team using both leadership skills and collaboration skills.
- 13) Work as a patient advocate in the health care system.
- 14) Use computer systems for medical information, patient monitoring and for communication between health care professionals at different sites.

### Convergence of Themes

Our graduates will emerge from the MBBS program with a synthesis of clinical skills, knowledge base and personal attitudes and qualities, which will combine to form the basis of their developing professional abilities. To reach this stage, the graduate will need to have made a successful transition from learning in the four separate themes of the course, to a single model of professional practice. The convergence of themes will accelerate over the last two years of the program, and careful attention to integration between the themes during the early years of the course will assist the process. In addition, expanded use of mentoring and role models in professional practice will allow students to appreciate how the synthesis of knowledge, skills and attitudes is central to effective and rewarding medical practice.

### Curriculum Structure and Organization

The medical curriculum is for five years preceded by one year of Foundation Year and followed by one year of internship.

**Phase I:** "Foundation Year"

**Phase II:** Year 1, 2, 3 "Pre-clerkship Phase"

**Phase III:** Year 4 and 5 "Clerkship Phase"

### Phase I - "Foundation Year"

This is an interface between high school education and the medical program. It introduces the students to a scientific foundation in Human Biology, Chemistry and Biochemistry, Physics relevant to medical sciences, Information Technology and Medical English.

An important characteristic of the Foundation Year is to introduce the students to modern trends in medical education, problem-based learning, small group learning, and study skills encouraging deep and lifelong learning. This is provided through the course of "Medical Education."

Students should demonstrate academic performance which will allow them to progress to the second phase of the medical program (see assessment).

The core courses to be studied in Foundation Year are:

| Year I, Semester 1 (15 Credits) |  |       |               |
|---------------------------------|--|-------|---------------|
| Course                          | Title                                  | CrHrs | Prerequisites |
| 0900101                         | Human Biology I                        | 3     |               |
| 1427107                         | General Chemistry - I                  | 3     |               |
| 1430113                         | Physics for Medical Sciences           | 3     |               |
| 1430114                         | Physics Lab for Medical Sciences (Lab) | 1     |               |
| 0900103                         | Medical Education                      | 2     |               |
| 0202121                         | English for Medical Students           | 3     |               |

| Year I, Semester 2 (15 Credits)                            |   |       |               |
|--|---|-------|---------------|
| Course   | Title                                   | CrHrs | Prerequisites |
| 0900106  | Human Biology II                        | 4     |               |
| 1427108  | Chemistry II for Medical Sciences       | 3     |               |
| 1427118  | Chemistry II for Medical Sciences (Lab) | 1     |               |
| 0900107  | History of Medical and Health Sciences  | 3     |               |
| 0710109  | Art & Medicine                          | 3     |               |
| 1411100  | Introduction to IT                      | 3     |               |
| General Education courses throughout the first three years |   |       |               |

## Descriptions of Phase I Courses

### **1427107                      General Chemistry I                      (0-3:3)**

**Prerequisite: None.**

This course describes general concepts of general chemistry such as principles of measurement, solutions, radiation, laws of heat and energy transfer and reactions equilibria. The chemical structure of macromolecules such as carbohydrate, lipid, proteins and nucleic acids are discussed.

### **0900101                      Human Biology I                      (0-3:3)**

**Prerequisite: None.**

This basic course covers the normal structure and function of the cell, basic genetics, basic histology and embryology.

### **1430113                      Physics for Medical Sciences                      (0-3:3)**

**Prerequisite: None.**

This course covers atomic spectra, nuclear physics, x-ray applications in biology and medicine, fluids, electricity and magnetism, geometrical optics and waves and sounds.

### **1430114                      Physics Lab for Medical Sciences (Lab)                      (1-0:1)**

**Prerequisite: None.**

Various experiments covering the topics studied in lectures are performed.

### **0900103                      Medical Education                      (0-2:2)**

**Prerequisite: None.**

This course is offered to students in the Foundation Year of the Medical Colleges (Medicine and Dentistry). It introduces them to the knowledge, skills and attitudes needed in order to be a self-directed lifelong learner. Study skills which encourage deep learning should be inculcated and developed at an early stage of their education. Students will explore through active learning the broad scope of health and related medical sciences, their future job responsibilities and competencies they should acquire in order to respond to societal needs and expectations. The context of health and wellness will be used in training the students to apply study skills which support critical thinking and lifelong learning.

The two content domains of the course “Health and Wellness and Medical Education” are interwoven through a problem-based learning strategy. It also sets the stage to enable the students to be successful when studying medical sciences in an era where scientific knowledge is rapidly growing.

The main strategy of learning will emphasize self-directed problem-based learning. Students will learn in small groups (7 – 8 students in each group) encouraging teamwork and multi-professional education (Medicine and Dentistry students). Faculty will play a facilitatory role rather than act an information provider.

**0202121                      English for Medical Students                      (0-3:3)**

**Prerequisite: None.**

This course concentrates on building the knowledge and skills related to medical terminology. Students learn to understand and write medical documents, read and understand medical records, reports and diagnostic test results, and develop accurate oral communication and research skills.

**1427108                      Chemistry II for Medical Sciences                      (0-3:3)**

**Prerequisite: None.**

This course describes the main basic biochemical pathways such as glycolysis, TCA cycles, electron transport chains, glycogenolysis and glycogenesis, ketogenesis, lipogenesis and lipolysis, and the urea cycle. It also describes the synthesis of nucleic acids including DNA and RNA.

**0900106                      Human Biology II                      (1-3:4)**

**Prerequisite: None.**

This course describes the general principles of human physiology. It focuses on the physiology of the cardiovascular system, blood function and composition. This course introduces students to the players of the immune system, endocrine, renal and respiratory and digestive systems. Special emphasis is placed on diseases related to homeostatic imbalances related to the above systems.

**1427118                      Chemistry II for Medical Sciences (Lab) (0-3:3)**

The laboratory procedures cover methods of identifications, chromatography, synthesis of biochemical molecules as well as qualitative and quantitative analysis.

**0710109                      Art & Medicine                      (0-3:3)**

**Prerequisite: None.**

Arts and Medicine is an Elective University course (3 credit hours) assigned for undergraduate healthcare-related students (Colleges of Medicine, Health Sciences, Dentistry and Pharmacy) as well as Students of College of Fine Arts. It distinguishes itself by raising questions about the specific role of medicine in visual and other arts (painting, sculpture, performance and drama) , particularly emphasizing and exploring its relevance to modern medical practice and common issues met by all health professionals , as well as the key position art holds within the medical humanities. The course is offered by the College of Medicine and the College of Fine Arts. The course coordinators are from both colleges. The pedagogical philosophy of the course is to stimulate team-based learning and to provoke students to interaction, engagement and dialogue.

The course is given over a full semester, with two sessions weekly, two hours each. To increase student participation in the learning process and active discussion, team-based learning is usually applied, dividing the students into 5 to 6 groups, 5 students per group. The learning outcomes depend very much on the student activities, including: small group class presentations, discussions, midterm and final exams, and submission of a term paper, artistic project or poster.

## 0900107 History of Medical and Health Sciences (0-3:3)

**Prerequisite: None.**

History of Medical and Health Sciences is an Elective University course (3 credit hours) assigned for undergraduate healthcare-related students (Colleges of Medicine, Health Sciences, Dentistry and Pharmacy). The course was successfully launched in the Fall semester of 2008. It runs in 15 weeks duration (overall 45-48 hours) covering the essential topics of the history of medicine in both a chronological as well as in a thematic manner.

Classes are based on guiding lectures delivered by different guest lecturers from different medical specialties but with interest in the History of Medicine. However, the learning outcomes depend very much on the student activities, including: small group class presentations, discussions, midterm and final exams, and submission of a term paper, artistic project or poster.

Feedback from students is encouraging as revealed from their Course Evaluation Forms. Moreover, immediate and continuous feedback from students showed that the course is interesting, informative, and provides knowledge useful in their careers.

### Phase II – Years 1, 2, and 3 “Pre-clerkship”

This phase integrates the four curriculum themes, mainly organ systems structured around **9** units which vary in their duration between 8 – 16 weeks.

Problem Based Learning (PBL) using written scenarios with simulated and real patients’ problems constitute the main strategy of learning and teaching in this phase. Core themes related to different Basic Medical Sciences “Anatomy, Physiology, Pathology, Microbiology, Pharmacology, Immunology” are integrated throughout the studied health problems. Clinical skills, population and community educational activities, ethics and professional development are coordinated with the PBL and run horizontally and vertically through the 3 years of Phase II.

In year three, students learn in different training sites (hospital, primary health care clinics, and community health). Integrated medical and surgical problems drive student learning. The experiences prepare the students to be more responsible towards their learning and patients when moving to the clerkship phase. The contents of each semester are organized and structured around the four curriculum themes.

### Course Coding System

The Pre-clerkship and Clerkship phase courses are designated the code 09CDEFG where:

|    |                     |
|----|---------------------|
| 09 | College of Medicine |
| CD | Department          |
| E  | Year                |
| FG | Units               |

For example, Endocrine and Reproductive unit is the third unit in Year 2, Medicine and is coded as 0900303.



## Descriptions of Phase II Courses Year One

### 0900201 - Life Cycle

**Description:** This 8-week course introduces students to the four themes upon which the five-year curriculum is based, which comprises the following:

- Theme 1: An orientation program focuses on transition, ethics, healthy lifestyle, group support and communication skills. Health Enhancement builds on this, with an introduction to Mind-Body Medicine, Ethics and Medical Law.
- Theme 2: Health, Knowledge and Society involves a series of 'hypothetical' scenarios to provide an analysis of the social aspects of medicine.
- Theme 3: Provides students with a foundation in genomics, cell biology, embryology and physiology. Case studies or Problem Based Learning sessions integrate material presented in all themes throughout the week.
- Theme 4: Introduces students to practical clinical skills. An introduction to communicative and medical interviewing, history taking skills, and basic ethical concepts.

### 0900202 - Man and His Environment

**Description:** This 8-week course introduces students to the four themes upon which the five-year curriculum is based, which comprise:

- Theme 1: An orientation program focusing on transition, ethics, healthy lifestyles, group support and communication skills. Health Enhancement builds on this, with an introduction to Mind-Body Medicine, Ethics and Medical Law.
- Theme 2: Health, Knowledge and Society involves a series of 'hypothetical' scenarios to provide an analysis of the social aspects of medicine.
- Theme 3: introduce concepts related to how we protect ourselves, body reaction to external risk factors, the "milieu interieur" and homeostasis. It integrates through 6 patient-centered problems and 13 mini problems the basic concepts from Pharmacology, Biochemistry, Genetics, Physiology, Anatomy, Immunology, Psychology, Pathology and Microbiology.
- Theme 4: Introduces students to practical clinical skills. An introduction to communicative and medical interviewing, history-taking skills and basic ethical concepts.

### 0900203 - Musculoskeletal System

- Description: This 12-week course will build on the four themes introduced in MED1011 while introducing new concepts within these themes with emphasis on:
- Theme 1: Personal and Professional Development - develops strategies for personal health enhancement and ethical/legal issues relevant to professional responsibility, the doctor-patient relationships and public accountability.
- Theme 2: Population Health and Epidemiology - develops an understanding of epidemiological research, study designs, interpretation of statistical information and introduction to critical appraisal of medical publications.
- Theme 3: Foundations of Medicine - Musculoskeletal, peripheral nerves and human behavior. Examines major concepts within the areas of muscles and innervation. It integrates through 9 PBL important concepts and 20 mini problems in Basic Medical Sciences.
- Theme 4: Clinical Skills - comprehensive medical history taking skills and awareness of key ethical issues involved in communication with patients, family members, careers and health professionals.

### 0900204 - Hematopoietic system

**Description:** This 3-week course will build on the four themes introduced in MED1011 while introducing new concepts within these themes with emphasis on:



- Theme 1: Personal and Professional Development - develops strategies for personal health enhancement and ethical/legal issues relevant to professional responsibility, the doctor-patient relationship and public accountability.
- Theme 2: Population Health and Epidemiology – involves defining a questionnaire and discussing ideas for developing a new questionnaire, as well as learning about the Ethical Issues in Research, including how to write a Research Consent Form and a Research Proposal.
- Theme 3: Foundations of Medicine - process of hematopoiesis, types of anemia and the pathophysiology of symptoms, blood cell malignancies and coagulation disorders. It integrates through 3 PBL important concepts and 6 mini problems in Basic Medical Sciences.
- Theme 4: Clinical Skills - to identify common signs in cardiovascular, respiratory and hematology (Image and video interpretation).
  - To take a history related to common hematological presentations.
  - To apply clinical reasoning in order to reach the correct diagnosis.
  - To know how to interpret common hematological investigations.

### **0900205 – Community Health I (Epidemiology & Statistics)**

**Description:** CH I is a year-long unit that introduces first-year medical students to basic principles of population health and epidemiology. This unit is covered under theme 2 of the medical curriculum.

#### **Year Two**

### **0900301 - Cardiovascular and Respiratory systems**

**Description:** This course introduces major concepts related to the Cardiovascular (6 weeks), Respiratory (4 weeks) systems of the human body and the concepts behind Information Management and Health promotion. These concepts are introduced as follows:

- Theme 1: Through Community-Based Programs, the student develops an awareness of the sector's relevance to the practice of medicine and the socio-economic context of health and illness.
- Theme 2: Through Information Management and Health Promotion, the student develops skills in data management and critical appraisal of evidence and knowledge to assist in clinical decision-making.
- Theme 3: Maintaining the internal environment enables the student to study the cardiovascular and respiratory systems, from normal structure and function to pathology of common health problems and their clinical presentations and management.
- Theme 4: Clinical Skills assists the student to develop clinical reasoning and focused history taking based on common presentations of diseases related to these systems.

### **0900302 - Gastrointestinal System/Nutrition/Metabolism**

**Description:** This course introduces students to major concepts and principles of the Gastrointestinal System/Nutrition/Metabolism (7 weeks)

- Theme 1: Through a Community Partnership, the student develops an awareness of the health sector's relevance to the practice of medicine and the socio-economic context of health and illness.
- Theme 2: Information Management and Health Promotion: the student develops skills in data management and critical appraisal of evidence and knowledge to assist in clinical decision-making. The student will develop and implement a Health Promotion project.
- Theme 3: Gastrointestinal, Nutrition and Metabolism enable the student to examine the gastrointestinal system from normal structure and function to pathology and management of

common GI presentations.

- Theme 4: Clinical Skills assists the student to develop clinical reasoning and focused history taking related to GIT.

### 0900303 - Endocrine system

**Description:** This 4-week course introduces students to major concepts and principles of the Endocrine System.

- Theme 1: The student will identify complex ethical issues related to confidentiality, notification and treatment choices that may arise in serious diseases.
- Theme 2: The student will be able to outline the approaches to preventive medical care and screening of chronic illnesses and will also identify important social factors which have an impact on health, illness and healthcare services.
- Theme 3: Study of the endocrine system will enable students to identify major anatomical features of the hypothalamus, pituitary, thyroid and adrenal glands, to understand the functions of each gland, including its hormonal regulation and the principles and clinical relevance of hormone assays. They will appreciate the anatomical and clinical consequences of aberrations in endocrine tissues and understand the link between clinical presentation and the underlying pathophysiology.
- Theme 4: Clinical Skills assist the student to develop communication skills.

### 0900304 - Renal and Reproductive Systems

**Description:** This course provides students with a foundation in Renal (4 weeks) and Reproductive (3 weeks) systems.

- Theme 1: Through a Community Partnership, the student develops an awareness of the health sector's relevance to the practice of medicine and the socio-economic context of health and illness.
- Theme 2: Information Management and Health Promotion: the student develops skills in data management and critical appraisal of evidence and knowledge to assist in clinical decision-making. The student will develop and implement a Health Promotion project.
- Theme 3: Renal and Reproductive systems enable the student to study the necessary knowledge required to understand common health problems related to those systems.
- Theme 4: Clinical Skills assists the student to develop clinical reasoning and focused history taking related to these systems.

### 0900305- Community Health II (Community-Based Research)

**Description:** CH II is covered horizontally throughout year 2 and introduces students to principles of research methodology, research ethics and biostatistics. This unit is based on theme 2 of the medical curriculum.

### Year Three

**Description:** The courses in Year 3 run horizontally all through the year. Different learning settings are used for learning and teaching. This includes PBL Tutorials, Clinical Skills Lab, Hospitals, Primary Health Care Centers, Preventive, Occupational and different Special Needs services. The four curriculum themes - Personal and Professional development; Population, Society, Health and Disease; Foundation of Medicine; Clinical Skills - run through all the following units:

### 0900401- Neurosciences

The Neuroscience Unit is part of Phase II of the College of Medicine curriculum at the University of Sharjah. As the student progresses through the different organ systems during year one and year two

he/she appreciates that the human body functions as one unit, with all the systems working together to maintain a constant internal environment.

In this Unit (Neuroscience), we build by introducing the fascinating world of the central nervous system – the fast and masterful system that controls all of our systems. How do we perceive the sensations triggered by our sense organs? How do we perform skilled movements (e.g. learning to write)? What is consciousness? Why and how do we do the things we do? What is intelligence? How do we learn? What things determine and shape our behavior?

The Neuroscience Unit is presented through 12 core problems which can be categorized into three main areas or subunits: Subunit I (Problems 1-6 and 10): CNS structure and function – dealing with the organization and function of the nervous system – how we perceive, move, learn, remember and what happens when these functions are disturbed. Subunit II (Problems 7-9): Human behavior – based on the central concepts of modern neuroscience that behavior is a reflection of brain function which, when deranged manifests as mental illness. Subunit III (Problems 11 and 12): Special senses – explores the peripheral structure and function of the special sense organs (vision, audition and the chemical senses) and how the complex information they convey is interpreted by the brain.

The General Objectives of the Neuroscience Unit are structure and functions of the central nervous system, higher functions of the nervous system involved in complex human behavior, and structure and function of the special sense organs.

#### **0900402- Special Senses & Neuro-psychiatry**

**Description:** This course introduces students to major concepts and principles of special senses (ear and eye) and neuropsychiatry (mood disorders and psychotic disorder) system (4 weeks).

- Theme 1: The student will identify complex ethical issues related to confidentiality, notification and treatment choices. In addition, they learn the communications skills and professionalism.
- Theme 2: The student will be able to screen ear, eye, mood and psychotic disorders and will also identify important psychosocial factors which have impact on health and illness.
- Theme 3: Study of the special sense system will enable students to identify anatomy, physiology, pathology of ear and eye. In addition, studying neuropsychiatry will enable students to enhance their psychopathology and psychopharmacology knowledge.
- Theme 4: Clinical Skills assist the student to develop skills related to ear and eye examination and psychiatry history taking.

#### **0900403- Multi-System Diseases (14 weeks)**

**Description:** This course is a continuation of the Integrated Medicine and Surgery curriculum based on the four themes of the medical curriculum. Students will encounter patients in hospital and ambulatory care settings.

- Theme 1: Develops student's awareness of legal and ethical issues, professional rights and responsibilities, patient advocacy, working in multi-disciplinary teams and identification and implementation of strategies used to meet personal and professional challenges.
- Theme 2: Develops the student's ability to apply key principles in use and appraisal of evidence-based medicine.
- Enables the student to acquire appropriate skills in environmental and occupational medicine.
- Theme 3: The student will apply the knowledge learnt in previous years to the identification, diagnosis and understanding of common and important illnesses, conditions and disorders, pathophysiology and pharmacology in Medicine and Surgery.
- Theme 4: By the end of the semester, students must be capable of undertaking history and clinical examinations of patients with straightforward conditions, and have an understanding of the relevant investigations and general management plans. Previous learning will be extended.

#### **0900404- Community Medicine (Research & Field work)**

**Description:** CH III extends throughout the third medical year and includes several educational field activities that expose students to a comprehensive community health program. This unit is based on theme 2 of the medical curriculum.

#### **Phase III - Clerkship Phase Years Four and Five**

**Description:** The later years of the medical program focus upon learning in the clinical environments. Students are responsible for their learning. The program provides them with diverse opportunities to encounter patients in different clinical settings. They function as sub-interns responsible under supervision for their patients. Students are attached to a range of clinical settings allowing them to work continuously in the clinical environment and to consolidate their basic and clinical science knowledge. Personal and professional development and patient advocacy skills developed in the early years of the MBBS course will be further developed and extended within a clinical context.

Learning activities focuses upon providing a clerkship experience for students. Clinical skills, practical techniques and procedures and underpinning knowledge specific to each discipline area will be linked to the clinical settings. A particular focus will be given to integrating key knowledge, skills and techniques applicable across disciplines.

During these rotations, the students are expected to function as members of the service teams and are assessed according to their ability to contribute to the care of the unit's patients.

- Theme 1: Students will demonstrate their ability to work as an effective member of a multidisciplinary health care team, including appropriate professional and ethical behavior and communication skills with patients and colleagues.
- Theme 2: Students will demonstrate their understanding of the context of illness, their ability to apply evidence-based medicine to clinical decision making in practice and to access information via technology.
- Theme 3: Students will demonstrate their understanding of the pathophysiological basis of health and disease, appropriate critical thinking in all aspects of clinical care and a commitment to independent learning, continuing education and quality assurance activities.
- Theme 4: Students will demonstrate appropriate clinical history and examination skills at the standard of an intern, the ability to competently diagnose and appropriately manage emergency and non-emergency cases and their ability to perform relevant clinical procedures.

#### **Year Four**

Four clerkship rotations of 10 weeks each related to four main clinical disciplines, i.e., Surgery, Medicine, Pediatrics, and Obstetrician/Gynecology.

**0900501: Obstetrician/Gynecology (10 weeks)**

**0900502: Pediatrics (10 weeks)**

**0900503: Medicine I (10 weeks)**

**0900504: Surgery I (10 weeks)**

**0900505: Compulsory clinical/research training electives (6 weeks)**

All students are offered 6 weeks of electives allowing them to explore educational experiences which they find interesting. This could be Clinical Sciences, Basic Medical Sciences, or Research. A report on their experiences during the electives will be presented and will constitute part of their portfolio.

## Year Five

Second rotation of clerkship surgical and medical sub-specialties; Family Medicine and Psychiatry.

**0900601: Medicine II (10 weeks):** Cardiology, Neurology, ENT, Accident and Emergency, Dermatology, Radiology

**0900602: Surgery II (10 weeks):** Orthopedics, Urology, ENT, Ophthalmology, Anesthesia

**0900603: Family Medicine (8 weeks):** Family Medicine

**0900604: Psychiatry (2 weeks):** Psychiatry

**0900700: Final MBBS Exam**

## General Education Requirements

Every student is required to take 24 credit hours of general education courses distributed over seven domains. Fifteen (15) mandatory credit hours are selected from domains 1, 2, 3 and 4 and (9) elective credit hours selected from domains 5, 6 and 7 as indicated in the University section (General Education).

## Teaching & Learning Strategies

Teaching and Learning Methods: “Blended Authentic Learning”, Problem Based Learning, Team Based Learning and Task Based Learning.

## Problem Based Learning (PBL)

At the College of Medicine, University of Sharjah, the main strategy of learning is PBL. Each week, small group of students (approx. 8 – 10) discuss a problem, identify by the end of the first tutorial session their learning needs and objectives. The second tutorial session takes place at the end of the week during which students present their findings and new knowledge acquired from their collaborative work and self-directed learning. Each student develops, presents and shares with the group a concept map of his/her learning, explaining the knowledge concepts in relation to the problem. In the two tutorial sessions, the tutor, who is a faculty member, facilitates the discussion. On the first day of the following week and before starting the next problem, a review session is offered to the students attended by more than one faculty, usually from the Basic Medical Sciences department and Clinicians (Figure – The Sharjah Model of PBL/TBL).

Between the first and second tutorial sessions, structured activities are offered by the college resource sessions, clinical skills labs, anatomy labs, pathology labs, etc. PBL does not stop at the end of year 3. It extends to the clerkship phase as “Patient-centered student-led tutorials”. The students in a clerkship are approx. 5 – 6. One student of the group selects one patient he/she is responsible for to do his/her workup. The student who is responsible for the patient acts as the group facilitator in the first tutorial session and discusses the patient’s presentation and management. Triggers in the history, physical examination, investigation and treatment lead to the generation of learning objectives. Tasks are distributed among the group. The students decide together on the date of the second tutorial session. During the second tutorial session, the students invite a faculty member who is a specialist in the problem. His or her role is a resource person commenting and sharing his/her experience with the student. The tutorials are conducted by the students with contribution from the clinical faculty.

### Team Based Learning (TBL)

Since 2009, Team Based Learning was introduced, changing the resource sessions from a lecture format into a “TBL” format where the students, approx. 80 – 100, go through the typical “pre-class preparations” which is based on the problem’s objectives. When they come to the class, they are given the “Individual Readiness Assurance Test” (IRAT) followed by the “Group Readiness Assurance Test” (GRAT). The typical “Application phase” is part of the second PBL tutorial where additional mini problems are presented. The review session was also changed into a TBL format, integrated and multi-disciplinary.

### Task Based Learning

Task Based Learning is practiced in the pre-clerkship phase through a program called “Learning basic medical sciences in the clinical environment”. In each organ system module, a number of tasks are identified. For example, in the respiratory system, one of the tasks is assessing the respiratory function of a patient. Students are provided with learning outcomes and competencies to be acquired when going through the task. One or more clinicians takes responsibility for planning the students’ activities when they go to the hospital. After completing the task, students reflect on their experience, commenting on what they actually saw, learned, did, what went well, offering suggestions for improvement. This task-based learning creates a strong link between the Basic Medical Sciences and Clinical Sciences, which demonstrates that a blend of authentic learning methods can be used in the same program. What is important is to ensure that the methods converge and complement each other. After the visit, students report and reflect on their experience using student feedback form.

Various innovative learning modalities have been adopted during the clinical skills training at the pre-clerkship phase (see Clinical Skills program). The emphasis is on learning by doing, utilizing the standard skills training stages supplemented by simulated patients, mannequins, video-based learning and continuous feedback. The Anatomy teaching and learning is supplemented by cadaveric models, 3-dimensional online models, plastic as well as plastinated specimens. Imaging, surface and functional anatomy are integral to all teaching and learning activities of this important discipline. It continues to the clerkship phase as Surgical Anatomy (spiral approach).

### Assessment System

- Assessment system is developed in order to match the integrated, Problem Based Learning curriculum.
- Assessment in Phase I “Foundation Year” is semester- based.
- Assessment in Phase II (years 1, 2 and 3), and Phase III (years 4 and 5) are based on annual assessment system.
- Pass/Fail decisions are made at the end of each year/phase.
- Continuous Assessment takes place at the end of units/semester in Phase II and at the end of each clerkship in Phase III.
- Summative comprehensive assessments checking the acquisition of intended learning outcomes of each phase takes place at the end of Foundation Year, Year 3 and end of Year 5.
- Test blueprints are used to guide the identification of what should be assessed, level of expected performance and best testing instruments to be used. This ensures adequate sampling and increases the reliability and validity of the examination. Test blueprints are then prepared and super-imposed on curriculum blueprint.
- **Student Assessment instruments:**
  - a. Assessment of knowledge at the *know ‘recall’* level and the *“knows how” ‘application of knowledge’* levels is based on context-rich of MCQs (A-type questions, one best answer) and Extended Matching Questions – R-type.



- Constructed response questions
- Key Feature Questions
- b. Assessment of skills 'shows how' level is assessed using Objective Structured Practical Examination (OSPE) and Objective Structured Clinical Examination (OSCE).
- c. Assessment of clinical and pathological signs is assessed by using computer based Clinical Image and Video Assessment (CIVA) in each year.
- d. Portfolios, logbooks and supervisors' evaluation of student performance are used in assessing students' population/community- based activities and performance in the clerkship. Reflective diary is an important component of the Portfolio.
- e. Peers and facilitators evaluations are used in assessing student performance in the PBL tutorials and other small group activities including research groups. This student assessment system provides valid and reliable information about the student.
- f. Direct Observation Clinical Encounter Examination (DOCEE, Hamdy, 2003), using real patients and mini CEX examinations are used during the clerkship phase, at the end of each clerkship rotation and at the Final Exit MBBS examination.
- **External Examiners:**  
Senior professors working in various medical colleges within UAE and outside are invited as External Examiners to conduct the clinical part of Final MBBS examination. These examiners are also provided with the details of

OSCE and written examinations. **The following are the extracts from few reports:**

- a. "I appreciate the method of assessment. The system of assessing students through DOCEE and OSCE is very comprehensive and excellent. There are excellent students" **Prof. D. Behera, India**
- b. "The clinical examination is very comprehensive and good selection of real patients. I examined 36 students. The highest mark obtained was 95%. History taking was of a high standard. Clinical reasoning and analysis was impressive" **Prof. Afif Hadj, Australia.**
- c. "The examination was organized in a perfect manner. The overall students' performance was very good and an increasing percentage of excellent students. The exposure to clinical practice, to some extent, has been potentiated with training in role models, video sessions and simulation. It seems to have worked well" **Prof. Rolf Hartung, UAE.**

### Assessment of Phase I - Foundation Year

- a. Assessment in the Foundation Year is discipline (i.e. course and semester)- based.
- b. Mid- and End-semester examinations are conducted.
- c. Results are presented as course GPA and cumulative GPAs.
- d. Scores and GPA in Foundation Year do not contribute to scores in Phase II or Phase III. Scores and grades reflecting performance in each phase are 'stand-alone'.

### Conditions for proceeding to Phase II

Regulations for Promotion of Foundation Year students to the medical program:

Due to the nature of study in the College of Medicine which is linked to the space available for clinical training in the hospitals and in reference to the University regulation for promotion of student to the First year of Medicine, students must pass all core subjects in the Foundation Year which are: Biology 1 and 2, Chemistry 1 and 2, Physics and their laboratories, Medical English and English language.

The following specific rules shall apply:

- a. Attaining a cumulative GPA > 2.5 in the subject of Chemistry 1 and 2 and Biology 1 and 2, Physics and their labs and Medical Education in addition to cumulative GPA 2.5 in all subjects studied by student.

- b. Priority in ranking will be according to student GPA in Chemistry, Biology, Physics and their labs and Medical Education. Then the cumulative GPA in all subjects studied.
- c. Students who successfully score that required GPAs are subject to competition for seats available in these colleges.
- d. The number of available seats for the College of Medicine depends on availability of clinical training in the hospitals.
- e. Student can repeat the Foundation Year only once whether he / she joins the Foundation Year in the fall or spring semester of the same academic year.
- f. A student repeating the Foundation Year and still unable to achieve the required GPA will leave the program. He / she can transfer to another program in the University.
- g. University regulations will apply to all other cases not included in the above student categories.
- h. GPAs of year one "Foundation Year" and GPAs of University Compulsory and Elective courses will be reported as GPAs following standard university regulations. They do not add to the score and grades of the medical program, but they could be transferred to other programs in the University.

### Assessment in Phase II (Pre-clerkship Phase)

There are a maximum of three assessments during the years 1, 2 and 3. Each examination is structured to include two to three systems. The examination tools include written, OSPE, OSCE, project/portfolio, and continuous PBL and weekly TBL-formatted assessments. At the end of the year, the comprehensive results from all examinations have the following weightage.

**Years 1 and 2 examinations:** End-year results are based on the aggregate scores accumulated from the end-of-units' assessments during each years (1 and 2). Scores are reported as percentage.

| Description  | Weight      |             |
|--|-------------|-------------|
|  | Year 1      | Year 2      |
| Written: MCQ & EMQ   | 40%         | 40%         |
| OSPE   | 25%         | 25%         |
| OSCE (Clinical Skills)   | 15%         | 15%         |
| Portfolios (consisting of Research activities and population/community-based activities) | 5%          | 5%          |
| PBL Continuous Assessment  | 5%          | 5%          |
| Continuous weekly TBL-formatted quiz   | 10%         | 10%         |
| <b>Total</b>   | <b>100%</b> | <b>100%</b> |

**Passing score:** In order to proceed from year 1 to year 2 and year 2 to year 3, a student must have a cumulative score of a **minimum of 70%** in the respective year, and a minimum of 60% in every system unit.

**Re-sit examination:** Students scoring **less than 70%** are eligible to sit for a re-sit examination in August of the same academic year. This examination is a comprehensive written examination covering all units of the corresponding year and OSCE and OSPE.

Re-sit examination is also given to students who did not appear in any examination due to medical reasons approved by the Dean of the College. In all cases, the re-sit examination is counted as an attempt. The re-sit examination for medical reasons is only in the examination missed. Marks obtained in re-sit examination for all except medically excused students, the minimum pass mark of 70% is given. For medically excused students, the actual score is counted.

**Repeat:** Students scoring **less than 70%** in the re-sit examination repeat the year. Students are allowed to repeat a given year only twice. If not passed, advised change of majors.



### Year 3 Examinations

Consisting of continuous assessment of Multi-system unit, Integrated Medicine and Surgery, Community and Population- based activities, Tutorial assessment, Evidence-Based Medicine). The following two examinations are given:

1. **End of first semester of year 3 exam.** It consists of the following components:

|   |             |
|---|-------------|
| Written: MCQ, SAQ and MEQ               | 40%         |
| OSCE (Clinical Skills)                  | 25%         |
| OSPE                                    | 15%         |
| PBL (Continuous Assessment) + Portfolio | 10%         |
| Continuous weekly TBL-formatted quiz    | 10%         |
| <b>Total</b>                            | <b>100%</b> |

Aggregate scores derived from end of years 1, 2 and assessments in year 3 contribute **50%** "Continuous assessment of Phase II".

1. **End of Year 3 Comprehensive Exam:** Students are assessed on the different competencies acquired during phase II (years 1, 2 and 3). The examination contributes 15% to the final aggregate scores for Phase II.

The 50% contribution from aggregate assessment scores in years 1, 2 and 3 is derived as follows: 20% on year 1, 20% on year 2 and 10% on Year 3.

IFOM- BS represents 10% of the written exam.

**Passing score:** In order to proceed to the clerkship phase, a student must score a minimum of **70%** on the aggregate of Phase II Continuous Assessment and end of Year 3 assessments.

**Re-sit examination:** Students scoring less than 70% are eligible to sit for a re-sit examination in August of the same academic year. This examination is a comprehensive written examination covering all units of the corresponding years (years 1, 2 and 3), OSCE and OSPE.

**Repeat:** Students scoring less than 70% in the re-sit examination shall repeat year 3. A student is allowed to repeat the year only once, if not passed after 2 years, advised change of major.

**Withdrawal:** Students failing to attain a pass (70%) at the end of the repeated year are given, on the recommendation of the College Council, a fourth and final attempt to re-sit the examination in August. If a student fails to achieve the expected pass score (70%), after this final attempt, they will have to withdraw from the medical program. He/she is given the option to transfer to another program in the University.

### Assessment in the Clerkship Phase III (Years 4 and 5) General Regulations

1. The minimum cumulative pass mark to pass clerkship examinations is 70 %, provided that a student scores a minimum pass mark (70%) in aggregate of the DOCEE + OSCE.
2. On the 9<sup>th</sup> week of rotation, the coordinators of the clerkship report to the College the suitability of any student to appear/not to appear for the clinical examination on the basis of his/ her continuous assessment. Unsatisfactory performance does not allow students to take the end of clerkship examination.

3. If a student fails in the clerkship examination and this failure is due to a low score on clinical examination, s, /he/ she is given a re-sit clinical exam with the following rotation.
4. Students failing the re-sit examination are allowed to continue his 5<sup>th</sup> year; however, they have a re-sit examination with a next batch of students during the 1<sup>st</sup> end-clerkship rotation examination. They also have to repeat 4 weeks of training in the clerkship in which they have failed, before taking the re-sit examination.
5. **In order to sit for the EXIT examination at the end of year 5, all students must pass all end-clerkship rotation examinations.**

### Student's Assessment

#### Year 4

- There are four clerkship rotations e.g. Medicine I (10 weeks), Surgery I (10 weeks), Pediatrics (10 weeks) and Obstetrics & Gynecology (10 weeks).
- Clerkship performance evaluation is based on:
  - Continuous assessment - 40% (Portfolios 10%, DOCEE 20%, Clinical faculty Assessment 10% includes Attendance & Active participation).
    1. Attendance
    2. Active participation in the clerkship activities (supervisory reports)
    3. Portfolios (contents in clerkship guide)
  - End of clerkship examinations - 60%
    1. Written - 35%
    2. OSCE - 25%

#### Year 5

1. At the end of year 5, the exit exam has 50% weightage and 50% from the aggregate scores of the seven clerkships in years 4 and 5.
2. There are four major clerkship rotations e.g. Medicine II (10 weeks), Surgery II (10 weeks) and Family Medicine (8 weeks) and Psychiatry (2 weeks). The assessments at the end of each of these rotations consist of:

|   |            |
|---|------------|
| Continuous Assessment (attendance and portfolio)  | 20%        |
| Written paper at the end of 10 weeks (Approximately 100 MCQs and EMQs from each subspecialty) | 45%        |
| OSCE  | 35%        |
| <b>Total</b>  | <b>100</b> |

### Final Integrated MBBS Examination

This is the final hurdle students must pass it in order to graduate. At the final gate, we ensure that the outcome competencies have been acquired. Successful completion and passing of all the Clerkship rotations is a requirement for taking the final Summative Integrated MBBS examination. The final EXIT examination has a weight of 50%, consisting of the following components:

|  |             |
|--|-------------|
| MBBS written: MCQ & EMQs and IFOM- CS (10% of the written) | 30%         |
| IFOM exam  | 10%         |
| OSCE (Clinical Skills)                                     | 30%         |
| DOCEE  | 30%         |
| <b>Total</b>   | <b>100%</b> |

The 50% contribution from aggregate assessment scores in year 4 and 5 examination are: Year 4 – 30% and Year 5 – 20%.

### **Pass score for completion of the Medical program**

A minimum score of 70% on the aggregate scores of continuous clerkship assessment, from the 8 clerkship rotation examinations, and final MBBS examination is required in order to pass. In addition, a student must get a pass score (70%) in the clinical components (OSCE + DOCEE) of the final MBB exit examination. Any student failing to achieve this benchmark is declared fail and has to repeat the examination in December of the same academic year.

### **Re-sit of the final exit examination at end of year 5:**

Students who fail to attain the passing score on the first attempt in May have a maximum of 3 more attempts, the following December, May and December, as long as the student does not exceed the number of years allowable to remain in the program, as per University regulations (currently 50% of the total duration of the program, i.e. 9 years (6 years

+ 3 years).

### **Graduation requirements**

Successful completion of the medical program with a minimum score of 70%. Satisfactory completion of the general and elective University requirements.

# College of Dental Medicine

## College of Dental Medicine

### Officers of the College

**Prof. Ahmad Mohammad Hamdan**

**Dean**

**Professor Sausan Al Kawas**

**Vice Dean**

### Personnel

#### Professors

Manal Awad, Colin Alexander Murray, Mehmet Omer Gorduysus, Rani Samsudin, Sausan Al Kawas, Zahi Badran, Ensanyah Abou Neel, Natheer Al-Rawi

#### Associate Professors

Nadia Khalifa, Betul Rahman, Hatem EL Damanhoury, Khaled Khalaf, Suhail Al-Amad, Venkateshbabu Nagendrababu, Vellore Gopinath, Wael Mohamed Taha.

#### Assistant Professors

Hisham Yehia Elbatawi, Ahmed Mohammed Alamri, MHD Adel Moufti, Mohamed Yahya El-Kishawi, Anirudh Balakrishna Acharya, Saaïd Ayesh Al-Shehadat, Zaid Hamdoon, Deepak Mehta, Mohammad Issa Michael Nassar, Sunaina Shetty Yadadi, Marwan Mansoor Ali Mohammed, Mohammed Amjed Al-Saegh, Shishir Ram Shetty, Smriti Aryal

#### Lecturers

Abdul Khaliq H. Abdul Khaliq, Abeer Abdul Sattar, Ali AbdulQadir Al-Qabbani, Basheer Salman, Elaf Al Zubaidi, Kausar Sadir Fakhruddin, Maysara Adnan Ibrahim, Nizam Abdulla, Omer Shalal Habeeb, Saad Wahbi Al Bayatti, Sangeetha Narasimhan, Sara Radi Jamil Jaser, Shadi Faisal Alkhatib, Sheela Balu Abraham, Shermin Hashir Karim, Waad Kheder, Zeina Hussain AL Doory

### Administrative Support Staff

|                     |                          |
|---------------------|--------------------------|
| Merifa Al-Katbi     | Administrative Assistant |
| Huda AlAsadi        | Administrative Assistant |
| Shamma Alkhatri     | Administrative Assistant |
| Maitha Al tamimi    | Administrative Assistant |
| Hayfa Khalil Bassol | Administrative Assistant |

### Contact Information

College of Dental Medicine Building, M28 University City  
Sharjah, UAE  
+971-6 5057333/+971-6 5057322

[www.sharjah.ac.ae/](http://www.sharjah.ac.ae/)

### Accreditation

The College has full accreditation since 2014.

### History

The college was founded in 2004; and has graduated ten classes of students. The tenth class graduated in 2020.

### Organization Structure

The College has two departments:

- Department of Preventive & Restorative Dentistry
- Department of Oral & Craniofacial Health Sciences

### Vision

The College of Dental Medicine will continue to strive towards national and regional prominence, and subsequently international prominence, by continually updating and aligning the undergraduate curriculum with the latest evidence-based practice, and by recruiting the best available faculty with a special emphasis to attract Emirati educators as role models and future leaders of the College.

A caring scholarly and research culture will be inculcated, nurtured and supported among students and faculty. The College will strive to provide the UAE with critical and effective national leaders in the delivery of optimal dental health care services, in dental education for the future of the University, and in scholarly activity for the development of new knowledge for the benefit of the region and the world. The College will strive to teach life lessons during the five years of the dental education so that we mould good citizens, and on the way make them great dentists.

### Mission

The mission of the College of Dental Medicine is to provide education to the dental students through the creation of a supportive scholarly environment that fosters excellence in the lifelong goals of continuing education and scholarly activity.

### Objectives

The following objectives form the foundation of the curriculum:

- Develop a more flexible curriculum structure that can respond rapidly to, and reflect on, developments in the science and practice of dentistry.
- Reduce formal contact hours for teaching and provide greater opportunities for self-directed, experiential learning throughout the program.
- Facilitate greater opportunities for contextual learning. In the traditional model most of the basic and applied science material was presented in the early years. This material was often not reinforced later in the course where its relevance would have been appreciated more by students. A greater integration, balance and flow of material throughout the course is an important objective.
- Introduce problem-based and team-based learning throughout the course so that students (and later graduates) are able to better integrate learning material and apply their knowledge.
- Make greater use of developments in computer-aided instruction, audio-visual material and laboratory-based technique exercises.
- Develop a course that students will find stimulating and enjoyable and one that engenders a desire to continue learning after graduation, i.e. to become life-long learners.

## Philosophy of Dental Education

Oral health is an integral part of general health. The general dental practitioner should strive to empower patients and communities to maintain optimal oral health throughout their lives. Good systemic health is not complete without good oral health.

## Academic Program

The College of Dental Medicine offers a program that leads to the degree Bachelor of Dental Surgery (BDS).

## Admission Requirements

Applicants to the College of Dental Medicine should refer to the University Section on Admissions in this bulletin for details on the admission requirements to the University. Admission to the Foundation Year of the BDS program is subject to satisfying English proficiency requirements and the necessary academic preparation as described in that section. Admission to BDS1 from Foundation Year is competitive and is limited by number of available seats.

## Graduation Requirements

The graduate should have:

- 1) Successfully completed all of the courses required for graduation in the study plan and obtained 70% or more in the combined results for years 4 and 5 (Phase III).
- 2) Obtained a minimum score of 70% in the final BDS Exit Examination.
- 3) Successfully completed all the other mandatory and elective requirements of the study plan with GPA 2.0 points.
- 4) Spent the minimum period stipulated for the award of the Bachelor's degree and did not exceed the maximum.

## Curriculum Rationale

The rationale behind the development of this curriculum is in response to:

- an explosion of knowledge in dentistry in the last ten years, leading to new approaches, new techniques and on-going controversies.
- major changes in the pattern of dental and oral disease.
- an increasing proportion of the population retaining their teeth into middle and old age and requiring special consideration.
- major advances in the field of teaching methodology and student learning.

## Curriculum Outcome and Competencies

### Graduate Outcomes/Responsibilities

The following outcomes should be developed through the learning experiences of the BDS program.

The dental graduate should:

- adopt and employ professional attitudes and standards / values
- effectively manage community-based oral health
- effectively manage individual patient care
- effectively manage a dental team
- engage in self-directed life-long learning.

### Graduate Outcome Indicators – “Competencies”

The dental graduate should have achieved the following competencies:

#### 1) Adopt and Employ Professional Attitudes and Standards / Values by:

- advocating for change
- communicating effectively with a range of audiences, e.g. professional, policymaking bodies,

community and patients

- providing dental care in a contemporary ethical and legal environment
- displaying integrity in all aspects of professional life
- applying a wide understanding of social, political and cultural perspectives to inform practice.

## **2) Effectively Manage Community-Based Oral Health by:**

- having a vision of oral health in the wider community
- committing to the improvement of oral health in the whole community, including underprivileged groups, through diagnosis, treatment and education
- being informed by a preventive approach to management
- engaging in promotion of oral health as it relates to general health

## **Effectively Manage Individual Patient Care By:**

- using an evidenced-based approach to provide holistic management
- acting as an advocate for patients
- providing a broad range of dental interventions
- having expertise in diagnosis, treatment planning and dental care in the long term
- integrating and applying an understanding of basic, clinical, behavioral and social science concepts to inform practice.

## **Effectively Manage a Dental Team by:**

- working effectively as a team member of an integrated dental team and inter professional teams
- managing self, resources and people within the constraints of the practice context
- utilizing information technology for communication, patient and practice management.

## **Engage in Self-Directed Life-Long Learning By:**

- using reflection and critical self-assessment to inform evidence-based practice
- accessing the most current information and research, critically evaluating it individually and in collaboration
- using up-to-date learning technologies
- monitoring social and economic trends and considering their implications for practice
- recognizing the need for further education and undertaking appropriate courses as necessary.

## **General and Key Characteristics of BDS Curriculum**

### **1) Continuum of Dental Education**

The curriculum will provide an educational experience that ensures continuing development from undergraduate to internship and further graduate training.

### **2) Outcome Competency Based Curriculum**

Core competencies essential for good dental practice guide the structure of the curriculum, organization, learning and teaching approaches, student assessment outcome and program evaluation.

### **3) Integrated Curriculum**

The thematic organization of the curriculum is based on streams and the building of new knowledge and skills based on experience in a previous stream allow a horizontal and vertical integration of the teaching-learning activities such that an excellent appreciation of the basic and clinical science is achieved, using critical thinking skills.

### **4) Early Introduction of Clinical Dentistry**

This approach allows early understanding of patho-physiological principles and generates the eagerness to know more; it further enables fine skills to be developed at a very early phase of education so that difficult eye-hand coordination abilities are identified and rectified early in the program.



### 5) Student-Centered Flexible Learning

The learning environment will be structured to allow more flexibility and choice in time, place and style of learning.

### 6) Problem/Team Based Learning

The direct relevance of the practice of dentistry will be emphasized by the use of patients' problems and conducting these problem-solving exercises based on sound medical, dental and social sciences evidence-based principles.

### 7) Community-Based Context

The course will emphasize the appropriate needs of dentistry in the community with special interest in providing dental services to underserved populations.

### 8) Leadership Quality

Methods of courses delivery will improve the students' abilities to become future leader in a health team, practicing team work, promoting the scientific method of problem solving and to be a lifelong learner to ensure his/her competitiveness and relevance throughout his/her career.

### 9) Constructive Assessment

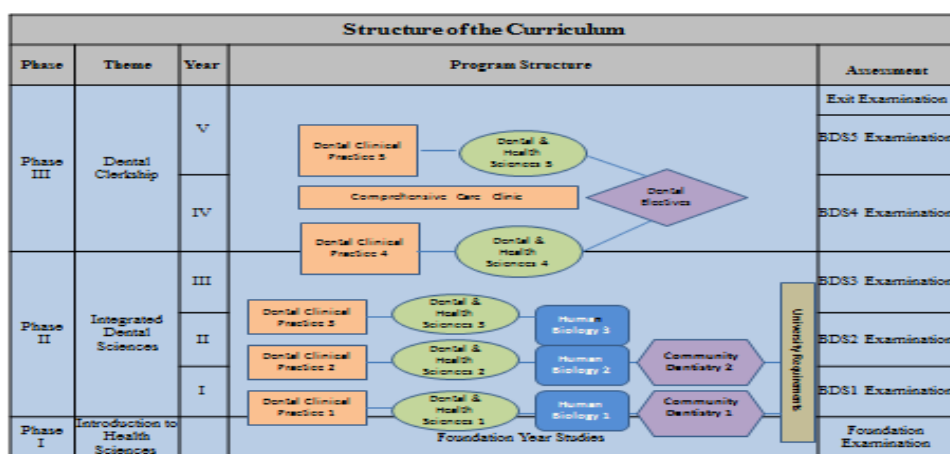
The assessment methods will enable recognition of one's strength and weaknesses, with the ability to improve and achieve goals for long-term professional qualities.

### 10) Yearly Assessment System

The continuous assessment system is reported on an annual basis made at the end of each academic year to enable early recognition and rectification of areas that demand attention. The curriculum has been adapted from the University of Adelaide Bachelor of Dental Surgery Program with modifications and adaptations made to fit the local culture, health care system and learning environment of the United Arab Emirates.

## Structure and Overview of the Curriculum

The structure of the Bachelor of Dental Surgery (BDS) curriculum is shown below.



The curriculum consists of three phases that are completed over a six-year period. The various phases and corresponding curricular components are described in the following section.

### Phase I: Foundation Sciences

The first year at the University prepares students to achieve a level of knowledge necessary to assimilate the more challenging medical and dental science subjects in the later phases. Students will be exposed to new learning methods in both physical and biological sciences in the form of problem-based learning, group projects, critical and lateral thinking, scientific literature search and academic writing. Self-directed learning philosophy will be emphasized, and other academic and social activities are conducted to achieve a smooth transfer from high school education to university campus life.

## **Phase II: Integrated Dental Sciences**

The Phase II program runs over the course of three academic years - First, Second and Third Years (BDS 1, BDS 2 and BDS 3) - and consists of teaching/ learning activities that are delivered in four streams. A “stream” is an educational structure, organization and philosophy that depicts a collection of established general science, basic medical and dental sciences and clinical sciences and practice disciplines, that are integrated to represent knowledge, skills and values necessary for the best health care practice at the individual and community level. The four streams are: Dental and Health Sciences, Dental Clinical Practice, Human Biology and Community Dentistry. The streams are integrated with each other laterally within a year and vertically within subsequent years.

### **Dental and Health Sciences I, II and III**

Dental and Health Sciences I forms the basis of oral anatomy and physiology that integrates with cell biology and subsequently will lead on to a Second-Year stream of human embryology, oral histology, and aspects of biochemistry.

The Dental and Health Science III stream includes physiology and disturbance of the masticatory system, disorders of the dental hard tissue, oral & dental radiology, introduction to oral surgery and craniofacial growth and development.

### **Dental Clinical Practice I, II and III**

Dental clinical Practice I introduces students to general dental practice environment. It emphasizes the art of medical and dental history, taking a physical examination, infection control, oral health and preventive dentistry. The Second Year Dental Clinical Practice stream follows on from Dental Clinical Practice I, providing acquisition and consolidation of basic clinical skills in tooth preservation and treatment of periodontal diseases. Students will also enhance their diagnostic and operative skills in laboratory exercises and in the simulation clinics.

Dental Clinical Practice III stream builds on previous years, concentrating on advanced restorative techniques and total dental rehabilitation of patients by introducing prosthodontics, endodontics and more complex conservative techniques. Students will begin simple restorative dentistry work on patients in the second semester of BDS 3.

### **Human Biology I, II and III**

The Human Biology I stream begins with a detailed understanding of human cell biology with emphasis on molecular biology and genetics that will form a strong foundation in understanding embryology, growth and development and functions of organ-based systems. This leads on to a Structure and Function of the Human Biology II in the Second Year that includes anatomy and physiology of the body systems, e.g. cardiovascular, respiratory, renal, as well as detailed gross anatomy of the head and neck region and neuroanatomy. In the Third Year, the Human Biology III Stream “Diseases and Disorders” of the Human Body includes aspects of general and oral pathology, microbiology, immunology and pharmacology.

### **Community Dentistry I and II**

The Community Dentistry stream is designed to support the learning activities of the students to ensure optimum benefits of their learning experience and as how it relates and affects the community. They are strategically embedded in the second and third year (BDS 1 and 2) to lay down the foundations of evidence-based dentistry. The stream consists of units that provide exercises in communication and learning skills, research methodology and social context of dentistry. Community Dentistry I and II provide the basis for the students from multicultural background to adopt critical thinking, ethics and professionalism.

### Phase III: Dental Clerkship

The Phase III or Dental Clerkship encompasses two integrated years – the Fourth and Fifth Years (BDS 4 and BDS 5) of study – of full time clinical rotations in four major dental and medical disciplines and ending with a multidisciplinary general practice clerkship in the sixth year. The teaching elements in this phase are the product of integration of both Dental Clinical Practice and Dental and Health Sciences streams. The teaching learning activities will mainly be in the form of multidisciplinary seminars conducted by multi-specialty faculty. This will lead to an innovative in-depth training in each dental/medical disciplines and at the same time applying this knowledge and skills in students' general dental practice clinics. A strong emphasis will be placed on clinical community dentistry and outreach activities. Students are also required to complete one graduation project in a related medical, dental or health sciences specialty as a partial fulfillment of the BDS degree. The dental clerkship phase is a student's training ground for independent learning and the final molding of a 'lifelong learner' for the future dentist.

### Assessment

#### Assessment Philosophy:

The College runs an annual assessment system.

Achievement and level of competence will be assessed according to the outcomes that are listed for each stream in this document. Assessment methods vary across the different streams, and may include:

- Practical and tutorial assignments
- Practical exercises
- Group projects and presentations
- Written examinations
- Clinical examination / OSCE
- Practice Assessment Portfolio.

#### The assessment procedures will:

- assess students' ability to apply knowledge, attitudes and skills, not just recall Information
- test for problem-analysis and management as important aspects, as well as the use of evidence-based basic science to justify decisions and critical thinking
- encourage students to monitor their own progress and plan remedial studies
- provide an open system where standards are explicit, and the required levels of competence are stated before- hand
- assess capability of team work and multi-professional tasks
- encourage students to measure peers' performance as an essential part of their own further education.

**Self-assessment.** Students must be good at, and comfortable with, assessing the standard of their own work, particularly in relation to Dental Clinical Practice. This is a particularly useful skill to have when working as a dentist and be life- long learners.

**Method of reporting results.** Results in Phase I and University mandatory and elective courses requirements are reported using the cumulative grade point average (CGPA) system (credit hour system) Results for major streams of the BDS program in Phase II and III are reported as percentages based on an annual system.

## Program Outline, Assessment and Promotion

### Phase I: Foundation Year

For more detailed information on foundation year in dentistry please refer to the College of Medicine. The Foundation Year is a medical sciences preparation year and admission to the BDS 1 year is competitive and limited by available seats.

### Phase II: First Year - BDS 1

#### 1001205 Human Biology 1

This stream consists of an integrated cluster of the following areas:

- 1) Human Cell Biology, Molecular Biology and Genetics
- 2) General Histology
- 3) Medical Physiology

#### 1001206 Dental and Health Sciences 1

This stream consists of an integrated cluster of the following areas:

- 1) Dental Terminology
- 2) Dental Anatomy, Physiology and Occlusion
- 3) Basic Anatomy of Masticatory System
- 4) Forensic Dentistry
- 5) Introduction to Oral Radiology

#### 1001204 Community Dentistry 1

This stream consists of an integrated cluster of the following areas:

- 1) Epidemiology
- 2) Introduction to Biostatistics
- 3) Evidence- Based Dentistry

#### 1002203 Dental Clinical Practice 1

- 1) Introduction to general dental practice
- 2) Preliminary history taking, physical examination, charting and record keeping.
- 3) Preventive Dentistry and Cariology
- 4) Periodontology
- 5) Basic Dental Biomaterials
- 6) Introduction to Operative Dentistry - Basic Terminology, Skills and Instruments
- 7) Dental Ergonomics and 4-handed dentistry

### Assessment and Promotion

Assessment of each stream for promotion to BDS 2 is based on the following criteria:

|                 |                         |     |
|-----------------|-------------------------|-----|
| First Semester  | Mid-Semester            | 15% |
|                 | Mid-Year Examination    | 20% |
| Second Semester | Mid-Semester            | 15% |
|                 | End of year Examination | 50% |

The components of the examination consist of:

- 1) MCQ examination
- 2) short answer questions

- 3) objective structured practical examination
- 4) laboratory practical test
- 5) a written project assignment.

The final result for each stream is the sum of the marks obtained throughout the year. The passing mark for each stream is 60%. Students must pass all streams to be promoted to the second BDS year. The final annual result is the average of the results of all streams. The passing mark is 70%. Failure in a stream will require 'repeat examinations' for that stream in the same year. Failure in the 'repeat examination' will require the student to repeat the whole year. Students must complete and pass all streams in the repeat year.

## Phase II: Second Year – BDS2

### 1001301 Human Biology 2

This stream consists of an integrated cluster of the following areas:

- 1) Medical Physiology
- 2) General and Head and Neck Anatomy
- 3) Neuroanatomy

### 1001302 Dental and Health Sciences 2

- 1) Dental and Craniofacial Embryology
- 2) Oral Histology
- 3) Biochemistry
- 4) Basic Oral and Dental Radiology

### 1001304 Community Dentistry 2

- 1) Evidence-Based Dentistry
- 2) Behavioral Sciences and Social context of Dentistry

### 1002303 Dental Clinical Practice 2

- 1) Operative Dentistry
- 2) Periodontology
- 3) Prosthodontics (Complete Dentures)

## Assessment and Promotion

Assessment of each stream for promotion to BDS 3 is based on the following criteria:

|                 |                         |     |
|-----------------|-------------------------|-----|
| First Semester  | Mid Semester            | 15% |
|                 | Mid Year Examination    | 20% |
| Second Semester | Mid Semester            | 15% |
|                 | End of year Examination | 50% |

The components of the examination consist of:

- 1) MCQ examination
- 2) Short answer question
- 3) Objective structured practical examination
- 4) Laboratory practical test
- 5) A written project assignment

The final result for each stream is the sum of the marks obtained throughout the year. The passing

mark for each stream is 60%. Students must pass all streams to be promoted to the third BDS year. The final annual result is the average of the results of all streams. The passing mark is 70%. Failure in a stream will require 'repeat examinations' for that stream in the same year. Failure in the 'repeat examination' will require the student to repeat the whole year. Students must complete and pass all streams in the repeat year.

## Phase II: Third Year - BDS 3

### 1001401 Human Biology 3

This stream consists of an integrated cluster of the following areas:

- 1) General Pathology
- 2) Oral Pathology
- 3) Microbiology
- 4) Immunology
- 5) Pharmacology and Therapeutics

### 1001402 Dental and Health Sciences 3

This stream consists of an integrated cluster of the following areas:

- 1) Craniofacial Growth and Development
- 2) Craniofacial Deformities
- 3) Disorders of the Masticatory System
- 4) Introduction to Oral Surgery
- 5) Pain Control Techniques
- 6) Oral Radiology

### 1002403 Dental Clinical Practice 3

This stream consists of an integrated cluster of the following areas:

- 1) Advanced Operative Dentistry
- 2) Endodontics
- 3) Removable Prosthodontics
- 4) Applied Biomaterial Science
- 5) Preventive Dentistry
- 6) Periodontology
- 7) Fixed Prosthodontics

## Assessment and Promotion

Assessment of each stream for promotion to BDS 4 (Phase III) is based on the following criteria:

|                 |                         |     |
|-----------------|-------------------------|-----|
| First Semester  | Mid Semester            | 15% |
|                 | Mid Year Examination    | 20% |
| Second Semester | Mid Semester            | 15% |
|                 | End of year Examination | 50% |

The components of the examination consist of:

- 1) MCQ examination
- 2) Short answer question
- 3) Objective structured practical examination
- 4) Laboratory practical test
- 5) A written project assignment

The final result for each stream is the sum of the marks obtained throughout the year. The passing mark for each stream is 60%. Students must pass all streams to be promoted to the Fourth BDS year. The final annual result is the average of the results of all streams. The passing mark is 70%. Failure in a stream will require 'repeat examinations' for that stream in the same year. Failure in the 'repeat examination' will require the student to repeat the whole year. Students must complete and pass all streams in the repeat year.

### **Phase III: Years 4 and 5 - BDS 4 and 5**

Dental and Health Sciences and Dental Clinical Practice

Both streams are closely coordinated, and they consist of an integrated cluster of the following major clinical rotations:

#### **1002501 Dental Clinical Practice 4A**

#### **1002601 Dental Clinical Practice 5A**

This stream consists of an integrated cluster of the following areas:

- 1) Clinical Preventive and Operative Dentistry
- 2) Endodontics
- 3) Removable and Fixed Prosthodontics
- 4) Periodontics

#### **1002503 Dental Clinical Practice 4B**

#### **1002603 Dental Clinical Practice 5B**

This stream consists of an integrated cluster of the following areas:

- 1) Population Health
- 2) Ethics and professionalism
- 3) Orthodontics
- 4) Pediatric Dentistry

#### **1000509 Comprehensive Care Clinical Training**

This six weeks multidisciplinary comprehensive care clinic is offered in the summer following the completion of the BDS 4 exams. This mandatory course is designed to strengthen the students' experiences in the provision of optimal comprehensive patient care.

Students must obtain a passing grade in this course to graduate.

#### **1002502 Dental and Health sciences 4**

#### **1002602 Dental and Health sciences 5**

This stream consists of an integrated cluster of the following areas:

- 1) General Medicine and Surgery
- 2) Oral Medicine and Oral Pathology
- 3) Oral and Maxillofacial Surgery
- 4) Oral Radiology
- 5) Oral Diagnosis

#### **1000502 Dental Selective 4**

#### **1000602 Dental Selective 5**

Dental Selective Streams aims to extend the students experience beyond the core BDS program and allow study in a mature, self directed fashion in greater depth in nominated areas of interest. In this way the learning experience for students is customised in areas that hold particular interest or will be relevant in future areas of practice. Other aims are to foster links with other institutions and to allow students to explore areas useful later in their careers, eg specialist training.

The Dental Clerkship in the 3 Majors Rotations over a period of two academic years are as follows:

| Clinical Rotations             | Stream | Year  |
|--------------------------------|--------|-------|
| Restorative Comprehensive Care | DCP 4A | BDS 4 |
| Community Dentistry            | DCP 4B | BDS 4 |
| Oral Medicine and Oral surgery | DHS 4  | BDS 4 |
| Comprehensive Care Clinic      | -----  | BDS 4 |
| Restorative Comprehensive Care | DCP 5A | BDS 5 |
| Community Dentistry            | DCP 5B | BDS 5 |
| Oral Medicine and Oral Surgery | DHS 5  | BDS 5 |

### Assessment in Phase III (years 4 and 5)

The Phase III assessment consists of a continuous assessment throughout the two integrated years followed by a summative assessment at the end of fifth year. The continuous assessment is derived from the examinations at the end of every dental clerkship rotation. The passing mark for each major clinical rotation is 60%.

Students in BDS 4 must obtain an average of 70% among all clinical rotations to be promoted to BDS 5.

Students are admitted into the final BDS Exit Examination after completing all the clinical schedules, project assignments, graduation research project reports and passed all clerkship rotations. Students must pass all three major clinical rotations in both theory and clinical components of the examination, and must obtain an average of 70% to be eligible to sit for the Final BDS Exit Examination.

The assessments in all the clinical rotations over the two years will carry 60% of the total marks and the final BDS Exit Examination will carry 40% of the marks.

The components of the assessment consist of:

- 1) MCQ examination
- 2) Short answer question
- 3) Objective structured practical examination
- 4) Laboratory practical test
- 5) A written project assignment

### Compilation of marks in Dental Clerkship Years

Assessment in BDS4 30%

Assessment in BDS5 30%

Final BDS Exit Examination 40%

The final BDS Exit Examination will be held in May of each year. Students who fail in the final BDS Examination in May will be counseled and allocated to the respective clinical rotations to improve their competencies. They will then resit for the Final BDS Examination in the beginning of the next academic year.

### General Education Requirements

Every student is required to take 24 credit hours of general education courses distributed over seven domains. Fifteen (15) mandatory credit hours are selected from domains 1, 2, 3 and 4 and (9) elective credit hours selected from domains 5, 6 and 7 as indicated in the University section (General Education).



# College of Pharmacy

## College of Pharmacy

### Officers of the College

|                     |                                  |
|---------------------|----------------------------------|
| Prof. Karim El'Zubi | Dean of College of Pharmacy      |
| Prof. Iman Saad     | Vice-Dean of College of Pharmacy |

|                   |  |
|-------------------|--|
| <b>Professors</b> | Suleiman El Sharif, Abdel Nasser El-Shorbagi, Taleb Al-Tel, Rafat El-Awady, Iman Saad, Mohammad Harb |
|-------------------|--|

### Associate Professors

Abduelmula Rajab Abduelkarem, Osama Mohamed Ibrahim, Hany Omar, Mohammed El Gamal, Mohamed Haider, Ghalia Khoder, Hasan Alniss, Sameh Soliman, Mark Rawas Qalaji

|                             |  |
|-----------------------------|--|
| <b>Assistant Professors</b> | Rania Harati, Hamzah Alzubaidi, Zahid Hussain, Feras Jirjees, Nadia Al Mazrouei, Nelson Soares |
|-----------------------------|--|

|                  |   |
|------------------|---|
| <b>Lecturers</b> | Manal Mohammad Al Sha'rawy, Rana M. Ibrahim, Amira Mahrous, Hamadeh Tarazi, Sachin Chaudhary, Shijna Kappally |
|------------------|---|

|                        |  |
|------------------------|--|
| <b>Clinical Tutors</b> | Mena Almallah, Razan Basim Al Humaidi, Chefaa Al Hourani, Farah Al-Daghistany, Rama Al-Sabbagh, Shatha Khalifa, Manal Abbas, Lama Abdulrahim Abdulmoti |
|------------------------|--|

|                        |                   |
|------------------------|-------------------|
| <b>Lab. Technician</b> | Amna Salim Al-Ali |
|------------------------|-------------------|

### Administrative Support Staff

|                   |                          |
|-------------------|--------------------------|
| Sawsan Al-Kabissi | Administration Assistant |
| Khawla Alnaqbi    | Administration Assistant |
| Amal Al Hadrami   | Secretary                |
| Farman Khan       | Laboratory Officer       |
| Mohammed Mazhar   | IT Officer               |

### Contact Information

College of Pharmacy, Building M-23, Medical and Health Sciences Campus  
University City, Sharjah, UAE  
+971-6-5057401  
www.sharjah.ac.ae

### Accreditation

The Bachelor of Pharmacy program offered in the College of Pharmacy is fully accredited by the Ministry of Education (MOE).

### History

The College of Pharmacy at the University of Sharjah was established in 2004, and since its inauguration, the College has witnessed and continues to make substantial strides in its academic and infrastructural development. The first batch of students graduated in 2009.

### Vision

The vision of the College of Pharmacy is to achieve excellence in pharmaceutical education, research and services to society and profession and to be recognized in the region for offering a comprehensive

pharmacy program of the highest quality that prepares students to meet the health challenges of today and tomorrow.

### **Mission**

The College of Pharmacy is committed to providing its students with a pharmacy education and learning experience of the highest quality, promoting the personal, social, academic and career growth of pharmacy students to prepare them for leadership roles in the pharmaceutical care system in Sharjah and the UAE, and contributing to the enhancement of human health through engagement in discovery and development of new drugs and drug delivery systems.

### **Goals**

The College of Pharmacy has four goals.

- Provide a creative program for pharmacy students that prepares them with attitudes, knowledge and skills that ensure competency and recognition in the pharmacy profession.
- Equip pharmacy students with professional skills that optimize interaction with health care providers, patients and society.
- Prepare pharmacy students to understand the most advanced technologies and research discoveries.
- Contribute to the progress of the pharmacy profession through effective engagement and collaboration with other institutions, organizations and other public and private pharmacy sectors.

### **Program Outcomes**

The Pharmacy Graduate Profile (PGP) describes the outcome competencies which graduates should have acquired by the end of the five-year pharmacy program.

The curriculum outcome competencies of the College of Pharmacy are derived from, and based on, competencies identified by national, regional and international pharmacy education organizations. They were adapted with sensitivity to the cultural context of pharmacy practice as an essential part of the healthcare system of the U.A.E.

The pharmacy graduate competencies are structured around the following six competency domains.

- Knowledge
- Ethics and professionalism
- Interpersonal communication skills
- Evidence-based practice and lifelong learning
- Effective, safe and economic pharmaceutical care
- Principles of research methods

### **Knowledge**

By the time of graduation, the College of Pharmacy graduate will:

- 1) Have acquired a core of biomedical, pharmaceutical, social, behavioral, administrative, and clinical sciences and integrate this knowledge with practice skills, professional attitudes and values.
- 2) Demonstrate a reasoning and analytic thinking approach to the proper and rational utilization of medications for the prevention and treatment of diseases.

### **Ethics and Professionalism**

The College of Pharmacy graduates will hold personal values and beliefs consistent with their role as responsible members of local, national, international and professional communities, and will demonstrate:

- 1) Compassion, integrity and responsiveness to the needs of patients and society that supersede self-interest and respect personal, social and cultural differences among patients.
- 2) A commitment to ethical principles pertaining to provision or withholding of pharmaceutical care, confidentiality of patient's information, informed consent, and business practices.

### **Interpersonal Communication Skills**

The College of Pharmacy graduates will recognize and value communication as a tool for negotiating and creating new understanding, interacting with others and furthering their own learning by:

- 1) Communicating effectively and professionally with patients, families, and other members of the healthcare team for the benefit of the patient and community.
- 2) Using effective, relevant and appropriate technologies to enhance learning, communication, and problem solving.

### **Evidence-Based Practice and Lifelong Learning**

By the time of graduation, the College of Pharmacy graduate will be able to:

- 1) Take evidence-based decisions founded on a regular practice of searching, criticizing, appraising and assimilating evidence from scientific studies related to rational use of medications in prevention and management of diseases.
- 2) Demonstrate the transition from a dependent to an active, self-directed learner, and use appropriate learning activities to ensure personal and professional development.

### **Effective, Safe and Economic Pharmaceutical Care**

By the time of graduation, the College of Pharmacy graduate will be able to:

- 1) Co-operate with patients and other professionals in designing, implementing and monitoring a therapeutic plan that will produce specific and safe therapeutic outcomes for the patient.
- 2) Revise the patient's list of drug-related problems and refer them to healthcare professionals when appropriate.

### **Principles of Research Methods**

The University of Sharjah, pharmacy graduate will be able to create new knowledge and understanding through the process of research and inquiry.

- 1) Apply principles and ethics of research methods and use results from projects or literature to propose changes and reevaluate the problem.

### **Program Effectiveness**

The program evaluation process at the College of Pharmacy is part of the ethos of the College and embedded in all its educational activities. In this regard, the committee for "Program Evaluation and Educational Quality Assurance" ensures that the program evaluation processes and related measurement tools are implemented, and the results are collected, analyzed and sent back to the curriculum committee for action.

To create an environment of common understanding about quality in education and its measurement, continuous faculty development is linked to all activities related to program evaluation and effectiveness.

## Career Opportunities

Graduates from the College of Pharmacy program will be ready to pursue careers in many fields such as community pharmacy, hospital pharmacy, pharmaceutical industry, drug information center, research and higher education sector as well as seeking advanced degrees in related fields.

## Academic Programs

The College of Pharmacy encompasses three departments: Department of Pharmaceutics and Pharmaceutical Technology, Department of Medicinal Chemistry and Department of Pharmacy Practice and Pharmacotherapeutics. The College of Pharmacy offers one program that leads to the Bachelor of Pharmacy degree (B. Pharm).

## Admission Requirements

Students must have a minimum average of 80% in the General Secondary School Certificate (Scientific Stream), or its equivalent for admission in the College of Pharmacy. However, acceptance of students is on competitive basis where students with 90% and above are accepted immediately while students with 80-89% are registered on a waiting list.

Admission to the College of Pharmacy is subject to satisfying the English proficiency requirement and the necessary academic preparation as described in the University section on Admission in this prospectus. Applicants should refer to the relevant section for details on the admission requirements. In addition to satisfying the University requirements, applicants aspiring to join the College of Pharmacy must submit to a personal interview.

## Graduation Requirements

The five-year Bachelor of Pharmacy degree comprises 170 credit hours of study divided as follows:

- General Education: 24 credit hours.
- College Requirements: 146 credit hours

## Period of Study

A Bachelor's degree in Pharmacy is conferred upon a student if he/she completes 170 credit hours of courses, attains a minimum CGPA of 2.0, and has been recommended by the College to receive the degree. The curriculum is distributed over 10 semesters. Although the program may normally be completed in 5 academic years, the period of study in the College of Pharmacy may not exceed 15 semesters. The curriculum is comprised of 24 credits of University requirements (UR) and 146 of College requirements (CR) as indicated in the following table.

| B. Pharm. (170 Credit)     |           |            |            |
|----------------------------|-----------|------------|------------|
|                            | UR        | CR         | Total      |
| Mandatory Courses          | 15        | 143        | 158        |
| Elective Courses           | 9         | -          | 9          |
| Special Topics in Pharmacy | -         | 3          | 3          |
| <b>Total</b>               | <b>24</b> | <b>146</b> | <b>170</b> |

## IV. University Requirements and Electives

Every student is required to take 24 credit hours of general education courses. Fifteen (15) credit hours from university compulsory. The student has to select one course from domain 1-3 as nine credit of university electives (this applied to the students registered in 2016 and above)

## V. College Requirements

The College requirements consist of 143 credits of mandatory courses and three credits of elective courses chosen from a group of selected topics.

### Study Plan

The Bachelor of Pharmacy program encompasses 170 credits distributed over 10 regular semesters that can be completed in five academic years. The following study plan serves as a roadmap for a smooth progression toward graduation.

| Year 1, Semester 1 (16 Credits) |                              |        |                 |
|---------------------------------|------------------------------|--------|-----------------|
| Course #                        | Title                        | Cr Hrs | Prerequisites   |
| 1101116                         | Chemistry for Pharmacy       | 3      | None            |
| 1101117                         | Chemistry for Pharmacy Lab   | 1      | Pre/Co: 1101116 |
| 1102110                         | Human Biology                | 3      | None            |
| 1430113                         | Physics for Medical Sciences | 3      | None            |
|                                 | General Education            | 3      | None            |
|                                 | General Education            | 3      | None            |

| Year 1, Semester 2 (15 Credits) |                       |        |               |
|---------------------------------|-----------------------|--------|---------------|
| Course #                        | Title                 | Cr Hrs | Prerequisites |
| 1103111                         | Pharmaceutics A       | 3      | None          |
| 1440135                         | Calculus for Pharmacy | 3      | None          |
| 1102113                         | Pathophysiology I     | 3      | 1102110       |
|                                 | General Education     | 3      | None          |
|                                 | General Education     | 3      | None          |

| Year 2, Semester 3 (17 Credits) |                          |        |                  |
|---------------------------------|--------------------------|--------|------------------|
| Course #                        | Title                    | Cr Hrs | Prerequisites    |
| 1440136                         | Medical Biostatistics    | 3      | 1440135          |
| 1104251                         | Introduction to Pharmacy | 2      | None             |
| 1101213                         | Medicinal Chemistry IA   | 3      | 1101116; 1101117 |
| 1103213                         | Pharmaceutics B          | 3      | 1103111          |
| 1102214                         | Pathophysiology 2        | 3      | 1102113          |
|                                 | General Education        | 3      |                  |

| Year 2, Semester 4 (19 Credits) |                               |        |               |
|---------------------------------|-------------------------------|--------|---------------|
| Course #                        | Title                         | Cr Hrs | Prerequisites |
| 1104252                         | Public Health in Pharmacy     | 3      | 1104251       |
| 1101214                         | Medicinal Chemistry IB        | 3      | 1101213       |
| 1102241                         | Pharmaceutical Microbiology I | 3      | None          |
| 1102231                         | Biochemistry                  | 4      | 1101213       |
| 1102321                         | Pharmacology IA               | 3      | 1102214       |
|                                 | General Education             | 3      | None          |

| Year 3, Semester 5 (19 Credits) |                         |        |               |
|---------------------------------|-------------------------|--------|---------------|
| Course #                        | Title                   | Cr Hrs | Prerequisites |
| 1104351                         | Social Pharmacy         | 3      | 1104252       |
| 1101311                         | Medicinal Chemistry IIA | 3      | 1101214       |
| 1103311                         | Pharmaceutics IA        | 3      | 1103213       |
| 1102322                         | Pharmacology IB         | 3      | 1102321       |

|         |                             |   |         |
|---------|-----------------------------|---|---------|
| 1102341 | Pharmaceutical Microbiology | 3 | 1102241 |
|         | General Education           | 3 |         |

| Year 3, Semester 6 (17 Credits) |                         |        |               |
|---------------------------------|-------------------------|--------|---------------|
| Course #                        | Title                   | Cr Hrs | Prerequisites |
| 1104352                         | Pharmacy Management     | 2      | 1104351       |
| 1101312                         | Medicinal Chemistry IIB | 3      | 1101311       |
| 1103312                         | Pharmaceutics IB        | 3      | 1103311       |
| 1102421                         | Pharmacology IIA        | 3      | 1102321       |
| 1102351                         | Pharmacognosy           | 4      | 1101214       |
|                                 | General Education       | 3      |               |

| Year 4, Semester 7 (15 Credits) |  |        |                         |
|---------------------------------|--|--------|-------------------------|
| Course #                        | Title  | Cr Hrs | Prerequisites           |
| 1104451                         | Drug literature Evaluation and Pharmacoeconomics | 3      | 1102322;<br>Co: 1104421 |
| 1101411                         | Medicinal Chemistry IIIA                         | 3      | 1101312                 |
| 1103411                         | Pharmaceutics IIA                                | 3      | 1103312                 |
| 1102422                         | Pharmacology IIB                                 | 3      | 1102321;<br>1102231     |
| 1104421                         | Clinical Pharmacy IA                             | 3      | 1102322;<br>Co: 1104451 |

| Year 4, Semester 8 (17 Credits) |                          |        |                  |
|---------------------------------|--------------------------|--------|------------------|
| Course #                        | Title                    | Cr Hrs | Prerequisites    |
| 1104452                         | Principle of OTC Therapy | 3      | 1104451          |
| 1101412                         | Medicinal Chemistry IIIB | 3      | 1101312          |
| 1103412                         | Pharmaceutics IIB        | 3      | 1103411          |
| 1102521                         | Pharmacology III         | 3      | 1102321; 1102341 |
| 1104422                         | Clinical Pharmacy IB     | 3      | 1104421          |
| 1104453                         | Law & Ethics             | 2      | 1104451          |

| Year 5, Semester 9 (15 Credits) |                            |        |   |
|---------------------------------|----------------------------|--------|---|
| Course #                        | Title                      | Cr Hrs | Prerequisites   |
| 1103511                         | Pharmaceutics 3            | 3      | 1103312   |
| 1104521                         | Clinical Pharmacy II A     | 3      | 1104422;<br>Co: 1104522   |
| 1104522                         | Clinical Pharmacy II B     | 3      | 1104422<br>Co: 1104521  |
| 1101521                         | Drug Development           | 3      | Offered only to 4 <sup>th</sup><br>and 5 <sup>th</sup> year<br>students |
| 1105512                         | Graduation Project         | 4      | Completion of 131<br>credits  |
| 110x5xx                         | Special Topics in Pharmacy | 3      |   |

| Year 5, Semester 10 (20 Credits) |                                       |        |   |
|----------------------------------|---------------------------------------|--------|---|
| Course #                         | Title                                 | Cr Hrs | Prerequisites                             |
| 1104551                          | Professional Experiential Placement A | 8      | 1104451, 1104452, 1104453;<br>Co: 1104552 |
| 1104552                          | Professional Experiential Placement B | 8      | 1104451, 1104452, 1104453;<br>Co: 1104551 |

### Course Coding

Accounting program courses are designated by numbers of the form 110XABC where:

|     |  |
|-----|--|
| X   | Area (as follows)<br>1: Medicinal Chemistry<br>2: Pharmacology<br>3: Pharmaceutics<br>4: Pharmacy Practice and Clinical Pharmacy |
| ABC | Year, term and course sequence in area   |

### Course Description

Competency outcomes acquired in various courses help students attain sound knowledge in pharmaceutical and clinical sciences, enabling them to integrate this knowledge with practical skills needed to offer pharmaceutical care for patients. Graduates acquire analytical thinking processes that help them in communicating within multidisciplinary teams, and in making evidence-based decisions about safe, effective and economic utilization of medications in the management and prevention of disease. As students' progress through these courses, they transition from dependent to active, self-directed learners who behave professionally according to the ethical principles which govern pharmaceutical practice in their care of patients and in dealing with other professionals. Students are also introduced to different research methods used in conducting research projects, along with familiarity with drug information resources available in conducting research projects and in providing patient care.

The following describe the contents of various pharmacy program courses.

### Mandatory Core Courses

#### 1430113 Physics for Medical Sciences

3-0:3

#### Prerequisite: None

This introductory course covers topics on physics in life sciences, specifically in medicine, pharmacy, and other applied health fields. It discusses biological systems that can be analyzed quantitatively and how life sciences have been aided by physical or engineering analysis. The course includes a collection of problems, examples, and discussions about the boundary between physics and biology/medicine. Students review basic concepts in mechanics, fluids motion, heat and thermodynamics, waves and sound, electricity and its application in biology and medicine, optics, the nature of atom, atomic spectra, nuclear physics and radioactivity, and X-ray applications in biology and medicine. It also includes applications of basic concepts of physics in medical sciences including mechanics, fluids, heat and thermodynamics, waves and sound, electricity and magnetism, geometrical optics, atomic spectra and radiation.



**1101116 Chemistry for Pharmacy****3-0:3****Prerequisite: None**

This course reviews basic facts, concepts, and terminology of chemistry that are essential for medicinal chemistry and related subjects. It covers the atomic structure and periodic table, mole concept and stoichiometry, acid and bases, reactions in aqueous solutions, oxidation-reduction reactions, theories of bonding and structure, chemical equilibrium, acid-base equilibrium in aqueous solutions, as well as alkanes and cycloalkanes and their stereochemistry. It emphasizes the chemical background necessary to understand various tests and procedures.

**1101117 Chemistry for Pharmacy Lab****0-1:1****Prerequisite: Pre/Co 1101116**

This course covers experiments on qualitative and quantitative aspects of chemistry as applied to medical and health science, such as separation, identification, purification, and synthesis procedures.

**1102110 Human Biology****3-0:3****Prerequisite: None**

This course provides a comprehensive study of the cell biology, histology, as well as the anatomy and physiology of the human body systems. Topics include: the language of anatomy, mechanisms for maintaining homeostasis, organization of the human body, and the study of cells, tissues and organ systems. The organ systems covered include: integumentary, skeletal, muscular and lymphatic system. Within each organ system, the normal anatomy and physiology as well as some diseases associated with each system are covered.

**1103111 Pharmaceutics A****2-3:3****Prerequisite: None**

This course covers several topics including basic pharmaceutical calculations, acids/ bases and buffer solutions, thermodynamics and heat capacity, phase equilibrium and the phase rule, partition behavior. Factors affecting solubility and dissolution. Formulation of solutions as dosage forms.

**1102113 Pathophysiology I****3-0:3****Prerequisite: 1102110**

This course covers the basic mechanisms of disease, specifically mechanisms of cell injury, cell death, inflammation, necrosis, neoplasia, and fluid, electrolytes and acid-base imbalances. These principles are then applied to dysfunction of the major organ systems (covered in Pathophysiology I and II). The course covers the physiology of the nervous system and the pathophysiology of common neurodegenerative diseases. Physiology of pain is also discussed.

**1440135 Calculus for Pharmacy****3-0:3****Prerequisite: None**

This course covers the methods of differentiation; first and second derivatives and their application to maxima and minima problems; integration methods and their application to rate equations (zero and first order) and chemical kinetics as well as half-life, exponential and power functions, and plots using logarithmic scale graph papers, triangular graph papers, plots and calculations, integration methods and the solution of simple ordinary differential equations. It also teaches the principles of partial differentiation, first and second derivatives, with an emphasis on application to thermodynamics and diffusion theory. Students gain an appreciation of the application of calculus to physical chemistry, pharmaceutics and formulation.

**1104251 Introduction to Pharmacy Practice 2-0:2**

**Prerequisite: None**

The course provides students with important knowledge of topics related to pharmacy history, pharmacy profession, and different dosage forms and formulations available for different medications. The course helps students begin using pharmaceutical calculations needed for compounding and dispensing of medications. Moreover, the course also covers basic skills and abilities needed to identify various pharmaceutical incompatibilities and basic techniques needed for identifying different drug interactions.

**1101213 Medicinal Chemistry IA 2-3:3**

**Prerequisite: 1101116, 1101117**

This course introduces students to the chemistry of organic compounds, their properties, synthesis, reactions and nomenclature. The functional groups covered in this course include alkane, chemical reaction, stereochemistry, alkyl halides, alkenes, alkynes, alcohols and ethers, the IR, and NMR-spectroscopy and their applications for structural determination. This course also includes practical experiments that allow students to master the synthetic methodologies related to the preparation of some functional groups, their purification, separation and structure elucidation.

**1103213 Pharmaceutics B 2-3:3**

**Prerequisite: 1103111**

This course provides the student with good knowledge to study some physical pharmacy principles such as: colligative properties of solutions, isotonic solutions and Van't Hoff factor. Rheology and flow properties of liquids and semisolids. Surface tension and interfacial phenomena. Physicochemical properties of disperse-systems and electrical and steric stabilization of colloidal systems.

**1102214 Pathophysiology 2 2-3:3**

**Prerequisite: 1102113**

This course is a continuation of Human Biology and Pathophysiology I. It provides a comprehensive study of the normal anatomy and physiology of the following human body systems (cardiovascular, respiratory, endocrine, urinary, digestive and reproductive) while simultaneously presenting the corresponding pathophysiology of common diseases.

**1440136 Medical Biostatistics 3-0:3**

**Prerequisite: 1440135**

This course focuses on the presentation of statistical data including binomial, normal and log normal distributions, normal probability and log probability graph papers, sampling distributions, confidence intervals, student's t-distributions, confidence intervals for the mean and for the difference of two means, confidence intervals for a proportion and for the difference of two proportions, confidence intervals for the variance and the chi square distribution, the confidence intervals for paired data, hypotheses testing, regression and correlation, and contingency tables.

**1104252 Public Health in Pharmacy 2-3:3**

**Prerequisite: 1104251**

This course covers hospital pharmacy services and health systems, an introduction to public health, the definition, principles and role of a pharmacist in public health, health promotion and disease prevention, and the role of a pharmacist in their promotion. Alternative and complementary medicines, including the nature and place of alternative and complimentary therapies in the health care system, are also covered in this course. The practical component covers aspects of compounding and proper dispensing.

**1101214                      Medicinal Chemistry IB    2-3:3**

**Prerequisite: 1101213**

This course introduces students to the chemistry of organic compounds, their properties, synthesis, reactions and nomenclature. The functional groups covered in this course include aromatic compounds, amines, aldehydes, ketones, carboxylic acid, and carboxylic acid derivatives. It also explains the principles of separation and mass spectroscopy as analytical techniques. This course also includes practical experiments that allow students to master the synthetic methodologies related to the preparation of some functional groups, their purification, separation and structure elucidation.

**1102241                      Pharmaceutical Microbiology I    2-3:3**

**Prerequisite: None**

Pharmaceutical Microbiology I aims to provide pharmacy students with an introduction to fundamental microbiology and microbiological concepts, an understanding of the interaction between microbes and hosts, and the resulting microbial diseases. The course highlights the different classes of antimicrobial agents, their mechanisms of action, resistance and stewardship. This course also covers different microorganisms such as bacteria, fungi, algae, protozoa and virus. This course is expected to form the basis for Pharmaceutical Microbiology II and help students in understanding some topics in other courses such as Pharmacology III.

**1102231                      Biochemistry    3-3:4**

**Prerequisite: 1101213**

This subject introduces the basic concepts of biochemistry and their application to biology and chemistry focused around interactions with humans or applied uses. This approach is designed to integrate the concepts of biochemistry and discourage rote learning. The specific topics that are addressed are as follows: structure and molecular properties of bio-molecules; receptors, hormones and signaling processes; metabolism; catabolic pathways, synthetic pathways, energy production, control of metabolism; information transfer (gene structure and regulation); protein synthesis; molecular biology. This course also includes practical experiments that covers the practical aspects of dealing with the major macromolecules such as; proteins, carbohydrates, lipids and nucleic acid alongside with essential skills common to most biological and biochemical labs.

**1103311                      Pharmaceutics IA    2-3:3**

**Prerequisite: 1103213**

The course is designed to teach the students theoretical and practical formulation principles where the physicochemical properties of the drug and excipients may influence the formulation, component compatibility, manufacturing, bioavailability and stability of the final dosage form.

The course deals with disperse systems and semisolids such as suspensions, emulsions, micro-emulsions, gels, ointments, aerosols, foams. Formulation principles of suppositories are also taught.

**1104351                      Social Pharmacy    2-3:3**

**Prerequisite: 1104252**

This course covers medication counseling, communication skills, interviewing skills, listening skills and barriers to communications and Consumer Medicine Information Leaflets. The course also covers the concept of patient-centered care, the definition of pharmaceutical care, and the process and steps for application of pharmaceutical care. Social pharmacy issues like adherence, placebo effect, illness behavior and men's and women's health are covered in this course. The hospital admission and discharge processes are also included. Tutorials cover hands-on experience for counseling, role-playing, oral and written communications, and the use of computer programs to retrieve information.

**1101311 Medicinal Chemistry IIA****2-3:3****Prerequisite: 1101214**

This course introduces students to heterocyclic organic chemistry with examples from the medicinal and pharmaceutical industry that have heterocyclic structures. This course covers the nomenclature, synthesis and reactions of six-membered aromatic heterocyclic with one and two heteroatoms, five-membered aromatic heterocycles with one and two heteroatoms, heterocyclic systems fused to benzene rings like quinolone, indoles and others, along with practical experiments that allow students to master the synthetic methodology related to drug synthesis and process chemistry. Therefore, students are trained on synthesis, purification, separation and analysis of heterocyclic organic compounds.

**1102321 Pharmacology IA****2-3:3****Prerequisite: 1102214**

This course is designed to introduce the science of pharmacology to the students. The course will address the general aspects of pharmacodynamics and pharmacokinetics. The pharmacological actions and therapeutic uses of drugs acting on the sympathetic and parasympathetic divisions of the autonomic nervous system will be discussed. Therapeutically useful neuromuscular blocking drugs and drugs used in respiratory system will be discussed as well. Also the course covers aspects of pharmacogenomics and pharmacogenetics. Autacoids and selected neurotransmitter substances are also covered including histamine, 5-HT, PGs, NO and endothelin. In studying pharmacotherapeutics agents, emphasis is made on their mechanisms of actions, pharmacokinetics, therapeutic indications, adverse effects and contraindications.

**1102351 Pharmacognosy****3-3:4****Prerequisite: 1101214**

The course provides a brief historical description of the emergence of pharmacognosy as a stand-alone branch of pharmaceutical science. The aim of this course is to provide pharmacy students with a descriptive knowledge of drugs from natural sources, including their chemical and pharmacological properties. The most-used natural drugs worldwide are described in detail, including their discovery, folkloric use, pharmacological actions, their production, their development for market use, and their published research and clinical studies along with their latest news. Taxonomic and chemotaxonomic classification of natural drugs is also taught.

**1104352 Pharmacy Management****2-0:2****Prerequisite: 1104351**

Principles and components of pharmacy management are covered in this course. Management topics covered include general operations, personnel and human resources, finance and business, goods and merchandizing, value-added services, medicine safety, prevention of medication errors and risk management. Conditions and factors relevant to employment, working effectively within an organization, planning of pharmacy services and resources, and safety in the work environment are also detailed in this course.

**1101312 Medicinal Chemistry IIB****2-3:3****Prerequisite: 1101311**

This course aims to introduce students to concrete knowledge about medicinal chemistry, drug-enzyme and drug-receptor interactions, including the design and types of agonists, antagonists, inverse agonists and partial agonists, types of inhibitors, and qualitative structure activity relationships, in addition to qualitative, quantitative structure-activity relationships (QSAR) and case studies in relation to qualitative and quantitative optimization of lead molecules. The medicinal chemistry aspects of metabolic biotransformation of drugs are covered in this course. Furthermore, it provides information on the medicinal chemistry of adrenergic and cholinergic CNS. This course also

encompasses practical experiments that are related to the synthesis, purification, analysis and identification of selected active drug molecules. Furthermore, students are also exposed to entry-level computer-aided modeling, 2-D and 3-D drawings as well as physicochemical calculations.

**1103312                      Pharmaceutics IB**

**2-3:3**

**Prerequisite: 1103311**

The course discusses topics related to solid dosage forms in terms of their production, manufacturing methods, machinery and evaluation of the final product. The general topics covered in this course include powders and granules, hard and soft gelatin capsules and tablets.

**1102322                      Pharmacology IB**

**2-3:3**

**Prerequisite: 1102321**

This course covers renal physiology, diuretics and pharmacotherapeutics of gout, physiological consideration of the cardiovascular system, pharmacotherapeutics of arrhythmias, hypertension, congestive heart failure, and angina, drug treatment of hyperlipidemia, and anemia as well as drugs affecting blood. It also includes practical classes using in vitro and in vivo experiments, and tutorial classes.

**1102341                      Pharmaceutical Microbiology II**

**2-3:3**

**Prerequisite: 1102241**

Pharmaceutical microbiology II course includes many topics ranging from the manufacture and quality control of pharmaceutical products to an understanding of the contribution of chemical disinfectants, antisepsis and preservatives in contamination and infection control as well as the wide contribution of microbiology in pharmaceutical sciences. Practical classes are related to the preparation of sterile pharmaceutical products.

**1104451                      Drug literature Evaluation and Pharmacoeconomics**

**3-0:3**

**Prerequisite: 1102322, Co-requisite 1104421**

Drug Information / Literature Evaluation such as sources of drug information, Internet search, study and research design, and bio-statistical analysis are concepts covered in this course. An introduction to pharmacoepidemiology and pharmacoeconomics including cost determination and analysis (cost-benefit, cost-effectiveness, cost-utility, cost minimizations and cost-of-illness) is also covered. Health-related quality of life analysis is included, too.

**1101411                      Medicinal Chemistry IIIA**

**3-0:3**

**Prerequisite: 1101312**

This course covers the medicinal chemistry aspects of antipsychotic, antiparkinson, narcotic and non-narcotic analgesic drugs, antidepressants, antidiabetic agents, antiarrhythmic agents, antianginal agents, ACE-inhibitors, statins, as well as prostaglandins and non-steroidal anti-inflammatory agents. The structure-activity relationship, metabolism, synthesis and biochemical mechanism of the actions of each class are also discussed.

**1103411                      Pharmaceutics IIA**

**2-3:3**

**Prerequisite: 1103312**

This course introduces students to the concepts of pharmacokinetics and biopharmaceutics. Students cover structure of membranes and drug movement across membranes, distribution and absorption mechanisms and formulation factors affecting physiological outcomes in terms of bioavailability and drug product selection. The general topics covered in this course include: Pharmacokinetics of IV and extravascular administrations; Compartmental PK modeling; Multiple dosing kinetics; Hepatic and renal clearance; Bioequivalence.

**1102421 Pharmacology IIA**

**2-3:3**

**Prerequisite: 1102321**

The course focuses on CNS and covers physiological aspects and neurochemistry of the brain, movement disorders, and pharmacotherapeutics of Parkinson's disease, epilepsy, psychoses, depression, anxiety, autacoids and treatment of migraine, sleep disorders, and appetite disorders in addition to general and local anesthesia, physiology and management of pain, opioid analgesics and non-steroidal anti-inflammatory drugs, and the pharmacology of alcohol, drug abuse and drug dependence. The course also includes practical classes using in vitro and in vivo experiments to illustrate some of the theoretical aspects as well as tutorial classes to interactively revise the various topics covered in theory classes.

**1104421 Clinical Pharmacy IA**

**3-0:3**

**Prerequisite: 1102322**

Topics covered in general are: approaches to clinical pharmacy, introduction to laboratory data, electrolyte homeostasis, arterial blood gases and drug use in pregnancy and breastfeeding. Disease states include respiratory disorders such as asthma, COPD and cystic fibrosis and cardiovascular disorders such as hypertension, coronary heart disease, heart failure and arrhythmias.

**1104452 Principles of Over the Counter (OTC) Therapy**

**3-0:3**

**Prerequisite: 1104451**

OTC pharmacy and primary health care, the role of the pharmacist in responding to symptoms and helping patients' self-care as an essential contribution to good health is covered in this course. Topics include: eye lid disorders, ear problems, nausea and vomiting, constipation and hemorrhoids, diarrhea, cold and flu, fever and pain, analgesics, eczema, acne, allergic rhinitis, dermatitis, contraception, smoking cessation, vitamins and supplements.

**1101412 Medicinal Chemistry IIIB**

**3-0:3**

**Prerequisite: 1101312**

This course discusses the important medicinal chemistry aspects of chemotherapeutic agents such as anticancer, antibacterial, antifungal, and antiviral agents as well as drugs that affect hormones like steroids, thyroid hormones. The focus is on structure-activity relationships, synthesis, metabolism, and biochemical mechanism of action.

**1103412 Pharmaceutics IIB**

**2-3:3**

**Prerequisite: 1103411**

This course aims to provide students with the fundamental knowledge required assess drug product stability including the kinetics and pathways of drug degradation, factors affecting the rate of decomposition of pharmaceutical products and methods used for determination of shelf-life. It also addresses the topic of preparation and characterization of sterile parenteral dosage forms. General topics covered in this course also include: Kinetics of chemical reaction, determination of drug stability and formulation and quality control of sterile products for injection.

**1102422 Pharmacology IIB**

**2-3:3**

**Prerequisite: 1102321; 1102231**

The course covers drugs affecting the endocrine system including the anti-inflammatory adrenocorticosteroids, and drugs affecting calcium metabolism, emphasizing the role of parathyroid hormone, vitamin D and calcitonin in regulation of calcium. It also covers pharmacotherapeutics of diabetes mellitus including insulin and oral hypoglycemic agents, drugs used in the management of thyroid gland disorders, gonadal hormones and hormonal contraceptives and their antagonists, drugs acting on the uterus, and drugs used in gastro-intestinal disorders including pharmacotherapeutics of

peptic ulcer, diarrhea, constipation and emesis. Tutorial classes and seminars interactively revise the various theoretical topics.

### **1104422 Clinical Pharmacy IB**

**3-0:3**

#### **Prerequisite: 1104421**

Topics covered in general are: geriatrics, musculoskeletal disorders such as rheumatoid arthritis, gout, and osteoarthritis, clinical pharmacokinetics of commonly used drugs, and common eye disorders including glaucoma. Endocrine diseases such as parathyroid, thyroid, diabetes, Cushing's disease as well as infectious diseases such as respiratory, skin, bone and soft tissue, urogenital and CNS are also covered.

### **1103511 Pharmaceutics 3**

**3-0:3**

#### **Prerequisite: 1103312**

The course covers topics related to novel drug delivery systems. The course focuses on the novel aspects in drug formulation designs such as prodrugs, drug delivery by different routes of administration such as per oral, transdermal, ocular, vaginal, and parenteral; and the development of new drug delivery systems such as microencapsulation, liposomes and drug-loaded resealed erythrocytes. The course also discusses the pharmaceutical applications of biotechnology and methods used in delivery of peptides and proteins and therapeutic genes.

### **1102521 Pharmacology III**

**3-0:3**

#### **Prerequisite: 1102321 and 1102341**

The topics covered in this course include: general aspects and mechanisms of the action of chemotherapeutic agents and development of resistance, inhibitors of cell wall synthesis, penicillin, cephalosporin, monobactams and vancomycin; drugs inhibiting protein synthesis, aminoglycosides, tetracycline, erythromycin and chloramphenicol; inhibitors of DNA gyrase, quinolones and inhibitors of RNA polymerase rifampicin; inhibitors of folic acid synthesis metabolism, trimethoprim and sulfonamides, anti-fungal, anti-tubercular and anti-leprosy and anti-viral agents as well as cancer chemotherapy.

### **1104521 Clinical Pharmacy II A**

**3-0:3**

#### **Prerequisite: 1104422 Co-requisite: 1104522**

Topics covered in general are: nutrition (enteral, parenteral feeding), dermatology (common skin conditions, psoriasis), hematology (anemia, coagulation disorders), gastrointestinal diseases (PUD, liver disease, IBS, IBD); neurology (stroke, migraine, epilepsy).

### **1104522 Clinical Pharmacy II B**

**3-0:3**

#### **Prerequisite: 1104422; Co-requisite: 1104521**

Topics covered in general are: oncology-principles of chemotherapeutic agents; psychiatry (depression, anxiety, bipolar disease, manic-depressive disorder, schizophrenia); drug abuse and harm reduction; transplant issues and clinical toxicology; palliative and end-of life supportive care; acute and chronic renal diseases.

### **1104453 Law and Ethics**

**2-0:2**

#### **Prerequisite: 1104451**

The course covers: ethical principles and codes that govern the practice of pharmacy and medicine in patient care; the different ethical issues pharmacists encounter in daily pharmacy practice; competency of pharmacists and standards of practice expected to be met by regulatory and licensing bodies locally and internationally; the laws and regulations governing pharmacy practice and drug control in the UAE.



**1101521 Drug Development****3-0:3****Offered only for 4th and 5th year students**

This subject provides students with a comprehensive view about the steps taken to develop a molecule into a pharmaceutical product. The purpose of this course is to provide a current and modern overview relevant to the drug development process including: stages of drug development, chemical development, aspects of drug design and synthesis, combinatorial synthesis, techniques utilized for studying the drug-receptor interaction, drug targets identification and verification, screening and bioassay of drugs. This course will also cover fundamentals and concepts of regulation of pharmaceuticals prevailing in different countries as well as clinical trials and marketing.

**1105512 Graduation Project****4-0:4****Prerequisite: completion of at least 131 Cr.Hr. and above**

This course provides students with skills needed to deal with a scientific problem and how to solve it (or write a review article with updated information about a specific problem). It consists of a literature review, the proper use of equipment and instruments, performing an experiment that deals with the research topic, analyzing the data obtained from the experiments, writing the dissertation and presenting a seminar about the work, which is then evaluated by faculty members.

**1104551 Professional Experiential Placement A****0-24:8****Prerequisites: 1104451, 1104452 and 1104453, Co-requisite: 1104552**

The Professional Experiential Placement A (PEP-A) provides B. Pharm students with a structured, supervised program of participation in the practice of pharmacy. Students gain experience in problem solving and providing patient care services while applying the basic and pharmaceutical sciences learned in the classroom and practice laboratories. Under the supervision of faculty and selected preceptors, the students learn to make decisions based on professional knowledge and judgment. Broad exposure to as many pharmacy activities as possible, as well as significant personal study and reflection facilitate this transition.

**1104552 Professional Experiential Placement B****0-24:8****Prerequisites: 1104451, 1104452, and 1104453; Co-requisite: 1104551**

The Professional Experiential Placement B (PEP-B) provides B. Pharm students with a structured, supervised program of participation in the practice of pharmacy. Students gain experience in problem solving and providing patient care services while applying the basic and pharmaceutical sciences learned in the classroom and practice laboratories. Under the supervision of faculty and selected preceptors, students learn to make decisions based on professional knowledge and judgment. Broad exposure to as many pharmacy activities as possible, as well as significant personal study and reflection, facilitate this transition.

**Special Topics in Pharmacy****1102561 Toxicology****2-3:3****Prerequisite: None**

This course deals with poisons that cause harmful effects to living organism. This includes the following items: studying the source of poisons or toxic agent, their absorption, distribution, as well as metabolism; classification of toxic agents according to the target organs that may be affected by these toxicants; examination of chemical toxicants according to exposure or specific use categories. Accordingly, it deals with toxicants found in air, soil, water, food, and the work place as well as chemicals encountered in specific use categories such as pesticides, drugs, and solvents.



**1103521                      Pharmaceutical Technology and Dosage Forms                      3-0:3**

**Prerequisite: None**

This course provides students with the latest and most advanced pharmaceutical technology. Dosage forms studied during this course include the following: sustained release technology, therapeutic rate controlling delivery system, ambulatory infusion devices, solubilization technology including cyclodextrin inclusion complexes and supercritical fluids, packaging technology and sterilization, and good manufacturing practice (GMP).

**1101522                      Pharmaceutical analysis                      2-1:3**

**Prerequisite: None**

This course introduces students to the main instrumental methods used for the separation, identification and quantification of pharmaceutical products. The course addresses both the theoretical and practical aspects of UV-visible spectroscopy, liquid chromatography, gas chromatography, and mass spectrometry. It also covers the criteria used for the validation of analytical methods. Experimental laboratories are included.

**1103221                      Cosmetics and Para-pharmaceuticals                      3-0:3**

**Prerequisite: None**

The course is designed to provide the students with the knowledge of the science and technology behind the production of cosmetic and personal care products. Theoretical lectures will focus on the cosmetic ingredients and active substances and the technology used in formulation and characterization of cosmetic products. Cosmetic GMP standards and requirements for optimal and sustainable quality control and management will be also covered as the quality and safety of these products used in our daily routine is essential for human safety.

**1104532                      Therapeutic Drug Monitoring (TDM)                      3-0:3**

**Prerequisite: None**

This course is specifically a practice applied to a small group of drugs in which there is a direct relation between serum drug concentration and pharmacological response as well as a narrow therapeutic range, and for which serum drug concentrations are used in conjunction with other measures of clinical observation to assess patient status. Students should learn how to use serum drug concentrations, pharmacokinetics and pharmacodynamics to individualize and optimize patient responses to drug therapy by maintaining serum drug concentration within therapeutic range above which drug induced toxicity occurs too after and below which the drug is too after ineffective. This makes no sense!

**1103241                      Quality Control                      3-0:3**

**Prerequisite: None**

This course exposes students to the current good manufacturing practice techniques of quality control of the following: injections, solutions, suspensions, emulsions, suppositories, topical preparations, transdermal therapeutic systems, aerosols, and tablets. Packaging and labeling control, holding and distribution and laboratory control are also studied in addition to the current good manufacturing practice (CGMP) of buildings and facilities as well as sterile and aseptic manufacturing facilities and design.

**1103222      Biopharmaceutical Technology**

**3-0:3**

**Prerequisite: None**

This course is designed to provide students with basic information about enzymes, their production, immobilization technology and its application, and fermentation covering general consideration to industrial applications. Basic genetics is given to prime up the existing familiarity and knowledge in this rapidly expanding science, and recombinant - DNA technology where gene engineering, cloning and expression as well as various applications are also discussed.

**1104531      Drug Information**

**2-3:3**

**Prerequisite: None**

The purpose of this course is to provide a current comprehensive overview of relevant information and concepts for students and pharmacists involved in providing drug information and evaluating scientific literature in a patient care setting.

# College of Sciences

## College of Sciences

### Officers of the College

Nouar Thabet                      Dean  
Ihsan Shehade                      Assistant-Dean

### Administrative Support Staff

Mustafa Snoubra                      Sr. Administrative Officer  
Amal Hamza                      Sr. Administrative Assistant

### Contact Information

College of Science Building, M7, University City, Sharjah, UAE  
+971-6-5050 225                      +971-6-5050 224

[www.sharjah.ac.ae](http://www.sharjah.ac.ae)

### Accreditation

All programs offered in the College of Sciences are accredited by MOE.

### History

The College of Sciences was established in 1997 as part of the College of Arts and Sciences. In recognition of the growing needs of the national and international job markets and scientific communities for graduates in various basic and applied sciences such as Computer Sciences, Applied Physics, Chemistry, Mathematics and Applied Biology, the College was officially split from the Arts and Sciences in September 2008 and was named as the College of Sciences, and since has emerged as a major college in the University of Sharjah.

The College of Sciences provides high quality education that enables its students to meet the changing needs of the national as well as the international job markets. In addition to academic institutions and research centers, opportunities for Graduates of the College of Sciences exist in a wide range of government and non-government institutions and organizations such as health authorities, factories, oil companies, public and private laboratories, environmental agencies, electricity authorities, hospitals, and military centers.

The College of Sciences currently comprises five departments:

- 1) Chemistry
- 2) Applied Physics & Astronomy
- 3) Mathematics
- 4) Applied Biology

In each of these departments, students are required to complete between 123-129 credit hours by the end of four years. The College accepts students graduating from scientific tracks in high schools with a minimum average of 70%.

In addition, the College of Sciences provides service courses to various departments in other colleges in the University. Such courses are in basic sciences and include Physics for Medical Sciences, Physics for Health Sciences, Physics I and II for Engineering, Chemistry for Medical and Health Sciences Students, General Biology for Civil Engineering, Astronomy and Space Science. In fact, the College offers over 500 sections every year to students of other colleges.

The College collaborates with the Center for Continuing Education and Community Service in providing short courses such as ICDL, Radiation Safety and Protection, and Programming.

In order to accomplish its goals, the College has employed a large number of highly-qualified, highly-experienced faculty members in various fields and disciplines. One of the primary criteria the College has adopted in its recruitment process over the years is to pay attention to the quality of faculty members. The College has successfully attracted high-caliber faculty from renowned institutions all over the world, particularly from North America and Europe, as well as prestigious Arabic institutions.

In research, the College is home to several research laboratories, equipped with the latest technology. The College hosts several national and international research and teaching laboratories, some of which are in collaboration with well-known agencies and institutions such as the International Atomic Energy Agency (IAEA), Stanford University (USA) (VLF station), CERN, ICTP and Cancer Care Manitoba in Canada. Staff at the College have been active in securing research funds from internal as well as external funding agencies. Also, faculty members are engaged with the three-different research sub-themes that were established recently within the UOS and all are working on gaining support.

In addition to its commitment to teaching and research, the College of Sciences has established a well-organized community service and outreach program. The aim of these programs is to establish strong ties with the local community and the various scientific institutions inside and outside the country by exchanging experiences with specialists, conducting relevant research projects and holding conferences. In addition, the College hopes to provide a consultancy service to various organizations in the community.

### **Vision**

The College of Sciences envisions itself as a vibrant scientific and educational community that is open and welcoming, creative and adaptable, dynamic, and regionally renowned for excellence in education, research, and community outreach programs, improving the world through its students, discoveries, and community service.

### **Mission**

The College of Sciences is the home of the basic sciences at the University of Sharjah, one of the region's leading universities. Its faculty, staff and students work together to create, share, and apply knowledge in the basic sciences. The mission of the College includes:

- 1) Advancing the frontiers of knowledge in the physical, biological, chemical and mathematical sciences.
- 2) Providing access to a rich educational experience that will motivate and enable students, both in the College and from across the University of Sharjah, to seek the highest levels of intellectual achievement and personal growth.
- 3) Sharing our knowledge, discoveries and inventions with the people of the United Arab Emirates, the region, and the world in order to improve appreciation and comprehension of science and to bring the benefits of science to society.
- 4) Providing leadership in the education of underrepresented and disadvantaged groups.

### **Goals**

The College of Science's core goals include enriching lives, improving society and addressing global challenges by producing scientifically-trained leaders and innovators, advancing the frontiers of science, and enhancing public understanding of science. Such goals are reflected through preserving the following core values:

- 1) Integrity

- 2) Intellectual Freedom
- 3) Commitment to the Public Good
- 4) Collegiality
- 5) Inclusiveness
- 6) Scientific Method

### Objectives

The College of Sciences works to achieve the following objectives which are in line with the objectives of the University of Sharjah:

- 1) Lend support to the university's mission and its programs.
- 2) Raise the standards of academic research and link it to teaching and to the needs of the local and regional communities.
- 3) Spread, disseminate and foster research cooperation with local, regional and international institutions.
- 4) Promote and contribute to efforts towards human development in the local community by organizing conferences, training courses, participating in workshops and providing well-prepared cadres for the Emirates society.
- 5) Foster passion for learning, technical skills, and life-long learning for creativity and analytical thinking.
- 6) Develop communication skills in both English and Arabic to enable students to achieve success in their professions and leadership in their fields, and to be committed to the prosperity and welfare of society.
- 7) Attract and support quality faculty, students, and staff so that the College achieves its strategic goals.

### Academic Programs

The College of Sciences is organized around the following four academic departments: Chemistry, Applied Physics, Mathematics, and Applied Biology. In addition of providing academic support to other colleges and specializations, the College of Sciences offers five undergraduate programs leading to a Bachelor of Science (BS) degree and two programs leading to a Master of Science (MS) degree:

- 1) Bachelor of Science in Chemistry
- 2) Bachelor of Science in Applied Physics
- 3) Bachelor of Science in Mathematics
- 4) Bachelor of Science in Biotechnology
- 5) Bachelor of Science in Petroleum Geosciences and Remote Sensing
- 6) Master of Science in Chemistry
- 7) Master of Science in Biotechnology

### Admission Requirements

A student who meets the university's admission requirements as stipulated in the Admission section of this Bulletin and chooses a science program (major) as a desired program of study will be admitted to the university as a science student. Students are strongly advised to carefully review the University Bulletin for admission and degree requirements as well as all related academic policies.

### Graduation Requirements

Each degree program comprises three categories: university requirements (UR), college requirements (CR), and program requirements (PR). The university and college requirements are common to all departments in the College of Sciences. Each program has its own required and elective courses. The credit hours allocations for each program are shown in the following table:

| <b>BSc in Chemistry (123 Credits Hours)</b> |           |           |           |              |
|---|-----------|-----------|-----------|--------------|
|   | <b>UR</b> | <b>CR</b> | <b>PR</b> | <b>Total</b> |
| Mandatory Credits                           | 15        | 15        | 50        | 80           |
| Elective Credits                            | 9         | -         | 34        | 43           |
| Total                                       | 24        | 15        | 84        | 123          |

| <b>BSc in Applied Physics (123 Credits Hours)</b> |           |           |           |              |
|---|-----------|-----------|-----------|--------------|
|   | <b>UR</b> | <b>CR</b> | <b>PR</b> | <b>Total</b> |
| Mandatory Credits                                 | 15        | 15        | 44        | 74           |
| Elective Credits                                  | 9         | 6         | 34        | 49           |
| Total   | 24        | 21        | 78        | 123          |

| <b>BSc in Mathematics (123 Credits Hours)</b> |           |           |           |              |
|---|-----------|-----------|-----------|--------------|
|   | <b>UR</b> | <b>CR</b> | <b>PR</b> | <b>Total</b> |
| Mandatory Credits                             | 15        | 15        | 45        | 75           |
| Elective Credits                              | 9         | -         | 39        | 48           |
| Total   | 24        | 15        | 84        | 123          |

| <b>BSc in Biotechnology (124 Credits Hours)</b> |           |           |           |              |
|---|-----------|-----------|-----------|--------------|
|   | <b>UR</b> | <b>CR</b> | <b>PR</b> | <b>Total</b> |
| Mandatory Credits                               | 15        | 15        | 70        | 100          |
| Elective Credits                                | 9         | -         | 15        | 24           |
| Total   | 24        | 15        | 85        | 124          |

| <b>BSc in Petroleum Geosciences and Remote Sensing (123 Credits Hours)</b> |           |           |           |              |
|--|-----------|-----------|-----------|--------------|
|  | <b>UR</b> | <b>CR</b> | <b>PR</b> | <b>Total</b> |
| Mandatory Credits  | 15        | 15        | 63        | 93           |
| Elective Credits   | 9         | -         | 21        | 30           |
| Total  | 24        | 15        | 84        | 123          |

A student enrolled in any College of Science program is eligible to graduate if he/she completes all degree requirements with a CGPA of 2.0 or higher.

### Course Numbering Scheme

Courses offered in the College of Sciences are designated numbers of the form 14XYABC where:

|     |  |
|-----|--|
| XY  | 20: Chemistry<br>30: Applied Physics<br>40: Mathematics<br>50: Biotechnology<br>60: Petroleum Geosciences and Remote Sensing |
| ABC | Program specific course number described in the respective program sections  |

#### I. University Requirements

Every student is required to take 24 credit hours of general education courses distributed over seven domains. Fifteen (15) mandatory credit hours are selected from domains 1, 2, 3 and 4 and nine (9) elective credit hours selected from domains 5, 6 and 7 as indicated in the University section (General Education).

#### II. College Requirements

##### Mandatory Courses

College requirements consist of 15 credit hours of foundation and skill courses, which are also mandatory for all College of Sciences students. The college requirements are listed in the table below and described thereafter.

| Course # | Course Title            | Credit | Prerequisite    |
|----------|-------------------------|--------|-----------------|
| 1411116  | Programming I           | 4      | None            |
| 1430110  | Physics I for Sciences  | 3      | None            |
| 1430116  | Physics I Lab           | 1      | Pre/Co: 1430110 |
| 1420101  | General Chemistry I     | 3      | None            |
| 1420102  | General Chemistry I Lab | 1      | Pre/Co: 1420101 |
| 1440131  | Calculus I              | 3      | None            |

The College Requirements for the B.Sc. degree in Physics are list and described in Department of Applied Physics section.

Descriptions of the required College of Sciences courses are given below:

#### **1411116                      Programming I                      (4-3:3)**

##### **Prerequisite: None**

This course introduces basic programming techniques with a high-level programming language. Topics include: general introduction to computers and numbering systems, program development process, variables, data types, expressions, selection and repetition structures, functions/procedures, text files, arrays, and pointers.



**1420101                      General Chemistry I                      (3-0:3)**

**Prerequisite: None**

Topics covered include: matter, atomic structure; stoichiometry of chemical reactions; chemical reactions in solution; energy and thermochemistry; atomic and electronic structure; chemical bonding; periodic correlation; properties of gases; liquids and Solids; solutions.

**1420102                      General Chemistry I Laboratory                      (0-3:1)**

**Prerequisite: Pre/Co 1420101**

Experiments on qualitative and quantitative aspects of General Chemistry I.

**1430110                      Physics I for Science                      (3-0:3)**

**Prerequisite: None**

Topics include: motion in 1 and 2 dimensions, vectors, particle dynamics and Newton's laws; work and energy, momentum and collision, rotation of a rigid body, elasticity, oscillatory motion, fluid mechanics and heat.

**1430116                      Physics I Laboratory                      (0-3:1)**

**Prerequisite: Pre/Co 1430110**

Various experiments covering the topics mentioned in Physics I course.

**1440131                      Calculus I                      (0-3:1)**

**Prerequisite: None**

Topics include: functions, domain and range, examples of functions. Limits and continuity. Derivatives, applications of derivatives in optimization, linearization and graphing, the Mean Value Theorem. Integration, the Fundamental Theorem of Calculus, areas, volumes of solids of revolution, arc length. Conic sections.

**Elective Courses**

The only program that includes College elective courses is the Applied Physics Program as described in the program's section of the Bulletin.

**III. Program Requirements**

Requirements for the Bachelor of Science degree are program-specific. They encompass three categories: Major specific core courses, major specific elective courses, and courses chosen from outside the major. The program requirements for the bachelor degrees in the different science majors are given below. Details and titles of relevant courses are included in the Student's Study Plan (SSP) that is available to every science student.

## DEPARTMENT OF CHEMISTRY

### Personnel

**Chairperson:** Prof. Monther Abdeljabbar

**Professor(s):** Ideisan Ibrahim Abu-Abdoun, Raed Abdallah Al Qawasmeh.

**Associate Professor(s):** Mahmoud Allawy Mohsin, Ayssar Nahlé, Ihsan Ahmed Shehadi, Ahmed Al Mehdi, , Ahmed Ali Mohammed.

**Assistant Professor(s):** Mohammed Al Naggar, Kamrul Hasan, Abdelaziz Elgamouz, Mahreen Arooj.

**Lecturer(s):** Ibrahim Abdul Rahman, Mona Kanj, Azeera Abdul Rahim, Ayesha Begum Mohammad.

### Vision

The Department of Chemistry envisions itself to be a center of excellence in teaching chemical sciences, community based-research, creative activities, and outreach services.

### Mission

The mission of the Department of Chemistry is to provide high quality education at the undergraduate level, and to prepare chemistry professionals to participate and contribute to their societies. It aspires to carry out the University of Sharjah's objective to instill in its student a spirit of independent research and a deep commitment to scientific thinking and continuous progress.

### Objectives

The Bachelor of Science degree program in chemistry has the following goals:

- Students are able to be critical and independent learners, and should recognize, recall, show an understanding of scientific knowledge, and communicate information. Graduates will be able to update their professional skills continuously to design integrated systems of people, information, energy, machines, materials and financial resources.
- Students are able to design, perform, analyze the results of chemical experiments, and be able to select appropriate practical methods and implement the safety techniques.
- Students are able to act as a source of expertise and assume responsibility in handling instrumentation independently and in team, and be able to formulate and present technical reports concisely.
- Students are able to carry out independent research in preparation for pursuing higher degrees and be observant to the ethical standards.

### Program Outcomes

Upon the successful completion of the BSc program in Chemistry, graduates will be able to:

- Draw defensible conclusions from data.
- Solve problems using systematic methods.
- Rationalize properties and structures using the principles of chemistry.
- Identify relationships between chemical principles and the other sciences.
- Correctly describe chemical principles and theories.

- Use correct chemical nomenclature, structural symbols, and terminology to accurately describe a process.
- Write a formal publication-quality report which concisely and unambiguously summarizes results of an experiment and states a conclusion and reviews a scientific topic.
- Assess the safety of a procedure and take the necessary precautions, based on the issues of safety regulations, ethics and societal issues in the use of chemicals in the laboratory work.
- Correctly use the proper tools and other equipment in laboratories.
- Be able to work in research and industrial institutions.

### Career Opportunities

Chemistry graduates have the opportunity to work in various areas such as:

- Petroleum and Petrochemical Industries.
- Environmental and Waste Management.
- Police Forensic and Criminal Laboratories.
- Quality Control and Safety Laboratories.
- Fine and Heavy Chemical Industries.
- Research Laboratories.
- Medical and Pharmaceutical Industries.
- Medical and Clinical Laboratories.
- Nanotechnology and Nanomaterials Laboratories.
- Laboratory Supervisors and Teaching Assistants.
- Education.
- Postgraduate: MSc and PhD

### Program Overview

The Department of Chemistry offers a BSc program in chemistry, which is accredited by the Commission for Academic Accreditation, Ministry of Higher Education and Scientific Research, United Arab Emirates in 2006 and 2018, also by the ASAC from ABET on 2018. The BSc Chemistry program is designed in accordance with the mission and vision of the University and the College of Sciences to meet the needs of the students, the chemistry community, and the society. Quality and excellence in both the curriculum and the instructional pedagogy are ensured. Student undertaking this program should complete a total of 123 credit hours which are distributed as:

| BSc in Chemistry (123 Credits) |    |    |    |       |
|--------------------------------|----|----|----|-------|
|                                | UR | CR | PR | Total |
| <b>Mandatory Core Credits</b>  | 15 | 15 | 50 | 80    |
| <b>Electives Core Credits</b>  | 9  | -  | 15 | 24    |
| <b>Free Elective Credits</b>   | -  | -  | 6  | 6     |
| <b>Supporting Credits</b>      | -  | -  | 13 | 13    |
| <b>Total</b>                   | 24 | 15 | 84 | 123   |

#### IV. University Requirements

The program requires students to take 24 credit hours, 18 of which are compulsory and the 6 are electives. Eight domains are covered:

- A. English Language
- B. Arabic Language
- C. Islamic Studies
- D. UAE Studies
- E. Innovation and Entrepreneurship
- F. Information Technology
- G. Humanities, Social and Arts
- H. Sciences and Technology

#### V. College Requirements

##### Mandatory Courses

College requirements consist of 15 credit hours of foundation and skill courses required for all College of Sciences students. The college requirements are listed in the table below and described thereafter.

| Course # | Course Title            | Credit | Prerequisite    |
|----------|-------------------------|--------|-----------------|
| 1411116  | Programming I           | 4      | None            |
| 1430110  | Physics I for Sciences  | 3      | None            |
| 1430116  | Physics I Lab           | 1      | Pre/Co: 1430110 |
| 1420101  | General Chemistry I     | 3      | None            |
| 1420102  | General Chemistry I Lab | 1      | Pre/Co: 1420101 |
| 1440131  | Calculus I              | 3      | None            |

The College Requirements for the BSc degree in IT-Multimedia are list and described in Department of Computer Science section. The College Requirements for the BSc degree in Physics are list and described in Department of Applied Physics section.

**Descriptions of the required College of Sciences courses are given below.**

##### **1411116                      Programming I                      4 (3:3)**

This course introduces basic programming techniques with a high level programming language. Topics include general introduction to computers and Numbering systems, program development process, variables, data types, expressions, selection and repetition structures, functions/procedures, text files, arrays, and pointers. *Prerequisite:* None.

##### **1420101                      General Chemistry I                      (3-0:3)**

Topics Covered include: Matter, Atomic structure; stoichiometry of chemical reactions; chemical reactions in solution; energy and thermochemistry; atomic and electronic structure; chemical bonding; periodic correlation; properties of gases; liquids and Solids; solutions. *Prerequisite:* None.

**1420102 General Chemistry I Laboratory (0-3:1)**

Experiments on qualitative and quantitative aspects of General Chemistry I. *Prerequisite:* Pre/Co 1420101.

**1430110 Physics I for Science (3-0:3)**

Motion in 1 and 2 dimensions, vectors, particle dynamics and Newton's laws; work and energy, momentum and collision, rotation of rigid body, elasticity, oscillatory motion, fluid mechanics and heat. *Prerequisite:* None.

**1430116 Physics I Laboratory (0-3:1)**

Various experiments covering the topics mentioned in Physics I course. *Prerequisite:* Pre/Co 1430110.

**1440131 Calculus I (0-3:1)**

Functions, domain and range, examples of functions. Limits and continuity. Derivatives, applications of derivatives in optimization, linearization and graphing, the Mean Value Theorem. Integration, the Fundamental Theorem of Calculus, areas, volumes of solids of revolution, arc length. Conic sections. *Prerequisite:* None.

## VI. Program Requirements

### A. Mandatory Core Courses

The Chemistry core courses are listed in the table below:

| Course # | Title   | CrHrs | Prerequisites    |
|----------|---|-------|------------------|
| 1420101  | General Chemistry I                               | 3     | -                |
| 1420102  | General Chemistry I Lab                           | 1     | Pre/Co: 1420 101 |
| 1420103  | General Chemistry II                              | 3     | 1420101; 1420102 |
| 1420104  | General Chemistry II Lab                          | 1     | Pre/Co: 1420103  |
| 1420221  | Analytical Chemistry                              | 3     | 1420103          |
| 1420222  | Analytical Chemistry Lab                          | 1     | Pre/Co: 1420221  |
| 1420211  | Organic Chemistry (1)                             | 3     | 1420103          |
| 1420212  | Organic Chemistry I Lab                           | 1     | Pre/Co:1420211   |
| 1420217  | Organic Chemistry II                              | 3     | 1420211          |
| 1420218  | Organic Chemistry II Lab                          | 1     | Pre/Co: 1420212  |
| 1420241  | Physical Chemistry I                              | 3     | 1420103          |
| 1420242  | Physical Chemistry I Lab                          | 1     | Pre/Co: 1420241  |
| 1420331  | Inorganic Chemistry I                             | 3     | 1420103          |
| 1420311  | Spectroscopic Identification of Organic Compounds | 2     | 1420217          |
| 1420361  | Biochemistry                                      | 3     | 1420217          |
| 1420362  | Biochemistry Lab                                  | 1     | 1420361          |
| 1420341  | Physical Chemistry II                             | 3     | 1420241          |
| 1420342  | Physical Chemistry II Lab                         | 1     | Pre/Co: 1420341  |
| 1420332  | Inorganic Chemistry II                            | 3     | 1420331          |
| 1420333  | Inorganic Chemistry Lab                           | 1     | Pre/Co: 1420331  |
| 1420322  | Instrumental Analysis                             | 3     | 1420221          |
| 1420323  | Instrumental Analysis Lab                         | 1     | Pre/Co: 1420322  |

| Course # | Title                           | CrHrs | Prerequisites       |
|----------|---------------------------------|-------|---------------------|
| 1420391  | Chemical Literature and Seminar | 3     | Note 1              |
| 1420490  | Chemistry Senior Project        | 3     | Senior standing     |
| 1420452  | Industrial Training             | 3     | Completing 80 CrHrs |

Note 1: Third year standing or Departmental approval

## B. Supportive Courses

13 credit hours offered by other Departments for students as follows

| Course # | Course Title                 | CrHr | Prerequisite                             |
|----------|------------------------------|------|--|
| 0202207  | Technical Writing            | 3    | -  |
| 1440132  | Calculus 2                   | 3    | 1440131                                  |
| 0202213  | Critical Reading and writing | 3    |  |
| 1430117  | Physics 2                    | 3    | Pre/Co: 1430110 or 1430115<br>1440131 or |
| 1430118  | Physics 2 lab                | 1    | Pre/Co: 1430110 or 1430115<br>1440131 or |

## C. Elective Core Courses

Every student in the chemistry department must take 15 credit hours of elective chemistry courses chosen from the list given in the table below. The support and chemistry core courses are the preparatory courses, which are designed to meet the breadth requirement in chemistry. After completing the preparatory courses, students are strongly encouraged to choose from alternative groupings of electives (referred to as “groups”) in different areas of chemistry to fulfill the depth requirement.

| Course # | Course Title                   | CrHrs | Prerequisite |
|----------|--------------------------------|-------|--------------|
| 1420420  | Electrochemistry               | 3     | 1420322      |
| 1420423  | Separation Methods in Chemical | 3     | 1420322      |
| 1420440  | Computational Chemistry        | 3     | 1420342      |
| 1420442  | Quantum Chemistry              | 3     | 1420342      |
| 1420451  | Polymer Chemistry              | 3     | 1420217      |
| 1420454  | Environmental Chemistry        | 3     | 1420322      |
| 1420453  | Petrochemistry                 | 3     | 1420217      |
| 1420433  | Homogeneous Catalysis          | 3     | 1420332      |
| 1420410  | Organic Chemistry III          | 3     | 1420217      |
| 1420412  | Chemistry of Natural Products  | 3     | 1420217      |
| 1420441  | Photochemistry                 | 3     | 1420341      |
| 1420461  | Nanochemistry                  | 3     | 1420332      |
| 1420460  | Biochemistry of Plants         | 3     | 1420361      |

#### D. Free Electives

Each student registered in the chemistry program is required to take 6 credits (2 courses) as general free elective courses. Such courses can be taken from the university's pool of courses at large upon the approval of the academic advisor. These courses are intended to broaden the knowledge of students by combining studies from chemistry with studies from other academic disciplines.

#### Study Plan

The BSc program in Chemistry encompasses 123 credits hours that are spread over eight semesters and could be completed in four years. The following distribution of courses by semester facilitates student's normal progression through the study plan.

| Year I, Semester 1 (17 Credits) |  |       |                  |
|---------------------------------|--|-------|------------------|
| Course #                        | Title  | CrHrs | Prerequisites    |
| 0201102                         | Arabic Language or Arabic Language for non-Arabic Speakers | 3     | None             |
| 0202112                         | English for Academic Purposes                              | 3     | None             |
| 1420101                         | General Chemistry I  | 3     | None             |
| 1420102                         | General Chemistry I Lab                                    | 1     | Pre/Co: 1420 101 |
| 1430115                         | Physics I  | 3     |                  |
| 1430116                         | Physics I Lab  | 1     | Pre/Co: 1430115  |
| 1440131                         | Calculus I   | 3     |                  |

| Year 1, Semester 2 (14 Credits) |                          |       |                 |
|---------------------------------|--------------------------|-------|-----------------|
| Course #                        | Title                    | CrHrs | Prerequisites   |
| 1411100                         | Introduction to IT       | 3     | None            |
| 1420103                         | General Chemistry II     | 3     | 1420101         |
| 1420104                         | General Chemistry II Lab | 1     | Pre/Co: 1420103 |
| 1430117                         | Physics II               | 3     | 1430116         |
| 1430118                         | Physics II Lab           | 1     | Pre/Co: 1430117 |
| 1440132                         | Calculus II              | 3     | 1440131         |

| Year 2, Semester 3 (18 Credits) |                              |       |                 |
|---------------------------------|------------------------------|-------|-----------------|
| Course #                        | Title                        | CrHrs | Prerequisites   |
| 1411116                         | Programming I                | 4     | None            |
| 0202213                         | Critical Reading and Writing | 3     | None            |
| 1420221                         | Analytical Chemistry         | 3     | 1420103         |
| 1420222                         | Analytical Chemistry Lab     | 1     | Pre/Co: 1420221 |
| 1420211                         | Organic Chemistry I          | 3     | 1420103         |
| 1420212                         | Organic Chemistry I Lab      | 1     | Pre/Co: 1420211 |
| 14202xx                         | Specialized Elective         | 3     | Note 1          |

| Year 2, Semester 4 (14 Credits) |                          |       |                 |
|---------------------------------|--------------------------|-------|-----------------|
| Course #                        | Title                    | CrHrs | Prerequisites   |
|                                 | University Elective      | 3     |                 |
| 0104101                         | Islamic Culture          | 3     |                 |
| 1420217                         | Organic Chemistry II     | 3     | 1420211         |
| 1420218                         | Organic Chemistry II Lab | 1     | Pre/Co: 1420217 |
| 1420241                         | Physical Chemistry I     | 3     | 1420103         |
| 1420242                         | Physical Chemistry I Lab | 1     | Pre/Co: 1420241 |

| Year 3, Semester 5 (16 Credits) |   |       |                 |
|---------------------------------|---|-------|-----------------|
| Course #                        | Title   | CrHrs | Prerequisites   |
| 1420331                         | Inorganic Chemistry I                             | 3     | 1420103         |
| 1420311                         | Spectroscopic Identification of organic compounds | 2     | 1420217         |
| 1420322                         | Instrumental Analysis                             | 3     | 1420221         |
| 1420323                         | Instrumental Analysis Lab                         | 1     | Pre/CO: 1420321 |
| 1420341                         | Physical Chemistry II                             | 3     | 1420241         |
| 1420342                         | Physical Chemistry II Lab                         | 1     | Pre/Co: 1420341 |
| 0202207                         | Technical Writing                                 | 3     |                 |



| Year 3, Semester 6 (17 Credits)                      |                                 |       |                 |
|--|---------------------------------|-------|-----------------|
| Course #   | Title                           | CrHrs | Prerequisites   |
| 14203xx  | Specialized Elective            | 3     | Note 1          |
| 1420332  | Inorganic Chemistry II          | 3     | 1420331         |
| 1420333  | Inorganic Chemistry Lab         | 1     | Pre/Co: 1420332 |
| 1420361  | Biochemistry                    | 3     | 1420217         |
| 1420362  | Biochemistry Lab                | 1     | 1420361         |
|  | University Elective             | 3     |                 |
| 1420391  | Chemical Literature and Seminar | 3     | Note 1          |
| Note 1: Third year standing or departmental approval |                                 |       |                 |

| Year 3, Summer Training (3 Credits) |                     |       |                     |
|-------------------------------------|---------------------|-------|---------------------|
| Course #                            | Title               | CrHrs | Prerequisites       |
| 1420452                             | Industrial Training | 3     | Completing 80 CrHrs |

| Year 4, Semester 7 (12 Credits) |                       |       |               |
|---------------------------------|-----------------------|-------|---------------|
| Course #                        | Title                 | CrHrs | Prerequisites |
| 14204xx                         | Specialized Elective  | 3     | Note 1        |
| 14204xx                         | Specialized Elective  | 3     | Note 1        |
|                                 | University Elective   | 3     |               |
|                                 | General Free Elective | 3     |               |

| Year 4, Semester 8 (12 Credits) |                          |       |                 |
|---------------------------------|--------------------------|-------|-----------------|
| Course #                        | Title                    | CrHrs | Prerequisites   |
| 14204xx                         | Specialized Elective     | 3     | Note 1          |
|                                 | General Free Elective    | 3     |                 |
| 1420490                         | Chemistry Senior Project | 3     | Senior standing |
|                                 | University Elective      | 3     |                 |

## Course Description

Courses in the proposed program that are offered in the department of Chemistry start with (1420xxx). The program of study contains courses that are offered by other departments as well as from outside the college. Consistent with the university policies, chemistry courses in the program will be assigned numbers of the form (1420 ABC) where:

|   |  |  |
|---|--|--|
| A | Year (level)   |  |
| B | Areas (as follows):<br>0: General Chemistry<br>1: Organic Chemistry<br>2: Analytical Chemistry<br>3: Inorganic Chemistry | 4: Physical Chemistry<br>5: Applied Chemistry<br>6: Biochemistry<br>9: Seminars and Projects |
| C | Course sequence in area  |  |

## Core Courses

Descriptions of the core courses are given below.

|  |                            |              |
|--|----------------------------|--------------|
| <b>1420101</b>   | <b>General Chemistry I</b> | <b>3-0:3</b> |
| Matter; atomic structure; stoichiometry of chemical reactions; chemical reactions in solutions; Energy and thermochemistry; atomic and electronic structure; chemical bonding; periodic correlations; properties of gases; liquids and solids; solutions are covered. <b>Prerequisite:</b> None. |                            |              |

|  |                                |              |
|--|--------------------------------|--------------|
| <b>1420102</b>   | <b>General Chemistry I Lab</b> | <b>0-3:1</b> |
| Experiments on qualitative and quantitative aspects of general chemistry. <b>Prerequisite:</b> Pre/Co 1420101. |                                |              |

|   |                             |              |
|---|-----------------------------|--------------|
| <b>1420103</b>  | <b>General Chemistry II</b> | <b>3-0:3</b> |
| Thermodynamics; reaction kinetics; chemical equilibrium; electrochemistry; nuclear reactions; properties of metals and metal complexes; organic compounds and macromolecules are covered. <b>Prerequisite:</b> 1420101. |                             |              |

|  |                                 |              |
|--|---------------------------------|--------------|
| <b>1420104</b>   | <b>General Chemistry II Lab</b> | <b>0-3:1</b> |
| Experiments on qualitative and quantitative aspects of general chemistry. <b>Prerequisite:</b> Pre/Co 1420103. |                                 |              |

|   |                            |              |
|---|----------------------------|--------------|
| <b>1420211</b>  | <b>Organic Chemistry I</b> | <b>3-0:3</b> |
| Structure; stereochemistry; properties of organic compounds; synthesis and reactions of alkanes, alkenes, alkynes, dienes, alicyclics, aromatic |                            |              |

compounds; mechanisms of radical substitution, radical and electrophilic addition, electrophilic substitution are covered.  
**Prerequisite:** 1420103

|   |                                |              |
|---|--------------------------------|--------------|
| <b>1420212</b>  | <b>Organic Chemistry I Lab</b> | <b>0-3:1</b> |
| Various separation, purification, and synthesis techniques are covered.<br><b>Prerequisite:</b> Pre/Co 1420211. |                                |              |

|  |                             |              |
|--|-----------------------------|--------------|
| <b>1420217</b>   | <b>Organic Chemistry II</b> | <b>3-0:3</b> |
| Identification of organic compounds by spectroscopic methods; synthesis and properties of alkyl halides, alcohols, and ethers; carboxylic acids; aldehydes and ketones; amines, phenols and derivatives are covered. <b>Prerequisite:</b> 1420211. |                             |              |

|   |                                 |              |
|---|---------------------------------|--------------|
| <b>1420218</b>  | <b>Organic Chemistry II Lab</b> | <b>0-3:1</b> |
| Synthesis of various organic compounds and basic spectroscopic techniques are covered. <b>Prerequisite:</b> Pre/Co 1420217. |                                 |              |

|  |                             |              |
|--|-----------------------------|--------------|
| <b>1420221</b>   | <b>Analytical Chemistry</b> | <b>3-0:3</b> |
| Treatment of errors; gravimetric and volumetric techniques; acid / base, precipitation, complex formation, and redox titrations; extraction; and electrochemistry will be covered. <b>Prerequisite:</b> 1420103. |                             |              |

|  |                                 |              |
|--|---------------------------------|--------------|
| <b>1420222</b>   | <b>Analytical Chemistry Lab</b> | <b>0-3:1</b> |
| Experiments related to the course main topics. <b>Pre/co:</b> 1420221. |                                 |              |

|   |                             |              |
|---|-----------------------------|--------------|
| <b>1420241</b>  | <b>Physical Chemistry I</b> | <b>3-0:3</b> |
| Basic gas laws and equations of state; laws of thermodynamics; reaction kinetics, entropy, and free energy; chemical equilibrium; phases and phase equilibrium are covered. <b>Prerequisite:</b> 1420103. |                             |              |

|  |                                 |              |
|--|---------------------------------|--------------|
| <b>1420242</b>   | <b>Physical Chemistry I Lab</b> | <b>0-3:1</b> |
| Techniques of physical measurement error analysis and statistics with experiments on gas laws; calorimetry; equilibrium, and phase diagram are covered. <b>Prerequisite:</b> Pre/Co 1420241. |                                 |              |

|  |  |              |
|--|--|--------------|
| <b>1420311</b>   | <b>Spectroscopic Identification of organic compounds</b> | <b>1-3:2</b> |
| Mass spectrometry; infrared spectroscopy; ultraviolet-visible spectroscopy; and proton and carbon nuclear magnetic resonance; functional groups by chemical tests; preparation of derivatives; and separation of mixtures are covered. <b>Prerequisite:</b> 1420217. |  |              |

|   |                              |              |
|---|------------------------------|--------------|
| <b>1420322</b>  | <b>Instrumental Analysis</b> | <b>3-0:3</b> |
| The theory and practice of modern methods of instrumental analysis including UV-VIS and infrared absorption spectrophotometry; emission spectroscopy; mass spectroscopy; electron and nuclear magnetic resonance spectroscopy; electrochemical methods; and chromatography will be covered. <b>Prerequisite:</b> 1420221. |                              |              |

|   |                                  |              |
|---|----------------------------------|--------------|
| <b>1420323</b>  | <b>Instrumental Analysis Lab</b> | <b>0-3:1</b> |
| Experimental implementation of instruments related to materials covered in the theoretical course. <b>Prerequisite:</b> Pre/Co 1420322. |                                  |              |

|  |                              |              |
|--|------------------------------|--------------|
| <b>1420331</b>   | <b>Inorganic Chemistry I</b> | <b>3-0:3</b> |
| Atomic structure; molecular structure and shape; symmetry and group theory; structure of solids; acids and bases; nomenclature of inorganic compounds; introduction to organometallic compounds of the main group elements; d-metal complexes; and electronic spectra will be covered. <b>Prerequisite:</b> 1420103. |                              |              |

|   |                               |              |
|---|-------------------------------|--------------|
| <b>1420332</b>  | <b>Inorganic Chemistry II</b> | <b>3-0:3</b> |
| Classical complexes; complexes of pi-acceptor (pi-acid) ligands; organometallic compounds of transition metals; organometallic compounds in homogeneous catalytic reactions; bio-inorganic chemistry of iron, cobalt, and some other metals; hydrogen bonding; and the noble gases are covered. <b>Prerequisite:</b> 1420331. |                               |              |

|  |                                |              |
|--|--------------------------------|--------------|
| <b>1420333</b>   | <b>Inorganic Chemistry Lab</b> | <b>0-3:1</b> |
| Experiments based upon synthesis and physical measurements of coordination and organometallic. <b>Pre/Co-requisite:</b> 1420332. |                                |              |

|  |                              |              |
|--|------------------------------|--------------|
| <b>1420341</b>   | <b>Physical Chemistry II</b> | <b>3-0:3</b> |
| Electromagnetic radiation; old quantum theory, Schrodinger's wave quantum, quantum mechanical postulates; quantum mechanics of simple systems; pure and vibration rotation spectroscopy, Raman |                              |              |

spectroscopy; electronic spectra, viscosity; diffusion and sedimentation. **Prerequisite:** 1420241.

|   |                                  |              |
|---|----------------------------------|--------------|
| <b>1420342</b>  | <b>Physical Chemistry II Lab</b> | <b>0-3:1</b> |
| Experiments involving electrochemistry; conductivities and transport properties of solutions; kinetics of reactions; measurements of surface properties; and transport properties of gases and liquids are covered. <b>Pre/Co-requisite:</b> 1420341. |                                  |              |

|  |  |              |
|--|--|--------------|
| <b>1420391</b>   | <b>Chemical Literature and Seminar</b> | <b>2-3:3</b> |
| A survey course concerning the use of traditional and automated methods for searching chemical information, with emphasis on on-line computer searching. Students will participate in giving and attending seminars of general chemical interest. Topics cover review of current literature and professional ethics in chemistry. <b>Prerequisite:</b> 3rd year standing or departmental approval. |  |              |

|  |                     |              |
|--|---------------------|--------------|
| <b>1420361</b>   | <b>Biochemistry</b> | <b>3-0:3</b> |
| A study of the constituents of living cells and their chemical reactions, emphasis is on intermediary metabolism and biologically important reactions of amino acids, proteins, carbohydrates, nucleic acids and lipids. <b>Prerequisite:</b> 1420217. |                     |              |

|   |                         |              |
|---|-------------------------|--------------|
| <b>1420362</b>  | <b>Biochemistry lab</b> | <b>0-3:1</b> |
| A study of the constituents of living cells and their chemical reactions, Application of general biochemistry techniques for studying isolation and identification of proteins, carbohydrate, lipids, and nucleic acids, enzyme assays and introductory experiments of enzyme kinetics<br><b>Prerequisite:</b> 1420361. |                         |              |

|   |                            |              |
|---|----------------------------|--------------|
| <b>1420452</b>  | <b>Industrial Training</b> | <b>0-8:3</b> |
| This course consists of a period of 6 weeks during the summer of the junior year training in an appropriate chemical industry or firm. The students will be evaluated based on their performance at the training site, and are required to submit a report and to present a seminar about their experience before receiving a grade for the course. <b>Prerequisite:</b> Junior Standing. |                            |              |

|   |                                 |              |
|---|---------------------------------|--------------|
| <b>1420490</b>  | <b>Chemistry Senior Project</b> | <b>1-6:3</b> |
| Students are introduced to research under the direction of a member of faculty, different techniques and principles of chemistry will be introduced. Both a formal oral and written report of the results of the research must be presented. <b>Prerequisites:</b> Senior standing. |                                 |              |

### Specialized electives

Descriptions of the specialized electives in Chemistry are given below:

|   |                              |              |
|---|------------------------------|--------------|
| <b>1420410</b>  | <b>Organic Chemistry III</b> | <b>3-0:3</b> |
| Modern synthetic organic chemistry including catalytic hydrogenation; metal hydride and dissolved metal reductions; oxidations with chromium, manganese, peracids and peresters; halogenation, alkylation of active methylene compounds; aldol condensation and related reactions; and acylation at carbon are covered. <b>Prerequisite:</b> 1420217. |                              |              |

|  |                                      |              |
|--|--------------------------------------|--------------|
| <b>1420412</b>   | <b>Chemistry of Natural Products</b> | <b>3-0:3</b> |
| Biosynthesis of fats, carbohydrates, proteins, steroids, terpenes, alkaloids, prostaglandins; Polysaccharides, natural products from carbohydrates; aliphatic compounds; prostaglandins; antibiotic; aromatic compounds; terpenes; steroids; alkaloids; the penicillin's; and coenzyme A, amino acids, peptides, proteins. <b>Prerequisite:</b> 1420217. |                                      |              |

|   |                         |              |
|---|-------------------------|--------------|
| <b>1420420</b>  | <b>Electrochemistry</b> | <b>3-0:3</b> |
| This course covers advances in electrochemistry and electrochemical techniques such as voltammetry, and rotating disc electrodes. <b>Prerequisite:</b> 1420322. |                         |              |

|  |  |              |
|--|--|--------------|
| <b>1420423</b>   | <b>Separation Methods in Chemical Analysis</b> | <b>3-0:3</b> |
| This course covers separation methods of analysis, which include, distillation, solvent extraction, partition chromatography, adsorption chromatography, ion exchange, size-exclusion, high performance liquid chromatography, Gas liquid chromatography and gas solid chromatography. <b>Prerequisite:</b> 1420322. |  |              |

|  |                                |              |
|--|--------------------------------|--------------|
| <b>1420440</b>   | <b>Computational Chemistry</b> | <b>3-0:3</b> |
| Application of Fortran programming and numerical methods to chemical problems in quantum mechanics; thermodynamics; and kinetics; with emphasis on literature review and implementation of ready-to-use programs in chemistry. <b>Prerequisite:</b> 1420342. |                                |              |

|   |                       |              |
|---|-----------------------|--------------|
| <b>1420441</b>  | <b>Photochemistry</b> | <b>3-0:3</b> |
| A study of the fundamental photochemical and photo physical processes which follow absorption of radiation by molecules and the techniques used to study these processes. <b>Prerequisite:</b> 1420341. |                       |              |

|   |                          |              |
|---|--------------------------|--------------|
| <b>1420442</b>  | <b>Quantum Chemistry</b> | <b>3-0:3</b> |
| Classical mechanics versus quantum mechanics; postulates of quantum mechanics; Schrodinger equation; particle in a box; atomic wave functions; Russell-Saunders coupling and perturbation theory; and molecular wave functions are covered. <b>Prerequisite:</b> 1420341. |                          |              |

|  |                              |              |
|--|------------------------------|--------------|
| <b>1420433</b>   | <b>Homogeneous Catalysis</b> | <b>3-0:3</b> |
| Transition metal chemistry; isomerization and hydrogenation; addition reactions of olefins and dienes; reactions of carbon monoxide; oxidation of olefins and dienes; arene reactions; acetylene reaction; olefin metathesis and alkene reaction; oxidation of hydrocarbons by oxygen; trends in homogeneous catalysis are covered. <b>Prerequisite:</b> 1420332 |                              |              |

|   |                          |              |
|---|--------------------------|--------------|
| <b>1420451</b>  | <b>Polymer Chemistry</b> | <b>3-0:3</b> |
| Introduction to polymer science; polymerization reactions; mechanism and kinetic studies; physical and analytical characterization of polymers; polymers properties and synthesis; copolymerization reactions; additives in polymer industries; basic concepts of polymer technology are covered. <b>Prerequisite:</b> 1420217. |                          |              |

|   |                       |              |
|---|-----------------------|--------------|
| <b>1420453</b>  | <b>Petrochemistry</b> | <b>3-0:3</b> |
| A study of the numerous chemicals obtained directly or indirectly from petroleum, including their chemistry and their industrial production and applications. <b>Prerequisite:</b> 1420218. |                       |              |

|   |                                |              |
|---|--------------------------------|--------------|
| <b>1420454</b>  | <b>Environmental Chemistry</b> | <b>3-0:3</b> |
| <p>This course explains the relationship between chemistry and the environment from the chemical viewpoint, considering the following; Chemistry of the atmosphere; Air and air pollution; Natural waters; analysis and purification of wastewater. Aspects of energy sources and their environmental consequences; Environmental impact of organic and inorganic pollutants; introduction to methods of dangerous wastes disposal. <b>Prerequisite:</b> 1420322.</p> |                                |              |

|   |                               |              |
|---|-------------------------------|--------------|
| <b>1420460</b>  | <b>Biochemistry of Plants</b> | <b>3-0:3</b> |
| <p>This course provides students with advanced knowledge about biochemical processes in plants including photosynthesis (light reaction and dark reaction), monosaccharides, disaccharides and polysaccharides biosynthesis and storage, nitrogen fixation and sulfur metabolism, lipid synthesis and storage, biosynthesis of flavonoids, antimicrobial peptides, peptide hormones, vitamins, and fibers are covered. <b>Prerequisite:</b> 1420361</p> |                               |              |

|   |                       |              |
|---|-----------------------|--------------|
| <b>1420461</b>  | <b>Nano chemistry</b> | <b>3-0:3</b> |
| <p>This course covers basics of nanoscience and chemical methods for the synthesis of nanomaterials in different shapes. Specifically, this course will focus on technologically important materials such as quantum dots, carbon nanotubes, semiconductor nanowires, conductive nanorods, nanoscale polymers, graphene, nanodiamond, and nanosized materials. Fundamental properties and applications in energy and medicine of these nanomaterials are covered. <b>Prerequisite:</b> 1420332.</p> |                       |              |

#### Courses offered to other majors

| Course # | Course Title                                      | CrHrs | Prerequisite   |
|----------|---|-------|----------------|
| 1427107  | Chemistry I for Medical Sciences                  | 3     | None           |
| 1427108  | Chemistry (II) for Medicine and Medical Sciences  | 3     | 1427107        |
| 1427118  | General Chemistry Laboratory for Medical Sciences | 1     | Pre/Co 1427108 |
| 1426155  | General Chemistry for Health Sciences             | 4     | None           |
| 1426217  | Organic Chemistry for Health Sciences             | 3     | 1426155        |
| 1420225  | Analytical Chemistry for Health Sciences          | 3     | 1426155        |
| 1420226  | Analytical Chemistry lab for Health Sciences      | 1     | Pre/Co 1420225 |



Description of these courses as shown below.

|  |   |              |
|--|---|--------------|
| <b>1427107</b>   | <b>General Chemistry 1 for Medical Sciences</b> | <b>3-0:3</b> |
| <p>Structure of the atom and the periodic table; structure and properties of ionic and covalent compounds; solutions; acids and bases and oxidation-reduction; the nucleus, radioactivity, and nuclear medicine; organic chemistry of saturated and unsaturated hydrocarbons, functional groups (Alcohols, thiols, amines, amides, carboxylic acids, esters and amides).</p> <p><b>Perquisite:</b> None.</p> |   |              |

|  |   |              |
|--|---|--------------|
| <b>1427108</b>   | <b>General Chemistry-2 for Medical Sciences</b> | <b>3-0:3</b> |
| <p>This course describes the main basic biochemical pathways such as glycolysis, TCA cycles, electron transport chain, glycogenolysis and glycogenesis, ketogenesis, lipogenesis and lipolysis and urea cycle. It also describes the synthesis of nucleic acids including DNA and RNA.</p> <p><b>Prerequisite:</b> 1427107</p> |   |              |

|   |   |              |
|---|---|--------------|
| <b>1427118</b>  | <b>General Chemistry 2 lab for Medical Sciences</b> | <b>0-3:1</b> |
| <p>Experiments on qualitative and qualitative general chemistry, various organic synthesis, and purification and separation techniques are covered. <b>Prerequisite:</b> 1420108.</p> |   |              |

|   |  |              |
|---|--|--------------|
| <b>1426217</b>  | <b>Organic Chemistry for Health Sciences</b> | <b>4-3:3</b> |
| <p>Chemistry of saturated hydrocarbons, unsaturated, and aromatic compounds; alcohols, phenols, ethers, and thiols; aldehydes and ketones; carboxylic acids and esters; amines and amides are covered. Experiments on qualitative and qualitative general chemistry, various organic synthesis, and purification and separation techniques also introduced. <b>Prerequisite:</b> 1426155.</p> |  |              |

|  |  |              |
|--|--|--------------|
| <b>1426155</b>   | <b>General Chemistry for Health Sciences</b> | <b>4-3:3</b> |
| <p>Topics in this course include: measurements in chemistry; atoms and elements; nuclear radiation; compounds and their bonds; energy and states of matter; chemical reactions; chemical quantities; gases; solutions; and acid and bases. This course also covers experiments on qualitative and quantitative aspects of general chemistry.</p> <p><b>Prerequisite:</b> None.</p> |  |              |

|   |   |              |
|---|---|--------------|
| <b>1420225</b>  | <b>Analytical Chemistry for Health Sciences</b> | <b>3-0:3</b> |
| Calculations used in Analytical Chemistry; Chemical equilibrium; Treatment of errors; gravimetric and volumetric techniques; acid/base; precipitation; complex formation; redox titrations; and introduction to electrochemistry will be covered. <b>Prerequisite:</b> 1426155. |   |              |

|   |  |              |
|---|--|--------------|
| <b>1420226</b>  | <b>Analytical Chemistry Laboratory for Health Sciences</b> | <b>0-3:1</b> |
| Experiments on qualitative and quantitative aspects of major topics of the course. <b>Prerequisite:</b> Pre/Co 1426225. |  |              |

## FACULTY LIST 2022-2023

### Department of Chemistry

Prof. Monther Abdeljabbar Khanfar, Inorganic Chemistry/Organometallics Ph.D. (Dr. rar nat.) from Universitaet Tuebingen, Germany, 2001.

Raed Abdallah Al Qawasmeh, Professor & Chair. Ph.D. from the University of Tübingen, Germany, 1999; Organic Chemistry.

Ideisan I. Abu-Abdoun, Professor. Ph.D. from the University of Liverpool, England, 1982; Applied Chemistry.

Mahmoud Allawy Mohsin, Associate Professor. Ph.D. from the University of Manchester Institute of Science and Technology, (UMIST), UK, 1984; Polymer Chemistry.

Ayssar Nahlé, Associate Professor. Ph.D. from the University of Southampton, Southampton, England, UK, 1989; Electrochemistry.

Ihsan A. Shehadi, Associate Professor. Ph.D. from Northeastern University, Boston, U.S.A, 1997; Physical Chemistry.

Ahmed Almehti, Associate Professor. Ph.D. from Oregon State University, Oregon, USA, 1991; Biochemistry.

Ahmed Ali Mohammed, Associate Professor. Ph.D. from the University of Maine, Orono, Maine, U.S.A, 2000; Inorganic Chemistry.

Mohamad El-Naggar, Assistant Professor. Ph.D. from the University of Queensland, Australia, 2010; Organic Chemistry.

Abdelaziz Elgamouz, Assistant Professor. Ph.D. from the University of Surrey, UK, 2009, Bioanalytical Chemistry.

Kamrul Hasan, Assistant professor. Ph.D. from the Memorial University of Newfoundland, NL, Canada, 2012; Organometallic Chemistry.

Mahreen Arooj, Assistant Professor. Ph.D. from Gyeongsang National University, South Korea 2013; Computational Chemistry.

Mona Kanj El-Harakeh, Lecturer. M.Sc. from the American University of Beirut, Lebanon, 1984; Physical Chemistry.

Ibrahim Abdul-Rahman, Lecturer. M.Sc. from Kuwait University, Kuwait, 1984; Physical Chemistry.

Azeera Abdul Rahim, Lecturer. M.Sc. from Mahatma Gandhi University, India, 2007; Chemistry.

Ayesha Begum Mohammad, Lecturer. M.Sc. from Kakatiya University, Warangal, India, 2004; Organic Chemistry.

## Department of Applied Physics & Astronomy

### Personnel

|                             |   |
|-----------------------------|---|
| <b>Chairperson</b>          | Mounir Kaidi  |
| <b>Professors</b>           | Nouar Tabet, Bashir M. Suleiman, Attaelmnan Gaffar, Mashhoor Al Wardat.   |
| <b>Associate Professors</b> | Hussain Alawadhi, Hachemi Benaoum, Mounir Kaidi, Gehad Sadik, Hussein Elmehdi, Ilias Fernini, Oleg Olendski, Kais Daoudi. |
| <b>Assistant Professors</b> | Rachik Soualah, Yassir Abdu, Mohammad Azeem, Hafsa Khurshid, Hamdan Hamdan, Danial Moraitis                               |
| <b>Visiting Academics</b>   | Antonios Manousakis   |
| <b>Lecturers</b>            | Bassam Rashed Khader, Omar Adwan, Mohammad Mansour, Nawal Nayfeh, Saja Abdulhadi, Tahani Alsarayreh, Abdulraheem Khudada  |

### Vision

To be among the top five applied physics departments in the gulf region; to achieve pre-eminence among universities in the region by providing a positive academic environment; to achieve excellence in educational programs that are based on research committed to the teaching process and community needs and to develop students skills, analytical and creative abilities.

### Applied Physics Program

#### Mission

The Applied Physics program has been designed to provide high quality education in physics at the undergraduate level. It has been constructed to prepare graduates to face the general challenges of a professional career and pursue further studies in physics or other related fields. The mission of the Department is summarized in the following:

- 1) To facilitate the success of physics graduates in solving societal problems and carrying out research related to pure and applied physics with a drive towards service and leadership.
- 2) To provide quality scientific and technical education and training.
- 3) To promote innovation and creativity in the areas of pure and applied sciences.

#### Program Goals

- 1) Provide a thorough introduction to classical physics and the basic concepts of quantum mechanics.
- 2) Help students to develop appropriate skills for the analysis of the physical systems. These include the ability to extract data from real systems, and mathematical skills for the study of physical models.
- 3) Enable students to develop scientific reasoning, critical thinking, logical argumentation skills, and the ability to adapt to new situations arising from the changing nature of science and technology.
- 4) Help students to develop the oral and written communication skills required for a scientific and technical career.
- 5) Help students to acquire an understanding of the nature of physics as it relates to the other sciences and the various technical fields.

### Program Outcomes

Upon successful completion of the B.Sc. program in Applied Physics, graduates will be able to:

- Design and conduct experiments, test hypotheses, analyze and interpret data in Physics areas.
- Apply knowledge of physics and other related disciplines to scientific and engineering problems.
- Identify, solve and analyze applied physics problems.
- Analyze the role of modern laboratory equipment and techniques to conduct experiments to solve contemporary issues in physics.
- Effectively communicate verbally and in writing.
- Apply the techniques, skills, and modern scientific and technical tools necessary for Physics practice.
- Identify professional and ethical responsibility related to Physics.
- Work individually or in a team to develop effective workplace relationships.
- Formulate or design a scientific process in Physics to meet the desired needs
- Acquire a broad education necessary to understand the impact of Physics solutions in a global and societal context.
- Recognize the need for and ability to engage in life-long learning in Physics.

### Career Opportunities

Graduates from the Applied Physics program will be prepared to seek advanced degrees and to pursue careers in many fields and agencies such as:

- Environmental agencies.
- Energy & Petroleum authorities and agencies.
- Various Industries.
- Hospitals and health care centers.
- Space agencies & Astronomical observatories.
- Ministry of Education and academic institutions.
- Telecommunication companies.
- Military forces, police, and civil defense.
- Research and scholarship centers.

### Program Overview

The BS in Applied Physics is designed in accordance with the mission and vision of the University of Sharjah and the College of Sciences to meet the needs of the students, the basic sciences community, and the UAE society at large. Quality and excellence in both the curriculum and instructional pedagogy are ensured by following. A student enrolled in this program must complete a total of 123 credit hours distributed as follows:

| BSc in Applied Physics (123 crs) |    |    |    |       |
|----------------------------------|----|----|----|-------|
|                                  | UR | CR | PR | Total |
| Mandatory Credits                | 15 | 15 | 44 | 74    |
| Electives Credits                | 9  | 6  | 24 | 39    |
| Supporting Credits               | -  | -  | 10 | 10    |
| Total                            | 24 | 21 | 78 | 123   |

## I. University Requirements

The program requires students to take 24 credit hours, 18 of which are compulsory and the 6 are electives. Eight domains are covered:

- A. English Language
- B. Arabic Language
- C. Islamic Studies
- D. UAE Studies
- E. Innovation and Entrepreneurship
- F. Information Technology
- G. Humanities, Social and Arts
- H. Sciences and Technology

## II. College Requirements

### Mandatory Courses

Every student in the College of Sciences irrespective of specialization is required to take the 15 credit hours of mandatory courses listed below:

| Course # | Course Title            | Credit | Prerequisite               |
|----------|-------------------------|--------|----------------------------|
| 1411115  | Programming I           | 4      | None                       |
| 1430110  | Physics 1 for Sciences  | 3      | 1430131                    |
| 1430116  | Physics 1 Lab           | 1      | Pre/Co: 1430110 or 1430115 |
| 1420101  | General Chemistry I     | 3      | None                       |
| 1420102  | General Chemistry I Lab | 1      | Pre/Co: 1420101            |
| 1440131  | Calculus I              | 3      | None                       |

### Elective Courses

The student must choose 6 credit hours outside the Department upon the approval of the academic advisor. The two elective courses are to be chosen from the table below.

| Course # | Course Title               | CrHrs | Prerequisites |
|----------|----------------------------|-------|---------------|
| 0202207  | Technical Writing          | 3     | 0202112       |
| 1450101  | General Biology I          | 3     | None          |
| 1440181  | Statistics for Science     | 3     | None          |
| 1440182  | Statistics for Science Lab | 1     | 1440181       |

### III. Program Requirements

The program requirements consist of 78 credit hours of courses divided into four major sets as described below.

#### A. Mandatory Core Courses

This set consists of 44 credit hours encompassing the courses listed below.

| Course # | Course Title                           | Crs | Prerequisite                                     |
|----------|--|-----|--|
| 1430100  | Physics Orientation                    | 1   | None   |
| 1430117  | Physics 2                              | 3   | Pre/Co: 1430110 or 1430115<br>1440131 or 1440133 |
| 1430118  | Physics 2 Lab                          | 1   | Pre/Co: 1430116, 1430117                         |
| 1430221  | Classical Mechanics                    | 3   | 1430110 or 1430115; 1430251                      |
| 1430241  | Modern Physics                         | 4   | 1430117; 1430118                                 |
| 1430251  | Mathematical Methods of Physics 1      | 3   | 1430110 or 1430115; 1440131 or 1440133           |
| 1430252  | Mathematical Methods of Physics 2      | 3   | 1430251  |
| 1430323  | Quantum Mechanics 1                    | 3   | 1440241; 1430251                                 |
| 1430324  | Quantum Mechanics 2                    | 3   | 1430323  |
| 1430331  | Electricity and Magnetism 1            | 3   | 1430117; 1430251                                 |
| 1430332  | Electricity and Magnetism 2            | 2   | 1430331  |
| 1430333  | Electronics for Experimental Physics 1 | 4   | 1430118  |
| 1430353  | Computational Physics                  | 3   | 1411116; 1430241                                 |
| 1430471  | Advanced Physics Lab                   | 3   | 1430241; 1430333                                 |
| 1430472  | Instrumentation and Control            | 3   | 1430333  |
| 1430491  | Senior Project                         | 3   | Department consent                               |

#### B. Support Courses

This category includes 10 credit hours of Mathematics and Chemistry courses as indicated in the table below.

| Course # | Course Title                         | Crs | Prerequisite   |
|----------|--------------------------------------|-----|----------------|
| 1440261  | Differential Equations for Engineers | 3   |                |
| 1440161  | Calculus II for Engineers            | 3   | 1440131        |
| 1420103  | General Chemistry II                 | 3   | 0215102        |
| 1420104  | General Chemistry II Lab             | 1   | Pre/Co 0215103 |

### C. Elective Courses

Depending on the student's interests and/or his/her future job prospects, the student selects in the senior year 24 credit hours from the following set of courses:

| Course # | Course Title                                | Crs | Prerequisite        |
|----------|---|-----|---------------------|
| 1430201  | Fundamentals of Astronomy & Space Science   | 3   | 1430110 or 1430115  |
| 1430202  | Celestial Mechanics                         | 3   | 1430110 or 1430115  |
| 1430211  | Physics 3                                   | 3   | 1430117             |
| 1430212  | Physics 3 Lab                               | 1   | 1430118;<br>1430211 |
| 1430261  | Thermodynamics                              | 3   | 1430110 or 1430115  |
| 1430301  | Astrophysics 1 (Stars)                      | 3   | 1430201             |
| 1430302  | Astronomical Techniques                     | 3   | 1430201             |
| 1430361  | Modern Optics                               | 3   | 1430211             |
| 1430362  | Thermal Physics                             | 3   | 1430211;<br>1430241 |
| 1430401  | Astrophysics 2 (Galaxies and the Universe)  | 3   | 1430301             |
| 1430433  | Electronic for Experimental Physics 2       | 3   | 1430333             |
| 1430441  | Solid State Physics                         | 3   | 1430323             |
| 1430442  | Introduction to Radiation Physics Dosimetry | 3   | 1430241             |
| 1430443  | Nuclear Physics                             | 3   | 1430323             |
| 1430481  | Fundamentals of Environmental Physics       | 3   | 1430241             |



| Course # | Course Title                 | Crs | Prerequisite        |
|----------|------------------------------|-----|---------------------|
| 1430482  | Physics of Materials         | 3   | 1430261;<br>1430323 |
| 1430483  | Health Physics               | 3   | 1430241             |
| 1430484  | Intro to Medical Imaging     | 3   | 1430241             |
| 1430485  | Physics of Energy Resources  | 3   | 1430241             |
| 1430486  | Photonics and Fiber Optics   | 3   | 1430241;<br>1430361 |
| 1430487  | Radiation Biology            | 3   | 1430241             |
| 1430488  | Meteorology                  | 3   | 1430241;<br>1430481 |
| 1430489  | Introduction to Spectroscopy | 3   | 1430323;<br>1430361 |

### Study Plan

The Applied Physics BS program encompasses 123 credits hours that are spread over eight semesters and could be completed in four years. The following distribution of courses by semester facilitates students' normal progression through the study plan.

| Year I, Semester 1 (14 Credits) |                              |     |                               |
|---------------------------------|------------------------------|-----|-------------------------------|
| Course                          | Title                        | Crs | Prerequisites                 |
| 1430100                         | Physics Orientation          | 1   | None                          |
| 1430110                         | Physics 1 for sciences       | 3   | 1430131                       |
| 1430116                         | Physics 1 Lab                | 1   | Pre/Co: 1430110 or<br>1430115 |
| 1440131                         | Calculus I                   | 3   | None                          |
| 1411100                         | Introduction to IT (English) | 3   | None                          |
| 0104100                         | Islamic Culture I            | 3   | None                          |

| Year 1, Semester 2 (17 Credits) |                           |     |   |
|---------------------------------|---------------------------|-----|---|
| Course #                        | Title                     | Crs | Prerequisites                                       |
| 1430117                         | Physics 2                 | 3   | Pre/Co: 1430110 or<br>1430115<br>1440131 or 1440133 |
| 1430118                         | Physics 2 Lab             | 1   | Pre/Co: 1430116,<br>1430117                         |
| 1440161                         | Calculus II for Engineers | 3   | 1440131   |

| Year 1, Semester 2 (17 Credits) |                               |   |      |
|---------------------------------|-------------------------------|---|------|
| 1411116                         | Programming I                 | 4 | None |
| 0201102                         | Arabic Language               | 3 | None |
| 0202112                         | English for Academic Purposes | 3 | None |

| Year 2, Semester 3 (16 Credits) |                                      |     |                    |
|---------------------------------|--------------------------------------|-----|--------------------|
| Course #                        | Title                                | Crs | Prerequisites      |
| 1430211                         | Physics 3                            | 3   | 1430117 (P/Co)     |
| 1430251                         | Math Methods of Physics 1            | 3   | 1440131 or 1430110 |
| 1420101                         | General Chemistry I                  | 3   | None               |
| 1420102                         | General Chemistry I Lab              | 1   | 1420101 (P/Co)     |
| 1440261                         | Differential Equations for Engineers | 3   |                    |
|                                 | University Elective - 1              | 3   |                    |

| Year 2, Semester 4 (17 Credits) |                           |     |                  |
|---------------------------------|---------------------------|-----|------------------|
| Course #                        | Title                     | Crs | Prerequisites    |
| 1430241                         | Modern Physics            | 4   | 1430117, 1430118 |
| 1430252                         | Math Methods of Physics 2 | 3   | 1430251          |
| 1430221                         | Classical Mechanics       | 3   | 1430115, 1430251 |
| 1420103                         | General Chemistry II      | 3   | 1420102          |
| 1420104                         | General Chemistry II Lab  | 1   | 1420103 (P/Co)   |
|                                 | University Elective - 2   | 3   |                  |

| Year 3, Semester 5 (16 Credits) |                                |     |                        |
|---------------------------------|--------------------------------|-----|------------------------|
| Course #                        | Title                          | Crs | Prerequisites          |
| 1430323                         | Quantum Mechanics 1            | 3   | 1440241, 1430251       |
| 1430331                         | Electricity and Magnetism 1    | 3   | 1430117, 1430251(P/Co) |
| 1430333                         | Electronics for Exp. Physics 1 | 4   | 1430118                |
|                                 | College Elective - 1           | 3   |                        |
|                                 | University Elective - 3        | 3   |                        |

| Year 3, Semester 6 (17 Credits) |                             |     |                  |
|---------------------------------|-----------------------------|-----|------------------|
| Course #                        | Title                       | Crs | Prerequisites    |
| 1430324                         | Quantum Mechanics 2         | 3   | 1430323          |
| 1430332                         | Electricity and Magnetism 2 | 2   | 1430331          |
| 1430353                         | Computational Physics       | 3   | 1430241, 1411116 |
| 1430472                         | Instrumentation and Control | 3   | 1430333          |
| 1430362                         | Thermal Physics             | 3   | 1430241, 1430211 |
|                                 | College Elective - 2        | 3   |                  |

| Year 4, Semester 7I (14 Credits) |                               |     |                  |
|----------------------------------|-------------------------------|-----|------------------|
| Course #                         | Title                         | Crs | Prerequisites    |
| 1430471                          | Advanced Physics Lab          | 2   | 1430241, 1430333 |
| 14304xx                          | Advanced Physics Elective - 3 | 3   |                  |
| 14304xx                          | Advanced Physics Elective - 4 | 3   |                  |
| 14304xx                          | Advanced Physics Elective - 5 | 3   |                  |
|                                  | University Elective - 4       | 3   |                  |

| Year 4, Semester 8 (12 Credits) |                               |     |                    |
|---------------------------------|-------------------------------|-----|--------------------|
| Course #                        | Title                         | Crs | Prerequisites      |
| 14304xx                         | Advanced Physics Elective - 6 | 3   |                    |
| 14304xx                         | Advanced Physics Elective - 7 | 3   |                    |
| 14304xx                         | Advanced Physics Elective - 8 | 3   |                    |
| 1430491                         | Senior Project                | 3   | Department consent |

### Courses Descriptions

Courses in the proposed program that are offered by the Applied Physics Department start with (1430). The program of study contains courses that are offered by other departments as well as from outside the college. Consistent with the university policies, Applied Physics courses in the program will be assigned numbers of the form (1430 ABC) where:

|   |  |  |
|---|--|--|
| A | Year (level)   |  |
| B | Areas (as follows):<br>0: Astronomy and Astrophysics<br>1: General Physics<br>2: Mechanics<br>3: Electromagnetism and Electronics<br>4: Physical Chemistry | 5: Mathematical and Computational Physics<br>6: Optics, Waves and Thermal Physics<br>7: Instrumentation and Labs<br>8: Applied Physics<br>9: Projects and Training |
| C | Course sequence in area  |  |

### Core courses

Description of the core courses are given below.

#### **1430100 Physics Orientation (1-0:1)**

**Prerequisite: None**

This course consists of a series of lectures on physics history, physical concepts, different fields of physics, physics-related careers, and the applied physics program and facilities at the University of Sharjah.

#### **1430110 Physics 1 for sciences (3-0:3)**

**Pre/Co-requisite: 1440131**

The course includes: Motion in 1 and 2 dimensions, vectors, particle dynamics and Newton's laws, work and energy, momentum and collisions, rotation of rigid bodies, fluid mechanics, heat and thermodynamics.

#### **1430116 Physics 1 Lab (0-3:1)**

**Pre/Co-requisite: 1430110 or 1430115**

This course consists of 10 experiments in mechanics, covering the topics in the Physics 1 course.

#### **1430117 Physics 2 (3-0:3)**

**Prerequisite: 1430110 or 1430115; Pre/Co-requisite: 1440131 or 01440133**

The course includes: Charge and matter; electric field; Gauss' law; electric potential; capacitors and dielectrics; current and resistance; electromotive force and circuits; magnetic field and forces; Ampere's law; Faraday's law of induction; introduction to Maxwell's equations.

#### **1430118 Physics 2 Lab (0-3:1)**

**Prerequisite: 1430116; Pre/Co-requisite: 1430117**

This course consists of 10 experiments in electricity and magnetism, covering topics in the Physics II course.

**1430201 Fundamentals of Astronomy & Space Science (3-0:3)**

**Prerequisite:** 1430110 or 1430115

The course discusses astronomy in general and space science in particular with emphasis on using physics to interpret the motions involved in the universe (planets, stars, and galaxies) as well as the tools and methods used to observe the sky.

**1430202 Celestial Mechanics (3-0:3)**

**Prerequisite:** 1430110 or 1430115

This course treats Newtonian gravitation – how it manifests itself, how to calculate its effect on a variety of objects (artificial and natural satellites, planets, and stars), and how to utilize passive or active radar data to predict the future locations and velocities of such objects. It discusses Newton's Laws of motion and law of gravitation as applied to system of particles; motion in the gravitation field with an especially full discussion of the two body problem; coordinates systems and time systems; data reduction; initial orbit determination; the differential correction of orbits, and perturbation theory. Astrophysical applications of classical gravitation to binary stars, clusters of stars, and clusters of galaxies.

**1430211 Physics 3 (3-0:3)**

**Prerequisite:** 1430117

The course includes: Rotation of rigid bodies, Dynamics of Rotational motion, Equilibrium and Elasticity, Periodic Motion, Fluid Mechanics, Mechanical Waves, Sound and Hearing, Thermal properties of Matter, introduction to the First and 2nd law of thermodynamics.

**1430212 Physics 3 Lab (3-0:3)**

**Prerequisite:** 1430118; **Pre/Co-requisite:** 1430211

This course consists of 5-8 selected experiments on the topics mentioned in the description of the theoretical part of physics 3.

**1430221 Classical Mechanics (3-0:3)**

**Prerequisite:** 1430110 or 1430115 and 1430251

The course includes: Newtonian mechanics of particles and systems, conservation laws, oscillations, Lagrangian mechanics, central force, motion in non-inertial frames, and motion of rigid bodies.

**1430241 Modern Physics (3-3:4)**

**Prerequisite:** 1430117 and 1430118

The course includes: Special theory of relativity and relativistic mechanics; photons; x-rays and the Compton effect; the Bohr model of hydrogen; de Broglie wavelength of matter and wave packet description of particles; Schrödinger wave equation in one dimension; energy quantization; the Spin and many-electron atoms; elements of nuclear physics and elementary particles. It also includes 12 experiments covering the topics above.

**1430251 Mathematical Methods of Physics 1 (3-0:3)**

**Prerequisite:** 1440131 or 1440133 and 1430110 or 1430115

The course includes: Infinite series, complex numbers, linear equations, vectors and vector analysis, matrices and matrix transformation, partial differentiation, multiple integrals, and vector spaces.

**1430252 Mathematical Methods of Physics 2 (3-0:3)**

**Prerequisite:** 1430251

The course includes: Tensor analysis, Calculus of variations, special functions, integral transforms, series solutions of differential equations, Partial Differential equations, complex variable theory.

**1430261                      Thermodynamics                      (3-0:3)**

**Prerequisite: 1430110 or 1430115**

The course includes: Entropy and the chemical potential, independent variables and state functions, basic energy concepts first and second laws of thermodynamics; ideal and real gases; thermodynamic properties; introductory cycle analysis.

**1430283                      Physics for Dentistry (0-3:1)                      (3-3:4)**

**Prerequisite: 1430107 or 1430111 and 1430110 or 1430115**

The course covers physics topics related to dental applications. These include biomechanics of the jaw, light and optics, atomic structure, spectra, radioactivity, x-rays (generation, safety and protection), bioelectricity, lasers, imaging, waves and ultrasound.

**1430301                      Astrophysics 1 (Stars)                      (3-0:3)**

**Prerequisite: 1430201**

Astrophysics is the application of physics to understand and interpret the art of observation and the measurement side of astronomy. This course ties astronomy to the different physics concepts that the student has experienced as a physics student. The main goal of this course is to help the students see that astrophysics is not just a high technology research branch, but as part of everyday living.

**1430302                      Astronomical Techniques                      (3-0:3)**

**Prerequisite: 1430201**

This course provides a comprehensive and accessible introduction to the whole of modern astrophysics beyond the solar system. It combines a critical account of observational methods (telescopes and instrumentation) with a clear description of the Universe, including stars, galaxies and cosmology. The course describes the techniques used by astronomers to observe the Universe: optical telescopes and instruments are discussed in detail, but observations at all wavelengths (from gamma rays to radio) are covered, and there are sections on cosmic rays, neutrinos and gravitation waves. After a short interlude describing the appearance of the sky at all wavelengths, the role of positional astronomy is highlighted. Students learn the quantitative aspects of the electromagnetic spectrum, atmospheric absorption, celestial coordinate systems, the motions of celestial objects, eclipses, calendar and time systems, telescopes in all wavebands, speckle interferometry and adaptive optics to overcome atmospheric jitter, astronomical detectors including CCDs, interferometry to improve angular resolution, radiation from point and extended sources, the determination of masses, temperatures, and distance of celestial objects. Moreover, a clear description is given to the contents of the Universe, including accounts of stellar evolution and cosmological models. In addition to all of this, students utilize methods for data reduction and statistical analysis.

**1430323                      Quantum Mechanics 1                      (3-0:3)**

**Prerequisites: 1430241 and 1430251**

The course includes: Schrodinger's equation; the correspondence principle; the uncertainty principle; 1- potentials; the harmonic oscillator; the hydrogen atom; elements of matrix mechanics; operators; angular momentum.

**1430324                      Quantum Mechanics 2                      (3-0:3)**

**Prerequisite: 1430323**

The course includes: Orbital angular momentum, radial wave function in three dimensions, eigenstates, commutation relations of the spin angular momentum operator, interaction of spin with angular momentum, behavior of electrons in a magnetic field, perturbation theory, approximation methods for time-dependent problems.

**1430331 Electricity and Magnetism 1 (3-0:3)**

**Prerequisite:** 1430117 and 1430251

The course includes: Electrostatics: Poisson's equation; energy in the electric field; electrostatics of materials; Magnetostatics: Vector potential; energy in the magnetic field; magneto-statics of materials; Faraday's law; inductance; solutions to the Laplace equation; Maxwell equations.

**1430332 Electricity and Magnetism 2 (2-0:0)**

**Prerequisite:** 1430331

The course includes: Electromagnetic induction, electromagnetic wave propagation, absorption and dispersion in conductors and dielectrics, EM wave transmission, potentials and fields, EM radiation.

**1430333 Electronics for Experimental Physics 1 (3-3:4)**

**Prerequisite:** 1430118

The course includes: Linear circuit theory; diodes and power supplies; transducers; analog integrated circuits: including filters and operational amplifiers; digital integrated circuits including: basic gates; combinational and sequential logic; storage elements; timing elements; arithmetic devices; digital-to-analog and analog-to-digital conversion. It also includes 12 experiments covering the topics mentioned above.

**1430353 Computational Physics (2-3:3)**

**Prerequisite:** Third Year Standing. **Prerequisite:** 1430241 and 141116

This course covers various techniques which use personal computers for physics including: numerical modeling and integration, processing of large data sets; experience in the use of statistical techniques to analyze data and to model physical events; the use of mathematical packages. Laboratory: hands-on experience in the use of PCs in solving physics problems.

**1430361 Modern Optics (3-0:3)**

**Prerequisite:** 1430211

The course includes: Physical optics with major emphasis on wave properties of light; boundary conditions; dispersion; optics of thin films; interference; diffraction; polarization; lasers; holography; Fourier analysis.

**1430362 Thermal Physics (3-0:3)**

**Prerequisite:** 1430211 and 1430241

The course includes: Equations of state; the first law of thermodynamics; heat engines and refrigerators; entropy and the second law of thermodynamics; phase equilibrium; kinetic theory; equipartition theory; transport phenomena; introduction to statistical mechanics including quantum statistics; applications to black body radiation, crystalline vibrations, magnetic ions in solids, electronic heat capacity of metals, phase transformations and chemical reactions.

**1430401 Astrophysics 2 (Galaxies and the Universe) (3-0:3)**

**Prerequisite:** 1430301

The course focuses on the physical properties of the planets to infer their origin and evolution. It first takes a comparative look at our current knowledge of the planets, especially our Earth, moon, as well as Mercury, Venus, and Mars. These planets show different degrees of evolution, with the Earth being the most evolved. The other planets – Jupiter, Saturn, Uranus, Neptune, and Pluto – have, in contrast, changed little since their birth. The course examines the composition and internal structure of the terrestrial planets and describes the major surface-shaping processes: planetary volcanism, impact cratering and wind processes. The atmosphere of the terrestrial planets is considered in detail, and this leads naturally to a discussion of the giant planets and why they are compositionally different from the planets of the inner Solar System. The course gives a fascinating description of the origin of

the Solar System and the evolution of the planets, and places our own planet Earth within the context of other, more distant worlds. Minor bodies, including comets, asteroids and Kuiper Belt objects, are described, and the course concludes with an examination of theories for the origin of the Solar System and the evidence that has come from meteorites.

### **1430433 Electronics for Experimental Physics 2 (3-0:3)**

#### **Prerequisite: 1430333**

The course includes: An introduction to the electronic theory of semiconductors, semiconductors in equilibrium, the ideal p-n junction, non-idealities, photo diodes, LEDs, semiconductor lasers, metal-semiconductor contacts, heterojunctions, JFET, MOST, small signal parameters, switching, and Thyristors.

### **1430441 Solid State Physics (3-0:3)**

#### **Pre-requisite: 1430323**

The course includes: An introduction to atomic structure and bonding in solids; reciprocal lattice and x-ray crystallography; phonons and crystal vibrations; phonons and thermal properties; classical free electron behavior of metals; energy bands in metals, semiconductors and insulators

### **1430442 Introduction to Radiation Physics and Dosimetry (3-0:3)**

#### **Prerequisite: 1430241**

The course includes: Radiation from accelerated charges; characteristics and quality of X-rays; attenuation of photon beams in matter; interactions of photons with matter; interaction of charged particle beams with matter; concepts of dosimetry; radiation spectrometry.

### **1430443 Nuclear Physics (3-0:3)**

#### **Prerequisite: 1430323**

The course includes: Basic properties and structure of atomic nuclei, introduction to nuclear models, nuclear reactions, decay and stability, the four-basic interaction - strong, electromagnetic, weak and gravitational, properties of - baryons, mesons, quarks, and leptons -, conservation laws, symmetries and broken symmetries, the standard model, experimental techniques.

### **1430471 Advanced Physics Lab (0-6:2)**

#### **Prerequisite: 1430333 and 1430241**

The course includes: Zeeman effect, UV spectroscopy, optical spectroscopy, ionizing radiation, crystal structure, gamma spectroscopy, elastic properties of materials, absolute radioactivity, thermal properties of materials, measuring blood speed by Doppler ultrasound, radiation Pollution.

### **1430481 Environmental Physics (3-0:3)**

#### **Prerequisite: 1430241**

The course includes: Relationship of physics to current environmental problems; energy production, comparison of sources and byproducts; nature of and possible solutions to problems of various pollutions particularly matter in atmosphere; radiation physics; the climate; spectroscopy and instrumentation.

### **1430482 Physics of Materials (3-0:3)**

#### **Prerequisite: 1430261 and 1430323**

The course includes: Advanced topics in elasticity, viscous flow, reaction kinetics, thermal properties, heat transfer, mechanical properties and optical properties of materials.



**1430483 Health Physics (3-0:3)**

**Prerequisite: 1430241**

The course includes: Sources of radiation, basic dosimetry and hazards of ionizing radiation. Techniques for detection, use and safe handling of radiation sources. Radiation safety codes laws and regulations.

**1430484 Introduction to Medical Imaging (2-3:3)**

**Prerequisite: 1430241**

The course includes: Fundamentals of image formation, analysis of the characteristics of medical images, parametric description of image quality, application to transmission of radiotherapy.

**1430485 Physics of Energy Resources (3-0:3)**

**Prerequisite: 1430241**

The course includes: Energy and environment; the economics of energy; traditional energy sources: fossil fuels; nuclear energy; sustainable and renewable energy; wind and solar power systems; hydroelectric and geothermal energy; energy storage and transportation.

**1430486 Photonics and Fiber Optics (3-0:3)**

**Prerequisite: 1430241 and 1430361**

The course includes: Models of light, optical fiber basics, optical fiber manufacture, incoherent light sources, laser light, light detectors, detector circuit and modulation, fiber optics transmitters and receivers, fiber optics telecommunications, interferometric fiber optic sensors.

**1430487 Radiation Biology (3-0:3)**

**Prerequisite: 1430241**

The course includes: Basic radiation physics, track structure, radiation chemistry, DNA damage and repair, cell survival curves, the 4R's of radiology, radiation therapy, radiation effects, radiation protection.

**1430488 Meteorology (3-0:3)**

**Prerequisite: 1430241 and 1430481**

The course includes: Fundamental concepts, earth and the atmosphere, warming the earth, daily and seasonal temperatures, atmospheric optics, atmospheric moisture, condensation, stability and cloud, precipitation, motion of the atmosphere, winds, air masses and fronts, cyclones, thunderstorms, tornadoes, hurricanes, air pollution, global climate and its changes, weather forecasting.

**1430489 Introduction to Spectroscopy (3-0:3)**

**Prerequisite: 1430361 and 1430323**

The course includes: Electromagnetic radiation and its interaction with atoms and molecules; experimental methods; molecular symmetry; rotational, vibrational and electronic spectroscopy; photoelectron and related spectroscopies; lasers and laser spectroscopy.

**1430491 Senior Project (0-6:3)**

**Prerequisite: Department consent**

Under the supervision of a faculty member, the student gets involved in a project, writes a report about a topic approved by the department, and defends it publicly.

## Petroleum Geosciences and Remote Sensing Program

### Vision

The program aims to be recognized in the region as one that provides highly qualified graduates who can address rapid technological change and the challenges that the future brings.

### Mission

The program is committed to graduate highly qualified professionals equipped with latest knowledge in Petroleum, Geosciences and remote sensing areas and skills who can contribute to the economic development of the United Arab Emirates and the region.

### Program Goals:

- 1) Provide students with the knowledge and skills necessary for a successful career in Petroleum Geosciences and remote sensing.
- 2) Equip students with skills of critical thinking, teamwork, leadership and communications, and encourage their use to solve complex problems in Petroleum Geosciences and remote sensing.
- 3) Prepare students to develop their knowledge using modern design tools and new technologies in sciences and learn through appropriate lifelong education processes.
- 4) Prepare students to be admitted to and succeed in graduate study in internationally-recognized universities.

### Program outcomes

Upon successful completion of the B.Sc. in Petroleum Geosciences and Remote Sensing program the student will have the ability to:

- a) Identify, formulate, and solve petroleum, geosciences and remote sensing problems.
- b) Apply fundamental principles and concepts of geosciences and remote sensing in theoretical and practical situations.
- c) Employ modern technologies and established IT skills to collect, interpret, and present geological data.
- d) Implement independent experiments under guidance using the appropriate research methodologies.
- e) Work effectively, responsibly and safely in an individual or team context.
- f) Communicate information concisely and accurately using written, visual, and verbal means appropriate to the situation.
- g) Actively engaging in professional development and life-long learning activities.
- h) Model geosciences related components to meet economic, environmental, social, political, ethical, health and safety needs.

### Career Opportunities

Graduates from the PGRS can expect to find employment opportunities in a wide range of roles mainly in the energy and extraction sectors. Geoscientists are in high demand in many oil and gas industries, mineral and water exploration, geo-imaging and remote sensing, natural risks management, environmental monitoring, forensic geosciences and archaeological excavation and preservation as well as research positions in industry and government laboratories. Problem-solving techniques learned in the petroleum geosciences curriculum create opportunities for continued educational pursuits and/or higher graduate study in geosciences. The main potential employers and probable outlets for Geoscientists in the UAE are:

- 1) National and international oil and gas companies such as ADNOC, ADMA and ADCO, ENOC, Dubai Oil and gas, ExxonMobil, Shell, BP, Total and Schlumberger.

- 2) Governmental agencies with activities related to soil, water, energy, and environment; such as Ministry of Environment and Water, Ministry of Energy, Abu Dhabi and other Environmental Agency as well as Municipalities in all the Emirates.
- 3) Academic and educational institutions.
- 4) Civil Engineering Bureaus, construction companies and cement and rock quarries industry at both the large and small scale.
- 5) Police authority in forensic laboratories.
- 6) Archaeological and Heritage Museums.

### Program Overview

The program is designed in accordance with the mission and vision of the University and the College of Science to meet the needs of the students, the community and the industry at large. The contents of the program are in line with or similar to many universities' undergraduate programs in USA and in Europe.

Quality and excellence in both the curriculum and instructional pedagogy are ensured by following the procedures listed in table below. A student undertaking this program should complete a total of 123 credit hours distributed as follows:

|                         | Compulsory | Support | Elective |      | Total |
|-------------------------|------------|---------|----------|------|-------|
| University Requirements | 15         | -       | 9        |      | 24    |
| College Requirements    | 15         | -       | -        |      | 15    |
| Department Requirements | 50         | 13      | Dep.     | Free | 84    |
|                         |            |         | 15       | 6    |       |
| Total                   | 80         | 13      | 30       |      | 123   |

**Course Numbering System:** Each course number consists of 7 digits that are grouped in 5 fields as follows:

| College No. |   | Dept. No. |   | Course level | Specialized field | Serial No. |
|-------------|---|-----------|---|--------------|-------------------|------------|
| 1           | 4 | 6         | 0 | X            | Y                 | Z          |

Specialized fields of knowledge in PESCRESE are numbered as follows:

| Digit | Field of Knowledge                   |
|-------|--------------------------------------|
| 1     | Petroleum                            |
| 2     | Geology                              |
| 3     | Remote Sensing                       |
| 0     | General [seminar, training, project] |

## I. University Requirements

The program requires students to take 24 credit hours, 18 of which are compulsory and the 6 are electives. Eight domains are covered:

- A. English Language
- B. Arabic Language
- C. Islamic Studies
- D. UAE Studies
- E. Innovation and Entrepreneurship
- F. Information Technology
- G. Humanities, Social and Arts
- H. Sciences and Technology

## II. College Requirements

The list of the College required courses and their descriptions are presented in the introductory pages of the College of Sciences section in this bulletin.

## III. Program Requirements

The program requirements consist of 84 credit hours of courses divided into four major sets as described below.

### A. Mandatory Core Courses

This set consists of 50 credit hours encompassing the courses listed below:

| Course # | Course Name   | CrHrs | Prerequisites          |
|----------|---|-------|------------------------|
| 1460120  | Physical Geology                                    | 3     | 1430117                |
| 1460220  | Sedimentary Rocks and Sedimentology                 | 3     | 1460120                |
| 1460221  | Stratigraphy and Structural Geology                 | 3     | 1460220                |
| 1460223  | General Geophysics                                  | 3     | 1460221                |
| 1460224  | Regional Geology                                    | 3     | 1460221, 1460310(P/Co) |
| 1460230  | Introduction to Geospatial Information System (GIS) | 3     | None                   |
| 1460231  | Introduction to Remote Sensing                      | 3     | 1460230                |
| 1460310  | Petrophysics  | 3     | 1460223, 1440241       |
| 1460311  | Petroleum Geology                                   | 3     | 1420101, 1460220       |
| 1460312  | Exploration Geophysics I                            | 3     | 1460223, 1440241       |

| Course # | Course Name                    | CrHrs | Prerequisites  |
|----------|--------------------------------|-------|--|
| 1460313  | Exploration Geophysics II      | 3     | 1460312  |
| 1460320  | Geologic Remote Sensing        | 3     | 1460231  |
| 1460322  | Seismology and Plate Tectonics | 3     | 1460223,<br>1440241  |
| 1460400  | Training                       | 1     | Senior Standing at level 4, standing the Approval of the Department. |
| 1460401  | Seminar                        | 1     | Senior Standing  |
| 1460402  | Graduation Project             | 3     | Department consent   |
| 1460413  | Reservoir Characterization     | 3     | 1460420  |
| 1460420  | Well Logging                   | 3     | 1460310  |

### B. Supportive Courses

This category includes 13 credit hours offered by other departments for the students as indicated in the table below:

| Course # | Course Name                      | CrHrs | Prerequisites             |
|----------|----------------------------------|-------|---------------------------|
| 0202207  | Technical Writing                | 3     | None                      |
| 1440132  | Calculus II                      | 3     | 1440131                   |
| 1430117  | Physics II                       | 3     | 1440131(P/Co),<br>1430110 |
| 1430118  | Physics II Lab                   | 1     | 1430116,<br>1430117(P/Co) |
| 1440241  | Ordinary Differential Equation I | 3     | 1440132                   |

### C. Elective Courses

These elective courses (15 credit hours) are to be chosen from a list of courses offered by the department. The support and core courses are the preparatory courses, which are designed to meet the breadth requirement in the program. After completing the preparatory courses, students are strongly encouraged to choose from alternative groupings of electives (referred to as “groups”) in different areas of PGRS to fulfill the depth requirement.

| Course # | Course Name                               | CrHrs | Prerequisites         |
|----------|---|-------|-----------------------|
| 1460222  | Paleontology                              | 3     | 1460220               |
| 1460225  | Igneous and Metamorphic Petrology         | 3     | 1460120, 1420101      |
| 1460300  | Special Topics I                          | 3     | Departmental approval |
| 1460301  | Special Topics II                         | 3     | Departmental approval |
| 1460314  | Petroleum Geology of the Middle East      | 3     | 1460224(P/Co)         |
| 1460324  | Hydrogeology                              | 3     | 1460220, 1460223      |
| 1460325  | Environmental Geology and Risk Management | 3     | 1460220 & 1460223     |
| 1460414  | Petroleum Geochemistry                    | 3     | 1460311               |
| 1460415  | Basin Analysis                            | 3     | 1460420, 1460221      |
| 1460421  | Seismic Stratigraphy                      | 3     | 1460221, 1460312      |
| 1460430  | Advanced Geographic Information System    | 3     | 1460231               |
| 1460431  | Environmental Remote Sensing              | 3     | 1460231               |
| 1460432  | Digital Image Processing                  | 3     | 1440132               |

#### D. General Free Elective Courses

Each student registered in the program is required to take 6 credits (2 courses) as general free elective courses. Such courses can be taken from the university's pool of courses at large upon the approval of the academic advisor. These courses are intended to broaden the knowledge of students by combining studies from the program with studies from other academic disciplines.

#### Study Plan

The Petroleum Geosciences and Remote Sensing program encompasses 123 credits hours that are spread over eight semesters and could be completed in four years. The following distribution of courses by semester facilitated students' normal progression through the study plan.

| Year 1, Semester 1 (16 Credits) |   |       |               |
|---------------------------------|---|-------|---------------|
| Course                          | Title   | CrHrs | Prerequisites |
| 0201102<br>0201105              | Arabic Language or Arabic for non-Arabic speakers | 3     | None          |
| 0202112                         | English for Academic Purposes                     | 3     | None          |
| 1460120                         | Physical Geology                                  | 3     | None          |
| 1430110                         | Physics I for Sciences                            | 3     | None          |
| 1430116                         | Physics I Lab                                     | 1     | 1430110       |
| 1440131                         | Calculus I  | 3     | None          |

| Year 1, Semester 2 (17 Credits) |                              |       |                                 |
|---------------------------------|------------------------------|-------|---------------------------------|
| Course                          | Title                        | CrHrs | Prerequisites                   |
| 1411100                         | Introduction to IT (English) | 3     | None                            |
| 1420101                         | General Chemistry I          | 3     | None                            |
| 1420102                         | General Chemistry I Lab      | 1     | 1420101 (P/Co)                  |
| 0202213                         | Short Fiction                | 3     | None                            |
| 1430117                         | Physics II                   | 3     | 1430117 (P/Co)                  |
| 1430118                         | Physics II Lab               | 1     | 1430118(P/Co),<br>1430211(P/Co) |
| 1440132                         | Calculus II                  | 3     | 1440131                         |

| Year 2, Semester 3 (16 Credits) |   |       |               |
|---------------------------------|---|-------|---------------|
| Course                          | Title   | CrHrs | Prerequisites |
| 1411116                         | Programming I                                       | 4     | None          |
| 1460220                         | Sedimentary Rocks and Sedimentology                 | 3     | 1460120       |
| 1460221                         | Stratigraphy and Structural Geology                 | 3     | 1460220       |
| 0104101                         | Islamic Culture                                     | 3     | None          |
| 1460230                         | Introduction to Geospatial Information System (GIS) | 3     | None          |

| Year 2, Semester 4 (15 Credits) |                                   |       |                           |
|---------------------------------|-----------------------------------|-------|---------------------------|
| Course                          | Title                             | CrHrs | Prerequisites             |
| 1440241                         | Ordinary Differential Equations I | 3     | 1440132                   |
| 1460223                         | General Geophysics                | 3     | 1460221                   |
| 1460231                         | Introduction to Remote Sensing    | 3     | 1460230                   |
| 1460224                         | Regional Geology                  | 3     | 1460221,<br>1460310(P/Co) |
| 1460xxx                         | Specialized Elective -1           | 3     |                           |

| Year 3, Semester 5 (15 Credits) |                          |       |                     |
|---------------------------------|--------------------------|-------|---------------------|
| Course                          | Title                    | CrHrs | Prerequisites       |
| 1460320                         | Geologic Remote Sensing  | 3     | 1460231             |
| 1460310                         | Petrophysics             | 3     | 1460223,<br>1440241 |
| 1460312                         | Exploration Geophysics I | 3     | 1460223,<br>1440241 |
| 1460xxx                         | Specialized Elective -2  | 3     |                     |
| 1460xxx                         | Specialized Elective -3  | 3     |                     |

| Year 3, Semester 6 (18 Credits) |                           |       |                     |
|---------------------------------|---------------------------|-------|---------------------|
| Course                          | Title                     | CrHrs | Prerequisites       |
| 1460313                         | Exploration Geophysics II | 3     | 1460312             |
| 1460311                         | Petroleum Geology         | 3     | 1420101,<br>1460220 |
| 1460xxx                         | Specialized Elective -4   | 3     |                     |
| 1460xxx                         | Specialized Elective -5   | 3     |                     |
|                                 | University Elective -1    | 3     |                     |
|                                 | General Free Elective -1  | 3     |                     |



| Year 4, Semester 7 (16 Credits) |                               |       |                     |
|---------------------------------|-------------------------------|-------|---------------------|
| Course                          | Title                         | CrHrs | Prerequisites       |
| 1460322                         | Seismology and Plate Tectonic | 3     | 1460223,<br>1440241 |
| 1460420                         | Well Logging                  | 3     | 1460310             |
| 1460401                         | Seminar                       | 1     | Senior Standing     |
|                                 | University Elective -2        | 3     |                     |
|                                 | University Elective -3        | 3     |                     |
|                                 | General Free Elective -2      | 3     |                     |

| Year 4, Semester 8 (10 Credits) |   |       |  |
|---------------------------------|---|-------|--|
| Course                          | Title   | CrHrs | Prerequisites  |
| 0302200                         | Fundamentals of Innovation and Entrepreneurship | 3     | None   |
| 1460402                         | Graduation Project                              | 3     | Department consent   |
| 1460413                         | Reservoir Characterization                      | 3     | 1460420  |
| 1460400                         | Training  | 1     | Senior Standing at level 4, standing the Approval of the Department. |

### Core courses

Description of the core courses are given below.

#### **1460120 Physical Geology (2-3:3)**

The course includes: Introduction to the fundamentals of physical geology. Composition and structure of the Earth, mineral and rock identification, plate tectonics, mountain building, geological structures, earthquakes, volcanism, erosion and sedimentation processes. Laboratory exercises concentrate on mineral and rock identification and the interpretation of topographic and geologic maps. At least one field trip to a nearby locality is required.

#### **1460220 Sedimentary Rocks and Sedimentology (3-0:3)**

The course includes: Elements of sedimentary basin formation, style of sedimentation, provenance, associated facies, and subsequent physicochemical changes through time. Plate tectonic, climatic, allo- and auto-cyclic constraints on sedimentary rocks. Emphasis on convergent and rifted margin sedimentary record. Usage of several macroscopically and microanalytically tools for detailed sedimentary basin analysis. Computer software is introduced for basin analysis and data interpretation. At least one field trip is required.

**1460221 Stratigraphy and Structural Geology (2-3:3)**

This course covers the principal laws of stratigraphy, facies, sea level changes, transgression, regression, sedimentation cyclic, correlation, mass extinction, sequence stratigraphy, surface and subsurface stratigraphy of the UAE. Principles of structural geology. Concepts of true and apparent dip of strata, folds, structural contours for homoclinal and complex surfaces, geological cross-sections, block diagrams, isopachs, faults, intrusive and extrusive igneous structures, impact structures, landslides and sinkholes. Laboratory exercises focus on the interpretation of geological maps and cross-sections and stereographic projection using Schmidt net. Computer software is used in directional data interpretation, manipulation, and diagram and graph construction. At least one field trip to a nearby locality is required.

**1460223 General Geophysics (2-3:3)**

The course includes: Introduction to applied and solid-earth geophysics; the gravitational, seismic, magnetic, thermal, and radioactive properties of rocks and earth materials; methods of measurement and their applications to the exploration of the Earth's interior. Physical properties of the earth's interior. Some field trips are required.

**1460224 Regional Geology (3-0:3)**

The course covers the major tectonic elements of the Arabian Peninsula, as well as the rocks and the sedimentary cover in Arabia peninsula. Geological, structural and geomorphological evolution of Arabia with emphasis on hydrocarbon potentials, mineral wealth and underground water resources. At least one field trip is required.

**1460230 Introduction to Geospatial Information Systems (GISs) (2-3:3)**

In this introductory course, students become familiar with the concepts and gain the experience necessary to appreciate the utility of Geographic Information Systems in decision making. Topics covered include the fundamentals of cartography, scale, projection, and coordinate systems in GIS, geo-referencing, data structures, querying, data classification, and basic spatial data analysis. The course provides an overview of the capabilities of GIS software and applications of GIS. Class time is divided between lectures and GIS exercises that reinforce critical concepts.

**1460231 Introduction to Remote Sensing (2-3:3)**

This course describes the fundamental theory and concept of remote sensing. The course presents an overview of the properties and capturing techniques of remote sensing data as generated by aerial photography, Landsat, Spot, radar imagery and thermal imagery. Basic principles include the basic characteristics of electromagnetic radiation; radiometry; the interactions between radiation and terrestrial materials and atmospheric constituents; characteristics of sensor systems and their measurements. The interactions between radiation and terrestrial materials (Vegetation, soil, water, and rocks) and atmospheric constituents, with incorporation of ancillary data and ground truth.

**1460310 Petrophysics (2-3:3)**

The different types of coring are covered in this course in addition to the handling and storage procedures of core samples. The course covers the methods of measuring the petrophysical characteristics of reservoir rocks such as porosity, permeability, density and resistivity.

**1460311 Petroleum Geology (2-3:3)**

The course includes the definition and properties of petroleum and natural gas. The origin, migration and accumulation of hydrocarbons as related to source, reservoir and seal rocks and reservoir properties. Structural, stratigraphic and combination traps are examined. Different exploration methods and the basin analysis are also introduced as a tool of understanding the course. Computer

software is introduced for basin analysis and data interpretation. At least one field trip is required to investigate the outcrop section of a major reservoir in Saudi Arabia

**1460312                      Exploration Geophysics I                      (2-3:3)**

The course covers the principles of the seismic reflection and refraction methods with special emphasis on the reflection techniques. It consists of two parts: an introduction to the data acquisition and processing; and the seismic interpretation. The course aims at delineating subsurface Geology including layer succession, types of structures, etc. Also, the course covers an introduction to the attributes as a tool, AVO, VSP and synthetic seismogram. Comparison with well logging data is included. In addition, the basis of the different stacking techniques is introduced.

**1460313                      Exploration Geophysics II                      (2-3:3)**

The course covers the theory and data acquisition and processing of the non-seismic methods, which include gravity, magnetic, electrical and electromagnetic. The role of these methods in the search for hydrocarbon, groundwater, minerals, as well as their civil and environmental applications, is examined. Survey execution, interpretation and data processing are also covered.

**1460320                      Geologic Remote Sensing                      (2-3:3)**

This course is an introduction to the theory and techniques of remote sensing tools with emphasis on the geosciences and geology. This course explores the use of remote sensing for integrated image interpretation and geological mapping to obtain lithological, stratigraphy and geological structure. It includes image processing techniques, interpretation and analysis that used for geological investigation. The integrated geological mapping approach re-interpreted in a GIS environment on the basis of aerial photographs, satellite imagery and airborne geophysical data. The laboratory work includes the data fusion and processing of satellite images with various spectral and geometric resolutions.

**1460322                      Seismology and Plate Tectonics                      (2-3:3)**

The course covers the dynamics of the solid Earth from theoretical, observational seismology and seismotectonics in relation to earthquake hazard and mitigation. It provides an in-depth study of earthquake seismology and earthquake hazard in relationship with the plate tectonics. The course includes understanding the plates' movements and the procedures of interpreting earthquake seismograms and determination of earthquake focal mechanisms. Examples of the UAE seismicity and the tectonic evolution of the Arabian Plate are given.

**1460400                      Training                      (1-0:1)**

On this course, students complete an eight-week internship in the industry to gain practical experience in the field of geology. Students are required to submit a written report and make an oral presentation at the department based on their experience of the training program.

**1460401                      Seminar                      (1-0:1)**

Preparation and presentation of selected topics. Each student is expected to submit a written report on his topic and make an oral presentation at the class.

**1460402                      Graduation Project                      (1-6:3)**

Topics will depend on student's and instructor's interest. They may vary from acquisition and interpretation of geophysical data from the field or the laboratory to computer models and simulation of theoretical problems of interest in geophysics, or a mixture of both. Weekly consultations with the instructor as well as a written report are required.

**1460413                      Reservoir Characterization                      (3-0:3)**

This course includes: Basic petrophysical properties of reservoir rocks including porosity, permeability, fluid saturation, electrical conductivity, capillary pressure, and relative permeability. Laboratory measurement of the reservoir rock characteristics mentioned above.

**1460420                      Well Logging                      (2-3:3)**

This course includes: Comprehensive study of modern well logging methods, open hole and cased hole log interpretation methods. Production logging. Design of logging programs and examples of applications.

**1460222                      Paleontology                      (3-0:3)**

This course covers the invertebrate fossils groups and their applications in stratigraphy and paleoecology. Special attention is given to their importance in the petroleum exploration in the United Arab Emirates. The course also includes the study of the fossils' characteristic morphology and microstructure and their role in the history of life on Earth.

**1460225                      Igneous and Metamorphic Petrology                      (3-0:3)**

This course includes: Nature, origin, differentiation and crystallization of magma. Phase relations in silicate melts. Mode of occurrence, textures, petrography and minerals of igneous rocks.

**1460300                      Special Topics I                      (3-0:3)**

The course covers a special topic in one of the fields of petroleum, Geology, Remote Sensing and related disciplines. Topics are selected according to the faculty expertise and the students' interest and enrollment.

**1460301                      Special Topics II                      (3-0:3)**

The course covers a special topic in one of the fields of petroleum, Geology, Remote Sensing and related disciplines. Topics are selected according to the faculty expertise and the students' interest and enrollment.

**1460314                      Petroleum Geology of the Middle East                      (3-0:3)**

This course gives an introductory overview of geographic and geomorphologic settings as well as geologic settings, and sequence stratigraphy. The History of hydrocarbon exploration is also given as well as the current status of oil in the Middle East.

**1460324                      Hydrogeology                      (2-3:3)**

In this course, students become familiar with the concepts of occurrence and movement of groundwater and gain knowledge of applications of ground water theories for practical use. Topics covered include the fundamentals of hydrological cycle, types and properties of geological formations holding ground water, theories of ground water movement, usage of flow nets, well hydraulics, analysis of pumping data, groundwater quality and pollution, field exploration and survey for ground water, and usage of computer software.

**1460325                      Environmental Geology and Risk Management                      (3-0:3)**

The course covers environmental problems, hazards and their mitigation. Critical evaluation of geological processes: volcanic activity, earthquakes, slope failures and landslides, flooding, groundwater movement, solution cavities and sinkholes. Environmental problems associated with human interaction: groundwater pollution, groundwater withdrawal, acid rain, solid waste disposal, land development and urbanization, agricultural activity, soil erosion, and desertification. Current environmental issues are examined. Selected case studies and computer software related to the subject are introduced. At least one field trip to a nearby locality is required.

**1460414                      Petroleum Geochemistry                      (3-0:3)**

The course's main goal is to provide the student with an overview of the petroleum industry: its history, its technical achievements, its role in the global-economy and its future prospects. An introduction to modern exploration, production and processing operations is included as well as an overview of the petrochemicals and petroleum industry.

**1460415                      Basin Analysis                      (3-0:3)**

The mystery of hydrocarbon accumulation in sedimentary basins is discussed with reference to worldwide and Arabian Gulf examples. The course examines the key elements of this mystery, including the formation and migration of accumulations.

**1460421                      Seismic Stratigraphy                      (3-0:3)**

This course covers the procedure of understanding stratigraphy by using seismic sections. It covers the key elements of seismic reflection patterns, amplitudes and frequencies essential to a specific basin stratigraphic and facies analysis that lead to oil and gas play definition. Also, the geological description and interpretation of seismic parameters within the seismic-sequence correlation framework are covered. The methods of analyzing depositional environment are examined with emphasis on carbonate environments, type of rocks, Sedimentary sequences, fluid content and contacts, palaeo-sea level change and the Geologic history.

**1460430                      Advanced Geographic Information Systems                      (2-3:3)**

The course deals with the design and operation of Geospatial Information Systems (GISs) and their role in digital mapping and spatial data management. Topics covered include basic data structure, data source and models, geospatial analysis, digital elevation data and terrain analysis. The Course includes an embedded computer lab for hands-on training with GIS software. It includes the use of GIS within oil and gas exploration and production activities using petroleum industry spatial data and workflows. It Introduce the functionality that allows geoscientists to import spatial and non-spatial databases, integrate, manage and analyze data to produce information for decision-making.

**1460431                      Environmental Remote Sensing                      (2-3:3)**

This course is designed to introduce students to remote sensing science and technology. It emphasizes mastering fundamental remote sensing concepts and utilizing remotely sensed data for environmental information extraction and problem solving. The course introduces the student to remote sensing basics for environmental Modeling and monitoring and its application in geoscience. The first part of the course covers the remote sensing and techniques to acquire, enhance, interpret and analyze remote sensing imagery using visual and computer-based methods. The second part of the course addresses the role and nature of Environmental Models. The third part deals with the application of remote sensing principles and data to environmental science. Topics include the use of remote sensing for environmental applications related to different studies of hazards monitoring, hydrology, air pollution, and land use/land cover.

**1460432                      Digital Image Processing                      (3-0:3)**

This course explores the major categories of digital image processing. Digital image fundamentals, perception, discrimination, and sampling. Image transforms using FFT Fourier Algorithm. Image rectification and restoration, image enhancement, filtering and multi-image manipulation, image encoding, image segmentation and description. Image classifications, typical steps in numerical analysis. Classification accuracy assessment and data merging training on a selected software such as Matlab.

## Department of Mathematics

### Personnel

|                             |  |
|-----------------------------|--|
| <b>Chairperson</b>          | Prof. Abdelaziz Soufyane   |
| <b>Professors</b>           | Bassem Attili, Khalil I.T. Al-Dosary, Ali Jaballah; Salim Messaoudi  |
| <b>Associate Professors</b> | Muhamad Islam, Hishyar Abullah, Mohamad Bataineh, Mahmoud Benkhalifa, Zahid Raza, Belkacem Said Houari, Mostafa Zahri, Firas Ghanim; Mohammed Al-Akhrass |
| <b>Assistant Professors</b> | -----  |
| <b>Lecturers:</b>           | Kholoud Mustafa, Nida Siddiqui   |

### Vision

The Department of Mathematics envisions itself to be a center of excellence in teaching mathematical sciences, community based-research, creative activities, and outreach services.

### Mission

The mission of the Department of Mathematics is to provide high quality education at the undergraduate level, and to prepare mathematics professionals to participate and contribute to their societies. It aspires to carry out the University of Sharjah's objective to instill in its students a desire to conduct independent research and a deep commitment to scientific thinking and continuous progress.

### Objectives

The Department of Mathematics seeks to provide quality education aimed at preparing high-caliber professionals capable of achieving success and contributing to the development of the country in line with an ever-changing world.

Graduates of the mathematics program will have the ability and desire to:

- 1) Use their mathematical background to implement innovative and effective solutions to real-life problems that they encounter in their professional careers.
- 2) Engage in lifelong learning and be intrinsically motivated to follow up or contribute to the latest research in all mathematics-related fields.
- 3) Contribute to society by joining professional and mathematical bodies, community task forces, and any other organization that benefits the community.
- 4) Work competently alone, as a team, and as leaders with strong ethical commitment.
- 5) Communicate their thoughts and suggestions effectively in written and oral forms.

### Program Outcomes

Graduates of the Bachelor of Science in Mathematics program will be able to:

- a) Apply a broad range of core mathematical knowledge and techniques, including advanced calculus, linear algebra, geometry, differential equations, probability and statistics.
- b) Apply scientific experiments and research methods to continuously build on existing knowledge with modern and innovative ideas.
- c) Utilize mathematical knowledge and IT skills to design, implement and enhance computer programs.

- d) Function on multidisciplinary teams.
- e) Analyze statistical data to identify and solve applied scientific problems
- f) Understand professional and ethical responsibility
- g) Communicate mathematical knowledge directly and indirectly with precision, clarity and organization.
- h) Formulate mathematical models to solve real-life problems in a contemporary global and societal context.
- i) Utilize modern techniques and skills obtained to achieve pre-determined goals and improve overall performance in a professional set-up.

### Career Opportunities

Graduates of the Department of Mathematics will be prepared to pursue graduate studies and early researcher career paths in myriad educational fields as well as careers in governmental and non-governmental organizations such as the Ministry of Education, the Census and Information Bureau, electricity and water companies, petroleum companies, financial and banking institutions, insurance companies, the Meteorology Department and many more.

### Program Overview

Established in 2007, the Department of Mathematics provides students at the University of Sharjah with the opportunity to learn fundamental scientific and mathematical concepts in an atmosphere that is friendly, conducive to learning and encourages intellectual curiosity, exploration and independent thinking, and high ethics.

The Department offers a wide array of courses in pure and applied mathematics for all types of learners. More adventurous students can study advanced courses in mathematics and its applications.

Faculty members are active professionals in the fields they teach. All are graduates of prestigious universities and are active in research and self-development. The faculty, through their dedication to teaching and guidance, help students develop meaningful and lasting bonds with science and mathematics, while providing invaluable skills for leading more interesting and productive lives.

A student undertaking the BS program in Mathematics should complete a total of 123 credit hours distributed as follows:

| BSc in Mathematics        |    |    |    |       |
|---------------------------|----|----|----|-------|
|                           | UR | CR | PR | Total |
| Mandatory Core Credits    | 15 | 15 | 45 | 75    |
| Mandatory Support Credits | -  | -  | 12 | 12    |
| Elective Core Courses     | 9  | -  | 21 | 30    |
| Elective Support Credits  | -  | -  | 6  | 6     |
| Total                     | 24 | 15 | 84 | 123   |

## I. University Requirements

The program requires students to take 24 credit hours, 18 of which are compulsory and the 6 are electives. Eight domains are covered:

- A. English Language
- B. Arabic Language
- C. Islamic Studies
- D. UAE Studies
- E. Innovation and Entrepreneurship
- F. Information Technology
- G. Humanities, Social and Arts
- H. Sciences and Technology

## II. College Requirements

The list of the 15 credit hours College required courses and their descriptions are presented in the introductory pages of the College of Sciences section in this bulletin.

## III. Program Requirements

### A. Mandatory Core Courses

The Department of Mathematics core courses (45 credit hours) are listed below:

| Course # | Course Title                               | CrHrs | Prerequisites       |
|----------|--|-------|---------------------|
| 1440132  | Calculus II                                | 3     | 1440131             |
| 1440211  | Linear Algebra I                           | 3     | 1440131             |
| 1440231  | Calculus III                               | 3     | 1440132             |
| 1440232  | Vector Calculus                            | 3     | 1440231             |
| 1440233  | Foundations of Mathematics                 | 3     | 1440131             |
| 1440241  | Ordinary Differential Equations I          | 3     | 1440132             |
| 1440251  | Geometry                                   | 3     | 1440233;<br>1440233 |
| 1440281  | Introduction to Probability and Statistics | 3     | 1440131             |
| 1440311  | Abstract Algebra I                         | 3     | 1440233             |
| 1440331  | Real Analysis I                            | 3     | 1440132;<br>1440233 |
| 1440332  | Complex Analysis                           | 3     | 1440231;<br>1440331 |
| 1440371  | Numerical Analysis I                       | 3     | 1440132;<br>1440211 |



| Course # | Course Title            | CrHrs | Prerequisites                        |
|----------|-------------------------|-------|--------------------------------------|
| 1440372  | Operations Research I   | 3     | 1440211                              |
| 1440381  | Mathematical Statistics | 3     | 1440281                              |
| 1440461  | Training Course         | 0     | 1440281 and at least 70 Credit Hours |
| 1440492  | Graduation Project      | 3     | Senior Standing                      |

### B. Mandatory Support Courses

All Mathematics major students are required to take the following four courses (12 credits) of mandatory computer science courses.

| Course # | Title                                       | CrHrs | Prerequisites |
|----------|---|-------|---------------|
| 1411211  | Programming II                              | 3     | 1411116       |
| 1411215  | Data Structures                             | 3     | 1411211       |
| 1411246  | Object Oriented Design with Java            | 3     | 1411211       |
| 1411263  | Introduction to Database Management Systems | 3     | 1411116       |

### C. Elective Courses

The program includes 27 credit hours of elective courses chosen from various categories; 21 credits are Mathematics core electives and 6 credits of Computer Science courses.

#### Elective Core Courses

The following courses are offered by the Mathematics Department as electives although all may not be available in a particular semester. Additional courses may be developed in the future, based on changes in the discipline and demand.

| Course # | Course Title                   | CrHrs | Prerequisites       |
|----------|--------------------------------|-------|---------------------|
| 1440235  | Mathematical Software          | 3     | 1440211             |
| 1440312  | Linear Algebra II              | 3     | 1440211             |
| 1440313  | Number Theory                  | 3     | 1440132;<br>1440233 |
| 1440341  | Partial Differential Equations | 3     | 1440231,<br>1440241 |
| 1440373  | Graph Theory                   | 3     | 1440211             |
| 1440411  | Abstract Algebra II            | 3     | 1440311             |
| 1440431  | Real Analysis II               | 3     | 1440331             |

| Course # | Course Title                       | CrHrs | Prerequisites        |
|----------|------------------------------------|-------|----------------------|
| 1440441  | Ordinary Differential Equations II | 3     | 1440341;<br>1440331  |
| 1440451  | Topology                           | 3     | 1440331              |
| 1440471  | Numerical Analysis II              | 3     | 1440371              |
| 1440472  | Operations Research II             | 3     | 1440372              |
| 1440481  | Stochastic Processes               | 3     | 1440381              |
| 1440491  | Selected Topics in Mathematics     | 3     | Department's Consent |

### Elective Support Courses

The required six-credit electives encompass two Computer Science courses selected from the following list:

| Course # | Course Title                        | CrHrs | Prerequisites |
|----------|-------------------------------------|-------|---------------|
| 1411319  | Programming Languages and Paradigms | 3     | 1411215       |
| 1411352  | Operating Systems                   | 3     | 1411215       |
| 1411365  | Database Design and Implementation  | 3     | 1411263       |
| 1411366  | Software Engineering                | 3     | 1411215       |
| 1411440  | Introduction to Computer Graphics   | 3     | 1411215       |

### Study Plan

The BS program in Mathematics encompasses 123 credits hours that are spread over eight semesters and could be completed in four years. The following distribution of courses by semester facilitates students' normal progression through the study plan.

| Year I, Semester 1 (16 Credits) |                    |       |               |
|---------------------------------|--------------------|-------|---------------|
| Course #                        | Title              | CrHrs | Prerequisites |
| 0201102<br>or<br>0201105        | Arabic Language    | 3     | None          |
| 1410100                         | Introduction to IT | 3     | None          |
| 1430111                         | Physics I          | 3     | None          |
| 1430112                         | Physics I LAB      | 1     | 1430111       |

| Year I, Semester 1 (16 Credits) |   |   |      |
|---------------------------------|---|---|------|
| 1440131                         | Calculus I                                      | 3 | None |
| 0302200                         | Fundamentals of innovation and Entrepreneurship | 3 | None |

| Year 1, Semester 2 (17 Credits) |                               |       |               |
|---------------------------------|-------------------------------|-------|---------------|
| Course #                        | Title                         | CrHrs | Prerequisites |
| 0202105                         | English for Academic Purposes | 3     | None          |
| 1411116                         | Programming I                 | 4     | None          |
| 1420101                         | Chemistry I                   | 3     | None          |
| 1420102                         | Chemistry I LAB               | 1     | 1420101       |
| 1440132                         | Calculus II                   | 3     | 1440131       |
| 1440211                         | Linear Algebra I              | 3     | 1440131       |

| Year 2, Semester 3 (15 Credits) |                        |       |               |
|---------------------------------|------------------------|-------|---------------|
| Course                          | Title                  | CrHrs | Prerequisites |
| 0104100                         | Islamic Culture I      | 3     | None          |
| 1411211                         | Programming II         | 3     | 1411116       |
| 1440231                         | Calculus III           | 3     | 1440132       |
| 1440233                         | Found. of Mathematics  | 3     | 1440131       |
| 1440281                         | Intro. To Prob.& Stat. | 3     | 1440131       |

| Year 2, Semester 4 (15 Credits) |                         |       |               |
|---------------------------------|-------------------------|-------|---------------|
| Course #                        | Title                   | CrHrs | Prerequisites |
| 1411215                         | Data Structures         | 3     | 1411211       |
| 1440232                         | Vector Calculus         | 3     | 1440231       |
| 1440241                         | Ord. Diff. Equation     | 3     | 1440132       |
| 1411xxx                         | Dept. Support Elect. I  | 3     |               |
|                                 | University Elective (1) | 3     |               |

| Year 3, Semester 5 (15 Credits) |                                  |       |                     |
|---------------------------------|----------------------------------|-------|---------------------|
| Course #                        | Title                            | CrHrs | Prerequisites       |
| 1411246                         | Object Oriented Design with Java | 3     | 1411211             |
| 1440251                         | Geometry                         | 3     | 1440233             |
| 1440311                         | Abstract Algebra I               | 3     | 1440233             |
| 1440371                         | Numerical Analysis I             | 3     | 1440132;<br>1440211 |
|                                 | University Elective (2)          | 3     |                     |

| Year 3, Semester 6 (15 Credits) |                          |       |                                   |
|---------------------------------|--------------------------|-------|-----------------------------------|
| Course #                        | Title                    | CrHrs | Prerequisites                     |
| 1440381                         | Mathematical Statistics  | 3     | 1440281                           |
| 1440332                         | Complex Analysis         | 3     | 1440231                           |
| 1411xxx                         | Dept. Support Elect. (2) | 3     |                                   |
| 1440xxx                         | Dept. Core Elect. I      | 3     |                                   |
|                                 | University Elect. (3)    | 3     |                                   |
| 1440461                         | Training Course          | 0     | 1440281<br>Completing<br>70 CrHrs |

| Year 4, Semester 7 (15 Credits) |                          |       |               |
|---------------------------------|--------------------------|-------|---------------|
| Course #                        | Title                    | CrHrs | Prerequisites |
| 1411263                         | Introduction to Database | 3     | 1411211       |
| 1440372                         | Operations Research I    | 3     | 1440211       |
| 1440xxx                         | Dept. Core Elect. (2)    | 3     |               |
| 1441xxx                         | Dept. Core Elect (3)     | 3     |               |
|                                 | Depart. Core Elect. (4)  | 3     |               |

| Year 4, Semester 8 (15 Credits) |                       |       |                     |
|---------------------------------|-----------------------|-------|---------------------|
| Course #                        | Title                 | CrHrs | Prerequisites       |
| 1440331                         | Real Analysis I       | 3     | 1440132;<br>1440233 |
| 1440492                         | Graduation Project    | 3     | Senior Standing     |
| 1440xxx                         | Dept. Core Elect. (5) | 3     |                     |
| 1440xxx                         | Dept. Core Elect. (6) | 3     |                     |
| 1440xxx                         | Dept. Core Elect. (7) | 3     |                     |

### Courses Description

Courses in the proposed program that are offered in the Department of Mathematics start with (1440). The program of study contains courses that are offered by other departments as well as from outside the College. Consistent with the University policies, mathematics courses in the program will be assigned numbers of the form (1440ABC) where:

|   |  |   |
|---|--|---|
| A | Year (level)   |   |
| B | Areas (as follows):<br>1: Algebra<br>3: Calculus and Analysis<br>4: Differential Equations | 5: Geometry<br>7: Applied Mathematics<br>8: Statistics<br>9: Projects and Selected Topics |
| C | Course sequence in area  |   |

### 1440098 Remedial Math 3-0:3

#### Prerequisite: None

The course includes: Real numbers, equations, inequalities, functions and their graphs, inverse functions, linear and quadratic functions, polynomial and rational functions, exponential and logarithmic functions, and trigonometry.

### 1440098 Pre-Calculus 3-0:3

#### Prerequisite: None

The course includes: Real numbers, equations, inequalities, functions and their graphs, inverse functions, linear and quadratic functions, polynomial and rational functions, exponential and logarithmic functions, and trigonometry.

### 1440100 Mathematics for Business 3-0:3

#### Prerequisite: None

The course includes: Linear and Non-linear functions and applications. Differentiation and application. Integration and application.

**1440131                      Calculus I                      3-0:3**

**Prerequisite: None**

The course includes: Functions, domain and range, examples of functions. Limits and continuity. Derivatives, applications of derivatives in optimization, linearization and graphing, the Mean Value Theorem. Integration, the Fundamental Theorem of Calculus, areas, volumes of solids of revolution, arc length. Conic sections.

**1440132                      Calculus II                      3-0:3**

**Prerequisite: 1440131**

The course includes: Functions, Inverse functions. Transcendental functions. L'Hopital's rule. Techniques of integration. Improper integrals. Sequence and infinite series of real numbers. Polar coordinates. Parametric curves in the plane.

**1440133                      Calculus I for Engineering                      3-0:3**

**Prerequisite: 1440098**

The course includes: Limits and continuity. Derivatives, applications of derivatives in optimization, linearization and graphing, the Mean Value Theorem. Integration, the Fundamental Theorem of Calculus, areas, volumes of solids of revolution, arc length. Conic sections.

**1440135                      Calculus for Pharmacy                      3-0:3**

**Prerequisite: None**

The course includes: Methods of differentiation; Graphing functions using first and second derivatives; Solving optimization problems; Partial differentiation; Integration methods and their application; Solving simple differential equations with applications.

**1440136                      Statistics for Pharmacy                      3-0:3**

**Prerequisite: 1440135**

The course includes: Descriptive statistics; Axiomatic probability; Random variables and their moments; Binomial Distribution and Normal Distribution; Sampling distributions; Estimation and Confidence Intervals; Hypotheses testing.

**1440151                      Analytic Geometry                      3-0:3**

**Prerequisite: None**

The course includes: Cartesian and parametric equations of curves (including lines) in plane and in space; and surfaces (including planes) in space. Conic sections and hyperbolic functions (Cartesian and Parametric Forms). Quadric surfaces (Cartesian and Parametric Forms). Cylindrical and Spherical Coordinates Systems. Level curves of scalar valued functions of two variables and level surfaces of scalar valued function of three variables. Introductory optimization, linear programming, Simplex method.

**1440161                      Calculus II for Engineers                      3-0:3**

**Prerequisite: 1440133**

The course includes: Techniques of integration; Improper integrals; Graphing in polar coordinates; Vectors and analytic geometry in space; Functions of several variables; Extreme values and saddle points; Double integrals in rectangular and polar coordinates; Triple integrals in rectangular coordinates.

**1440162 Business Mathematics 3-0:3**

**Prerequisite: 1440100**

The course includes: Linear equations, systems of linear equations, matrix algebra, determinants and applications to demand and supply functions. Financial mathematics. Functions of several variables.

**1440163 Calculus I for Health Science 3-0:3**

**Prerequisite: None**

The course includes: Preliminaries. Limits and continuity. Differentiation. Applications of derivatives. Integration. Applications of integrals.

**1440181 Statistics for Science 3-0:3**

**Prerequisite: None**

The objective of this course is to introduce the students to different statistical concepts including data collection, sampling methods, types of data, descriptive statistics (graphical and numerical), probability, random variables (discrete and continuous), sampling distribution, statistical inference, regression and ANOVA.

**1440182 Statistics for Science Lab 1-3:1**

**Prerequisite: None**

The course offers an introduction to SPSS. On this course, students generate frequency tables and produce summaries of data with SPSS, use the Binomial and Normal distributions to solve real life problems with SPSS, make graphs using the Normal distribution and find percentiles with SPSS, make statistical Inferences with application in real life problems with SPSS.

**1440211 Linear Algebra I 3-0:3**

**Prerequisite: 1440131**

The course includes: Systems of linear equations, Gauss and Gauss-Jordan elimination processes. Matrix algebra, determinants, Cramer's rule. Vector spaces, subspaces, basis and dimension, rank, change of basis. Characteristic polynomial, eigenvalues and eigenvectors of square matrices, diagonalization. Inner product spaces, orthogonal projections, Gram-Schmidt process. Computer applications. Introduction to linear transformation.

**1440231 Calculus III 3-0:3**

**Prerequisite: 1440131, 1440132**

The course includes: Vectors and analytic geometry in space. Graphing surfaces in three dimensions. Vector-valued functions and motion in space. Functions of several variables. Extreme values and Lagrange multipliers. Multiple integrals. Areas and volumes.

**1440232 Vector Calculus 3-0:3**

**Prerequisite: 1440231**

The course includes: Integration in vector fields. Line integrals, circulation and flux, path independence and conservative fields. Green's Theorem in the plane. Surface area and surface integrals. Parameterized surfaces. Stoke's and Divergence Theorems. Curvilinear coordinates. Transformation of coordinates. Introduction to Cartesian tensors.

**1440233 Foundations of Mathematics 3-0:3**

**Prerequisite: 1440131**

The course includes: Logic, propositional logic, truth tables, propositional formulas, logical implication and equivalence, tautologies and contradictions, quantifiers. Methods of proof. Sets, applications of sets, Venn diagrams, Cartesian product, the power set. Cardinality. Mathematical Induction. Relations and partitions, functions. Zorn's Lemma and Axiom of Choice.

**1440235 Mathematical Software 3-0:0**

**Prerequisite: 1440211**

This course is an introduction to the necessary software used for scientific programming such as MATLAB and MATHEMATICA or Maple. It is designed for science and engineering students. The main concern is the learning of advanced techniques for solving and graphing basic problems of Calculus and Linear algebra. Moreover, this course focuses on advanced scientific writing using LATEX packages.

**1440241 Ordinary Differential Equations I 3-0:3**

**Prerequisite: 1440132**

This course covers first and higher order ordinary differential equations (ODE) with applications in various fields. It covers the following: Basic concepts. First order ODE's, initial value problems, an existence and uniqueness theorem. Higher order ode's with constant coefficients. Laplace transform and inverse. Power series solutions, Frobenius theorem. Introduction to Linear systems of ODE's.

**1440251 Geometry 3-0:3**

**Prerequisite: 1440233**

The course includes: The axiomatic Systems, Finite geometry. Finite Projective Plane, Non-Euclidean geometry. Hyperbolic geometry (Sensed Parallels, Asymptotic Triangles. Saccheri Quadrilaterals, Area of Triangles, Ultraparallels, Transformations of the Euclidean Plane.

**1440261 Differential Equations for Engineers 3-0:3**

**Prerequisite: 1440161**

This course covers first and higher order ordinary differential equations with applications in various fields. It contains: Basic concepts. First order ode's, initial value problems, an existence and uniqueness theorem. Higher order ode's with constant coefficients. Laplace transform and its inverse. Power series solutions, Frobenius theorem.

**1440262 Mathematics for Engineers 3-0:3**

**Prerequisite: 1440161**

The course includes: Topics from linear algebra: Matrix multiplication; Linear systems; Gaussian elimination; Determinants; Cramer's rule; Inverse of a matrix. Infinite sequences and limits; Infinite series: Convergence tests; Power series; Taylor and Maclaurin series. Complex analysis: Complex numbers; Analytic functions; Cauchy-Riemann equations; Line integral; Laurent series; Singularities and zeros; Residue integration theorem.

**1440264 Business Statistics 3-0:3**

**Prerequisite: 1440162**

This course provides the basic statistical concepts and methods common in business applications. The goal is to help the students gain an understanding of how to use, communicate and interpret statistics. The knowledge and skills students acquire will help them in other business courses and in their business career. In this course, the students learn the basic descriptive statistical methods, probability rules and sampling distributions and how to draw inference about a population mean.

**1440265 Statistics for Sociology 3-0:3**

**Prerequisite: None**

This course covers the basic statistical concepts and methods common in applied social sciences. The goal is to help the students gain an understanding of how to use, communicate and interpret



statistics. In this course, the students learn the basic descriptive statistical methods, probability rules and sampling distributions, how to draw inference about a population mean and linear regression.

**1440281 Introduction to Probability and Statistics 3-0:3**

**Prerequisite: 1440131**

The course includes: Descriptive statistics; Axiomatic probability; Random variables and their moments; Special discrete and continuous distributions; Sampling distributions; Estimation; Hypothesis testing; Linear regression; Analysis of variance.

**1440381 Mathematical Statistics 3-0:3**

**Prerequisite: 1440281**

The course includes: Review of basic concepts of probability, random variables and distribution theory. Distribution of functions of random variables. Expectation and moment generating functions. Unbiased and Sufficient estimators. Point estimation, optimal properties of estimators. Interval estimation. Hypotheses testing.

**1440311 Abstract Algebra I 3-0:3**

**Prerequisite: 1440233**

The course includes: Groups. Subgroups. Quotient groups and homomorphisms. Introduction to rings and fields. Ideals. Ring homomorphisms and quotient rings. Applications.

**1440312 Linear Algebra II 3-0:3**

**Prerequisites: 1440211 and 1440233**

The course includes: Linear transformations. Change of basis, transition matrix and similarity. Nilpotent linear transformations and matrices. Canonical representation of matrices, Jordan canonical forms. Linear functionals and the dual space. Bilinear forms. Quadratic forms and real symmetric bilinear forms. Complex inner product spaces. Normal operators. Unitary operators. The spectral theorem.

**1440313 Number Theory 3-0:3**

**Prerequisites: 1440132 and 1440233**

The course includes: Divisibility. Prime numbers. Euclidean algorithm. Linear congruences. The Chinese remainder theorem. Fermat's little theorem. Wilson's theorem. Euler's theorem. Quadratic residues and reciprocity laws. Diophantine equations. Fermat's last theorem. Applications to cryptology and primality tests. Other possible applications.

**1440331 Real Analysis I 3-0:3**

**Prerequisites: 1440132 and 1440233**

The course includes: Sequences and Cauchy sequences of real numbers. Topology of the real line. The Bolzano-Weierstrass theorem. The Heine-Borel theorem. Limits, continuity, uniform continuity and differentiability of real-valued functions. The Mean Value Theorem. L'Hopital's rule. The Riemann integral.

**1440332 Complex Analysis 3-0:3**

**Prerequisite: 1440231; 1440331**

The course includes: Complex numbers; Analytic functions; Derivatives; Differentiation; Cauchy-Riemann equations; Polar coordinates; Harmonic functions; Elementary functions; Integrals; Complex-valued functions; Antiderivatives; Cauchy-Goursat theorem; Cauchy-integral formulas; Morera's theorem; Liouville's theorem; Fundamental Theorem of algebra; Series; Taylor and Laurent series; Power series, Integration and differentiation of power series; Residues and poles.

**1440341 Partial Differential Equations 3-0:3**

**Prerequisite: 1440241**

The course includes: First order partial differential equations, the method of characteristics. Classification of second order pde's: parabolic, elliptic, and hyperbolic. The canonical form. Boundary value problems with applications to physical sciences and engineering. Detailed analysis of the wave, heat and Laplace equations; Separation of variables. Application of Fourier theory.

**1440371 Numerical Analysis I 3-0:3**

**Prerequisites: 1440132; 1440211**

The course includes: Error analysis. Roots of nonlinear equations: bisection, fixed point, secant and Newton's methods. Systems of linear equations: direct methods, iterative methods. Systems of nonlinear equations: Newton's method. Interpolation: Lagrange, Newton's formulas, Gaussian quadrature. Approximation theory: orthogonal polynomials (Legendre, Laguerre, Chebychev, Hermite), Gram-Schmidt process, LS approximation. Numerical differentiation and integration: trapezoidal, Simpson, Newton-Cotes formulas.

**1440372 Operations Research I 3-0:3**

**Prerequisites: 1440211, 1440231**

The course includes: Linear Programming. The simplex method, duality, sensitivity analysis, various versions of the simplex method. Transportation models. Network models. Nonlinear programming. Constrained and unconstrained optimization, KKT conditions.

**1440373 Graph Theory 3-0:3**

**Prerequisite: 1440211**

The course includes: Introduction to graphs. Representation of graphs. Graph isomorphism, connectivity. Euler and Hamilton paths. Shortest path problems. Planarity, graph coloring. Trees, tree traversal, sorting, spanning trees, matching. Networks, max flow.

**1440411 Abstract Algebra II 3-0:3**

**Prerequisite: 1440311**

The course includes: Unique factorization domains. Modules and sub-modules. Field extensions. Finite Fields. Introduction to Galois theory. Applications.

**1440431 Real Analysis II 3-0:3**

**Prerequisite: 1440331**

The course includes: The Riemann-Stieltjes integral and functions of bounded variation. Metric spaces. Pointwise and uniform convergence of sequences of functions in metric spaces. Completeness of the space  $C(X,Y)$  of continuous functions. Pointwise and uniform convergence of infinite series of real-valued functions.

**1440441 Ordinary Differential Equations II 3-0:3**

**Prerequisites: 1440241 and 1440331**

The course includes: Existence and uniqueness of solutions. Some fixed point theorems. Matrix analysis of differential equations. Second order differential equations in phase plane. Lyapunov functions. Stability of equilibria. Qualitative theory. Autonomous systems in one and two dimensions. Phase portraits, stability. Sturm-Liouville theory: eigenvalues and eigenfunctions.

**1440451 Topology 3-0:3**

**Prerequisite: 1440331**

The course includes: Topological spaces. Open and closed sets. Bases and sub-bases. Interior, exterior and boundary points. The closure of a set. Continuous functions. Homeomorphisms. Product spaces.

Axioms of countability and separability. Compact spaces. Connected spaces. Metric spaces.

**1440461                      Training Course                      0-0:0**

**Prerequisite: 1440281 and at least 70 Credit Hours**

This course aims to provide students with practical training. The training Program provides students with the knowledge, skills, abilities and opportunities required for success in their studies and workplace.

**1440471                      Numerical Analysis II                      3-0:3**

**Prerequisite: 1440371**

The course includes: Numerical solution of ordinary differential equations. One-step methods: Euler, Taylor, Runge-Kutta. Multistep methods. The eigenvalue problem: power and inverse power methods. Numerical solution of boundary value problems: finite difference and shooting methods. Numerical solution of partial differential equations: Difference methods

**1440472                      Operations Research II                      3-0:3**

**Prerequisite: 1440372**

The course includes: Dynamic programming. Integer programming. Inventory models. Introduction to Game Theory. Queuing theory. Simulation models. Markov chains. Nonlinear programming algorithms: unconstrained optimization, constrained optimization.

**1440481                      Stochastic Processes                      3-0:3**

**Prerequisite: 1440381**

The course includes: Revision of probability. Bernoulli processes and sum of independent random variables. Poisson processes. Markov chains and their application to queuing theory and branching process. Markov processes. Renewal process.

**1440491                      Selected Topics in Mathematics                      3-0:3**

**Prerequisite: Completion of 70 Credit Hours.**

The course covers some selected advanced topics in a chosen field of mathematics, which adds an additional knowledge to students. The Topic depends on the interest of the instructor and those of the senior interested students.

**1440492                      Graduation Project                      3-0:3**

**Prerequisite: Senior Student (more than 94 Credit hours)**

Students should choose a topic for investigation in the first week. Then an independent research should be conducted using library facilities, the internet, etc. Understanding of the topic should be proven through the writing of the project and an oral presentation of the project through a seminar.

## Department of Applied Biology

### Personnel

|                             |   |
|-----------------------------|---|
| <b>Chairperson</b>          | Kareem Mosa   |
| <b>Professors</b>           | Ismail Saadoun, Ali El-Keblawy, Ihsan Ali Mahasneh                                    |
| <b>Associate Professors</b> | Hassen Hadj Kacem, Mona Rushdi Hassuneh, Abdelaziz Tlili                              |
| <b>Assistant Professors</b> | Amir Ali Khan, Kareem Mosa, Khalid Bajou, Mohamed Nasir Khan, Abdullah Fahd Al Mutery |
| <b>Academic Visiting</b>    | -   |
| <b>Lecturers</b>            | Ban Al-Joubori, Racha Al-Khoury, Uzma Inayat, Islam Mohamed, Tasneem Ahmed Obeid      |

### Vision

The Department of Applied Biology is committed to enhancing its standing as a national and international leader in biotechnology education, research and service delivery with an emphasis on serving the needs of the United Arab Emirates.

### Mission

The mission of the Department of Applied Biology is to provide a high-quality education to both undergraduate and graduate students. A significant aspect of this mission is to prepare students to be life sciences professionals, allowing them to participate and contribute to the development of society. The Department strives to increase scientific literacy in the general public through its service courses and community service activities for the benefit of the UAE and the region.

### Objectives

The bachelor degree in the Biotechnology Program has the following goals:

1. Prepare for careers in academia, government, industry and health related fields for the benefit of the community.
2. Reach levels of technical knowledge and professional gain necessary for career advancement and assume leadership positions in biotechnology professions.
3. Pursue scientific inquiry and lifelong learning opportunities that will further their careers and impact on society.

### Program Outcomes

Upon successful completion of the BS program in Biotechnology, graduates will:

- a) Design, conduct experiments, test hypotheses, analyze and interpret data in biotechnology areas.
- b) Apply knowledge of mathematics and core sciences in biotechnology
- c) Identify and solve technical as well as scientific problems in biotechnology
- d) Have knowledge of modern laboratory equipment and techniques to conduct experiments to solve contemporary issues in biotechnology
- e) Effectively communicate verbally and in writing
- f) Apply the techniques, skills, and modern scientific and technical tools necessary for biotechnology practice

- g) Understand professional and ethical responsibility related to biotechnology
- h) Work individually or in a team to develop effective workplace relationships
- i) Formulate or design a scientific process in biotechnology to meet the desired needs
- j) Acquire a broad education necessary to understand the impact of biotechnological solutions in a global and societal context
- k) Recognize the need for and ability to engage in life-long learning in biotechnology

### Career Opportunities

- 1) Graduates from the Biotechnology program have many opportunities to be employed in various positions such as:
  - 1) Lab specialists in food processing and manufacturing, pharmaceuticals, medical pathology and diagnostics, reproductive biology industries, plant biotechnology and a range of veterinary and agricultural supporting industries.
  - 2) Forensic, medical and quality control laboratory specialists for conducting DNA analysis related to criminal investigations and diagnosis of microbial and genetic diseases.
  - 3) Environmental consultants assessing and monitoring environmental contamination, developing landfill sites, implementing environmental bioremediation programs, working with environmental agencies, and supporting food and microbiology labs
  - 4) Scientific journalists and media presenters writing articles and helping preparing broadcast programs to communicate the importance of scientific development to the public.
  - 5) Sales representative/marketing professional providing advice about special scientific products to clients in research, and solving specific problems related to equipment applications and experimental procedures.
  - 6) Laboratory supervisors in academic institutions (schools or universities) or research centers and laboratories.
  - 7) Teachers or teaching assistant in private and public schools.

### Program Overview

To obtain a Bachelor of Science degree in Biotechnology, the student must complete a total of 124 credit hours. These hours span University requirements (UR), College requirements (CR) and program requirements (PR). The allocation of the credit hours is shown in the following table:

| <b>BSc in Biotechnology (Total Credit Hours: 124 Credits)</b> |    |    |    |       |
|---|----|----|----|-------|
|   | UR | CR | PR | Total |
| Mandatory Credits   | 15 | 15 | 70 | 100   |
| Electives Credits   | 9  | -  | 15 | 24    |
| Total   | 24 | 15 | 85 | 124   |

## I. University Requirements

The program requires students to take 24 credit hours, 18 of which are compulsory and the 6 are electives. Eight domains are covered:

- A. English Language
- B. Arabic Language
- C. Islamic Studies
- D. UAE Studies
- E. Innovation and Entrepreneurship
- F. Information Technology
- G. Humanities, Social and Arts
- H. Sciences and Technology

## II. College Requirements

The list of the 15 credit hours College required courses and their descriptions are presented in the introductory pages of the College of Sciences section in this bulletin. Students of the program study the courses 1430107 Physics for Health Sciences instead of the course 1430110 Physics I for Sciences, and the course Calculus for Health Science 1440163 instead of the course 1440130 Calculus I for Sciences.

## III. Program Requirements

a)

### A. Mandatory Courses

The mandatory core courses offered by the Biotechnology program encompasses the 56 credits listed in the table below.

| Course # | Course Title              | CrHrs | Prerequisites       |
|----------|---------------------------|-------|---------------------|
| 1450101  | General Biology 1         | 3     | -                   |
| 1450102  | General Biology 2         | 3     | 1450101             |
| 1450107  | General Biology Lab       | 1     | Pre/Co: 1450101     |
| 1450201  | Basic Biotechnology       | 2     | 1450102             |
| 1450251  | Cell Biology              | 3     | 1450102             |
| 1450301  | Bio-informatics           | 2     | 1411100;<br>1411116 |
| 1450331  | General Microbiology      | 3     | 1450251             |
| 1450332  | General Microbiology Lab. | 1     | Pre/Co: 1450331     |
| 1450333  | Immunology and Serology   | 3     | 1450251             |

| Course #   | Course Title                            | CrHrs | Prerequisites       |
|--|---|-------|---------------------|
| 1450336  | Immunology and Serology Lab.            | 1     | Pre/Co: 1450333     |
| 1450361  | Tissue Culture and Animal Biotechnology | 2     | 1450332;<br>1450333 |
| 1450341  | Molecular Genetics                      | 3     | 1450251             |
| 1450342  | Molecular Genetics Lab                  | 1     | Pre/Co: 1450341     |
| 1450351  | Biochemistry                            | 3     | 1426217,<br>1450251 |
| 1450352  | Biochemistry Lab                        | 1     | Pre/Co: 1450351     |
| 1450399  | Field Training                          | 3     | Note 1              |
| 1450421  | Plant Biotechnology                     | 3     | 1450201             |
| 1450431  | Microbial and Process Biotechnology     | 3     | 1450201;145033<br>1 |
| 1450436  | Environmental Biotechnology             | 3     | 1450201;145033<br>1 |
| 1450441  | Molecular Human Genetics                | 3     | 1450341             |
| 1450451  | Molecular Biology                       | 3     | 1450341             |
| 1450452  | Molecular Biology Lab                   | 1     | Pre/Co: 1450451     |
| 1450491  | Seminar                                 | 1     | 1450451 or cor      |
| 1450493  | Research Graduation Project             | 3     | Note 2              |
| 1450496  | Ethical Aspects of Biotechnology        | 1     | 1450201             |
| Note 1: Completion of 65 credits + 1450361 + 1450352 |   |       |                     |
| Note 2: Completion 99 credits                        |   |       |                     |

Other mandatory courses offered by other departments consists of the 14 credits listed below.

| Course # | Title                        | CrHrs | Prerequisites      |
|----------|------------------------------|-------|--------------------|
| 0202121  | English for Medical Sciences | 3     |                    |
| 0504252  | Biostatistics                | 3     |                    |
| 1426217  | Organic Chemistry (HS)       | 4     | 1426155            |
| 1420225  | Analytical Chemistry         | 3     | 1426155            |
| 1420226  | Analytical Chemistry Lab     | 1     | Pre/Co:<br>1420225 |

### B. Technical Elective

Students in the Bachelor of Science program in Biotechnology are required to study 15 credit hours of department elective courses selected with the help of their academic advisor from two groups to best meet their needs and aspirations. The two groups to choose from are:

**Group A.** Students are encouraged to take a minimum of 11 credit hours from this group

| Course #                           | Title                                 | CrHrs | Prerequisites                      |
|------------------------------------|---------------------------------------|-------|------------------------------------|
| 1450311                            | Introduction to Forensic Sciences     | 3     | 1450102;<br>1420155                |
| 1450334                            | Microbial Genetics                    | 3     | 1450332;<br>1450341                |
| 1450391                            | Scientific Writing and Presentation   | 1     | 0202104 or<br>0202112 ;<br>1450201 |
| 1450437                            | Pharmaceutical Biotechnology          | 3     | 1450201                            |
| 1450453                            | Protein Biochemistry and Engineering  | 3     | 1450351                            |
| 1450454                            | Molecular Developmental Biology       | 3     | 1450451                            |
| 1450455                            | Biotechnology in Medicine             | 3     | 01450341                           |
| 1450492<br>A                       | Selected Topics in Biotechnology<br>A | 3     | Note 1                             |
| 1450492<br>B                       | Selected Topics in Biotechnology<br>B | 2     | Note 1                             |
| 1450492<br>C                       | Selected Topics in Biotechnology<br>C | 1     | Note 1                             |
| Note 1: Completion 99 credit hours |                                       |       |                                    |



**Group B.** Students are encouraged to take one course of 4 credit hours from this group.

| Course #                  | Title                | CrHrs | Prerequisites |
|---------------------------|----------------------|-------|---------------|
| 0501253                   | Medical Microbiology | 4     | 0500150*      |
| 0501254                   | Histology            | 3     | 0500150*      |
| 0501258                   | Molecular Genetics   | 4     | 0500150*      |
| 0501359                   | Clinical Chemistry I | 4     | 0501260*      |
| 0501370                   | Hematology I         | 4     | 0500160*      |
| 0501463                   | Medical Virology     | 2     | 0501253*      |
| *or departmental Approval |                      |       |               |

### Study Plan

The BS program in Biotechnology encompasses 124 credits hours that are spread over eight semesters and could be completed in four years. The following distribution of courses by semester facilitates students' normal progression through the study plan

| Year I, Semester 1 (17 Credits) |  |       |                 |
|---------------------------------|--|-------|-----------------|
| Course #                        | Title  | CrHrs | Prerequisites   |
| 0104100                         | Islamic Culture I  | 3     |                 |
| 0201102<br>0201105              | Arabic language or Arabic language for non-Arabic Speakers | 3     |                 |
| 0202112                         | English for Academic Purposes                              | 3     |                 |
| 1450101                         | General Biology I  | 3     |                 |
| 1450107                         | General Biology Lab  | 1     | Pre/Co: 1450101 |
| 1426155                         | General Chemistry (HS)                                     | 4     |                 |

| Year 1, Semester 2 (16 Credits) |                              |       |               |
|---------------------------------|------------------------------|-------|---------------|
| Course #                        | Title                        | CrHrs | Prerequisites |
| 1410100                         | Introduction to IT (English) | 3     |               |
| 1430107                         | General Physics for HS       | 4     |               |
| 1450102                         | General Biology II           | 3     | 1450101       |
| 1440163                         | Calculus for Health Sciences | 3     |               |
|                                 | University Elective (1)      | 3     |               |

| Year 2, Semester 3 (16 Credits) |   |       |               |
|---------------------------------|---|-------|---------------|
| Course #                        | Title   | CrHrs | Prerequisites |
| 1411116                         | Programming I                                   | 4     |               |
| 1426217                         | Organic Chemistry (HS)                          | 4     | 1426155       |
| 1450201                         | Basic Biotechnology                             | 2     | 1450102       |
| 0504252                         | Biostatistics                                   | 3     |               |
| 0302200                         | Fundamentals of Innovation and Entrepreneurship | 3     | -             |

| Year 2, Semester 4 (16 Credits) |                                |       |                 |
|---------------------------------|--------------------------------|-------|-----------------|
| Course #                        | Title                          | CrHrs | Prerequisites   |
| 0202121                         | English for Medical Sciences 1 | 3     |                 |
| 1420225                         | Analytical Chemistry (HS)      | 3     | 1426155         |
| 1420226                         | Analytical Chemistry Lab (HS)  | 1     | Pre/Co: 1420225 |
| 1450251                         | Cell Biology                   | 3     | 1450102         |
|                                 | University Elective (2)        | 3     |                 |
|                                 | University Elective (3)        | 3     |                 |

| Year 3, Semester 5 (15 Credits) |                             |       |                 |
|---------------------------------|-----------------------------|-------|-----------------|
| Course                          | Title                       | CrHrs | Prerequisites   |
| 1450331                         | General Microbiology        | 3     | 1450251         |
| 1450332                         | General Microbiology Lab    | 1     | Pre/Co: 1450331 |
| 1450333                         | Immunology and Serology     | 3     | 1450251         |
| 1450336                         | Immunology and Serology Lab | 1     | Pre/Co: 1450333 |
| 1450341                         | Molecular Genetics          | 3     | 1450251         |
| 1450342                         | Molecular Genetics Lab      | 1     | Pre/Co: 1450341 |
|                                 | Program Elective (1)        | 3     |                 |

| Year 3, Semester 6 (14 Credits) |   |       |                     |
|---------------------------------|---|-------|---------------------|
| Course #                        | Title                                   | CrHrs | Prerequisites       |
| 1450351                         | General Biochemistry                    | 3     | 1426217;1450251     |
| 1450352                         | General Biochemistry Lab                | 1     | Pre/Co: 1450351     |
| 1450361                         | Tissue Culture and Animal Biotechnology | 2     | 1450332;<br>1450333 |
| 1450301                         | Bioinformatics                          | 2     | 1411100;<br>1411116 |
|                                 | Program Elective (2)                    | 3     | -                   |
|                                 | Program Elective (3)                    | 3     | -                   |

| Year 3, Summer Semester (3 Credits) |                |       |   |
|-------------------------------------|----------------|-------|---|
| Course #                            | Title          | CrHrs | Prerequisites                           |
| 1450399                             | Field Training | 3     | Completing 65 CrHrs;<br>1450352;1450361 |

| Year 4, Semester 7 (13 Credits) |  |       |                     |
|---------------------------------|--|-------|---------------------|
| Course                          | Title                                  | CrHrs | Prerequisites       |
| 1450431                         | Microbial Processing and Biotechnology | 3     | 1450201;<br>1450331 |
| 1450436                         | Environmental Biotechnology            | 3     | 1450201;<br>1450331 |
| 1450451                         | Molecular Biology                      | 3     | 1450341             |
| 1450452                         | Molecular Biology Lab                  | 1     | Pre/Co: 1450451     |
|                                 | Program Elective (4)                   | 3     |                     |

| Year 4, Semester 8 (14 Credits) |                                  |       |                        |
|---------------------------------|----------------------------------|-------|------------------------|
| Course                          | Title                            | CrHrs | Prerequisites          |
| 1450421                         | Plant Biotechnology              | 3     | 1450201                |
| 1450441                         | Molecular Human Genetics         | 3     | 1450341                |
| 1450491                         | Seminar                          | 1     | Pre/Co:<br>1450451     |
| 1450493                         | Research Project                 | 3     | Completing 99<br>CrHrs |
| 1450496                         | Ethical Aspects of Biotechnology | 1     | 1450201                |
|                                 | Program Elective (5)             | 3     |                        |

### Course Description

Courses that are offered in the Biotechnology program start with (1450). The program of study contains courses that are offered by other Science departments as well as from outside the college. Consistent with the university policies, Biotechnology courses in the program are assigned numbers of the form (1450ABC) where:

|   |   |   |
|---|---|---|
| A | Year (level)  |   |
| B | Areas (as follows)<br><br>0: General, Introductory, Biology and Chemistry<br><br>1: Forensic<br><br>2: Plant and Agriculture<br><br>3: Microbiology, Immunology and Serology<br><br>4: Genetics | 5: Cell Biology, Biochemistry and Molecular Biology<br><br>6: Animal<br><br>9: Projects, Seminars, Selected Topics and Training |
| C | Course Sequence in area   |   |

## Core Courses

Descriptions of the core courses are given below.

### **1450101                      General Biology I                      3-0:3**

#### **Prerequisite: None**

This course includes topics concerned with cell biochemistry, structure, function, respiration and photosynthesis. The cell cycle (its control and the division of animal and plant cells) is discussed. Classical and molecular genetics are emphasized. In addition, animal and plant tissues are introduced.

### **1450102                      General Biology II                      3-0:3**

#### **Pre-requisite: 1450101**

This course includes topics concerned with the molecular basis of life and selected physiological systems of the human body. The course investigates genes and proteins, the regulation of gene expression, the genetics of bacteria and viruses and offers an introduction to biotechnology. Selected physiological systems of the human body are addressed such as human nutrition, circulation, and gas exchange and immune system.

### **1450107                      General Biology Lab                      0-3:1**

#### **Prerequisite: 1450101 or concurrently**

Experiments involve the use of the microscope; hence, its detailed parts and functions are examined. The chemical and physical characteristics of macromolecules are illustrated. The structure and composition of plant and animal cells are covered along with respiration, cell division, and genetics. Animal tissues in addition to human anatomy are studied.

### **1450201                      Basic Biotechnology                      2-0:2**

#### **Pre-requisite: 1450102**

This course discusses the fundamental aspects of biotechnology and its importance to mankind, offering a concise and lucid explanation of this newly-founded science. The course emphasizes how cell structure and function is a vital starting point for knowledge of genetic engineering and gene technology. Lectures examine the underlying principles of Recombinant DNA technology and its application in the industrial, agricultural, pharmaceutical, and biomedical fields. Lectures also discuss the fermentation systems for commercial production of useful products and their purification. Students practice on all of these technologies in the lab sessions.

### **1450251                      Cell Biology                      3-0:3**

#### **Prerequisite: 1450102**

The course describes the fundamental aspects of cell biology. Introduction to cells covers cell chemistry and cell macromolecules. Cell structure and functions include cell organelles, cytoskeleton, and membrane transport across membranes, intracellular compartments and cellular aspects of cancer.

**1450301                      Bio-informatics                      2-3:3**

**Prerequisite: 1411100; 1411116**

This course introduces students to some of the most commonly used software packages for genetic analysis of nucleic acid, protein sequences and designing primers for PCR. In addition, the class explores and explains some of the computational biology tools found on the Internet and how they can be applied to problems in genomic and molecular biology

**1450331                      General Microbiology                      3-0:3**

**Prerequisite: 1450251**

The course includes: An introduction to the microbial world. Diversity of prokaryotes, their development, structure and function. Prokaryotic metabolism, nutrition, growth and methods of control. Microbial genetics and control. Fundamental principles of the interrelationships of microorganisms and man, and their role in the environment.

**1450332                      General Microbiology Lab                      0-3:1**

**Prerequisite: Pre/Co 1450331**

The laboratory is set up to familiarize students with the techniques used to grow and identify microorganisms. The first section of the semester covers the basic safety and handling procedures inside the microbiology laboratory, and the techniques of bacterial staining and the use of microscopy. The second section covers the media-related aspects, recognition and differentiation of microbial characteristics in culture. The next section is devoted for the effect of several physical parameters on microbial growth. Microbial identification based on metabolic differences is also covered extensively using a number of tests. The students' ability to identify an unknown bacterial culture using the above information is then tested. In the last section of the course, students are introduced to the concept of indicator microorganisms, the coliforms.

**1450333                      Immunology and Serology                      3-0:3**

**Prerequisite: 1450251**

The course describes the fundamental aspects of immunology. Antigen and antigenicity. Antibody structure, function and diversity. Cell and organs of immune system. Humoral and cellular immune response. Complement and phagocytosis. Immunity against infectious pathogens and tumors. Immunodeficiency and AIDS, hypersensitivity, autoimmunity and transplantation.

**1450336                      Immunology and Serology Lab                      0-3:1**

**Prerequisite: Pre/Co 1450333**

This course is designed to provide the appropriate laboratory exposure necessary to prepare the student to function at the career-entry skill level in the immunology laboratory. The first section of this course is devoted to solution preparations and experimental animal handling and immunization. Next, students investigate some elements of innate immunity. The study of the formation, characteristics and reactions of antigens and antibodies is covered extensively during this course along with their serological applications (agglutination, flocculation and precipitation reactions). The last section focuses on the use of electrophoresis in immunology.

**1450341                      Molecular Genetics                      3-0:3**

**Prerequisite: 1450251**

This course aims to introduce students to the fundamental principles and mechanisms of heredity and variation. Topics include: Mendelian and non-Mendelian inheritance, the basic principle of heredity, its chromosomal basis, molecular mechanisms of mutation, DNA repair, recombination, cytogenetics, viral genetics, bacterial and fungal genetics, quantitative and population genetics. The use of prokaryotic and eukaryotic organism models for genetic analysis is emphasized.

**1450344                      Molecular Genetics Lab                      0-3:1**

**Prerequisite: Pre/Co: 1450341**

This course is an introduction to many areas of modern genetics and emphasizes the principles of genetics in each of 4 main areas: transmission, cytogenetics, quantitative and molecular genetics. The course begins by introducing students to the concepts and the statistical laws commonly used in genetics. The key section of this course focuses on studying how genes are transmitted between generations and what the laws governing their transmission are. All genetic investigations on the course make use of the fruit fly, *Drosophila melanogaster*. Some sections of this course arm students with experience in preparing karyotype slides. Moreover, bacterial mutagenesis are covered extensively in this course. The last section is devoted to molecular genetics, where students are asked to extract and characterize different types of genetic material

**1450351                      General Biochemistry                      3-0:3**

**Prerequisite: 1426217; 1450251**

The course is designed to provide an understanding of the structure of the chemical components of living matter. Topics covered include: chemical principles of biologic systems; chemical and physical properties of nucleotides, amino acids, proteins and water; protein structure and stability; introduction to steady-state kinetics; enzyme mechanism; controlling enzyme activity; metabolic circuitry; glucose transport and metabolism; pyruvate metabolism; the TCA cycle; electron flow and oxidative phosphorylation; glycogen metabolism; gluconeogenesis and the pentose shunt; fatty acid catabolism and synthesis; disposal of nitrogen: the urea cycle; amino acid catabolism and synthesis; integrating metabolism: fed and fasted states and exercise.

**1450352                      General Biochemistry Lab                      0-3:1**

**Prerequisite: Pre/Co: 1450351**

The aim of the laboratory course is to provide an introduction to general laboratory techniques in biochemistry with a focus on the experimental basis for theoretical training in biochemistry. The course deals with principles and practices of biochemistry, chromatography and electrophoresis for investigations of metabolites, proteins, polysaccharides; application of enzymes for quantitative determinations by spectroscopic methods; introductory experiments with protein purification and kinetics of enzyme action.

**1450361 Tissue Culture and Animal Biotechnology 1-3:2**

**Prerequisite: 1450332; 1450333**

The course is designed to study the basic principles of animal tissue culture. The topics include: types of culture, biology of cell culture, culture media and their preparation, disaggregation of tissues, maintenance of culture, methods of cell separation, culture of specific cell types and specialized techniques in tissue culture. The course will also introduce the student to basic hybridoma technology concepts and monoclonal antibodies production techniques. Good laboratory practices and good manufacturing practices are also discussed.

**1450399 Field Training 0-9:3**

**Prerequisite: Completion of 65 credit hours + 1450361 + 1450352**

The department contacts certain private and public sector institutions in order to make a schedule for training in specialized areas, such as: hospitals, forensic labs, food industries, environment labs control, private and governmental labs and research labs. The duration of such training is 6 weeks. A faculty member is assigned to the students, visits them while training and arranges lectures and seminars for them. After that the student writes a report in which he describes the basic skills learned during that period.

**1450421 Plant Biotechnology 2-3:3**

**Prerequisite: 1450201**

This class is designed to provide students with up-to-date ways to develop higher-yielding and more nutritious crop varieties, to improve resistance to disease, or to reduce the need for inputs of fertilizers and other expensive agrochemicals.

**1450421 Microbial Processing and Biotechnology 2-3:3**

**Prerequisite: 1450201; 140331**

This course includes the following topics: Principles and practices of microbiology in industry, substrate for industrial fermentation, methods of fermentation, and product recovery of organic feed-stocks produced by fermentation, large scale cultivation and commercial exploitation of industrial microorganisms to produce organic acids, amino acids, enzymes, vitamins, antibiotics and single cell protein.

**1450436 Environmental Biotechnology 2-3:3**

**Prerequisite: 1450201, 1450331**

The aim of this course is to provide an understanding of the specific application of metabolic capability and molecular biology of microorganisms for exploitation of many areas of biotechnology to reverse and prevent environmental problems. Topics include: Environmental monitoring, Sewage treatment, pollution control of domestic, agricultural and industrial wastes, bioremediation and clean technology, energy and biofuels, and mineral resource recovery

**1450441 Molecular Human Genetics 3-0:3**

**Prerequisite: 1450341**

The course covers topics in human genetics such as: Human genetic diseases, Mapping the human genome; The molecular analysis of single gene disorders; the genetic analysis of complex diseases; Gene therapy, Gene testing; The human genome project; Human population genetics and evolution; DNA fingerprinting; Human genetics and society.



**1450451                      Molecular Biology                      3-0:3**

**Prerequisite: 1450341**

This lecture course deals with the molecular nature of gens and genomes and analysis of the biochemical processes (homologous recombination, transcription, RNA splicing, and translation) involved in expression and regulation of prokaryotic and eukaryotic genes.

**1450452                      Molecular Biology Lab                      0-3:1**

**Prerequisite: Pre/Co 1450451**

This course provides students with a 'hands on' introduction to modern molecular biology techniques. Students learn about bacterial transformation and plasmid DNA purification, restriction digest and gel electrophoresis, gene transfer and expression, isolation of DNA and RNA from eukaryotic cells, Southern hybridization, reverse transcription, and polymerase chain reaction (PCR and RT-PCR), and cloning DNA fragments.

**1450491                      Seminar                      1-0:1**

**Pre-requisite: Pre/Co 1450451**

The student should consult his supervisor and agree with him on a breaking news topic in biotechnology to be presented in an established form of scientific report.

**1450493                      Research Project                      0-9:3**

**Prerequisite: Completion of 99 credit hours**

A well-defined problem is assigned to the student in order to carry out experimental work to be presented in an established form of scientific report.

**1450496                      Ethical Aspects of Biotechnology                      1-0:1**

**Prerequisite: 1450201**

This course focuses on discussing what is morally right or wrong in the practice of biotechnology. Because the applications of modern biotechnology impinge upon some of the most fundamental of human situations – our health, food and environment – they raise serious questions in our minds. Focus is on topics such as medical biotechnology: moral, religious, legislative and public perspectives in regards to human cloning; public acceptance of biotechnology and cultural aspects of food and the use of transgenic animals and plants; considering the ethical aspects of agricultural biotechnology in relation to the environment.

**Supportive Courses**

**0202121                      English for Medical Sciences 1                      3-0:3**

**Prerequisite: 0202112**

This course focuses on academic reading and writing skills, including extensive work in reading comprehension and retention. Students practice identifying topics, determining the main idea of a text, recognizing the supporting deals of a paragraph, recognizing authors' writing patterns, and understanding new vocabulary through context clues. Emphasis is given to the rhetorical structure of cause and effect.

**0504252                      Biostatistics                      3-0:3**

**Prerequisite: None**

This course provides students with an understanding of the principles of biostatistics as related to biological sciences. It helps students to understand the nature of data, data sources, methods of data presentation, sampling distributions, data transformations, statistical inference, correlation and regression analyses. It also gives the student an idea about the concept of hypothesis testing and tests of significance.

**1426217                      Organic Chemistry for HS                      3-3:4**

**Prerequisite: 1426155**

The course includes: Chemistry of saturated hydrocarbons, unsaturated, and aromatic compounds; alcohols, phenols, ethers, and thiols; aldehydes and ketones; carboxylic acids and esters; amines and amides; and a brief introduction to biochemistry are covered. Experiments on qualitative and qualitative general chemistry, various organic synthesis, purification and separation techniques also introduced

**1420225                      Analytical Chemistry for HS                      3-0:3**

**Prerequisite: 1426155**

The course includes: Calculations used in Analytical Chemistry; Chemical equilibrium; Treatment of errors; gravimetric and volumetric techniques; acid/base; precipitation; complex formation; redox titrations; and introduction to electrochemistry will be covered.

**1420226                      Analytical Chemistry Lab for HS                      0-3:1**

**Prerequisite: Pre/Co 1426225**

Experiments on qualitative and quantitative aspects of major topics of the course are covered.

**Elective Courses**

The technical elective courses consist of two groups, 16 credit hours of courses offered by the Biotechnology program and 12 credit hours taken from courses offered in other departments. Those course are described below.

**Program Electives – Group A (10 Credit hours)**

**1450311                      Introduction to Forensic Science                      3-0:3**

**Prerequisite: 1426155; 1450102**

This course introduces the basic principles and relationships between the applications of chemistry, biology, and physics to forensic science as they relate to the criminal investigative process. The course is designed to give students insight into the many areas of forensic science and to study the newest techniques used by forensic laboratories. Topics discussed include organic and inorganic chemical analyses of physical evidence, principles of serology and DNA analysis, identification of fresh and decomposed human remains, ballistics, fingerprint analysis, facial reconstruction, drug analysis, and forensic entomology.

**1450334                      Microbial Genetics                      2-3:3**

**Prerequisite: 1450332; 1450341**

This course covers the following topics: Cell growth, reproduction and differentiation. Classical genetics of bacteria and microorganisms. DNA structure and replication, genetic recombination, transformation, transduction and transposition. Linkage and mapping in prokaryotes and viruses.

Gene structure and expression, gene transfer systems, cloning and expression systems, proteolytic systems and bacteriophages.

**1450391                      Scientific Writing and Presentation                      1-0:1**

**Prerequisite:** 0202104 or 0202112 ; 1450201

This class outlines the basic requirements for science essay and technical report writing and covers the tools of writing references, using examples. Students are taught how to write a CV and a job application letter.

**1450437                      Pharmaceutical Biotechnology                      3-0:3**

**Prerequisite:** 1450201

The aim of this course is to provide an understanding of the specific application of metabolic capability and molecular biology of microorganisms for exploitation in many areas of biotechnology with the aim of reversing or preventing environmental problems. Topics cover: Environmental monitoring, Sewage treatment, pollution control of domestic, agricultural and industrial wastes, bioremediation and clean technology, energy and biofuels, and mineral resource recovery.

**1450453                      Protein Biochemistry and Engineering                      2-3:3**

**Prerequisite:** 1450351

This course covers basic biochemical principles along with a comprehensive survey of products currently available or under development by the biotechnology industry. The scope of protein biochemistry; protein sources; downstream processing of protein products; therapeutic proteins (blood products, vaccines, monoclonal antibodies and related substances, hormones, regulatory factors and enzymes, proteins employed for diagnostic purposes) and polymer degrading enzymes of industrial significance are all emphasized.

**1450454                      Molecular Developmental Biology                      3-0:3**

**Prerequisite:** 1450451

This course introduces students to basic concepts in developmental biology, including: vertebrate limb cell specification, microarrays, RNA interference, microtubular motors, floxed genes, vertebra formation, neural crest differentiation, neural crest specification, heart cell specification, herbicide-induced gonadal disruptions, pancreatic development, digit determination, developmental symbioses, and the developmental origins of feathers, jaws, and teeth during evolution.

**1450455                      Biotechnology in Medicine                      3-0:3**

**Prerequisite:** 1450341

This course focuses on the uses of modern biotechnology in the areas of medicine, from making vaccines and drugs to determining genetic origins of diseases, producing organs for xenotransplant and developing nanomedical diagnostic methods. The students undertake genetic counseling training, based on studying and writing a report on selected cases that address specific genetic diseases and their outcomes.

1450492

**Selected Topics in Biotechnology**

**A (3-0:3)**

**B (2-0:2)**

**C (1-0:1)**

**Prerequisite: Completion of 99 credits**

This course is taught to 4th year-level or biotechnology students who are expected to graduate. The course explores different areas of biotechnology program through discussion of lecture material or research articles and students are expected to write a report and present it in an acceptable format

**Program Electives - Group B (4 credit hours)**

**0501253**

**Medical Microbiology**

**3-3-0:4**

**Prerequisite: 0500150 or departmental approval**

This course focuses on the basic microbiology concepts to MLT, with emphasis on the general characteristics of prokaryotic cell, general properties of microorganisms, bacteria, fungi, viruses, and protozoa. Methods of antiseptic and microbial growth and antibiotic sensitivity. Students in practical sessions will experience preparation of bacterial culture media, sterilization and antiseptic techniques and an antibiotic sensitivity test.

**0501254**

**Histology**

**2-3-0:3**

**Prerequisite: 0500150 or departmental approval**

This course focuses on the study of microscopic structure of the human body. The course introduces the structure of human cells, basic tissues types and organization including epithelial, connective, muscular and nervous tissues. This is followed by the study of the microscopic structure of major organs and systems of the human body. The relationship between structure and function is addressed. The practical part of this course focuses on the microscopic examination of tissues within different organs of the human body.

**0501258**

**Molecular Genetics**

**3-3-0:4**

**Prerequisite: 0500150 or departmental approval**

This course examines the molecular basis of cellular processes, with emphasis on gene structure and function, DNA replication, transcription and translation, gene expression and regulation, genetic engineering and genetic diseases which are studied in theory and in the practical laboratory sessions. Laboratory experiments are designed for the student to become familiar with micro pipettes and reagent preparation for use in the preparation of agarose gels to identify human DNA and RNA, plasmids after bacterial cell transformation, PCR products and DNA that has been manipulated by restriction enzymes and ligase for use in Southern blots.

**0501359**

**Clinical Chemistry (1)**

**3-3-0:4**

**Prerequisite: 0501260 or departmental approval**

This course is designed to introduce the student to the various analytical techniques and methods used in the measurement of various parameters in the blood and other body fluids, and to gain technical skills and knowledge of interpretation of test results in health and disease states. The course mostly covers routine laboratory investigations related to disorders of plasma proteins and amino acids, kidney function, liver function, carbohydrate disorders, lipids and lipoprotein abnormalities, pancreatic function, and gastrointestinal disorders.

**0501370**

**Hematology (1)**

**3-3-0:4**

**Prerequisite: 0500160 or departmental approval**

This course examines blood composition, hematopoiesis and its requirement, erythrocytes and their disorders, hemoglobin and leukocytes structure and function are closely examined. Students are expected to gain sufficient skills and knowledge in performing procedures and laboratory techniques (manual and automated) used in the investigation and diagnosis of various blood disorders.

**0501463**

**Medical Virology**

**2-0-0:2**

**Prerequisite: 0501253 or departmental approval**

The course introduces the basic principles of virology including definitions, structure, nomenclature, classifications, modes of viral infection, viral diseases and viral vaccines.

## Master of Science in Chemistry

### Personnel

**Chairperson:** Raed Abdallah Al Qawasmeh.

**Professor(s):** Ideisan Ibrahim Abu-Abdoun, Raed Abdallah Al Qawasmeh.

**Associate Professor(s):** Mahmoud Allawy Mohsin, Ayssar Nahlé, Ihsan Ahmed Shehadi, Ahmed Al Mehdi, Ahmed Ali Mohammed.

**Assistant Professor(s):** Mohammed Al Naggar, Kamrul Hasan, Abdelaziz Elgamouz, Mahreen Arooj.

**Lecturer(s):** Ibrahim Abdul Rahman, Mona Kanj, Azeera Abdul Rahim, Ayesha Begum Mohammad.

### Vision

The Department of Chemistry envisions itself to be a center of excellence in teaching chemical sciences, community based-research, creative activities, and outreach services.

### Mission

The mission of the Department of Chemistry is to provide high quality education at the undergraduate and graduate level, and to prepare chemistry professionals to participate and contribute to their societies. It aspires to carry out the University of Sharjah's objective to instill in its student a spirit of independent research and a deep commitment to scientific thinking and continuous progress.

### Program description

The curriculum of the MSc program in Chemistry provides advanced courses in essential science disciplines, including: organic synthesis, polymer synthesis and characterization, catalysts, corrosion, electroanalytical chemistry, nano-chemistry, Spectroscopy, biochemistry, proteomics, environmental, petrochemical, natural products, and education. The students will also be introduced to more specialized fields in Chemistry such as advanced analytical, organic, inorganic, and physical Chemistry. Students taking the MSc degree by research (Thesis) will carry out their research in laboratories which are supported by up-to-date instrumentation and professional staff

### Program Objectives

The objectives of the MSc Chemistry program are to:

- provide excellent education at the graduate levels in all fields of Chemistry.
- provide graduates with technical and communication skills necessary to make sound and responsible and ethical decisions and conclusions.
- prepare graduates to take up leadership positions with skills to seek to open life-long learning opportunities.
- prepare students to conduct high quality pioneer research in chemistry and related fields that enable them to pursue higher degrees.

Minimum total credits hours required for the graduation from the MSc program in Chemistry is 34.

The projected fees for the MSc program in Chemistry 2950 AED/credit hour.

## Program Goals

The MSc Chemistry program has the following goals:

1. to provide graduates with technical chemical skills necessary to make sound and responsible decisions in competitive and sustainable environment that are in line with legal requirements.
2. to equip graduates with the knowledge and skills required to identify and solve problems facing organizations and effectively utilize resources.
3. to help graduates take up leadership roles with strong communication skills and be able to work competently alone and as members of multi-disciplinary and culturally diverse teams.
4. to equip students with skills to seek life-long learning opportunities such as professional development and training.

|                  |    | Program Goals |   |   |   |
|------------------|----|---------------|---|---|---|
|                  |    | A             | B | C | D |
| University Goals | 1  | ✓             | ✓ | ✓ | ✓ |
|                  | 2  |               | ✓ | ✓ |   |
|                  | 3  |               | ✓ |   |   |
|                  | 4  |               |   |   | ✓ |
|                  | 5  | ✓             | ✓ | ✓ | ✓ |
|                  | 6  | ✓             | ✓ | ✓ | ✓ |
|                  | 7  |               | ✓ | ✓ |   |
|                  | 8  | ✓             |   |   | ✓ |
|                  | 9  |               |   |   | ✓ |
|                  | 10 |               | ✓ | ✓ |   |

**Table 1.** Alignment of Program Goals with University Goals.

## Program Outcomes

By the end of the program, students should be able to:

1. solve complex problems in chemical applications.
2. use modern methods to carry out research and solve real life problems.
3. properly document and present the results of research work.
4. work effectively in teams and manage group tasks.
5. apply appropriate ethical standards to issues related to science, research, and work.
6. critically evaluate current information in the field of chemistry.

## Student Learning Outcomes

Upon successful completion of the MSc degree in chemistry, graduates will be able to:

1. demonstrate advanced knowledge and applicable research principles and methods in chemistry.
2. implement acquired Chemistry skills to operate effectively in a new learning or professional context such as higher education, specialized industrial labs, pharmaceuticals and forensics.

3. demonstrate advanced skills of scientific writing, and oral presentation to analyze research findings and conclusions.
4. manage laboratory activities and engage in effective scientific work as individuals and as team members.
5. carry out independently a research project in any Chemistry discipline.
6. assess and critically evaluate ethical issues related to Chemistry implications.

### Career Opportunities

Chemistry postgraduates have the opportunity to work in various areas such as:

13. Petroleum and Petrochemical Industries.
14. Environmental and Waste Management.
15. Police Forensic and Criminal Laboratories.
16. Quality Control and Safety Laboratories.
17. Fine and Heavy Chemical Industries.
18. Research Laboratories.
19. Medical and Pharmaceutical Industries.
20. Medical and Clinical Laboratories.
21. Nanotechnology and Nanomaterials Laboratories.
22. Laboratory Instructors.
23. Education.
24. Pursuing Ph.D. Degree.

### Graduate Admission

The MSc degree in Chemistry is available to students who meet the requirements for admission. Every candidate student must pass the "Placement Examination" conducted by the department for evaluation of the candidate's background in Chemistry. Candidates with deficiencies will be required to take, within the first year, all remedial courses for which no credit will be given towards the MSc degree.

In accordance with the University requirements for graduate degrees, a candidate to be admitted into the Master program in Chemistry must fulfill the following minimum requirements:

1. To hold a Bachelor's degree from a UAE-recognized university with a minimum cumulative GPA of 3 out of 4 or its equivalence. Students with a GPA of 2.0 to 2.99 may be admitted conditionally provided that they register for 6-9 credits hours in the first semester of their study and obtain a "B" average. Otherwise, a student will be expelled from the program.
2. The undergraduate degree must have been achieved by attending no less than 75% of the required period. Students with degrees obtained by distance learning will not be considered.
3. To achieve the required "English Proficiency" score; a minimum of 550 in TOEFL or 6 in IELTS (or its equivalence) is required. A student may be admitted conditionally if he/she obtained 530 points or better on the TOEFL provided that the student must enroll in an English language course and receive a TOEFL score of 550 at the end of his first semester of study. The student will be expelled from the program if these two conditions are not met.
4. The undergraduate degree should be in a subject that would qualify the student for the graduate major he/she wants to pursue. Students with different majors in their undergraduate degrees may be admitted upon the recommendation of the department after studying the prerequisite courses assigned by the department.
5. The student must submit a letter of approval by his/her employer if he/she is employed.



## Transfer Admission

The transfer policy is documented in the Bylaws, Policies and Procedures and Graduate studies Catalog. The University firmly adheres and fully implements the published student transfer policy.

- A. A student may, by a decision of the Council based on a recommendation from the “Postgraduate Studies Committee” in the Department, transfer from a Master’s program from outside the University to a similar program if he satisfies admission conditions and has not been dismissed from the university he is transferring from.
- B. The “Postgraduate Studies Committee” in the Department may recommend to the Dean that no more than 9 credit hours of corresponding courses to be transferred provided that the student’s grade therein is not less than Very Good or (B) (3.0 out of 4.0) or equivalent.
- C. A maximum of four years have elapsed since he/she had studied the courses to be counted.
- D. Course grades transferred as above will not be calculated in the cumulative GPA.

## Program Components

The MSc program has two tracks:

1. MSc with Courses only (Track1)
2. MSc with Courses and Thesis (Track 2)

As shown in table 2 a satisfactory completion of 34 credits is required for the two tracks. The course work for Track 1 includes 13 credit hours of compulsory courses, 3 credit hours of research project, 3 credit hours of technical elective course, and 15 credit hours of elective courses.

Track 2 includes 13 credit hours of compulsory courses, 9 elective credit hours, and a nine-credit hour's master thesis. The two tracks also require a satisfactory completion of a 3 credit Technical Elective Course, and to pass the comprehension exam for track 1 only.

| Components                | Credit Hours     |           |
|---------------------------|------------------|-----------|
|                           | Track 1          | Track 2   |
| Compulsory Courses        | 16<br>(including | 13        |
| Elective Courses          | 15               | 9         |
| Technical Elective Course | 3                | 3         |
| Comprehensive Examination | 0                | -         |
| MSc Thesis                | -                | 9         |
| <b>Total</b>              | <b>34</b>        | <b>34</b> |

**Table 2.** Components of the MSc Chemistry Program.

## Master's Thesis

The master's thesis should exhibit competence in the research process by applying an existing body of knowledge in the critical analysis of a new question or of a specific problem or issue in a new

setting. Based on that conceptual understanding and methodological competence, should demonstrate at least one of the following:

1. the development and support of a sustained analysis and related arguments in written form.
2. originality in the application of knowledge to solve a defined problem or to answer a substantial question.

### Oral Examinations in Thesis Track

Students are required to undertake an oral examination of the thesis. The master's thesis will be examined by a board which consists of faculty members, including the thesis supervisor. Reference is made to the Regulations governing the Master's Thesis Defense.

### Student Supervision

Students opting for degree program (Masters of Science in Chemistry) with the thesis track will normally be working under supervision and/or co-supervisor from UOS. The supervisor will agree on the thesis topic, monitor and guide the student through the thesis research phase, and participate in the thesis defense examination by attending the oral defense examination in person or via video teleconferencing. The supervisor will be named upon completion of the courses required before the student registers for the master's thesis work.

### Degree Completion Requirements

The time limit set for the student to obtain the Master's degree shall be no less than four semesters and not more than eight semesters. The student may postpone or withdraw his/her study up to two academic semesters thus making the maximum time limit 10 semesters, excluding the summer session. The maximum time limit, however, in certain justified cases, and for the purposes of defending the thesis, may be extended up to only one semester, upon a recommendation from the supervisor, and after the approval of the Dean and the Council (Article 6, Executive Regulations for the Master's Programs in UOS/Based on the Decision of the Dean's Council No. 25, Year 2006-2007, and its modifications for the Years 2008-2009 and 2011-2012).

### Study Plan: Course List

The following courses will be offered by the MSc program in Chemistry:

#### a- Compulsory Courses

|    | Course Code | Course Name                   | Prerequisite                                       | Credit Hours |
|----|-------------|-------------------------------|--|--------------|
| 1. | 1420515     | Advanced Organic Chemistry    | Two semesters of undergraduate organic chemistry   | 3            |
| 2. | 1420525     | Advanced Analytical Chemistry | One semester of undergraduate analytical chemistry | 3            |
| 3. | 1420535     | Advanced Inorganic Chemistry  | Two semesters of undergraduate inorganic chemistry | 3            |

|    | Course Code | Course Name                 | Prerequisite                                      | Credit Hours |
|----|-------------|-----------------------------|---|--------------|
| 4. | 1420545     | Advanced Physical Chemistry | Two semesters of undergraduate physical chemistry | 3            |
| 5. | 1420590     | Research Methodology        | Consent of the instructor                         | 1            |
| 6. | 1420591     | Research Project            | Consent of the instructor                         | 3            |

**Table 3.** Academic Courses (Compulsory) for the MSc Chemistry Program.

**b- Elective Courses**

|     | Course Code | Course Name                             | Prerequisite                         | Credit Hours |
|-----|-------------|---|--------------------------------------|--------------|
| 1.  | 1420510     | Special Topics in Organic Chemistry     | 1420515 & consent of the instructor  | 3            |
| 2.  | 1420511     | Physical Organic Chemistry              | 1420515 or consent of the instructor | 3            |
| 3.  | 1420512     | Advanced Organometallics                | 1420535                              | 3            |
| 4.  | 1420516     | Heterocyclic Chemistry                  | 1420515                              | 3            |
| 5.  | 1420520     | Special Topics in Analytical Chemistry  | 1420525 & consent of the instructor  | 3            |
| 6.  | 1420521     | Electrochemistry Techniques             | 1420525                              | 3            |
| 7.  | 1420530     | Special Topics in Inorganic Chemistry   | 1420535 & consent of the instructor  | 3            |
| 8.  | 1420531     | Physical Methods in Inorganic Chemistry | 1420535                              | 3            |
| 9.  | 1420540     | Special Topics in Physical Chemistry    | 1420545 & consent of the instructor  | 3            |
| 10. | 1420541     | Advanced Spectroscopy                   | 1420545 & 1420525                    | 3            |
| 11. | 1420550     | Special Topics in Applied               | 1420515 & 1420535                    | 3            |
| 12. | 1420551     | Advanced Polymer Science                | 1420515 & 1420545                    | 3            |
| 13. | 1420554     | Green Chemistry                         | 1420525 & 1420535                    | 3            |
| 14. | 1420555     | Advanced Biochemistry                   | 1420515                              | 3            |
| 15. | 1420556     | Advanced Material Science               | 1420515 & 1420535                    | 3            |

**Table 4.** Academic Elective Courses for the MSc Chemistry Program.

Study Plan: Course Distribution.

**(Track 1): MSc Degree in Chemistry with Courses Only.**

The MSc degree by instruction (Non-Thesis) will be awarded after the successful completion of a minimum of 34 credit hours distributed as follows:

| Year | Semester        | Course Code                 | Courses/Project                              | Cr. Hrs. | Total Cr. Hrs. |
|------|-----------------|-----------------------------|--|----------|----------------|
| 1    | Fall Semester   | 1420525                     | Advanced Analytical Chemistry                | 3        | 22             |
|      |                 | 1420535                     | Advanced Inorganic Chemistry                 | 3        |                |
|      |                 | 1420515                     | Advanced Organic Chemistry                   | 3        |                |
|      |                 | 1420545                     | Advanced Physical Chemistry                  | 3        |                |
|      |                 | Total semester credit hours |  | 12       |                |
|      | Spring Semester | 14205xx                     | Special Topics                               | 3        |                |
|      |                 | 14205xx                     | Special Topics                               | 3        |                |
|      |                 | 14205xx                     | Special Topics                               | 3        |                |
|      |                 | 1420590                     | Research Methodology                         | 1        |                |
|      |                 | Total semester credit hours |  | 10       |                |
| 2    | Fall Semester   | 14205xx                     | Chemistry Elective Course (from any cluster) | 3        | 12             |
|      |                 | 14205xx                     | Chemistry Elective Course (from any cluster) | 3        |                |
|      |                 | 14205xx                     | Chemistry Elective Course (from any cluster) | 3        |                |
|      |                 | Total semester credit hours |  | 9        |                |
|      | Spring Semester | 1420599                     | Comprehensive Examination                    | 0        |                |
|      |                 | 1420591                     | Research Project                             | 3        |                |
|      |                 | Total semester credit hours |  | 3        |                |
|      |                 | Total Program Credit Hours  |  |          |                |

**Table 5.** Study Plan for the MSc Chemistry Program with Courses only (Track 1).  
**(Track 2): MSc Degree in Chemistry with Courses and Thesis.**

The MSc degree by "Thesis" will be awarded after the successful completion of a minimum of 34 credit hours distributed as follows:

| Year                       | Semester                | Course Code                 | Courses/Project               | Cr. Hrs. | Total Cr. Hrs. |
|----------------------------|-------------------------|-----------------------------|-------------------------------|----------|----------------|
| 1                          | Fall Semester           | 1420525                     | Advanced Analytical Chemistry | 3        | 24             |
|                            |                         | 1420535                     | Advanced Inorganic Chemistry  | 3        |                |
|                            |                         | 1420515                     | Advanced Organic Chemistry    | 3        |                |
|                            |                         | 1420545                     | Advanced Physical Chemistry   | 3        |                |
|                            |                         | Total semester credit hours |                               | 12       |                |
|                            | Spring Semester         | 14205xx                     | Chemistry Elective Course     | 3        |                |
|                            |                         | 14205xx                     | Chemistry Elective Course     | 3        |                |
|                            |                         | 14205xx                     | Chemistry Elective Course     | 3        |                |
|                            |                         | 14205xx                     | Technical Elective Course     | 3        |                |
|                            |                         | Total semester credit hours |                               | 12       |                |
| 2                          | Fall Semester           | 1420590                     | Research Methodology          | 1        | 10             |
|                            | Fall & Spring Semesters | 1420595                     | MSc Thesis                    | 9        |                |
| Total Program Credit Hours |                         |                             |                               |          | 34             |

**Table 6.** Study Plan for the MSc Chemistry Program with Courses and Thesis (Track 2).

## Course Descriptions

### **1420515      Advanced Organic Chemistry      (3-0-3)**

Organic reaction types; less common functional groups; reaction mechanisms; basic synthetic methods and structure determination.

**Prerequisite:** Two semesters of undergraduate organic chemistry.

### **1420511      Physical Organic Chemistry      (3-0-3)**

This course covers structure of reactivity of organic molecules; energetic, kinetics, and investigation of reaction mechanisms; reaction rates and equilibria; acids and bases mechanisms and reactivity in nucleophilic substitution; elimination reactions; electrophilic and free radical addition to multiple bonds; and chemistry of carbonium ions, carbanions, free radicals, and molecular rearrangements.

**Prerequisite:** 1420515 or consent of the instructor.

### **1420512      Advanced Organometallics      (3-0-3)**

Synthesis, structure, and reactivity of organometallic compounds of transition metals; industrial applications; organometallic clusters, free and supported homogeneous catalysis; organic synthesis using organometallic compounds; structure and reactivity of main-group organometallic compounds, industrial application.

**Prerequisite:** 1420535

### **1420510      Special Topics in Organic Chemistry      (3-0-3)**

This course will be offered to graduate chemistry students. The course should explore selected area(s) of organic chemistry fields through updated discussion of lecture material or research articles and students are expected to write a report and present it in an acceptable format as part of the course evaluation.

**Prerequisite:** 1420515 & consent of the instructor

### **1420520      Special Topics in Analytical Chemistry      (3-0-3)**

Selected topics of contemporary interest in analytical and instrumental chemistry.

**Prerequisite:** 1420525 and consent of the instructor

### **1420521      Electroanalytical Techniques      (3-0-3)**

Advanced treatment of the analytical techniques and methodology with emphasis on the modern methods; basic principles, kinetics; and mechanisms of electrode reactions and surface phenomena, and analytical applications of potentiometry; voltammetry, coulometry, and conductometry.

**Prerequisite:** 1420525

**1420525      Advanced Analytical Chemistry (3-0-3)**

Advanced treatment of acid-base equilibria in aqueous and non-aqueous systems; complex action equilibria; electrochemical analysis with emphasis on potentiometry, and polarography; atomic absorption and emission spectrometry; separation methods; and mass spectrometry.

**Prerequisite:** Two semesters of undergraduate analytical chemistry.

**1420530      Special Topics in Inorganic Chemistry (3-0-3)**

Selected topics of contemporary interest in inorganic chemistry.

**Prerequisite:** 1420535 & consent of the instructor

**1420531      Physical Methods in Inorganic Chemistry (3-0-3)**

Theoretical principles and applications of the common physical methods used in the characterization of inorganic and organometallic compounds; introduction to group theory leading to the understanding of symmetry in chemistry, application of symmetry considerations to theories of bonding in coordination compounds, electron absorption, vibration, and Raman spectroscopy; nuclear magnetic resonance, electron paramagnetic resonance, nuclear quadrupole resonance, Mössbauer effect, optical rotary dispersion and circular dichroism and photoelectron spectroscopy.

**Prerequisite:** 1420535

**1420535      Advanced Inorganic Chemistry (3-0-3)**

Review of the chemistry of transition and inner transition elements; theories of bonding in coordination compounds; applications of the ligand field theory to the interpretation of spectra and magnetochemistry; structure and reactivity; and coordination compounds in biological systems and industry.

**Prerequisite:** Two semesters of undergraduate inorganic chemistry.

**1420540      Special Topics in Physical Chemistry (3-0-3)**

Selected topics of contemporary interest in physical chemistry.

**Prerequisite:** 1420545 & consent of the instructor.

**1420541      Advanced Spectroscopy (3-0-3)**

An introduction to modern molecular spectroscopy with emphasis on the concepts and methods needed to understand the interaction of radiation with matter will be covered. Topics including atomic, rotational, vibrational, and electronic spectra of molecules, and radio frequency spectroscopy.

**Prerequisite:** 1420545 & 1420525

**1420545      Advanced Physical Chemistry (3-0-3)**

Classical and statistical thermodynamic concepts with emphasis on application to chemical species in solution; consideration of theories of chemical reaction rates; kinetic studies of simple and complex

systems; and basic principles and procedures of quantum chemistry with applications to atomic and molecular systems will be covered.

**Prerequisite:** Two semesters of undergraduate physical chemistry

**1420550      Special Topics in Applied Chemistry      (3-0-3)**

The course should explore selected area(s) of Applied Chemistry fields through updated discussion of lecture material or research articles and students are expected to write a report and present it in an acceptable format as part of the course evaluation. Topics of current applied chemistry are offered reflecting new developments in any area of chemistry and the changing needs of students and faculty.

**Prerequisite:** 1420515 & 1420535

**1420551      Advanced Polymer Science      (3-0-3)**

Types of polymerization reactions; kinetic and mechanistic studies of addition and condensation polymerization by ionic; free radical and coordination initiators and catalysts; ring opening polymerization; Stereochemistry of polymerization.

**Prerequisite:** 1420515 & 1420535

**1420554      Green Chemistry      (3-0-3)**

Understanding basic environmental chemistry and biology; the effect of humans lays the groundwork for applying the Green; Principles of designing safer chemicals and less hazardous chemical synthesis; using catalysis to avoid unnecessary waste; using safer solvents and auxiliaries, reducing unnecessary chemical derivatives; designing for energy efficiency; designing for degradation; developing real-time analysis for pollution prevention; and using renewable feed stocks.

**Prerequisite:** 1420525 & 1420535

**1420555      Advanced Biochemistry(3-0-3)**

Biochemical functions of biomolecules including proteins, carbohydrates, lipids, and nucleic acids. Proteins structure, folding/misfolding. Role of enzymes and coenzymes in metabolism and biosynthesis. Membrane structure and function. Photosynthesis and bioenergetics.

**Prerequisite:** 1420515

**1420556      Advanced Material Science      (3-0-3)**

This course introduces the properties, structures, and uses of engineering materials; and the impact of material selection and material performance on the performance of a structure or mechanism due to the relationship between macroscopic properties and microscopic causes.

**Prerequisite:** 1420535 and 1420515



**1420590      Research Methodology (1-0-1)**

**Prerequisite:** Approval of the academic advisor

General introduction to postgraduate research, its methodologies, its challenges and its organization, including in creative practice. Students will be introduced to a range of research tools and will be equipped to plan and organize their research, as well as to communicate their findings.

**Prerequisite:** Consent of the instructor.

**1420591      Research Project      (3-0-3)**

**Prerequisite:** Approval of the academic advisor

The research project in Chemistry is carried out under the supervision of one academic staff. Student undertaking original lab-based research in an area of their liking. The Chemistry staff supervisor is responsible for approving the writing and submission of a thesis. **Prerequisite:** Consent of the instructor.

**1420595      Thesis (0-0-6)**

The student pursues an individual investigation, which is carried out under the supervision of a Faculty member. In order to complete the MSc work, the student must pass his/her thesis defense.

**Prerequisite:** Approval of the academic advisor.

**1420599      Comprehensive Exam (0-0-0)**

Graduate students must take a comprehensive exam which covers the four chemistry compulsory core courses according to the College of Graduate Studies and Research by-laws.

**Prerequisite:** Approval of the academic advisor.

## FACULTY LIST 2022-2023

### Department of Chemistry

Raed Abdallah Al Qawasmeh, Professor & Chair. Ph.D. from the University of Tübingen, Germany, 1999; Organic Chemistry.

Ideisan I. Abu-Abdoun, Professor. Ph.D. from the University of Liverpool, England, 1982; Applied Chemistry.

Mahmoud Allawy Mohsin, Associate Professor. Ph.D. from the University of Manchester Institute of Science and Technology, (UMIST), UK, 1984; Polymer Chemistry.

Ayssar Nahlé, Associate Professor. Ph.D. from the University of Southampton, Southampton, England, UK, 1989; Electrochemistry.

Ihsan A. Shehadi, Associate Professor & Assistant Dean of College of Sciences. Ph.D. from Northeastern University, Boston, U.S.A, 1997; Physical Chemistry.

Ahmed Almehti, Associate Professor. Ph.D. from Oregon State University, Oregon, USA, 1991; Biochemistry.

Ahmed Ali Mohammed, Associate Professor. Ph.D. from the University of Maine, Orono, Maine, U.S.A, 2000; Inorganic Chemistry.

Mohamad El-Naggar, Assistant Professor. Ph.D. from the University of Queensland, Australia, 2010; Organic Chemistry.

Abdelaziz Elgamouz, Assistant Professor. Ph.D. from the University of Surrey, UK, 2009, Bioanalytical Chemistry.

Kamrul Hasan, Assistant professor. Ph.D. from the Memorial University of Newfoundland, NL, Canada, 2012; Organometallic Chemistry.

Mahreen Arooj, Assistant Professor. Ph.D. from Gyeongsang National University, South Korea 2013; Computational Chemistry.

Mona Kanj El-Harakeh, Lecturer. M.Sc. from the American University of Beirut, Lebanon, 1984; Physical Chemistry.

Ibrahim Abdul-Rahman, Lecturer. M.Sc. from Kuwait University, Kuwait, 1984; Physical Chemistry.

Azeera Abdul Rahim, Lecturer. M.Sc. from Mahatma Gandhi University, India, 2007; Chemistry.

Ayesha Begum Mohammad, Lecturer. M.Sc. from Kakatiya University, Warangal, India, 2004; Organic Chemistry.

## Master of Science in Biotechnology

### Personnel

|                             |   |
|-----------------------------|---|
| <b>Chairperson</b>          | Ismail Saadoun  |
| <b>Professors</b>           | Ismail Saadoun, Ali El-Keblawy, Ihsan Ali Mahasneh                                    |
| <b>Associate Professors</b> | Hassen Hadj Kacem, Mona Rushdi Hassuneh, Abdelaziz Tlili                              |
| <b>Assistant Professors</b> | Amir Ali Khan, Kareem Mosa, Khalid Bajou, Mohamed Nasir Khan, Abdullah Fahd Al Mutery |
| <b>Lecturers</b>            | Ban Al-Joubori, Racha Al-Khoury, Uzma Inayat, Islam Mohamed, Tasneem Ahmed Obeid      |

### I. General Information

|                           |   |                     |                       |
|---------------------------|---|---------------------|-----------------------|
| <b>Program's Name</b>     | <b>Master of Science in Biotechnology</b> |                     |                       |
| <b>College</b>            | Science                                   | <b>Department</b>   | Applied Biology       |
| <b>Specializations</b>    |   |                     |                       |
| <b>Adoption Date</b>      |   | <b>Location</b>     | Main Campus           |
| <b>Level</b>              | Graduate                                  | <b>Study System</b> |                       |
| <b>Total Credit Hours</b> | 34  | <b>Total Amount</b> |                       |
| <b>Duration</b>           | 2 – 4 Years                               | <b>Language</b>     | English               |
| <b>Intake</b>             | Fall & Spring                             | <b>Study Mode</b>   | Full Time – Part Time |

|                         |   |
|-------------------------|---|
| <b>II. Introduction</b> | <p>The increase in human population and in the demand for enhancing the quality of life in areas such as health, nutrition and environment, argued for high quality education and scientific research, especially in the field of Biotechnology. This field can play a crucial role in solving the problems of food and environment. For example, the genetic and genomic modification of plants, animals and bacteria was paramount to the production of new food, fibers and chemicals with high quality and quantity.</p> <p>The Department of Applied Biology at the University of Sharjah offers a Master of Sciences in Biotechnology that prepares graduates to confidently confront current and future challenges in a profession that equips them with an advanced knowledge in different scientific fields practical and application skills of high standards, as well as stimulates their thirst for discoveries. The Department has well qualified faculty members and lecturers with many years of academic and practical experience both regionally and internationally. The expertise of the academic staff spans the main disciplines of modern Biotechnology. In addition, the department has laboratory facilities that are furnished with state-of-the-art equipments and analytical instruments in support of advanced experimental work for teaching, research and community services. The laboratories are also staffed with qualified and well-trained laboratory supervisors and technicians.</p> |
|-------------------------|---|

|                                |  |
|--------------------------------|--|
| <b>III. Program Objectives</b> | <p>The Biotechnology MSc program is oriented to achieve the following objectives:</p> <ol style="list-style-type: none"> <li>1. To provide graduates with advanced knowledge and applicable research principles and methods in biological sciences which include cellular biology, biochemistry, molecular biology, human genetics, cytogenetics, microbiology, and immunology</li> <li>2. To provide the students with required biotechnology skills which enables them to operate effectively in a new learning or professional context such as higher education, specialized industrial labs, pharmaceuticals and forensics.</li> <li>3. To enrich graduates with advanced skills of scientific writing, and oral presentation to analyze research findings and conclusions</li> <li>4. To train graduates to manage laboratory activities and engage in effective scientific work as individuals and as team members.</li> <li>5. To enable students to carry out a research project in a biotechnology discipline</li> <li>6. To improve students' ability in assessing and critically evaluating ethical issues related to biotechnology implications</li> </ol> |
|--------------------------------|--|

|   |   |                           |                    |
|---|---|---------------------------|--------------------|
| <b>IV. Program Structure &amp; Requirements</b> | The Department of Applied Biology received “Eligibility Accreditation Status” from the Ministry of Higher Education and Scientific Research. The degree is titled: “Master of Science in Biotechnology”. The program of study offers two options: |                           |                    |
|   | 1- Research thesis track, catering for the needs of research-oriented students who can devote adequate time to complete high quality research thesis. It consists of 25 credit hours of course work in addition to 9 credit hours of thesis       |                           |                    |
|   | 2- Non-thesis track, catering for the needs of professionals, especially those who work full-time. It consists of 31 credit hours of course work, 3 credit hours of research project and a final comprehensive exam                               |                           |                    |
|   | The minimum degree requirement is 34 credit hours distributed as follows for the thesis and the non-thesis tracks:  |                           |                    |
|   | <b>Credit Hours</b>   |                           | <b>Components</b>  |
|   | Track 2   | Track 1                   | Course Title       |
|   | 13  | 13                        | Compulsory Courses |
|   | 12  | 18                        | Elective Courses   |
| -   | 3   | M.Sc. Project             |                    |
| -   | 0   | Comprehensive Examination |                    |
| 9   | -   | M.Sc. Thesis              |                    |

|   | 34  | 34          | Total        |
|---|---|-------------|--------------|
| <b>The curricula requirements are classified into the following categories:</b><br><b>a- Compulsory Courses</b> |   |             |              |
| No.   | Course Name                                 | Course Code | Credit Hours |
| 1   | Research Methodology                        | 1450501     | 1            |
| 2   | Biotechnology & Genetic Engineering         | 1450502     | 3            |
| 3   | Advanced Cell Biology                       | 1450512     | 3            |
| 4   | Advanced Human Molecular Genetics           | 1450542     | 3            |
| 5   | Advanced Biochemistry and Molecular Biology | 1450551     | 3            |
| 6   | Research Project                            | 1450596     | 3            |
| 7   | Comprehensive Examination                   | 1450598     | 0            |
| 8   | M.Sc. Thesis                                | 1450599     | 9            |
|   |   |             |              |
| <b>b- Elective Courses</b>  |   |             |              |
| No.   | Course Name                                 | Course Code | Credit Hours |
| 1   | Advanced Microbiology                       | 1450531     | 3            |
| 2   | Advanced Immunology                         | 1450532     | 3            |
| 3   | Advanced Virology                           | 1450534     | 3            |
| 4   | Regulation of Gene Expression               | 1450543     | 3            |

|  |   |  |          |   |
|--|---|--|----------|---|
|  | 5 | Advanced Molecular Developmental Biology | 1450545  | 3 |
|  | 6 | Molecular Diagnosis of Genetic Diseases  | 1450546  | 3 |
|  | 7 | Selected Topics in Biotechnology A       | 1450592A | 3 |
|  | 8 | Selected Topics in Biotechnology B       | 1450592B | 3 |
|  |   |  |          |   |

**Elective Courses are selected based on the following criteria:**

1. At least **four courses for thesis track** and **six courses for non-thesis track** should be taken from Group I-III Elective Courses
2. Subject to supervisor and program coordinator's approval only one graduate course may be taken from Group IV Elective Courses which are offered by College of Medicine.

| <b>Cluster I</b>   |  |                   |
|--------------------|--|-------------------|
| <b>Cr. Hrs.</b>    | <b>Course Title</b>                      | <b>Course No.</b> |
| 3                  | Regulation of Gene Expression            | 1450543           |
| 3                  | Molecular Diagnosis of Genetic Diseases  | 1450546           |
| <b>Cluster II</b>  |  |                   |
| <b>Cr. Hrs.</b>    | <b>Course Title</b>                      | <b>Course No.</b> |
| 3                  | Advanced Molecular Developmental Biology | 1450545           |
| 3                  | Selected Topics in Biotechnology A       | 1450592A          |
| 3                  | Selected Topics in Biotechnology B       | 1450592B          |
| <b>Cluster III</b> |  |                   |

| Cr. Hrs.          | Course Title                         | Course No. |
|-------------------|--------------------------------------|------------|
| 3                 | Advanced Microbiology                | 1450531    |
| 3                 | Advanced Immunology                  | 1450532    |
| 3                 | Advanced Virology                    | 1450534    |
| <b>Cluster IV</b> |                                      |            |
| Cr. Hrs.          | Course Title                         | Course No. |
| 3                 | Gene Expression                      | 0900702    |
| 3                 | Biomedical Genomics                  | 0900703    |
| 3                 | Selected Topics in Cell Biology      | 0900705    |
| 3                 | Selected Topics in Immunology        | 0900709    |
| 3                 | Selected Topics in Molecular Biology | 0900711    |

#### Study Plan for the M.Sc. Degree in Biotechnology

| <u>Non-Thesis Track</u> |                                   |            |               |   |            |
|-------------------------|-----------------------------------|------------|---------------|---|------------|
| First Year              |                                   |            |               |   |            |
| Spring Semester         |                                   |            | Fall Semester |   |            |
| Cr. Hrs.                | Course Title                      | Course No. | Cr. Hrs.      | Course Title                              | Course No. |
| 3                       | Advanced Cell Biology             | 1450512    | 3             | Biotechnology & Genetic Engineering       | 1450502    |
| 3                       | Advanced Human Molecular Genetics | 1450542    | 3             | Advanced Biochemistry & Molecular Biology | 1450551    |
| 3                       | Biotechnology Elective Course     | 1450xxx    | 3             | Biotechnology Elective Course             | 1450xxx    |
| 9                       | Total                             |            | 9             | Total                                     |            |
| Second Year             |                                   |            |               |   |            |
| Spring Semester         |                                   |            | Fall Semester |   |            |
| Cr. Hrs.                | Course Title                      | Course No. | Cr. Hrs.      | Course Title                              | Course No. |
| 3                       | Biotechnology Elective Course     | 1450xxx    | 1             | Research Methodology                      | 1450501    |

|   |                           |         |    |                               |         |
|---|---------------------------|---------|----|-------------------------------|---------|
| 3 | Research Project          | 1450596 | 3  | Biotechnology Elective Course | 1450xxx |
| 0 | Comprehensive Examination | 1450598 | 3  | Biotechnology Elective Course | 1450xxx |
|   |                           |         | 3  | Biotechnology Elective Course | 1450xxx |
| 6 | <b>Total</b>              |         | 10 | <b>Total</b>                  |         |

**Thesis Track**

**First Year**

| <b>Spring Semester</b> |                                   |                   | <b>Fall Semester</b> |   |                   |
|------------------------|-----------------------------------|-------------------|----------------------|---|-------------------|
| <b>Cr. Hrs</b>         | <b>Course Title</b>               | <b>Course No.</b> | <b>Cr. Hrs</b>       | <b>Course Title</b>                       | <b>Course No.</b> |
| 3                      | Advanced Cell Biology             | 1450512           | 3                    | Biotechnology & Genetic Engineering       | 1450502           |
| 3                      | Advanced Human Molecular Genetics | 1450542           | 3                    | Advanced Biochemistry & Molecular Biology | 1450551           |
| 3                      | Biotechnology Elective Course     | 1450xxx           | 3                    | Biotechnology Elective Course             | 1450xxx           |
| 3                      | Biotechnology Elective Course     | 1450xxx           | 3                    | Biotechnology Elective Course             | 1450xxx           |
| 12                     | <b>Total</b>                      |                   | 12                   | <b>Total</b>                              |                   |

**Second Year**

| <b>Spring Semester</b> |                      |                   |
|------------------------|----------------------|-------------------|
| <b>Cr. Hrs.</b>        | <b>Course Title</b>  | <b>Course No.</b> |
| 1                      | Research Methodology | 1450501           |
| 9                      | Thesis               | 1450599           |
| 10                     | <b>Total</b>         |                   |

| <b>V. Course Description</b> | (1-0:1)  | Research Methodology | 1450501 |
|------------------------------|--|----------------------|---------|
|                              | <p>Prerequisite: None</p> <p>The course is designed to introduce students to research methods that would help them generating proposals for master's theses in different field of biotechnology. It will provide students with a broad introduction to research methodology and guided opportunities to explore the application of research methods in biotechnology. The course will focus on how to organize a research project, including</p> |                      |         |



|  |                                     |         |
|--|-------------------------------------|---------|
| <p>developing the research question, reviewing and synthesizing prior research and writing, using computer software in presenting and analyzing the data and understanding the elements of a research proposal. Students will be encouraged to represent their thesis proposal and to work together to help each other develop an appropriate and feasible research design, considering the merits of alternative methods. Students should expect to work intensively with their advisors during this period.</p>  |                                     |         |
| (3-0:3)  | Biotechnology & Genetic Engineering | 1450502 |
| <p>Prerequisite: None</p> <p>Biotechnology and Genetic Engineering is a course, aimed at graduate level students who want to expand their knowledge of the biotechnology world and its applications. The major themes are the use of biological systems in medicine, industry and agriculture; food and drug production; application of genetic engineering. Lectures will underlie the principles and application of recombinant DNA technology in industrial, agricultural, pharmaceutical, and biomedical fields. Lecture will also include the fermentation systems for commercial production of useful products and their purification. Students will be expected to develop an understanding of these topics, and be able to use them in class, in their writings and presentations, and in exams.</p>   |                                     |         |
| (3-0:3)  | Advanced Cell Biology               | 1450512 |
| <p>Prerequisite: None</p> <p>Students will be introduced to the advanced topics in Cell Biology including: Brief discussion of evolution of Cell from simple molecules; revision of structure and function of main eukaryotic cell's organelles; mechanism of proteins targeting and their subsequent modification inside nucleus, mitochondria, chloroplast, ER, Golgi and lysosome; detail mechanism of substances transport across the plasma membrane; bulk transport across the cells such as exocytosis and endocytosis and examples of dysregulation of such transports in the different diseases; the roles of cytoskeletal proteins in the cellular organization, movement and intracellular transport; the role of extracellular matrix in the organization of tissue and cellular interaction; the details mechanism of eukaryotic cell cycle regulation and understanding the mechanism of cancer resulting from the dysregulation of eukaryotic cell cycle. Once the theoretical aspects of the contents have been delivered the course will focus on the application of cellular processes in the application of Biotechnology such as the Use of extracellular matrix in tissue engineering and the roles of ER in engineering the secretion in mammalian cells to improve the secretion of recombinant proteins.</p> |                                     |         |

|  |  |                       |         |
|--|--|-----------------------|---------|
|  | (3-0:3)  | Advanced Microbiology | 1450531 |
|  | <p>Prerequisite: None</p> <p>Advanced Microbiology is a course, that is designed for Biology or Biotechnology majors who want to expand their knowledge of the microscopic world, in general, or for use in professional or graduate school. The major themes are structure and function, general principles for growth, microbial genetics, description of microbiological life forms, uses of microorganisms, microorganisms in disease, and antimicrobial drugs. Students will be expected to develop an understanding of these topics, and be able to use them in class, in their writings and presentations, and in exams.</p>  |                       |         |
|  | (3-0:3)  | Advanced Immunology   | 1450532 |
|  | <p>Prerequisite: None</p> <p>The course covers the main aspects of Immunology at an advanced level and is suited to postgraduate students with background knowledge of immunology. Topics covered include the molecular basis of immune recognition, regulation of the immune response, mechanisms of host response against infectious pathogenic agents, transplantation, vaccine design, immunodeficiency and other immune disorders.</p> <p>Selected cutting-edge topics of clinically and scientifically relevant research topics are be chosen by the lecturers and short introductory notes will be delivered. Oral and poster presentation tasks as well as written assignments are designed to reinforce the lecture material</p> <p><b>PART-I:</b><br/>The first part of the course gives an introduction to Cellular Immunology: the cell types involved in immune responses, the interactions between these cells during immune and inflammatory responses, and the mechanisms of host response against infectious pathogens.</p> <p><b>PART-II:</b><br/>Part-I is then extended into Molecular Immunology, which covers in detail the molecular events responsible for the regulation of T cells, B cells, and other immune cells. This also extends into the mechanisms underlying T and B cell recognition of antigens and antigen processing, in transplantation, viral immunity and in various immune diseases.</p> <p><b>PART-III:</b><br/>The understanding of the cellular and molecular basis of the immune response is then developed to cover Clinical Immunology. The role of the immune system in human health and disease is described in detail, with examples showing how the immune dysfunction leads to chronic inflammatory diseases such as rheumatoid arthritis and asthma, cancer immunology, immunogenetics and immune deficiency.</p> <p>Throughout the course students will also learn about Applied Immunology, with lectures on vaccine technology and</p> |                       |         |

|   |                                   |         |
|---|-----------------------------------|---------|
| immunotherapeutic. Problem-based learning exercises will be used to demonstrate these topics.   |                                   |         |
| (3-0:3)   | Advanced Virology                 | 1450534 |
| <p>Prerequisite: None</p> <p>This course will focus on virus-host interactions at the molecular and cellular levels. Presentations and readings will focus on understanding of viral structure, replication, gene expression, and effects of virus infection on cells as well as cell biology. Emphasis will be on vertebrate animal viruses, but the course will include comparative aspects of bacterial and plant viruses. The course will be comprehensive and will feature presentations and discussions of recent virology research. Furthermore, this course will also emphasize on the impact of biotechnology on virology and viral diseases. This course will critically focus on the understanding of how to construct viral vectors for gene therapy and the latest advances in molecular virology findings and applications.</p> |                                   |         |
| (3-0:3)   | Advanced Human Molecular Genetics | 1450542 |
| <p>Prerequisite: None</p> <p>This course provides a broad grounding in human genetics, with the emphasis on the molecular aspects of human genetics, particularly in relation to human disease. It is aimed mainly at science graduates who seek research careers in areas such as fundamental human molecular genetics, genetic factors in human health and disease, or molecular and cytogenetic approaches to diagnosis. The course is flexible and is updated regularly to reflect important advances in human genetics. The course covers a wide range of topics, including fundamental human genetics, clinical genetics and statistical genetics, together with advanced human genetics, which covers areas of human disease, such as type 2 diabetes, cancer and rare monogenic disease.</p>  |                                   |         |
| (3-0:3)   | Regulation of Gene Expression     | 1450543 |
| <p>Prerequisite: None</p> <p>The processes of gene expression are fundamental to all biologically driven processes in the cell. Furthermore, the mechanisms by which the expression levels of specific genes are controlled are key to adaptive responses, cell growth and differentiation and developmental biology. In this module we aim to provide an understanding of the underlying molecular basis of the processes of gene expression in cells, with a focus on regulatory mechanisms that control the expression of protein-coding genes. This will cover three areas related to the regulation of gene expression in eukaryotes: (i) chromatin structure and mechanisms of transcriptional regulation (ii) extracellular signaling pathways, and (iii) posttranscriptional regulation mechanisms.</p>                               |                                   |         |

|  |   |   |         |
|--|---|---|---------|
|  | (3-0:3)   | Advanced Molecular Developmental Biology    | 1450545 |
|  | <p>Prerequisite: None</p> <p>This course will introduce students to advanced concepts in Developmental Biology, including: The roles of paracrine factors and differential genes regulation in development; molecular development of a non-vertebrate such as Drosophila, including elucidating the roles of Gap, Pair-rule, Segment polarity and Homeotic genes in the development; molecular development of the early mammals explaining the main events from zygote till gastrulation; molecular mechanisms of mammalian axis formation; describing the development of central nervous system from ectoderm during the mammalian development; describing the neural crest migration and their subsequent differentiation to tissues during the mammalian development; the formation of main tissues and organs from the mesoderm and endoderm during the mammalian development. Case studies from the literatures such as the roles of microRNAs regulator (RISC) in mammalian development and In vitro fertilization for infertile couples will be discussed.</p> |   |         |
|  | (3-0:3)   | Molecular Diagnosis of Genetic Diseases     | 1450546 |
|  | <p>Prerequisite: None</p> <p>Molecular Diagnosis of Genetic Diseases is a course, aimed at graduate levels that is designed for Biology, Biotechnology, medicine, or pharmacy majors who want to expand their knowledge in molecular tools for use in professional or graduate school. This course will cover the principles of Molecular Diagnosis which is the process of identifying a disease by studying molecules, such as proteins, DNA, and RNA, in a tissue or fluid. Molecular diagnostics is a new discipline that captures genomic and proteomic expression patterns and uses the information to distinguish between two or more conditions at the molecular level. The conditions under investigation can be human genetic disease or infectious diseases. Molecular diagnostics is not confined to human diseases but can be used in animals or plants. It can be also used in environmental monitoring, food processing etc...</p>   |   |         |
|  | (3-0:3)   | Advanced Biochemistry and Molecular Biology | 1450551 |
|  | <p>Prerequisite: None</p> <p>Advanced Biochemistry and Molecular biology deals with nucleic acids and proteins and how these molecules interact within the cell to promote proper growth, division, and development. This course will emphasize the molecular mechanisms of site-specific recombination, metabolism of lipids, nucleic acids and proteins, hormonal regulation and integration of metabolism in different organisms. We will study the techniques and experiments used to describe these mechanisms, often referring to the original scientific literature. In addition, we will take a</p>   |   |         |

|   |                                    |          |
|---|------------------------------------|----------|
| look at some rapidly evolving fields, including genomics, proteomics, and metabolomics.   |                                    |          |
| (3-0:3)   | Selected Topics in Biotechnology A | 1450592A |
| <p>Prerequisite: None</p> <p>This course will be offered to students enrolled for master's program. Mainly this will explore other topics that are not described in the MSc. program. It will cover recent and varied scientific topics that will enhance the student's knowledge. The course is aimed to provide a comprehensive overview of cutting-edge research on different biotechnological areas based on the research interest of the faculty who is teaching the course. The course will investigate recent developments and techniques in the different areas of biotechnology through discussion of lecture material or research articles, and students are expected to write a mini-review and present it in an acceptable format. The delivery of the course materials will include students reading latest reports and primary literature articles and then discussion around these.</p> <p>One example of the topics that could be covered in this course is: "Omics approaches for plant stress tolerance", which discussing the recent applications of the different omics technologies including genomics, proteomics, metabolomics and other omics to develop strategies to cope with plant stresses. Another example is: "Metagenomics applications", which discussing the importance of metagenomics as a powerful tool for the analysis of genetic materials recovered directly from environmental samples, and to identify and explore the unculturable microorganisms, which could be applied to solve challenges in agriculture, biofuel production, remediation ...etc. Another example is: "Recent advances in stem cell therapy", which discussing the recent research on developing various sources for stem cells and applying it on the treatment of diseases such as cancer, diabetes, heart diseases..... etc. In addition to the ongoing approaches of stem cell regenerative medicine.</p> |                                    |          |
| (3-0:3)   | Selected Topics in Biotechnology B | 1450592B |
| <p>Prerequisite: None</p> <p>This course will be offered to students enrolled for master's program. Mainly this will explore other topics that are not described in the MSc. program. It will cover recent and varied scientific topics that will enhance the student's knowledge. The course is aimed to provide a comprehensive overview of cutting-edge research on different biotechnological areas based on the research interest of the faculty who is teaching the course. The course will investigate recent developments and techniques in the different areas of biotechnology through discussion of lecture material or research articles, and students are expected to write a mini-review and present it in an acceptable</p>  |                                    |          |

|  |   |                           |         |
|--|---|---------------------------|---------|
|  | <p>format. The delivery of the course materials will include students reading latest reports and primary literature articles and then discussion around these.</p> <p>One example of the topics that could be covered in this course is: “Omics approaches for plant stress tolerance”, which discussing the recent applications of the different omics technologies including genomics, proteomics, metabolomics and other omics to develop strategies to cope with plant stresses. Another example is: “Metagenomics applications”, which discussing the importance of metagenomics as a powerful tool for the analysis of genetic materials recovered directly from environmental samples, and to identify and explore the unculturable microorganisms, which could be applied to solve challenges in agriculture, biofuel production, remediation ...etc. Another example is: “Recent advances in stem cell therapy”, which discussing the recent research on developing various sources for stem cells and applying it on the treatment of diseases such as cancer, diabetes, heart diseases..... etc. In addition to the ongoing approaches of stem cell regenerative medicine.</p> |                           |         |
|  | (0-9:3)   | Research Project          | 1450596 |
|  | <p>Prerequisite (Dept. Approval)</p> <p>The research project course is designed to provide non-thesis students with practical skills by accomplishing practical research projects under the supervision of a faculty member. Students will work in a group to review recent literature reviews in their area before embark on laboratory research. The students will pursue well-defined hypotheses to disseminate finding for research publication</p>   |                           |         |
|  | (0-0:0)   | Comprehensive Examination | 1450598 |
|  | <p>Prerequisite: (Dept. Approval)</p> <p>The Comprehensive Examination is a graduation requirement for students enrolled in a non-thesis M.Sc. in Biotechnology. This examination aims at demonstrating the students’ knowledge of Biotechnology and its applications. It consists of a written examination held in the 3rd month of Fall and Spring semesters in the year of graduation; typically, the second year. The examination covers areas drawn from the undergraduate and graduate curriculum in Biotechnology at University of Sharjah, such as research, Cell Biology, Biochemistry and Molecular Biology, Human Genetics, Biotechnology &amp; Genetic Eng. etc., and is update to reflect the changes in curriculums.</p>  |                           |         |
|  | (0-27:9)  | Thesis                    | 1450599 |

|  |   |
|--|---|
|  | <p>Prerequisite: (Dept. Approval)</p> <p>The Master's Degree Course is concluded with the master's thesis. Here students are expected to show that they are able to handle a scientific problem independently within a maximum period of six months. In the Master Thesis the student shall integrate, deepen and expand his or her knowledge within a restricted area of the practical and theoretical aspects of biotechnology. Project work encourages students to show initiative in their individual work under supervision, using appropriate analytical techniques to generate and interpret new data. Dissertation preparation develops literature researching, presentation and written communication skills essential in professional life.</p> <p>In order to complete the M.Sc. work, the student must pass his/her thesis defense.</p> |
|--|---|

# College of Computing and Informatics



## College of Computing and Informatics

### Officers of the College

**Prof. Abbas Amira**

**Dean**

**Prof. Zaher Al Aghbari**

**Vice Dean**

### Administrative Support Staff

Reem Hisham Al-Jaber

Administrative and Financial Coordinator

Hajar Ismaeil AlHousani

Administrative Assistant

### Contact Information

College of Computing & Informatics Building, M5-239  
University City

Sharjah, UAE

00971-6-5050 2525

[www.sharjah.ac.ae](http://www.sharjah.ac.ae)

## Accreditation

All programs offered in the College of Computing and Informatics are accredited by MOE.

## College Overview

The aim of founding the college is to fulfil the vision of His Highness Sheikh Dr. Sultan bin Mohammed Al Qasimi, Member of the Supreme Council, Ruler of Sharjah, and President of the University of Sharjah, to offer emerging and state-of-the-art programs at the University of Sharjah to serve the UAE's national agenda. This an agenda that stresses on cybersecurity, artificial intelligence, smart cities and systems, machine learning, computing and IT applications in all areas of national, social and scientific development, including the knowledge economy, health care, the environment.

Computing and informatics are critical for any nation hoping to succeed in the era of digital economy. The strength of the college is its programs, resources, and people. Currently, the college is comprised of three departments: Computer Science, Computer Engineering, and Information Systems.

We also offer a number of graduate programs that include M.Sc. Computer Engineering, M.Sc. Computer Science, and M.Sc. Business Information Systems. The College offers a doctoral program in electrical and computer engineering jointly with the College of Engineering. We also plan to offer another doctoral program in computer science.

New programs that are in the planning stage at present include: M.Sc. Biomedical and Health Informatics, M.Sc. Cybersecurity, M.Sc. Data Science, B.Sc. Cyber Security Engineering, B.Sc. Data Science, B.Sc. Software Engineering and B.Sc. e-Commerce.

### Vision:

To be a leading college of computing and informatics in education, research, and community service.

### Mission:

1. Educate and train future IT talent for national and international communities
2. Expand to embrace emerging fields in computing and informatics
3. Develop a strong culture of research and innovation
4. Engage communities through scholarship, service and economic development

### Goals:

The CCI is committed to:

1. Improving students' learning experience
2. Fostering excellence in teaching and learning
3. Encouraging impactful research competences
4. Engaging the community through scholarship and services
5. Fostering a culture of collaboration and productivity

### Core Values:

The CCI is committed to the same core values of the University. The University of Sharjah is united by six core values that underpin our daily actions as students, staff, faculty, administrators and alumni. These are:

- Integrity and Ethics: Ethical standards at the University of Sharjah are founded on ethical and civic responsibility in accordance with progressive Arab and Islamic ideals.
- Dedication: Dedication to providing students with knowledge and support so that they are fully prepared to be the leaders of the future.
- Inclusiveness: We welcome and value each other and embrace the diversity of ideas and people.
- Excellence with limitless Drive: For quality enhancement and continuous improvement.
- Accountability and Transparency: We pride ourselves on our responsibility, and transparency in our actions, providing a fair and positive work environment.
- Innovation and Creativity: We work without bounds to improve lives through creativity and innovation in the pursuit of academic excellence.

### Academic Programs

The College of Computing and Informatics is currently organized around the following three academic departments: Computer Science, Computer Engineering, and Business Information Systems. In addition to providing academic support to other colleges and specializations, the College of Computing and Informatics offers four undergraduate programs leading to a Bachelor of Science (BS) degree, two programs leading to a Master of Science (MS) degree, and one program leading to a (PhD) degree:

1. Bachelor of Science in Biomedical Informatics
2. Bachelor of Science in Cybersecurity Engineering
3. Bachelor of Science in Computer Engineering
4. Bachelor of Science in Computer Science
5. Bachelor of Science in Information Technology - Multimedia
6. Bachelor of Science in Business Information Systems
7. Master of Science in Artificial Intelligence
8. Master of Science in Cybersecurity Engineering
9. Master of Science in Computer Science
10. Master of Science in Computer Engineering
11. Master of Science in Data Science
12. Doctor of Philosophy in Computer Science

### Admission Requirements

A student who meets the university's admission requirements as stipulated in the Admission section of this Bulletin and chooses one of the college programs as a desired program of study will be admitted to the university as a science student in the Department of Computer Science, as an engineering student in the Department of Computer Engineering, or as a business information systems student in the Department of Information Systems. students admitted to the computer engineering program are required to take a placement examination in mathematics and physics. Students who fail to attain a passing score in one of these subjects are required to pass a related remedial course to ensure their mastery of basic skills and improve their ability to handle the rigor of college-level subjects. Students are

strongly advised to carefully review the University Bulletin for admission and degree requirements as well as all related academic policies.

### Graduation Requirements

Each degree program comprises three categories: university requirements (UR), college requirements (CR), and program requirements (PR). The university requirements are common to all departments in the college of Computing and Informatics. Each program has its own required and elective courses. The credit hours allocations for each program are shown in the following table:

| <b>B.Sc. in Computer Engineering (132 credits)</b> |    |     |       |
|--|----|-----|-------|
|  | UR | PP  | Total |
| Mandatory Core Credits                             | 15 | 99  | 114   |
| Electives Credits                                  | 9  | 9   | 18    |
| Total  | 24 | 108 | 132   |

| <b>BSc in Computer Science (123 credits)</b> |    |    |       |
|--|----|----|-------|
|  | UR | PR | Total |
| Mandatory Core Credits                       | 15 | 58 | 73    |
| Support Credits                              | -  | 23 | 23    |
| Electives Credits                            | 9  | 12 | 21    |
| Free Elective Credits                        | -  | 6  | 6     |
| Total  | 24 | 99 | 123   |

| <b>B.Sc. in Business Information Systems (123 Credits)</b> |    |     |    |       |
|--|----|-----|----|-------|
|  | UR | CR* | PR | Total |
| Mandatory Core Credits                                     | 15 | 48  | 24 | 84    |
| Electives Credits  | 9  | 6   | 6  | 24    |
| Minor Credits  | -  | -   | 15 | 15    |
| Total  | 24 | 54  | 45 | 123   |

CR\* College of Business

| <b>BSc in IT - Multimedia (123 credits)</b> |    |    |       |
|---|----|----|-------|
|   | UR | PR | Total |
| Mandatory Core Credits                      | 15 | 54 | 69    |
| Support Credits                             | -  | 24 | 24    |
| Electives Credits                           | 9  | 15 | 24    |
| Free Elective Credits                       | -  | 6  | 6     |
| Total                                       | 24 | 99 | 123   |

A student enrolled in any College of Computing and Informatics program is eligible to graduate if he/she completes all degree requirements with a CGPA of 2.0 or higher.

## Course Numbering Scheme

Courses offered in the College of Computing and Informatics are designated numbers of the form 15XYABC where:

|     |   |
|-----|---|
| XY  | 01: Computer Science and IT-Multimedia<br>02: Computer Engineering<br>03: Information Systems |
| ABC | Program specific course number described in the respective program sections                   |

## University Requirements

Every student is required to take 24 credit hours of general education courses distributed over seven domains. Fifteen (15) mandatory credit hours are selected from domains 1, 2, 3 and 4 and (9) elective credit hours selected from domains 5, 6 and 7 as indicated in the University section (General Education).

The university 15 mandatory credits are listed in the following table:

| Course # | Course Title                  | Cr Hrs | Prerequisite      |
|----------|-------------------------------|--------|-------------------|
| 0201102  | Arabic Language               | 3      | None              |
| 0202112  | English for Academic Purposes | 3      | None              |
| 0302200  | Fundamentals of Innovation    | 3      | 3rd Year Standing |
| 0104100  | Islamic Culture               | 3      | None              |
| 1501100  | Introduction to IT            | 3      | None              |

The university 9 elective credits and their descriptions are presented in the University Catalog.

## Department of Computer Science

### Personnel

|                                  |  |
|----------------------------------|--|
| <b>Chairperson:</b>              | Naveed Ahmed   |
| <b>Professors:</b>               | Mohammad S.Obaidat, Madjid Merabti, Ashraf Elnagar, Zaher Al Aghbari, Ahmed Khedr            |
| <b>Associate Professors:</b>     | Abdullah Hussein, Manar Abu Talib, Mohammad Alsmirat, Thar M Baker Shamsa                    |
| <b>Assistant Professors:</b>     | Djedjiga Mouheb, Sohail Abbas, Mohammed Lataifeh, Imad Afyouni, Ibrahim Abaker Targio Hashem |
| <b>Lecturers:</b>                | Nasr Mohamed Abdalla Mohamed   |
| <b>Administrative Assistant:</b> | Mahiba Ahmed Alhammadi   |

## **Vision**

The Department of Computer Science aims to be a leader in the region in graduating highly qualified computing professionals who are well prepared to contribute to the development of the nation and the region.

## **Mission**

The Department of Computer Science is committed to graduate highly qualified computing professionals equipped with state of the art knowledge and skills who can contribute to the economic development of the United Arab Emirates and the region, and have an ability for life-long learning and a sense of professional responsibility. The department offers a unique educational opportunity for students to achieve excellence in quality learning and participation in cutting-edge research.

## **Department Goals**

The department goals were set to:

1. Educate and train the next generation of computer professionals.
2. Attain leadership in computer-related education and research.
3. Foster close relationships with industry, institutes and government agencies.
4. Equip students with independent and critical thinking, and competency in communication skills.
5. Produce graduates with an understanding of their personal, professional and ethical responsibilities.
6. Prepare students to engage in life-long learning and to effectively work in a collaborative environment.

## **Department Learning Outcomes**

The department outcomes are classified into two categories:

### **Department outcomes: The department**

- a. Attracts outstanding students.
- b. Provide opportunities for its faculty to collaborate effectively with industries, institutes and government agencies.
- c. Cooperates effectively with industries, institutes and government agencies through student internships, seminars and research.

### **Graduates outcomes: Graduates attain ability to**

- d. Apply acquired computing knowledge to solve real-life problems.
- e. Demonstrate critical thinking.
- f. Communicate effectively.
- g. Work effectively in teams.
- h. Appreciate professional, social and ethical responsibilities.
- i. Engage in life-long learning.

## Computer Science Program

### CS Program Overall Goals:

1. To prepare students for computer science positions in industry or government,
2. To prepare students for graduate study in Computer Science, and
3. To provide a solid foundation in Computer Science that will allow graduates to adapt effectively in a quickly changing field.

### CS Program Educational Objectives:

1. Apply knowledge of mathematics and computer science to develop software systems.
2. Analyze, design, implement, and test complete software systems.
3. Communicate effectively and critically in both written documents and oral presentations.
4. Work effectively in a team.
5. Apply computer science skills, tools and knowledge in designing software systems that are adaptive to new requirements.
6. Understand the social and ethical issues that arise in their work and deal with them professionally.
7. Appreciate the need for lifelong learning and adapt to rapid technological changes

### CS Program Learning Outcomes

CS Program Outcomes: Upon completing the program requirements, a Computer Science graduate should be able to:

- a. Apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.
- b. Analyze a problem, and identify and define the computing requirements appropriate to its solution.
- c. Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
- d. Function effectively on teams to accomplish a common goal.
- e. Apply professional, ethical, legal, security and social issues and responsibilities.
- f. Communicate effectively with a range of audiences.
- g. Analyze the local and global impact of computing on individuals, organizations, and society.
- h. Recognize the need for and an ability to engage in continuing professional development.
- i. Use current techniques, skills, and tools necessary for computing practice.
- j. Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
- k. Apply design and development principles in the construction of software systems of varying complexity.

### Career Opportunities

Graduate from the Computer Science program are prepared to pursue advanced degrees in related fields and seek career pathways as a: Programmer, Application Designer, Application Developer, Systems Analyst, Data Mining Program Developer, Database Designer and Developer, Database Administrator, User Interface Designer, E-commerce Application Developer, Graphic designer, Game Designer and Developer, Product Design Specialist, Advertisement Designer, Web Developer,

Audio/Video Production Specialist, Visual Effect Artist, Cinematic Artist, Technical Artist, 3D Tool Programmer, Computer Animator.

### Program Overview

The program is designed to satisfy the curricular requirements of the ACM/IEEE-CS curricular task force and other relevant professional accreditation bodies, such as CSAC/CAAB. A student undertaking this program should complete a total of 123 credits distributed as follows:

| BSc in Computer Science (123 credits) |    |    |       |
|---------------------------------------|----|----|-------|
|                                       | UR | PR | Total |
| Mandatory Core Credits                | 15 | 58 | 73    |
| Support Credits                       | -  | 23 | 23    |
| Electives Credits                     | 9  | 12 | 21    |
| Free Elective Credits                 | -  | 6  | 6     |
| Total                                 | 24 | 99 | 123   |

#### 1. University Requirements

As stated in the University Requirements section of the college catalog.

#### 2. Program Requirements

The program requirements of 99 credit hours are divided into four major sets.

- CS mandatory core courses (58 credits)
- CS program elective courses (12 credits)
- Support Courses (23 credits)
- General Free elective courses (6 credits)

#### A. Mandatory Support Courses

This set consists of the 23 credit hours offered by other programs.

| Course #                        | Course Title                                       | Cr Hrs | Prerequisite                  |
|---------------------------------|--|--------|-------------------------------|
| 1430110                         | Physics I for Sciences                             | 3      | None                          |
| 1430116                         | Physics I Lab                                      | 1      | Pre/Co:<br>1430110            |
| 1420101                         | General Chemistry I                                | 3      | None                          |
| 1420102                         | General Chemistry I Lab                            | 1      | Pre/Co:<br>1420101            |
| 0202213                         | Critical Reading and Writing                       | 3      | 0202112                       |
| 1440132                         | Calculus II  | 3      | 1440131                       |
| 1440211                         | Linear Algebra                                     | 3      | 1440131                       |
| 1440281                         | Intro. to Prob. and Statistics                     | 3      | 1440131                       |
| 1450101/<br>1430117/<br>1420103 | General Biology I/<br>Physics II /<br>Chemistry II | 3      | None/<br>1430111/<br>1420101/ |



## B. Mandatory Core Courses

This set consists of 58 credit hours listed below.

| Course # | Course Title                                | CrHrs | Prerequisite        |
|----------|---|-------|---------------------|
| 1501116  | Programming I                               | 4     | None                |
| 1440131  | Calculus I                                  | 3     | None                |
| 1501211  | Programming II                              | 3     | 1501116             |
| 1501215  | Data Structures                             | 3     | 1501211             |
| 1501246  | Object Oriented Design with Java            | 3     | 1501211             |
| 1501252  | Computer Organization and Assembly Language | 4     | 1403201             |
| 1501263  | Introduction to Database Management Systems | 3     | 1501116             |
| 1501279  | Discrete Structures                         | 3     | 1440131             |
| 1501319  | Programming Languages and Paradigms         | 3     | 1501215             |
| 1501322  | Prof. Social and Ethical Issues in CS       | 2     | None                |
| 1501352  | Operating Systems                           | 3     | 1501215             |
| 1501365  | Advance Database Systems                    | 3     | 1501263             |
| 1501366  | Software Engineering                        | 3     | 1501215             |
| 1501370  | Numerical Methods                           | 3     | 1501116             |
| 1501371  | Design and Analysis of Algorithms           | 3     | 1501215,<br>1501279 |
| 1501372  | Formal Languages and Automata Theory        | 3     | 1501215,<br>1501279 |
| 1501394  | Junior Project in Computer Science          | 2     | None                |
| 1501398  | CO-OP Summer Training                       | 0     | Senior Standing     |
| 1501494  | Senior Project in Computer Science          | 3     | 1501395             |
| 1502201  | Digital Logic Design                        | 3     | 1501116             |
| 1502202  | Digital Logic Design - LAB                  | 1     | 1502201             |

## C. Elective Courses

Every student in the CS Department must take 12 credit hours of elective Computer Science courses chosen from the list given in the table below. The support and computer science core courses are the preparatory courses, which are designed to meet the breadth and depth requirements in Computer Science.

| Course # | Course Title   | Cr Hrs | Prerequisite        |
|----------|--|--------|---------------------|
| 1501250  | Networking Fundamentals                              | 3      | 1501214             |
| 1501330  | Introduction To Artificial Intelligence              | 3      | 1501215,<br>1501279 |
| 1501341  | Web Programming                                      | 3      | 1501116             |
| 1501342  | 2D/3D Computer Animation                             | 3      | 1501247             |
| 1501343  | 3D Design for Web                                    | 3      | 1501247             |
| 1501355  | Computer Architecture                                | 3      | 1501252             |
| 1501433  | Introduction to Computer Vision and Image Processing | 3      | 1501215             |

| Course # | Course Title                      | Cr Hrs | Prerequisite        |
|----------|-----------------------------------|--------|---------------------|
| 1501440  | Introduction to Computer Graphics | 3      | Senior Standing     |
| 1501441  | Multimedia Technology             | 3      | 1501215             |
| 1501443  | Human Computer Interaction        | 3      | 1501340,<br>1501247 |
| 1501444  | Game Design and Development       | 3      | 1501247             |
| 1501445  | IT Application in E-Commerce      | 3      | 1501341             |
| 1501451  | Computer Networks                 | 3      | 1501352             |
| 1501458  | Mobile Applications and Design    | 3      | 1501215             |
| 1501459  | Information Security              | 3      | 1501263             |
| 1501465  | Development of Web Applications   | 3      | 1501263,<br>1501341 |
| 1501474  | Compiler Design                   | 3      | 1501372             |
| 1501490  | Topics in Computer Science I      | 3      | Senior standing     |
| 1501491  | Topics in Computer Science II     | 3      | Senior standing     |
| 1501492  | Special Topics in IT              | 3      | Senior Standing     |

#### D. General Free Elective Courses

Each student registered in the CS program is required to take 6 credits (2 courses) as general free elective courses. Such courses can be taken from the University's pool of courses at large upon the approval of the academic advisor. These courses are intended to broaden the knowledge of students by combining studies from CS with studies from other academic disciplines.

#### Study Plan

The BS program in Computer Science encompasses 123 credits hours that are spread over eight semesters and could be completed in four years. The following distribution of courses by semester facilitates student's normal progression through the study plan.

| Year I, Semester 1 (16 Credits) |                               |        |                            |
|---------------------------------|-------------------------------|--------|----------------------------|
| Course #                        | Title                         | Cr Hrs | Prerequisites              |
| 0201102                         | Arabic Language               | 3      | None                       |
| 0202112                         | English for Academic Purposes | 3      | None                       |
| 1401100                         | Introduction to IT (English)  | 3      | None                       |
| 1440131                         | Calculus I                    | 3      | None                       |
| 1430115                         | Physics I                     | 3      | 1430131                    |
| 1430116                         | Physics I Lab                 | 1      | Pre/Co: 1430110 or 1430115 |

| Year I, Semester 2 (17 Credits) |   |        |               |
|---------------------------------|---|--------|---------------|
| Course #                        | Title   | Cr Hrs | Prerequisites |
|                                 | University Elective – 1                         | 3      |               |
| 0302200                         | Fundamentals of Innovation and Entrepreneurship | 3      | None          |
| 1501116                         | Programming I                                   | 4      | None          |
| 1440132                         | Calculus II                                     | 3      | 1440131       |
| 1420101                         | General Chemistry I                             | 3      | None          |
| 1420102                         | General Chemistry I LAB                         | 1      | 1420101       |

| Year 2, Semester 1 (16 Credits) |  |        |               |
|---------------------------------|--|--------|---------------|
| Course #                        | Title                                      | Cr Hrs | Prerequisites |
| 0101100                         | Islamic Culture                            | 3      | None          |
| 1501211                         | Programming II                             | 3      | 1501116       |
| 1440281                         | Introduction to Probability and Statistics | 3      | 1440131       |
| 1501279                         | Discrete Structures                        | 3      | 1440131       |
| 1502201                         | Digital Logic Design                       | 3      | 1501116       |
| 1502202                         | Digital Logic Design Laboratory            | 1      | 1502201       |

| Year 2, Semester 2 (16 Credits) |   |        |               |
|---------------------------------|---|--------|---------------|
| Course #                        | Title                                       | Cr Hrs | Prerequisites |
|                                 | University Elective – 2                     | 3      |               |
| 1501215                         | Data Structures                             | 3      | 1501211       |
| 1501246                         | Object Oriented Design with Java            | 3      | 1501211       |
| 1501252                         | Computer Organization and Assembly Language | 4      | 1403201       |
| 1440211                         | Linear Algebra I                            | 3      | 1440211       |

| Year 3, Semester 1 (17 Credits) |                                       |        |                  |
|---------------------------------|---------------------------------------|--------|------------------|
| Course #                        | Title                                 | Cr Hrs | Prerequisites    |
|                                 | Department Specialized Elective – 1   | 3      |                  |
|                                 | University Elective – 3               | 3      |                  |
| 1501263                         | Intro. to Database Management Systems | 3      | 1501116          |
| 1501371                         | Design and Analysis of Algorithms     | 3      | 1501215; 1501279 |
| 1501394                         | Junior Project in CS                  | 2      | Junior Standing  |
| 0202213                         | Critical Reading and Writing          | 3      | None             |

| Year 3, Semester 2 (15 Credits) |  |        |                              |
|---------------------------------|--|--------|------------------------------|
| Course #                        | Title  | Cr Hrs | Prerequisites                |
| 1501319                         | Programming Languages and Paradigms                | 3      | 1501215                      |
| 1501352                         | Operating Systems                                  | 3      | 1501215                      |
| 1501365                         | Advanced Database Systems                          | 3      | 1501263                      |
| 1501372                         | Formal Language and Automata Theory                | 3      | 1501215; 1501279             |
| 1430117/<br>1420103/<br>1450101 | Physics II /<br>Chemistry II/<br>General Biology I | 3      | 1430115/<br>1420102/<br>None |

| Year 4, Semester 1 (14 Credits) |   |        |               |
|---------------------------------|---|--------|---------------|
| Course                          | Title   | Cr Hrs | Prerequisites |
| 1501322                         | Professional, Social and ethical Issues in Computer Science | 2      | None          |
| 1501366                         | Software Engineering  | 3      | 1501215       |
| 1501370                         | Numerical Methods   | 3      | 1501116       |
|                                 | General Free Elective – 1                                   | 3      |               |
|                                 | Department Specialized Elective – 2                         | 3      |               |

| Year 4, Semester 2 (12 Credits) |                                     |        |               |
|---------------------------------|-------------------------------------|--------|---------------|
| Course                          | Title                               | Cr Hrs | Prerequisites |
| 1501494                         | Senior Project in CS                | 3      | 1501395       |
|                                 | General Free Elective – 2           | 3      |               |
|                                 | Department Specialized Elective – 3 | 3      |               |
|                                 | Department Specialized Elective – 4 | 3      |               |

### Courses Descriptions

Courses in the proposed program that are offered in the Department of Computer Science start with (1501). The program of study contains courses that are offered by other departments as well as from outside the college. Consistent with the university policies, Computer Science courses in the program will be assigned numbers of the form (1501ABC) where:

|   |   |
|---|---|
| A | Year (level)  |
| B | Areas (as follows):<br>1: Basic Skills<br>2: Programming Languages<br>3: Social, Ethical and Professional Issues<br>4: Artificial Intelligence<br>5: Graphics, Multimedia and Internet<br>6: Systems and Architecture<br>7: Database and Software Engineering<br>8: Theoretical Foundations<br>9: Special Topics, Seminars and Projects |
| C | Course sequence in area   |

Courses in the proposed program that are offered in the Department of Computer Science start with (1401). The program of study contains courses that are offered by other departments as well as from outside the College. Consistent with the University policies, Computer Science courses in the program will be assigned numbers of the form (1401ABC).

### Mandatory Core Courses

Description of the core courses are given below:

#### 1501100 Introduction to IT (English)

(2-2:3)

#### Prerequisite: None

The Course explains what a computer is and what it can (and can't) do; it clearly explains the basics of information technology, from multimedia PCs to the internet and beyond. It illustrates how digital devices and networks affect our lives, our world, and our future. In addition, the course is intended to equip students with the necessary skills to use computer and essential software applications effectively in order to better prepare them for their professional careers.

**1501116 Programming I****(3-2:4)****Prerequisite: None**

This course introduces basic programming techniques with a high level programming language. Topics include general introduction to computers and numbering systems, program development process, variables, data types, expressions, selection and repetition structures, functions/procedures, text files, arrays, and pointers.

**1501211 Programming II****(2-2:3)****Prerequisite: 1501116 Programming I**

This course introduces fundamental conceptual tools and their implementation of object-oriented design and programming such as: object, type, class, implementation hiding, inheritance, parametric typing, function overloading, polymorphism, source code reusability, and object code reusability. Object-Oriented Analysis/Design for problem solving. Implementation of the Object-Oriented programming paradigm is illustrated by program development in an OO language (C++).

**1501215 Data Structures****(3-0:3)****Prerequisite: 1501211 Programming II**

Basics of algorithm design. Linear Structures: Multidimensional arrays and their storage organization, Lists, Stacks and Queues. Introduction to recursion. Nonlinear structures: trees (binary trees, tree traversal algorithms) and Graphs (graph representation, graph algorithms). Elementary sorting and searching methods: bubble sort, quick sort, sequential search and binary search algorithms.

**1501246 Object Oriented Design with Java****(2-2:3)****Prerequisite: 1501211 Programming II**

This course will introduce fundamental concepts of Internet technologies at both advanced and introductory levels. The introductory level includes, Java programming and object oriented design; the advanced level includes advanced programming concepts such as GUI design, multimedia and exception handling.

**1501252 Computer Organization and Assembly Language****(3-2:4)****Prerequisite: 0403201 Digital Logic Design**

This course introduces the basic concepts of computer architecture and low level programming, Subject includes: Microprocessors architectures, Bus concepts, 8086 assembly language instructions set, Segmentation and memory addressing modes, debugging and testing programs, DOS system calls, Multiprocessor systems, pipelining.

**1501263 Introduction to Database Management Systems****(3-0:3)****Prerequisite: 1501116 Programming I**

This course explores how databases are designed, implemented, and used. The course emphasizes the basic concepts/terminology of the relational model and applications. The students will learn database design concepts, data models (the Entity-Relationship and the Relational Model), SQL functional dependencies and normal forms. The students will gain experience working with a commercial database management system.

**1501279 Discrete Structures****(3-0:3)****Prerequisite: 1440131 Calculus I**

This course emphasizes the representations of numbers, arithmetic modulo, radix representation of integers, change of radix. Negative and rational numbers. Sets, one-to-one correspondence, properties of union, intersection, and complement, countable and uncountable sets. Functions: Injective, subjective, and bijective functions. Mathematical Induction, proof by contradiction. Combinatory: Multiplication rule, Pigeonhole principle, Recurrence relations. Fundamentals of logic, truth tables, conjunction, disjunction, and negation, Boolean functions and disjunctive normal form. Logic circuits. Graphs theory: Introduction, Paths and connectedness, Eulerian and Hamiltonian Graphs, Graph Isomorphisms, coloring of graphs. Trees: Spanning trees, Binary Search Trees, Huffman Code.

**1501319 Programming Languages and Paradigms****(3-0:3)****Prerequisite: 1501215 Data Structures**

This course covers the fundamental concepts of programming languages (PL) and paradigms. It focuses on the design issues of the various languages constructs and the criteria used for evaluating PL and PL constructs. It covers the role of programming languages and primary formal methods for describing the syntactic and semantics structure of PLs. It also covers the design issues for imperative languages and examines data abstractions which support Object Oriented Programming, Functional Programming, and Logical Programming.

**1501322 Professional, Social, and Ethical Issues in CS****(2-0:2)****Prerequisite: None**

This course introduces many social and ethical prospective using information technology. Subjects include: different ethical theories, privacy on the Web, security vs privacy and civil liberties, copyright on the Net, copyright and software, email and spam, morality of breaking the law, Internet addition, protecting intellectual property, data mining, identity theft, computer reliability, professional ethics, network security, and case studies.

**1501352 Operating Systems****(3-0:3)****Prerequisite: 1501215 Data Structures**

This course covers the history of operating systems. Processes: IPC, process scheduling, process synchronization, and deadlock. I/O: principles of I/O hardware and software, disks and clocks. Memory management: Swapping, paging, virtual memory and page replacement algorithms. File systems: Examples of some popular operating systems such as Unix, Linux, and Windows.

**1501365 Advanced Database Systems****(3-0:3)****Prerequisite: 1501263 Introduction to Database Management Systems**

This course will build on the concepts introduced in 1501263. The students will be exposed to more advanced topics and implementation related aspects of database management systems such as object databases, XML data querying, file structures, indexing, query optimization, transaction processing, concurrency control, and database recovery.

**1501366      Software Engineering**

**(3-0:3)**

**Prerequisite: 1501215 Data Structures**

Follows the formal software life cycle from the requirement, specification, and design phases through construction of actual software. Topics include models for the software life cycle, object-oriented analysis and design, management of software projects, CASE tools, verification and testing techniques, software quality assurance, and issues related to maintenance and delivery.

**1501370      Numerical Methods**

**(3-0:3)**

**Prerequisite: 1501116 Programming I**

The objectives are to introduce basic principles and techniques of computational methods and their algorithms for solving real mathematical problems that arise in science and engineering. At the end of the course, the students should be able to understand the behavior of numbers when calculated by computers. In addition, students should know the theory and application of different numerical techniques to solve mathematical problems.

**1501371      Design and Analysis of Algorithms**

**(3-0:3)**

**Prerequisite: 1501215 Data Structures, 1501279 Discrete Structures**

This course emphasizes the fundamental concepts of analyzing and designing algorithms, including divide and conquer, greedy methods, backtracking, randomization and dynamic programming. A number of algorithms for solving problems which arise often in applications of Computer Sciences are covered, including sorting, searching, graph algorithms, string matching, dynamic programming and NP-complete problems.

**1501372      Formal Languages and Automata Theory**

**(3-0:3)**

**Prerequisite: 1501215 Data Structures, 1501279 Discrete Structures**

This course covers the fundamental concepts of formal languages and automata. The emphasis and focus are on finite automata and regular languages, pushdown automata and context-free languages, regular expressions, closure properties and pumping lemmas. Turing Machines, recursive and recursively enumerable languages. Chomsky hierarchy. Discuss fundamental notions and (un) decidability.

**1501394      Junior Project in Computer Science**

**(2-0:2)**

**Prerequisite: 1501215 Data Structures**

This course introduces many skills and perspectives using information technology. Topics will vary. The course can include an individual study, which can be any topic that students and the instructor agree on, such as the new trends in networking, AI, Data mining, PLs, new hardware, development of applications building a hardware device and network security etc. Students present their project and submit a report.

**1501398      CO-OP Summer Training**

**(0-0:0)**

**Prerequisite: Junior Standing**

This course aims to provide students with practical training, concentrating on their fields of study, and to enhance their abilities to communicate with industry, and real life projects. Summer Training Program provides students with knowledge, skills, abilities and opportunities required for success in their studies and workplace.

**1501494 Senior Project in Computer Science (3-0:3)**

**Prerequisite: 1501394 Junior Project in Computer Science**

This course builds on the skills learned from the Junior Project course and focuses on the design, analysis and implementation of the project. The course involves a significant project that requires different Computer Science techniques. It is a group based project.

**Core Electives**

Descriptions of the Computer Science program core electives are given below.

**1501330 Introduction to Artificial Intelligence (3-0:3)**

**Prerequisite: 1501215 Data Structures, 1501279 Discrete Structures**

This course will provide an introduction to the fundamental concepts and techniques in the field of artificial intelligence. Topics covered in the course include: problem solving and search, logic and knowledge representation, planning, reasoning and decision-making in the presence of uncertainty, and machine learning. Areas of application such as knowledge representation, natural language processing, expert systems, and robotics will be explored. AI programming languages (LISP/Prolog) will also be introduced.

**1501341 Web Programming (3-0:3)**

**Prerequisite: 1501116 Programming I**

Introduction to HyperText Markup Language (HTML5): Tags, headers, text style, fonts, line breaks, rules, linking, images, lists, tables, forms, and frames. Semantic tags, Canvas, Geolocation, JQuery, Drag and Drop. Dynamic HTML: Cascading Style Sheets: Inline styles, external style sheets, backgrounds, positioning elements, text flow and box model. Filters: Flip, grayscale, sepia, saturate, hue-rotate, invert, opacity, blur, brightness, contrast, drop-shadow. JavaScript: A simple program, memory concepts, assignment operators, decision making, control structures, if-else, while, repetition, for, switch, do/while, functions, arrays. Object Model and Collections: all, children. Event Model: OnClick, OnLoad, OnError, OnMouseMove, OnMouseOver, OnMouseOut, OnFocus, OnBlur, OnSubmit, OnReset. Multimedia. DHTMLMenu builder. PHP and databases.

**1501433 Introduction to Computer Vision and Image Processing (3-0:3)**

**Prerequisite: 1501215 Data Structures**

Introduction to the basic concepts in computer vision and image processing: An introduction to low-level image analysis methods, including image formation, edge detection, feature detection, line fitting, and image segmentation. Camera models, Image transformations (e.g., warping, morphing, and mosaics) for image synthesis. Background subtraction and tracking, Motion and video analysis. Applications such as optical character recognition, action recognition or face recognition may also be introduced.

**1501465 Development of Web Applications (3-0:3)**

**Prerequisite: 1501263 Intro. to Database Management Systems, 1501341 Web Programming**

The course primarily emphasizes the underlying concepts rather than the current hot tools to web-based database applications. It discusses the three-tier architecture commonly used in web-based database applications. Also, the course briefly introduces the tools to build web-based database applications, such as PHP, MySQL, Apache, HTML, HTTP, TCP/IP and JavaScripts.



**1501355 Computer Architecture (3-0:3)**

**Prerequisite: 1501252 Computer Organization & Assembly Language**

This course covers the core concepts of computer architecture design. The main focus is on key principles for high-performance and low-cost design. It covers in details logical design of computer systems. Topics include reduced instruction set computer architecture (RISC), using the MIPS central processor as an example, interface between assembly and high level programming constructs and hardware, interrupt systems, instruction and memory cache systems, parallelism, pipeline architecture and multiprocessors.

**1501451 Computer Networks (3-0:3)**

**Prerequisite: 1501352 Operating Systems**

Network uses. Network components. Network classification and services. Network architectures. Network protocols and their performance. Study of specific protocols, methods, and algorithms for framing, flow control, error detection and correction, medium access, routing, congestion control, internetworking, addressing, connection establishment and release, multiplexing, and fragmentation. Overview of Internet application protocols, resources, and services.

**1501474 Compiler Design (3-0:3)**

**Prerequisite: 1501372 Formal Languages & Automata Theory**

This course introduces students to the theory and implementation of compiler construction. It covers symbol tables, lexical analysis, syntax analysis, semantic analysis and code generation. This course includes a substantial project component, in which students will construct and implement all stages of a compiler for a subset of a general purpose programming language.

**1501440 Introduction to Computer Graphics (3-0:3)**

**Prerequisite: 1501215 Data Structures**

This course presents an introduction on Hardware and software components of graphics systems, also it covers the following topics: Output and filled data primitives, OpenGL, geometric transformations, viewing pipeline, clipping, and windowing, viewing transformations, data structures and vector tools for graphics (lines, planes, dot product, cross product, visible surface detection and illumination models), 2D animations, and curves.

**1501441 Multimedia Technology (3-0:3)**

**Prerequisite: Senior Standing**

The course emphasizes underlying concepts rather than how to use the current multimedia tools. Topics covered by the course include introduction to multimedia, multimedia authoring, image and video representation, color basics, fundamental concepts of video, basics of digital audio, lossless and lossy compression algorithms, image and video compression standard, and content-based image and video retrieval.

**1501459 Information Security (3-0:3)**

**Prerequisite: 1501215 Data Structures**

Definition of Computer Security, CIA and DAD Triads. Access Control Methodologies, Subjects and Objects, Access Control Models. Security Policies, Security Administration Tools. Handling Security Incidents, Common Types of Attacks. Firewall Security, Perimeter Security Devices, Types of Firewalls.

Network and Server Attacks and Penetration, Phases of Control, Methods of Taking Control. Cryptology, Secret-Key Cryptography, Bit Generators, History of ciphers, Data Encryption Standard, Advanced Encryption Standard. Number Theory, Primality, Integer Factorization, Congruence, Hash Functions. Public-Key Cryptography, trapdoor one-way functions, Secure Key-Exchange Protocol, different Cryptosystems, Digital Signatures, Database Security, Secret Sharing Scheme.

**1501445 IT Application in E-Commerce**

**(3-0:3)**

**Prerequisite: 1501341 Web Programming**

This course prepares students to understand e-commerce architecture, e-commerce models, their legal, ethical and social issues. They will also be able to design and develop web sites with dynamic web content, and to integrate web solutions into the organization's information system. The course focuses on many techniques for e-commerce applications such as displaying product catalogue, applying shopping carts, handling online transactions.

**1501458 Mobile Applications & Design**

**(3-0:3)**

**Prerequisite: 1501215 Data Structures or 1501214 Programming with Data Structures**

This course focuses on the fundamentals of mobile applications development. It covers mobile and wireless network technologies from a software developer's perspective. The students will be exposed to several different markup as well as the techniques that can be used to generate this technology for the wide range of wireless devices. Furthermore, students will gain hands on experience in developing mobile applications for iOS devices.

**1501490 Topics in Computer Science I**

**(3-0:3)**

**Prerequisite: Senior Standing**

This course involves special topics in Computer Science. The course usually introduces advanced/specialized areas that are not currently offered as regular courses in the computer Science curricula. The topic depends on the interest of the instructor and those of the senior students.

**1501491 Topics in Computer Science II**

**(3-0:3)**

**Prerequisite: Senior standing**

This course involves special topics in Computer Science. The course usually introduces advanced/specialized areas that are not currently offered as regular courses in the computer Science curricula. The topic depends on the interest of the instructor and those of the senior students.

**1501492 Special Topics in IT**

**(3-0:3)**

**Prerequisite: Senior Standing**

This course involves special topics in IT Multimedia. The course usually introduces advanced/specialized areas that are not currently offered as regular courses in the computer Science curricula. The topic depends on the interest of the instructor and those of the senior students.

**1501342 2D/3D Computer Animation**

**(3-0:3)**

**Prerequisite: 1501247 Multimedia Programming & Design**

This course presents a number of concepts in 2D and 3D computer animation. The concepts of animation in both object space and view and lighting space (camera control, and dynamic lighting) will be covered. Fundamental principles of animation, major techniques for 2D and 3D animation: raster and vector animations, key-framing, tweening, morphing, linear and non-linear interpolation will be introduced.

The concepts of 3D animation such as physics-based animation, particle system, along with 3D camera and lighting animation, forward and inverse kinematics for motion capture will be covered.

**1501250                      Networking Fundamentals    (3-0:3)**

**Prerequisite: 1501214 Programming with Data Structures**

Foundation knowledge for computer networks and communications. Topics include basic network design, layered communications models, IP addressing and subnets, and industry standards for networking media and protocols, with an emphasis on TCP/IP protocol suite and Ethernet environments.

**1501343                      3D Design for Web    (2-2:3)**

**Prerequisite: 1501247 Multimedia Programming & Design**

This course covers a complete introduction to modeling, animating, and rendering while learning to build a 3D scene from plans and bring it to life. The course covers modeling, material creation, animation and global illumination lighting, and creating a more realistic virtual environment. Learn complex modeling techniques, customizing the user interface, scene composition, background photo compositing and material mapping.

**1501443 Human-Computer Interaction    (3-0:3)**

**Prerequisite: 1501247 Multimedia Programming & Design**

Introduction to concepts centered on Human-Computer Interaction from hardware and software perspectives. Topics include design principles, usability principles and engineering, solving user-centered problems, device interaction, and graphical user interface design (2D and 3D interfaces).

**1501444 Game Design and Development    (3-0:3)**

**Prerequisite: 1501247 Multimedia Programming & Design**

How games function to create experiences, including rule design, play mechanics, game balancing, social game interaction and the integration of visual, audio, tactile and textual elements into the total game experience. Students will design and implement a game for desktop or mobile devices.

**IT-Multimedia Program**

**ITMM Program Overall Goals:**

1. To prepare students for IT multimedia positions in industry or government,
2. To prepare students for graduate study in IT Multimedia, and
3. To provide a solid foundation in IT Multimedia that will allow graduates to adapt effectively in a quickly changing field.

**ITMM Program Educational Objectives:**

1. Apply knowledge of IT Multimedia to the development of multimedia systems.
2. Apply acquired skills and multimedia tools to integrate different media components to create complete multimedia systems.
3. Blend the artistic design creativity and technological proficiency in analysis, design and development of multimedia systems.
4. Understand the social and ethical issues that arise in their work and deal with them professionally.
5. Communicate effectively and critically in both written documents and oral presentations.

6. Work effectively in a team.
7. Appreciate the need for lifelong learning and adapt to rapid technological changes

### ITMM Program Learning Outcomes

Upon completing the program requirements an ITMM graduate can:

- a. Apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.
- b. Analyze a problem, and identify and define the computing requirements appropriate to its solution.
- c. Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
- d. Function effectively on teams to accomplish a common goal.
- e. Understand the professional, ethical, legal, security and social issues and responsibilities.
- f. Communicate effectively with a range of audiences.
- g. Analyze the local and global impact of computing on individuals, organizations, and society.
- h. Recognize the need for and be able to engage in continuing professional development.
- i. Use current techniques, skills, and tools necessary for computing practice.
- j. Use and apply current technical concepts and practices in the core information technologies of human computer interaction, information management, programming, networking, and web systems and technologies.
- k. Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.
- l. Effectively integrate IT-based solutions into the user environment.
- m. Understand the best practices and standards and their application.
- n. Assist in the creation of an effective project plan.

### Career Opportunities

Graduate from the IT-Multimedia program will be prepared to pursue advanced degrees in related fields and seek careers as: Programmer, Application Designer, Application Developer, Systems Analyst, Data Mining Program Developer, Database Designer and Developer, Database Administrator, User Interface Designer, E-commerce Application Developer, Graphic designer, Game Designer and Developer, Product Design Specialist, Advertisement Designer, Web Developer, Audio/Video Production Specialist, Visual Effect Artist, Cinematic Artist, Technical Artist, 3D Tool Programmer, and Computer Animator.

### Program Overview

The program is designed to satisfy the curricular requirements of the ACM/IEEE-CS curricular task force and other relevant professional accreditation bodies, such as CSAC/CAAB. A student undertaking this program should complete a total of 123 credits distributed as follows:

| BSc in IT -Multimedia (123 credits) |    |    |       |
|-------------------------------------|----|----|-------|
|                                     | UR | PR | Total |
| Mandatory Core Credits              | 15 | 54 | 69    |
| Support Credits                     | -  | 24 | 24    |
| Electives Credits                   | 9  | 15 | 24    |
| Free Elective Credits               | -  | 6  | 6     |
| Total                               | 24 | 99 | 123   |

## 1. University Requirements

As stated in the University Requirements section of the college catalog.

## 2. Program Requirements

The program requirements of 99 credit hours are divided into four major sets.

- A. Multimedia compulsory core courses (54 credits)
- B. Multimedia program elective courses (15 credits)
- C. Support Courses (24 credits)
- D. General Free elective courses (6 credits)

### A. Mandatory Support Courses

| Course # | Title                        | Cr Hrs | Prerequisites |
|----------|------------------------------|--------|---------------|
| 1440131  | Calculus I                   | 3      | None          |
| 1501116  | Programming I                | 4      | None          |
| 1440181  | Statistics for Sciences      | 3      | None          |
| 1440182  | Statistics Lab               | 1      | 1440181       |
| 1503431  | Project Management           | 3      | 1503230       |
| 0302170  | Principles of Marketing      | 3      |               |
| 0202213  | Critical Reading and Writing | 3      | 202112        |

Students select 4 credits from the following college requirements:

| Course # | Title                 | Cr Hrs | Prerequisites   |
|----------|-----------------------|--------|-----------------|
| 1420101  | Chemistry I           | 4      | None            |
| 1420102  | Chemistry Lab I       |        | Pre/Co: 1420101 |
| 1450101  | General Biology I     | 4      | None            |
| 1450107  | General Biology Lab I |        | Pre/Co: 1450101 |
| 1430115  | Physics I             | 4      | None            |
| 1430116  | Physics Lab I         |        | Pre/Co: 1430115 |

### B. Mandatory Core Courses

This set consists of 54 credit hours listed below.

| Course # | Course Title                          | Cr Hrs | Prerequisite           |
|----------|---------------------------------------|--------|------------------------|
| 1501114  | Problem Solving                       | 3      | None                   |
| 1501240  | Graphics Design                       | 3      | None                   |
| 1501242  | Interactive Multimedia                | 3      | 1501100                |
| 1501244  | Design and Authoring                  | 3      | 1501100                |
| 1501247  | Multimedia Programming                | 3      | 1501116                |
| 1501214  | Programming with Data Structures      | 3      | 1501116                |
| 1501393  | Multimedia Junior Project             | 2      | 1501214                |
| 1501263  | Intro. to Database Management Systems | 3      | 1501116                |
| 1501341  | Web Programming                       | 3      | 1501116                |
| 1501250  | Networking Fundamentals               | 3      | 1501214                |
| 1501443  | Human Computer Interaction            | 3      | 1501341, 1501247       |
| 1501342  | 2D/3D Computer Animation              | 3      | 1501247                |
| 1501361  | OO Software Design and Implementation | 3      | 1501214                |
| 1501398  | CO-OP Summer Training                 | 0      | Junior/Senior standing |
| 1501343  | 3D Design for Web                     | 3      | 1501247                |

| Course # | Course Title                    | Cr Hrs | Prerequisite     |
|----------|---------------------------------|--------|------------------|
| 1501444  | Game Design and Development     | 3      | 1501247          |
| 1501459  | Information Security            | 3      | Senior Standing  |
| 1501465  | Development of Web Applications | 3      | 1501341, 1501263 |
| 1501496  | Multimedia Senior Project       | 4      | Senior standing  |

### C. Elective Courses

Multimedia elective courses (15 credits) are to be chosen from a list of courses offered by the Department. The support and core courses are preparatory courses which are designed to meet the breadth and depth requirements in information technology.

| Course # | Course Title                                       | Cr Hrs | Prerequisite        |
|----------|--|--------|---------------------|
| 1501319  | Programming Language Paradigms                     | 3      | 1401215             |
| 1501330  | Introduction To Artificial Intelligence            | 3      | 1501215, 1501279    |
| 1501352  | Operating Systems                                  | 3      | 1501214             |
| 1501355  | Computer Architecture                              | 3      | 1501252             |
| 1501366  | Software Engineering                               | 3      | 1501215             |
| 1501370  | Numerical Methods                                  | 3      | 1501116             |
| 1501433  | Introduction to Computer Vision & Image Processing | 3      | 1501215, or 1501214 |
| 1501440  | Introduction to Computer Graphics                  | 3      | 1501215             |
| 1501441  | Multimedia Technologies                            | 3      | Senior Standing     |
| 1501445  | IT Application in E-Commerce                       | 3      | 1501341             |
| 1501451  | Computer Networks                                  | 3      | 1501352             |
| 1501458  | Mobile Applications and Design                     | 3      | 1501463             |
| 1501365  | Advanced Database Systems                          | 3      | 1501263             |
| 1501474  | Compiler Design                                    | 3      | 1501372             |
| 1501490  | Topics in Computer Science I                       | 3      | Senior standing     |
| 1501491  | Topics in Computer Science II                      | 3      | Senior standing     |
| 1501492  | Special Topics in IT                               | 3      | Senior standing     |

### D. General Free Elective Courses

Each student registered in the multimedia program is required to take 6 credits (2 courses) as general free elective courses. Such courses can be taken from the University's pool of courses at large upon the approval of the academic advisor. These courses are intended to broaden the knowledge of students by combining studies from multimedia with studies from other academic disciplines.

### Study Plan

The IT-Multimedia program encompasses 123 credits hours that are spread over eight semesters and could be completed in four years. The following distribution of courses by semester facilitates student's normal progression through the study plan.

| Year I, Semester 1 (18 Credits) |                              |        |               |
|---------------------------------|------------------------------|--------|---------------|
| Course                          | Title                        | Cr Hrs | Prerequisites |
| 0201102                         | Arabic Language              | 3      | None          |
| 0202112                         | English for Academic Purpose | 3      | None          |
| 1501100                         | Introduction to IT           | 3      | None          |
| 1440131                         | Calculus I                   | 3      | None          |
| 1501114                         | <i>Problem Solving</i>       | 3      | <i>None</i>   |
| 1501240                         | <i>Graphics Design</i>       | 3      | <i>None</i>   |

| Year I, Semester 2 (17 Credits) |   |        |               |
|---------------------------------|---|--------|---------------|
| Course                          | Title   | Cr Hrs | Prerequisites |
| 0302200                         | Fundamentals of Innovation and Entrepreneurship | 3      | None          |
|                                 | University Elective – 1                         | 3      |               |
| 1501116                         | Programming I                                   | 4      | None          |
| 1501242                         | Interactive Multimedia                          | 3      | 1501100       |
|                                 | College Requirement                             | 4      |               |

| Year 2, Semester 1 (15 Credits) |                                  |        |               |
|---------------------------------|----------------------------------|--------|---------------|
| Course                          | Title                            | Cr Hrs | Prerequisites |
| 0101100                         | Islamic Culture                  | 3      | None          |
|                                 | University Elective - 2          | 3      |               |
| 1501244                         | Design and Authoring             | 3      | 1501100       |
| 1501214                         | Programming with Data Structures | 3      | 1501116       |
| 0202213                         | Critical Reading and Writing     | 3      | 2020112       |

| Year 2, Semester 2 (16 Credits) |                                 |        |               |
|---------------------------------|---------------------------------|--------|---------------|
| Course                          | Title                           | Cr Hrs | Prerequisites |
|                                 | University Elective - 3         | 3      |               |
| 1440181                         | Statistics for Sciences         | 3      | None          |
| 1440182                         | Statistics for Science Lab      | 1      | 1440181       |
| 0302220                         | Principles of Marketing         | 3      | None          |
| 1501361                         | OO Design and Implementation    | 3      | 1500214       |
| 1501245                         | Multimedia Programming & Design | 3      | 1501116       |

| Year 3, Semester 1 (14 Credits) |                                |        |               |
|---------------------------------|--------------------------------|--------|---------------|
| Course                          | Title                          | Cr Hrs | Prerequisites |
| 1501393                         | Multimedia Junior Project      | 2      | 1500214       |
| 1501263                         | Intr. to DB Management Systems | 3      | 1501116       |
| 1501341                         | Web Programming                | 3      | 1501116       |
| 1501340                         | 2D\3D Comp. Animation          | 3      | 1501245       |
|                                 | Program Elective - 1           | 3      |               |

| Year 3, Semester 2 (15 Credits) |                           |        |                  |
|---------------------------------|---------------------------|--------|------------------|
| Course                          | Title                     | Cr Hrs | Prerequisites    |
| 1501250                         | Networking Fundamentals   | 3      | 1500214          |
| 1501341                         | 3D Design for Web         | 3      | 1501245          |
| 1501443                         | Human –Comp. Interaction  | 3      | 1501245; 1501341 |
| 1501459                         | Information Security      | 3      | 1501263          |
|                                 | General Free Elective - 1 | 3      |                  |

| Year 4, Semester 1 (15 Credits) |                         |        |                  |
|---------------------------------|-------------------------|--------|------------------|
| Course #                        | Title                   | Cr Hrs | Prerequisites    |
| 1501465                         | Development of Web App. | 3      | 1501341, 1501263 |
| 1501444                         | Game Design and Dev.    | 3      | 1501245          |
| 1503431                         | Project Management      | 3      | 1503230          |
|                                 | Program Elective – 2    | 3      |                  |
|                                 | Program Elective - 3    | 3      |                  |

| Year 4, Semester 2 (13Credits) |                           |        |                 |
|--------------------------------|---------------------------|--------|-----------------|
| Course #                       | Title                     | Cr Hrs | Prerequisites   |
| 1501496                        | Multimedia Senior Project | 4      | Senior Standing |
|                                | Program Elective – 4      | 3      |                 |
|                                | Program Elective - 5      | 3      |                 |
|                                | General Free Elective - 2 | 3      |                 |

### Course Description

Courses in the proposed program that are offered in the Department of Computer Science start with (1501). The program of study contains courses that are offered by other departments as well as from outside the college. Consistent with the university policies, Computer Science courses in the IT multimedia program will be assigned numbers of the form (1501ABC) where:

|   |  |
|---|--|
| A | Year (level)   |
| B | Areas (as follows):<br>1: Basic Skills<br>2: Programming Languages<br>3: Social, Ethical and Professional Issues |



|   |   |
|---|---|
|   | 4: Artificial Intelligence<br>5: Graphics, Multimedia and Internet<br>6: Systems and Architecture<br>7: Database and Software Engineering<br>8: Theoretical Foundations<br>9: Special Topics, Seminars and Projects |
| C | Course sequence in area   |

Courses in the proposed IT multimedia program that are offered in the department of Computer Science start with (1501). The program of study contains courses that are offered by other departments as well as from outside the college. Consistent with the university policies, Computer Science courses in the program will be assigned numbers of the form (1501ABC).

### Mandatory Core Courses

Description of the core courses are given below:

#### 1501100 Introduction to IT (English)

(2-2:3)

##### Prerequisite: None

The Course explains what a computer is and what it can (and can't) do; it clearly explains the basics of information technology, from multimedia PCs to the internet and beyond. It illustrates how digital devices and networks affect our lives, our world, and our future. In addition, the course is intended to equip students with the necessary skills to use computer and essential software applications effectively in order to better prepare them for their professional careers.

#### 1501116 Programming I

(3-2:4)

##### Prerequisite: None

This course introduces basic programming techniques with a high level programming language. Topics include general introduction to computers and numbering systems, program development process, variables, data types, expressions, selection and repetition structures, functions/procedures, text files, arrays, and pointers.

#### 1501263 Introduction to Database Management Systems

(3-0:3)

##### Prerequisite: 1501116 Programming I

This course explores how databases are designed, implemented, and used. The course emphasizes the basic concepts/terminology of the relational model and applications. The students will learn database design concepts, data models (the Entity-Relationship and the Relational Model), SQL functional dependencies and normal forms. The students will gain experience working with a commercial database management system.

#### 1501341 Web Programming

(3-0:3)

##### Prerequisite: 1501116 Programming I

Introduction to HyperText Markup Language (HTML5): Tags, headers, text style, fonts, line breaks, rules, linking, images, lists, tables, forms, and frames. Semantic tags, Canvas, Geolocation, JQuery, Drag and Drop. Dynamic HTML: Cascading Style Sheets: Inline styles, external style sheets, backgrounds, positioning elements, text flow and box model. Filters: Flip, grayscale, sepia, saturate, hue-rotate, invert, opacity, blur, brightness, contrast, drop-shadow. JavaScript: A simple program, memory concepts, assignment operators, decision making, control structures, if-else, while, repetition, for, switch, do/while, functions, arrays. Object Model and Collections: all, children. Event Model: OnClick, OnLoad,

OnError, OnMouseMove, OnMouseOver, OnMouseOut, OnFocus, OnBlur, OnSubmit, OnReset. Multimedia. DHTMLMenu builder. PHP and databases.

**1501250 Networking Fundamentals (3-0:3)**

**Prerequisite:** 1501214 Programming with Data Structures

Foundation knowledge for computer networks and communications. Topics include basic network design, layered communications models, IP addressing and subnets, and industry standards for networking media and protocols, with an emphasis on TCP/IP protocol suite and Ethernet environments.

**1501443 Human Computer Interaction (3-0:3)**

**Prerequisite:** 1501247 Multimedia Programming & Design, 1501341 Web Programming

Introduction to concepts centered on Human-Computer Interaction from hardware and software perspectives. Topics include design principles, usability principles and engineering, solving user-centered problems, device interaction, and graphical user interface design (2D and 3D interfaces).

**1501114 Problem Solving (3-0:3)**

**Perquisite:** None

General methods of problem solving and principles of algorithmic design using flowcharts and pseudo-code. Applications will be drawn from different domains.

**1501240 Graphic Design (2-2:3)**

**Perquisite:** None

This course is concerned with the basic elements and concepts of design and typography. The hands-on nature adopted is the key to successfully attain the stated course objectives. The course combines practical exercises, workshops, presentations along with major theoretical foundations in the domain.

**1501242 Interactive Multimedia (2-2:3)**

**Prerequisite:** 1501110 Introduction to IT

Multimedia Definition, Multimedia in our life (Business, Education, Communication, Entertainment), Editing and generating media elements: text, images, audio and video, authoring tools and systems, multimedia tools and applications, Implementing and Broadcasting Multimedia elements into WWW.

**1501244 Design and Authoring (2-2:3)**

**Prerequisite:** 1501110 Introduction to IT

Using multimedia authoring programs, students create interactive presentations for publication on local, mobile or web platform. Topics include advanced tools within the software programs, importing and controlling video and audio, importing graphics and animation. Also, the use of emerging platforms to create web-enabled interactive sites, apps, that accounts for the basics of contemporary concepts in HCI, interactivity and user experience design.

**1501247 Multimedia Programming & Design (3-0:3)**

**Prerequisite:** 1501116 Programming 1

This course covers practical and advanced programming concepts in the context of multimedia software. Students will explore fundamental programming issues applied to the use and representation of sound, graphics, animation, and text. They will be introduced to the key ideas of event-driven programming and object-oriented programming using primarily Java as the programming language. They will work with sophisticated programming aids such as integrated development environments, along with the use of JFCs and/or large code libraries.

**1501214 Programming with Data Structures****(2-2:3)****Prerequisite: 150116 Programming I**

This course introduces object oriented programming paradigm, classes and data abstraction; inheritance; templates; recursion; searching and sorting algorithms; linear data structures: lists, stacks, queues. Non-linear data structures: binary trees, and graphs.

**1501393 Multimedia Junior Project****(0-2:2)****Prerequisite: Junior Standing**

This course introduces many skills and perspectives using Multimedia information technology. Topics will vary. Students work in a team to design and if required create a prototype of a multimedia system. At the end students present the current status of the project and the final report. The main implementation of the project will continue in the Multimedia Senior Project course.

**1501340 2D/3D Computer Animation****(3-0:3)****Prerequisite: 1501247 Multimedia Programming & Design**

This course presents a number of concepts in 2D and 3D computer animation. The concepts of animation in both object space and view and lighting space (camera control, and dynamic lighting) will be covered. Fundamental principles of animation, major techniques for 2D and 3D animation: raster and vector animations, key-framing, tweening, morphing, linear and non-linear interpolation will be introduced. The concepts of 3D animation such as physics-based animation, particle system, along with 3D camera and lighting animation, forward and inverse kinematics for motion capture will be covered.

**1501361 Object Oriented Software Design and Implementation****(3-0:3)****Prerequisite: 1501214 Programming with Data Structures**

The course teaches the essential skills in object-oriented analysis and design in Universal Modeling Language (UML). The course introduces the students to the software life cycle, requirements, analysis, system design, and implementation.

**1501398 CO-OP Summer Training****(0-0:0)****Prerequisite: Junior Standing**

This course aims to provide students with practical training, concentrating on their fields of study, and to enhance their abilities to communicate with industry, and real life projects. Summer Training Program provides students with knowledge, skills, abilities and opportunities required for success in their studies and workplace.

**1501343 3D Design for Web****(2-2:3)****Prerequisite: 1501247 Multimedia Programming & Design**

This course covers a complete introduction to modeling, animating, and rendering while learning to build a 3D scene from plans and bring it to life. The course covers modeling, material creation, animation and global illumination lighting, and creating a more realistic virtual environment. Learn complex modeling techniques, customizing the user interface, scene composition, background photo compositing and material mapping.

**1501444 Game Design and Development****(3-0:3)****Prerequisite: 1501247 Multimedia Programming & Design**

How games function to create experiences, including rule design, play mechanics, game balancing, social game interaction and the integration of visual, audio, tactile and textual elements into the total game experience. Students will design and implement a game for desktop or mobile devices.

### **1501459 Information Security**

**(3-0:3)**

**Prerequisite:** 1501215 Data Structures, or 1501214 Programming with Data Structures

Definition of Computer Security, CIA and DAD Triads. Access Control Methodologies, Subjects and Objects, Access Control Models. Security Policies, Security Administration Tools. Handling Security Incidents, Common Types of Attacks. Firewall Security, Perimeter Security Devices, Types of Firewalls. Network and Server Attacks and Penetration, Phases of Control, Methods of Taking Control. Cryptology, Secret-Key Cryptography, Bit Generators, History of ciphers, Data Encryption Standard, Advanced Encryption Standard. Number Theory, Primality, Integer Factorization, Congruence, Hash Functions. Public-Key Cryptography, trapdoor one-way functions, Secure Key-Exchange Protocol, different Cryptosystems, Digital Signatures, Database Security, Secret Sharing Scheme.

### **1501465 Development of Web Applications**

**(3-0:3)**

**Prerequisite:** 1501263 Intro. to Database Management Systems, 1501341 Web Programming

The course primarily emphasizes the underlying concepts rather than the current hot tools to web-based database applications. It discusses the three-tier architecture commonly used in web-based database applications. Also, the course briefly introduces the tools to build web-based database applications, such as PHP, MySQL, Apache, HTML, HTTP, TCP/IP and Javascripts.

### **1501496 Multimedia Senior Project**

**(0-4:4)**

**Prerequisite:** Senior Standing

This course is a continuation of the 1501393 Multimedia Junior Project. Student will finalize the project started in the previous semester. All projects are group projects. Generally, a group has two to three students. Under special conditions (e.g. limited number of students) a single student might be allowed to work on the project.

### **Core Elective Courses**

Descriptions of the core electives are given below:

### **1501319 Programming Languages and Paradigms**

**(3-0:3)**

**Prerequisite:** 1501215 Data Structures

This course covers the fundamental concepts of programming languages (PL) and paradigms. It focuses on the design issues of the various languages constructs and the criteria used for evaluating PL and PL constructs. It covers the role of programming languages and primary formal methods for describing the syntactic and semantics structure of PLs. It also covers the design issues for imperative languages and examines data abstractions which support Object Oriented Programming, Functional Programming, and Logical Programming.

### **1501330 Introduction to Artificial Intelligence**

**(3-0:3)**

**Prerequisite:** 1501215 Data Structures, 1501279 Discrete Structures

This course will provide an introduction to the fundamental concepts and techniques in the field of artificial intelligence. Topics covered in the course include: problem solving and search, logic and knowledge representation, planning, reasoning and decision-making in the presence of uncertainty, and machine learning. Areas of application such as knowledge representation, natural language processing, expert systems, and robotics will be explored. AI programming languages (LISP/Prolog) will also be introduced.

**1501352 Operating Systems****(3-0:3)****Prerequisite: 1501215 Data Structures**

This course covers the history of operating systems. Processes: IPC, process scheduling, process synchronization, and deadlock. I/O: principles of I/O hardware and software, disks and clocks. Memory management: Swapping, paging, virtual memory and page replacement algorithms. File systems: Examples of some popular operating systems such as Unix, Linux, and Windows.

**1501355 Computer Architecture****(3-0:3)****Prerequisite: 1501252 Computer Organization & Assembly Language**

This course covers the core concepts of computer architecture design. The main focus is on key principles for high-performance and low-cost design. It covers in details logical design of computer systems. Topics include reduced instruction set computer architecture (RISC), using the MIPS central processor as an example, interface between assembly and high level programming constructs and hardware, interrupt systems, instruction and memory cache systems, parallelism, pipeline architecture and multiprocessors.

**1501366 Software Engineering****(3-0:3)****Prerequisite: 1501215 Data Structures**

Follows the formal software life cycle from the requirement, specification, and design phases through construction of actual software. Topics include models for the software life cycle, object-oriented analysis and design, management of software projects, CASE tools, verification and testing techniques, software quality assurance, and issues related to maintenance and delivery.

**1501370 Numerical Methods****(3-0:3)****Prerequisite: 1501116 Programming I**

The objectives are to introduce basic principles and techniques of computational methods and their algorithms for solving real mathematical problems that arise in science and engineering. At the end of the course, the students should be able to understand the behavior of numbers when calculated by computers. In addition, students should know the theory and application of different numerical techniques to solve mathematical problems.

**1501433 Introduction to Computer Vision and Image Processing****(3-0:3)****Prerequisite: 1501215 Data Structures, or 1501214 Programming with Data Structures**

Introduction to the basic concepts in computer vision and image processing: An introduction to low-level image analysis methods, including image formation, edge detection, feature detection, line fitting, and image segmentation. Camera models, Image transformations (e.g., warping, morphing, and mosaics) for image synthesis. Background subtraction and tracking, Motion and video analysis. Applications such as optical character recognition, action recognition or face recognition may also be introduced.

**1501440 Introduction to Computer Graphics****(3-0:3)****Prerequisite: 1501215 Data Structures, or 1501214 Programming with Data Structures**

This course presents an introduction on Hardware and software components of graphics systems, also it covers the following topics: Output and filled data primitives, OpenGL, geometric transformations, viewing pipeline, clipping, and windowing, viewing transformations, data structures and vector tools for graphics (lines, planes, dot product, cross product, visible surface detection and illumination models), 2D animations, and curves.

**1501441 Multimedia Technology****(3-0:3)****Prerequisite: Senior Standing**

The course emphasizes underlying concepts rather than how to use the current multimedia tools. Topics covered by the course include introduction to multimedia, multimedia authoring, image and video representation, color basics, fundamental concepts of video, basics of digital audio, lossless and lossy compression algorithms, image and video compression standard, and content-based image and video retrieval.

**1501445 IT Application in E-Commerce****(3-0:3)****Prerequisite: 1501341 Web Programming**

This course prepares students to understand e-commerce architecture, e-commerce models, their legal, ethical and social issues. They will also be able to design and develop web sites with dynamic web content, and to integrate web solutions into the organization's information system. The course focuses on many techniques for e-commerce applications such as displaying product catalogue, applying shopping carts, handling online transactions.

**1501451 Computer Networks****(3-0:3)****Prerequisite: 1501352 Operating Systems**

Network uses. Network components. Network classification and services. Network architectures. Network protocols and their performance. Study of specific protocols, methods, and algorithms for framing, flow control, error detection and correction, medium access, routing, congestion control, internetworking, addressing, connection establishment and release, multiplexing, and fragmentation. Overview of Internet application protocols, resources, and services.

**1501458 Mobile Applications & Design****(3-0:3)****Prerequisite: 1501215 Data Structures, or 1501214 Programming With Data Structures**

This course focuses on the fundamentals of mobile applications development. It covers mobile and wireless network technologies from a software developer's perspective. The students will be exposed to several different markup as well as the techniques that can be used to generate this technology for the wide range of wireless devices. Furthermore, students will gain hands on experience in developing mobile applications for iOS devices.

**1501365 Advanced Database Systems****(3-0:3)****Prerequisite: 1501263 Introduction to Database Management Systems**

This course will build on the concepts introduced in 1501263. The students will be exposed to more advanced topics and implementation related aspects of database management systems such as object databases, XML data querying, file structures, indexing, query optimization, transaction processing, concurrency control, and database recovery.

**1501474 Compiler Design****(3-0:3)****Prerequisite: 1501372 Formal Languages & Automata Theory**

This course introduces students to the theory and implementation of compiler construction. It covers symbol tables, lexical analysis, syntax analysis, semantic analysis and code generation. This course includes a substantial project component, in which students will construct and implement all stages of a compiler for a subset of a general purpose programming language.

**1501490 Topics in Computer Science I****(3-0:3)****Prerequisite: Senior Standing**

This course involves special topics in Computer Science. The course usually introduces advanced/specialized areas that are not currently offered as regular courses in the computer Science curricula. The topic depends on the interest of the instructor and those of the senior students.

**1501491 Topics in Computer Science II****(3-0:3)****Prerequisite: Senior standing**

This course involves special topics in Computer Science. The course usually introduces advanced/specialized areas that are not currently offered as regular courses in the computer Science curricula. The topic depends on the interest of the instructor and those of the senior students.

**1501492 Special Topics in IT****(3-0:3)****Prerequisite: Senior Standing**

This course involves special topics in IT Multimedia. The course usually introduces advanced/specialized areas that are not currently offered as regular courses in the computer Science curricula. The topic depends on the interest of the instructor and those of the senior students.



## Department of Computer Engineering (CE)

### Personnel

|                             |   |
|-----------------------------|---|
| <b>Chairperson</b>          | Ali A. El-Moursy  |
| <b>Professors</b>           | Mohammad S. Obaidat, Ibrahim Kamel, Tamer Rabie, Mohamed Saad |
| <b>Associate Professors</b> | Bassel Soudan, Talal Bonny, Ali Bou Nassif                    |
| <b>Assistant Professor</b>  | Ala' Barakat Altaweel   |
| <b>Staff</b>                | Maha AlaaEddin (Lab Officer)                                  |

### Vision

The Department aims to be a leader in the region in providing highly qualified engineers who can address the rapid technological challenges of the future.

### Mission

The Department is committed to graduate highly qualified computer engineers equipped with state of the art knowledge and skills who can contribute to the economic development of the United Arab Emirates and the region, and have ability for life-long learning and a sense of professional responsibility.

### Computer Engineering Core Values:

Computer Engineers provide the key building blocks of the modern information technology based society, from improved software systems and faster computers to next-generation communication networks. Graduates of the Computer Engineering program will have knowledge, practice, and design capabilities in the following areas:

- Information and Network Security: computer engineers design and implement cryptography mechanisms, protocols, software and hardware systems to protect the Internet and information systems from hostile attacks and security threats.
- Communications and Networks: computer engineers design and build faster and more secure communication networks, network protocols and network applications.
- Software systems: computer engineers design and implement software for Internet search engines, gaming, mobile devices, multimedia applications, and medical imaging.
- Computer Systems Architecture: Computer engineers design and implement modern computer systems and their various components, e.g., processors and memory.
- Embedded Systems: computer engineers design and build embedded hardware and software systems for robots, smart appliances, mobile phones, media players, etc.
- Integrated Circuit Design: computer engineers design smaller and faster chips for computers and mobile devices.

Computer technology and the related applications such as telecommunications and networking are advancing at a high pace. The Computer Engineering curriculum is modern and dynamic. It provides a thorough foundation in hardware and software design.



### CE Program Educational Objectives

The Computer Engineering program educational objectives are to prepare engineering professionals who:

1. Maintain the knowledge and skills necessary for a lifelong career in computer engineering to provide quality services to the community.
2. Remain globally competent and effective leaders.
3. Continue to develop, through lifelong learning opportunities, their knowledge for using modern design tools and new technologies in the practice of computer engineering.
4. Secure admission to and succeed in graduate study in internationally recognized universities.

### CE Program Learning Outcomes

Upon successful completion of the B.Sc. Computer Engineering program, a student will have:

- a. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- b. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- c. Communicate effectively with a range of audiences
- d. Describe ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
- e. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
- f. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- g. Apply new knowledge as needed, using appropriate learning strategies

### Career Opportunities

Graduates from the Computer Engineering program will be prepared to pursue careers in many fields as well as to seek advanced degrees in related fields.

- Computer and embedded systems design.
- Robotics and IoT
- Cyber Security
- Networking and telecommunications industry.
- Cloud computing
- IT industry.
- Software industry.
- Web development and services

## Program Overview

To obtain a Bachelor of Science degree in Computer Engineering, the student must complete a total of 132 credit hours. These hours span university and departmental requirements. The allocation of the credit hours is shown in the following table:

| B.Sc. in Computer Engineering (132 credits) |                         |                         |       |
|---|-------------------------|-------------------------|-------|
|   | University Requirements | Department Requirements | Total |
| Mandatory Core Credits                      | 15                      | 99                      | 114   |
| Electives Credits                           | 9                       | 9                       | 18    |
| Total                                       | 24                      | 108                     | 132   |

### 1. University Requirements

As stated in the University Requirements section of the college catalog.

### 2. Program Requirements

The program requirements of 108 credit hours are divided into two major sets.

1. CE mandatory core courses (99 credits)
2. CE program elective courses (9 credits)

#### A. Mandatory Core Courses

The Computer Engineering core courses are listed in the table below.

| Course # | Course Title                        | Cr Hrs | Prerequisite                               |
|----------|-------------------------------------|--------|--|
| 1430115  | Physics I                           | 3      | Placement Test or 1430106<br>Pre/Co1440133 |
| 1430116  | Physics I Lab                       | 1      | Pre/Co1430115                              |
| 1420101  | General Chemistry                   | 3      | None                                       |
| 1420102  | General Chemistry Laboratory        | 1      | 1420101                                    |
| 1430117  | Physics II                          | 3      | 1430115, 1430116                           |
| 1430118  | Physics II Laboratory               | 1      | 1430116; Pre/Co 1430117                    |
| 1502101  | Introduction to CPE                 | 3      | None                                       |
| 1440133  | Calculus I For Engineers            | 3      | None                                       |
| 1440161  | Calculus II for Engineers           | 3      | 1440133                                    |
| 1501116  | Programming I                       | 4      | None                                       |
| 1502111  | Discrete Mathematics for Engineers  | 3      | Pre/Co 1501116                             |
| 0402202  | Circuit Analysis I                  | 3      | Pre/Co 1430117, 1440261                    |
| 0402203  | Circuit Analysis I Laboratory       | 1      | Pre/Co: 0402202, 1430118                   |
| 1501211  | Programming II                      | 3      | 1501116                                    |
| 1440261  | Differential Equation for Engineers | 3      | 1440161                                    |
| 1502201  | Digital Logic Design                | 3      | Pre 1501116                                |
| 0402241  | Random Signal Theory                | 3      | Pre/Co: 0402202                            |
| 0402240  | Signals and Systems                 | 3      | 0402202                                    |

| Course # | Course Title  | Cr Hrs | Prerequisite                      |
|----------|---|--------|-----------------------------------|
| 0402250  | Fundamentals of Electronic Circuits                       | 3      | 0402202; 1502201                  |
| 0402251  | Fundamentals of Electronic Circuits Laboratory            | 1      | 0402203; Pre/Co 0402250           |
| 1502202  | Digital Logic Design Laboratory                           | 1      | Pre 1502201                       |
| 1502232  | Microprocessors and Assembly Language                     | 4      | 1502201                           |
| 1501215  | Data Structures   | 3      | Pre/Co1502111                     |
| 0402346  | Telecommunication Systems I                               | 3      | 0402240; 0402241                  |
| 1502346  | Computer Communications and Networks                      | 3      | Pre/Co 0402241                    |
| 0402340  | Engineering Computation and Linear Algebra                | 3      | 1501116; 1440261                  |
| 1502326  | Computer System Architecture                              | 3      | 1502232                           |
| 1501352  | Operating Systems   | 3      | 1501215                           |
| 0402347  | Telecommunication Systems I Laboratory                    | 1      | 0402346                           |
| 1502347  | Computer Communications and Networks Laboratory           | 1      | 1502346                           |
| 1502444  | Computer & Network Security                               | 3      | 1501215, 1502346                  |
| 1502334  | Embedded Systems Design                                   | 3      | 1502232; 0402250                  |
| 1501366  | Software Engineering                                      | 3      | 1501215                           |
| 0202207  | Technical Writing   | 3      | 0202103                           |
| 1502442  | Network Programming                                       | 3      | 1502346                           |
| 0401301  | Engineering Economics                                     | 3      | 3rd Year Standing                 |
| 1502491  | Senior Design Project I                                   | 1      | Senior Standing<br>Pre/Co 0202207 |
| 1502300  | Professional, Societal, and Ethical Issues in Engineering | 1      | 3rd Year Standing                 |
| 1502492  | Senior Design Project II                                  | 3      | 1502491                           |
| 1502490  | Practical Training  | 0      | Completion of 90 credits          |

## B. Elective courses

As part of the program for the Bachelor of Science in Computer Engineering, the student is required to study some technical elective courses (9 credits). These courses allow the student to focus on a specific area for in depth knowledge and deep understanding. The student can also mix and match elective courses from the different areas to get a wider exposure to the different Computer Engineering disciplines. The student should select, in cooperation with his/her academic advisor, the list of electives that best meet his/her needs and aspirations. It is highly recommended that the student registers for these courses after completing all department required courses. The following table shows the list of elective courses.

| Course # | Course Title                           | Cr Hrs | Prerequisite            |
|----------|--|--------|-------------------------|
| 1502412  | Parallel and Distributed Processing    | 3      | Pre: 1502232 or 1502336 |
| 1502413  | Computer System Modeling               | 3      | 0402241                 |
| 1502414  | Verification in Software               | 3      | 1501366                 |
| 1502416  | Real-time Systems Design               | 3      | 1501352                 |
| 1502420  | Advanced Digital Design                | 3      | 1502201                 |
| 1502422  | Performance Analysis                   | 3      | 1502326                 |
| 1502424  | High Performance Computer Architecture | 3      | 1502326                 |
| 1502443  | Computer Networks Design and Analysis  | 3      | 1502346                 |

| Course # | Course Title   | Cr Hrs | Prerequisite                   |
|----------|--|--------|--------------------------------|
| 1502430  | Design of IOT Systems                                | 3      | 1502334 or 1502336 and 1502346 |
| 1502445  | Digital Image Processing                             | 3      | 0402240; Pre/Co 0402340        |
| 1502447  | Wireless Communication                               | 3      | 0402346                        |
| 1502452  | VLSI Design  | 3      | 0402250                        |
| 1502454  | Application Specific Integrated Circuits             | 3      | 0402250                        |
| 1502457  | Digital Integrated Circuits                          | 3      | 0402250                        |
| 1502458  | Digital Integrated Circuits Laboratory               | 1      | Pre/Co 1502457                 |
| 1502460  | Special Topics in Computer Engineering               | 3      | 4th Year standing              |
| 1502462  | Special Topics in Computer Architecture              | 3      | 1502326                        |
| 1502463  | Special Topics in Software and Computer Applications | 3      | Instructor Consent             |
| 1502464  | Special Topics in Computer Networks                  | 3      | 1502346                        |
| 1502465  | Special Topics in Microelectronics and VLSI          | 3      | 0402250                        |
| 1502493  | Senior Seminar in Computer Engineering               | 1      | Senior standing                |
| 1502449  | Autonomous Robotics Control                          | 3      | 1501116; 0402240               |
| 1501263  | Introduction to Database Management Systems          | 3      | 1501116                        |
| 1501365  | Database Design & Implementation                     | 3      | 1501263                        |
| 1501440  | Introduction to Computer Graphics                    | 3      | 1501215                        |
| 0402330  | Feedback Control Systems                             | 3      | 0402240                        |
| 0402341  | Multimedia Technology Laboratory                     | 1      | 0402240                        |
| 0402353  | Electronic Circuits                                  | 3      | 0402250                        |
| 0402354  | Electronic Circuits Laboratory                       | 1      | Pre/Co 0402353                 |
| 0402437  | Programmable Logic Controllers and Applications      | 3      | Pre: 1502336 or 1502334        |
| 0402442  | Telecommunications Systems II                        | 3      | 0402346                        |
| 0402444  | Digital Signal Processing                            | 3      | 0402240                        |
| 0402446  | Cellular Telephony                                   | 3      | 0402346                        |
| 0402447  | Wireless Communication                               | 3      | 0402346                        |
| 0402448  | Speech Signal Processing and Applications            | 3      | 0402340; 0402346               |
| 0406320  | Solar PV Systems                                     | 3      | 0402250                        |
| 0406321  | Solar PV Systems Laboratory                          | 1      | Pre/Co 0406320                 |

## Study Plan

The Bachelor of Science in Computer Engineering encompasses 132 credit hours that are spread over eight semesters and can be completed in four years. The following study plan serves as a roadmap for a smooth progression toward graduation.

| Year I, Semester 1 (17 Credits) |                               |        |                |
|---------------------------------|-------------------------------|--------|----------------|
| Course #                        | Title                         | Cr Hrs | Prerequisites  |
| 0201102                         | Arabic Language               | 3      | None           |
| 0202112                         | English for Academic Purposes | 3      | None           |
| 1420101                         | General Chemistry             | 3      | None           |
| 1420102                         | General Chemistry Laboratory  | 1      | Pre/Co 1420101 |
| 1440133                         | Calculus I for Engineers      | 3      | 1440133        |

| Year I, Semester 1 (17 Credits) |                      |   |  |
|---------------------------------|----------------------|---|--|
| 1430115                         | Physics I            | 3 | Placement Test, or 1430106 Pre/Co1440133 |
| 1430116                         | Physics I Laboratory | 1 | Pre/Co 1430115                           |

| Year I, Semester 2 (17 Credits) |                                      |        |                          |
|---------------------------------|--------------------------------------|--------|--------------------------|
| Course #                        | Title                                | Cr Hrs | Prerequisites            |
| 1501116                         | Programming I                        | 4      | None                     |
| 1440161                         | Calculus II for Engineers            | 3      | 1440133                  |
| 1430117                         | Physics II                           | 3      | 1430115; Pre/Co: 1440161 |
| 1430118                         | Physics II Laboratory                | 1      | 1430116; Pre/Co: 1430117 |
| 1502101                         | Introduction to Computer Engineering | 3      | None                     |
| 1502111                         | Discrete Math. for Engineers         | 3      | Pre/Co 1501116           |

| Year 2, Semester 1 (16 Credits) |                                      |        |                         |
|---------------------------------|--------------------------------------|--------|-------------------------|
| Course #                        | Title                                | Cr Hrs | Prerequisites           |
| 1501100                         | Introduction to IT (English)         | 3      | None                    |
| 1501211                         | Programming II                       | 3      | 1501116                 |
| 1440261                         | Differential Equations for Engineers | 3      | 1440161                 |
| 0402202                         | Circuit Analysis I                   | 3      | Pre/Co 1430117, 1440261 |
| 0402203                         | Circuit Analysis I Laboratory        | 1      | Pre/Co 0402202, 1430118 |
| 1502201                         | Digital Logic Design                 | 3      | Pre 1501116             |

| Year 2, Semester 2 (18 Credits) |  |        |                         |
|---------------------------------|--|--------|-------------------------|
| Course #                        | Title  | Cr Hrs | Prerequisites           |
| 1501215                         | Data Structures                                | 3      | Pre/Co 1502111          |
| 0402240                         | Signals and Systems                            | 3      | 0402202                 |
| 0402241                         | Random Signal Theory                           | 3      | Pre/Co: 0402202         |
| 1502202                         | Digital Logic Design Laboratory                | 1      | 1502201                 |
| 1502232                         | Microprocessors & Assembly Language            | 4      | 1502201                 |
| 0402250                         | Fundamentals of Electronic Circuits            | 3      | 0402202; 1502201        |
| 0402251                         | Fundamentals of Electronic Circuits Laboratory | 1      | 0402203; Pre/Co:0402250 |

| Year 3, Semester 1 (18 Credits) |                              |        |                  |
|---------------------------------|------------------------------|--------|------------------|
| Course #                        | Title                        | Cr Hrs | Prerequisites    |
| 1501352                         | Operating Systems            | 3      | 1501215          |
| 0402346                         | Telecommunication Systems I  | 3      | 0402240; 0402241 |
| 1502326                         | Computer System Architecture | 3      | 1502232          |

| Year 3, Semester 1 (18 Credits) |  |   |                  |
|---------------------------------|--|---|------------------|
| 0402340                         | Engineering Computation & Linear Algebra | 3 | 1501116; 1440261 |
| 1502346                         | Computer Communication & Networks        | 3 | Pre/Co: 0402241  |
| 0302200                         | Fundamentals of Innovation               | 3 | None             |

| Year 3, Semester 2 (14 Credits) |  |        |                  |
|---------------------------------|--|--------|------------------|
| Course #                        | Title  | Cr Hrs | Prerequisites    |
| 0202207                         | Technical Writing                              | 3      | 0202112          |
| 1501366                         | Software Engineering                           | 3      | 1501215          |
| 1502334                         | Embedded Systems Design                        | 3      | 1502232; 0402250 |
| 1502347                         | Computer Communication and Networks Laboratory | 1      | 1502346          |
| 0402347                         | Telecommunication Systems I Laboratory         | 1      | 0402346          |
| 1502444                         | Computer and Network Security                  | 3      | 1501215, 1502346 |

| Year 3, Summer Training (0 Credit) |                                |        |                          |
|------------------------------------|--------------------------------|--------|--------------------------|
| Course #                           | Title                          | Cr Hrs | Prerequisites            |
| 1502490                            | Practical Training for 8 weeks | 0      | Completion of 90 credits |

| Year 4, Semester 1 (16 Credits) |                         |        |   |
|---------------------------------|-------------------------|--------|---|
| Course #                        | Title                   | Cr Hrs | Prerequisites                                   |
| 0104100                         | Islamic Culture         | 3      |   |
| 1502491                         | Senior Design Project I | 1      | Senior Standing; Pre/Co 0202207; Pre/Co 0202110 |
|                                 | University Elective I   | 3      |   |
| 0401301                         | Engineering Economics   | 3      |   |
| 1502442                         | Network Programming     | 3      | 1502346   |
| 150XXXX                         | Department Elective I   | 3      |   |

| Year 4, Semester 2 (16 Credits) |  |        |                   |
|---------------------------------|--|--------|-------------------|
| Course #                        | Title                                  | Cr Hrs | Prerequisites     |
| 1502492                         | Senior Design Project II               | 3      | 1502491           |
| 1502300                         | Professional Societal & Ethical Issues | 1      | 3rd Year Standing |
| 150XXXX                         | Department Elective II                 | 3      |                   |
| 150XXXX                         | Department Elective III                | 3      |                   |
|                                 | University Elective II                 | 3      |                   |
|                                 | University Elective III                | 3      |                   |

### Course Description

Courses in the proposed program that are offered in the department of Computer Engineering start with (1502). The program of study contains courses that are offered by other colleges. Consistent with the university policies, CE courses in the program will be assigned numbers of the form (1502ABC) where:

|   |  |
|---|--|
| A | Year (level)   |
| B | Areas (as follows)<br>0: General Electrical Engineering<br>1: Electromechanical and Power<br>2: Electromagnetism<br>3: Control & Instrumentation<br>4: Communications & Signal Processing<br>5: Electronics<br>6: Special Topics |
| C | Course sequence in area  |

### Mandatory Core Courses

Descriptions of the core courses are given below.

#### **1502101 Introduction to Computer Engineering (0-3:3)**

##### **Prerequisite: None**

This course helps students to understand computer engineering as a balance among hardware, software, applications and theory. Study of the basic architecture of computer systems: information representation, computer hardware, software and programming languages, peripherals, storage systems, concept of programming, high level languages, e.g., C++, Python vs. low level languages, e.g. assembly, operating system, embedded systems, computer networks and Internet, and computer security. The course includes introductory laboratory components, e.g., digital logic design lab, microprocessor lab, robotics lab, network lab, cloud computing lab, and computer programming. The course will introduce the students to a perspective on engineering profession, engineering design process, problem solving, and job prospects of computer engineering.

#### **1502111 Discrete Mathematics for Engineers (3-0:3)**

##### **Prerequisite: Pre/Co: 1501116 Programming I**

Propositional logic, predicates, quantifiers; sets, functions; algorithms and their complexity; proof strategy, sequences, induction, recursion; relations, equivalence relations, partial orders; basic counting techniques; recurrence relations; graphs, shortest path problems; trees and tree traversal; computation models.

#### **1502201 Digital Logic Design (3-0:3)**

##### **Prerequisite: 1501116 Programming I**

Number systems and conversions. Boolean algebra and its application in analysis and design of logic circuits. Logic gates and networks. Techniques for analysis and synthesis of combinational and sequential logic systems. Programmable logic devices and field programmable gate arrays.

#### **1502202 Digital Logic Design Laboratory (0-3:1)**

##### **Prerequisite: 1502201 Digital Logic Design**

The operation of basic logic gates, examples of some combinational and sequential circuits such as adders, subtractors, decoders, encoders, flip-flops, counters, and shift registers. Design of combinational and sequential logic circuits using SSI or MSI blocks.

**1502232 Microprocessors & Assembly Language****(3-3:4)****Prerequisite: 1502201 Digital Logic Design**

Microprocessor architecture and systems. Assembly language programming of microprocessors, data representation, addressing and instruction sets, I/O programming, interrupts, assembly process, cross assemblers and debugging.

**1502300 Professional, Societal and Ethical Issues in Engineering****(1-0:1)****Prerequisite: 3<sup>rd</sup> year standing**

An examination of the social impact of engineering and technology and its relationship to ethics, with the objective of identifying and clarifying obligations that might arise in technological research and its applications. The course will survey a variety of moral theories, as well as engineering codes of ethics. The case study method will be used: source will include the history of science and technology, and reports from professional societies. Topics covered include whistle blowing, environmental, safety, and privacy issues.

**1502326 Computer System Architecture****(1-0:1)****Prerequisite: 1502232 Microprocessors and Assembly Language**

Computer instruction types, bus structures and data control. Hard-wired control and microprogramming. Implementation of memory systems: Virtual and cache memory organization and management. Input/output control and how it is achieved, interrupts and interrupt handling.

**1502334 Embedded Systems Design****(2-2:3)****Prerequisite: 1502232 Microprocessors and Assembly Language; 0402250 Fundamentals of Electronic Circuits**

Study of the basic architecture of a microcontroller including its applications in a microcontroller system. Implementation of the principles of micro-processing, interfacing and total system design by implementing projects. Application of top-down design to microcontroller software development in assembly language and C. Introduction into the evaluation of hardware and software trade-offs.

**1502346 Computer Communications and Networks****(3-0:3)****Prerequisite: Pre/Co: 0402241 Random Signal Theory**

Essentials of data communications of relevance to computer networks. Circuit and packet switched networks. Protocols and routing. Network layers based on OSI and the Internet models. Local area network topologies and medium access methods. Wide-band and high-speed networks.

**1502347 Computer Communications and Networks Laboratory (0-3:1)****Prerequisite: 1502346 Computer Communications and Networks**

This laboratory provides hands-on experience essential to the real understanding of computer networking and the devices used in building these networks. The goals are to give the student practical aspects of network topologies, network operating systems including the setup of network services DHCP, DNS, peer to peer and server based networking, switch setup and VLANs, Basics of IP addressing, subnetting and router configuration.

**1502442 Network Programming****(3-0:3)****Prerequisite: 1502346 Computer Communications and Networks**

Review of network protocols and topologies, TCP/IP, RFCs; communication across layers; communication models: peer-to-peer, client server; streams, datagram and TCP sockets; algorithm classifications: centralized and distributed; application-layer protocols: specifications and implementation; Inter-Process Communications, multi-threading, concurrency, scheduling.



**1502444 Computer and Network Security****(3-0:3)****Prerequisite:** 1501215 Data Structures; **Pre/Co:** 1502346 Computer Communications and Networks

Concepts and techniques for access to computer systems and network resources. Identification and authentication. Protection of information against intentional and unintentional attacks and threats. Cryptography and encryption of data. Encryption algorithms and their information theory foundations. Computer hardware and software for data encryption.

**1502491 Senior Design Project I****(1-0:1)****Prerequisite:** Senior standing in Computer Engineering; **Pre/Co:** 0202207 Technical Writing; **Pre/Co:** 0202110 Speech Communication

This is the first phase of the capstone project, which, consists of two courses Senior Design Project I and Senior Design Project II. Subjects for the projects are linked to research interests in the department or sometimes in co- operation with local industry. Small groups of students work together to design, build, refine and test complete hardware or software systems to meet specifications. During this phase, students are expected to study the current literatures, acquire the required skills for the project, and finalize the high-level specifications for the design. Each group of students submits a report and gives a presentation.

**1502492 Senior Design Project II****(3-0:3)****Prerequisite:** 1502491 Senior Design Project I

This is second phase of the capstone project, which consists of two courses Senior Design Project I and Senior Design Project II. During this phase, students are expected to implement the proposed project as outlined in the report produced at the end of Senior Design Project I. Each group of students is required to prepare a detailed report, a poster, and make a formal presentation of their work that will be used to evaluate their engineering design and verbal and communication skills.

**Elective Courses**

Descriptions of the elective courses are given below:

**1502412 Parallel and Distributed Processing****(3-0:3)****Prerequisite:** 1501352 Operating Systems

Parallel computer architectures: Multiprocessor vector computers and pipelined vector processors. Parallel processing algorithms. Distributed processing with applications. Centralized/Decentralized Distributed systems. Parallel Programming Paradigms.

**1502413 Computer System Modeling****(3-0:3)****Prerequisite:** 0402241 Random Signal Theory

Elements of computer simulation, including modeling deterministic and stochastic systems, generation of uniform and non-uniform random numbers, discrete-event simulations, simulation languages, design of simulations, statistical analysis of the output of simulations, variance reduction, applications to modeling stochastic systems in computer science and engineering.

**1502414 Verification in Software****(3-0:3)****Prerequisite:** 1501366 Software Engineering

Design specification and software requirements. Verification and validation of software specifications: completeness, consistency, feasibility, and testability. The design of software components and the study of faults resulting from interfacing, computation, and/or data specifications. Knowledge-based approaches to verification and validation. Test generation systems and tools.

**1502416 Real-Time Systems Design****(3-0:3)****Prerequisite: 1501352 Operating Systems**

Study of 16/32 bit architectures and features for real-time control. Instruction pre-fetch, instruction set extension, exception processing, bus arbitration and multiprocessor control. Introduction to real-time operating systems. Application of computers to real-time on-line control of systems.

**1502420 Advanced Digital Design****(2-2:3)****Prerequisite: 1502201 Digital Logic Design**

Algorithmic State Machines, PLDs, PALs, PLAs, Stability of Sequential Circuits. The course will also complement the sequential circuit portion of Digital Logic Design (1502201).

**1502422 Performance Analysis****(3-0:3)****Prerequisite: 1502326 Computer System Architecture**

A systematic approach to computer systems performance evaluation and analysis. Performance metrics. Evaluation Techniques, Measurements, Queuing Models, Simulation of Computer Systems.

**1502424 High Performance Computer Architecture****(3-0:3)****Prerequisite: 1502326 Computer System Architecture**

Cost-performance analysis, advanced topics in computer architecture, pipelining concepts, instructions Set Architecture issues, Instruction Level Parallelism: Dynamic and Static.

**1502430 Design of IOT Systems****(2-2:3)****Prerequisite: 1502334 Embedded Systems Design or 1502336 Microcontroller Based Design and 1502346 Computer Communications and Networks**

Introduction of IOT, design principles for connected devices, prototyping of embedded devices and prototyping of online components. Topics covered also include the underlying principles in building interactive systems and using a combination of hardware, embedded software, web services and cloud computing platforms. Topics on low power design, energy harvesting, and renewable energy power sources will also be introduced.

**1502443 Computer Networks Design and Analysis****(3-0:3)****Prerequisite: 1502346 Computer Communications and Networks**

This course focuses on modeling, analysis and design of computer and communication networks, with an emphasis on: switched/extended LANs and optimal/distributed spanning tree algorithms; fairness and bandwidth sharing objectives; some network design problems including optimal access network connectivity; some network design tools including linear programming and genetic algorithms; basic queuing models and network delay analysis; introduction to wireless resource allocation including scheduling and power control; new technological trends.

**1502445 Digital Image Processing****(3-0:3)****Prerequisite: 0402240 Signals and Systems, Pre/Co: 0402340 Engineering Computation and Linear Algebra**

Fundamentals of digital image processing. Image representation and standards. Image acquisition and display. Image transforms. Image enhancement. Image restoration. Introduction to image compression. Introduction to Image segmentation. Industrial and Multimedia applications.

**1502452 VLSI Design****(3-0:3)****Prerequisite: 0402250 Fundamentals of Electronic Circuits**

Fundamentals of MOS technology in VLSI design: MOS devices and circuits, Design, layout (CAD techniques), masking, fabrication, packaging and testing of VLSI chips.

#### **1502454 Application Specific Integrated Circuits (ASIC) (3-0:3)**

##### **Prerequisite: 0402250 Fundamentals of Electronic Circuits**

Synthesis, modeling and testability issues. Tools and techniques required in all phases of ASIC design, implementation and fabrication. Design alternatives and comparisons. Practical issues in fabrication.

#### **1502457 Digital Integrated Circuits (3-0:3)**

##### **Prerequisite: 0402250 Fundamentals of Electronic Circuits**

Digital CMOS process technology, Static CMOS circuit design, Dynamic CMOS logic, CMOS sequential logic circuits, Complex CMOS logic, layout techniques, Pass-transistor & transmission gate logic, Timing in CMOS circuits, CMOS buffers & bus drivers, Fast CMOS adder & multiplier design, CMOS SRAM & DRAM circuits, Low-power CMOS circuit techniques.

#### **1502458 Digital Integrated Circuits Laboratory (0-3:1)**

##### **Prerequisite: Pre/Co: 1502457 Digital Integrated Circuits**

Spice models for BJT and MOS transistors in digital circuits, simulation of digital inverter circuits with design optimization, design and simulation of basic digital gates (e.g., NAND, NOR, XOR) with power/frequency-response constraints, the CMOS n-well process and layout with area efficiency, top-down design of a complex circuit.

#### **1502460 Special Topics in Computer Engineering (3-0:3)**

##### **Prerequisite: 4<sup>th</sup> year standing**

This course will be offered to cover special advanced topics in one of the areas of Computer Engineering. The contents and pre-requisite will vary depending on the topic.

#### **1502462 Special Topics in Computer Architecture (3-0:3)**

##### **Prerequisite: 1502326 Computer System Architecture**

This course covers emerging and advanced topics in compute architecture. The contents will vary depending on the topic.

#### **1502463 Special Topics in Software and Computer Applications (3-0:3)**

##### **Prerequisite: Instructor Consent**

This course covers emerging and advanced topics in Software and Computer Applications. The contents will vary depending on the topic.

#### **1502465 Special Topics in Microelectronics and VLSI (3-0:3)**

##### **Prerequisite: 0402250 Fundamentals of Electronic Circuits**

This course covers emerging and advanced topics in microelectronics and VLSI. The contents will vary depending on the topic.

#### **1502493 Senior Seminar in Computer Engineering (1-0:1)**

##### **Prerequisite: Senior standing**

Course provides a review of contemporary topics in computer engineering to enrich senior students' knowledge about the latest technologies and research areas in computer engineering field. It includes latest software, hardware, networking technologies and their uses in new computer, Internet, and security applications. The course also gives students the opportunity to introduce the students to research methodologies and sharpen skills needed to be successful as future engineers. It helps senior students to understand career development process and explore trends in the market while at the same

time preparing them to start their career path. The course aims to enhance oral communication skills by giving the opportunity for senior students to give seminars about new topics of their selection.

**1502449 Autonomous Robotics Control (3-0:3)**

**Prerequisite:** 1501116 Programming I, 0402240 Signals and System

A comprehensive treatment on the fundamentals of robotics & dynamics. Topics include: Forward kinematics, Inverse kinematics, Dynamics. Robot actuators and sensors. Humanoid anthropomorphic and bio-mimetic Robots and parallels to biological systems. Robot navigation fundamentals; foveation, saccadic eye movements and Attention. Field Stabilization, Pursuit of non-rigid targets in Motion, Object Classification, Robotic Control and Navigation, Robotic object detection and Robotic obstacle avoidance. Projects using Laboratory Robots to develop robotic tracking and navigation applications based on course concepts.

**Courses offered for other majors**

The Computer Engineering department offers courses for other engineering majors. These courses are described below.

**1502201 Digital Logic Design (3-0:3)**

**Prerequisite:** 1501116 Programming I

Number systems and conversions. Boolean algebra and its application in analysis and design of logic circuits. Logic gates and networks. Techniques for analysis and synthesis of combinational and sequential logic systems. Programmable logic devices and field programmable gate arrays.

**1502202 Digital Logic Design Laboratory (0-3:1)**

**Prerequisite:** 1502201 Digital Logic Design

The operation of basic logic gates, examples of some combinational and sequential circuits such as adders, subtractors, decoders, encoders, flip-flops, counters, and shift registers. Design of combinational and sequential logic circuits using SSI or MSI blocks.

**1502336 Microcontroller Based Design (3-0:3)**

**Prerequisite:** 1502201 Digital Logic Design

Study of the use of a microcontroller in a complex engineering system. Microcontroller architecture, programming techniques using assembly and C languages, peripheral interfacing, common on-chip peripheral devices used in microcontroller-based systems, interfacing to different types of sensors and actuators.

**1502337 Microcontroller Based Design Laboratory (0-3:1)**

**Prerequisite:** Pre/Co: 1502202-Digital Logic Design Laboratory; Pre/Co: 1502336 - Microcontroller Based Design

The laboratory companion to 1502336 (Microcontroller Based Design). Students in this laboratory will Microcontroller training module to implement the techniques learned in the companion lecture course in practice.

**1502300 Professional, Societal and Ethical Issues in Engineering (1-0:1)**

**Prerequisite:** 3<sup>rd</sup> year standing

An examination of the social impact of engineering and technology and its relationship to ethics, with the objective of identifying and clarifying obligations that might arise in technological research and its applications. The course will survey a variety of moral theories, as well as engineering codes of ethics. The case study method will be used: source will include the history of science and technology, and reports from professional societies. Topics covered include whistle blowing, environmental, safety, and privacy issues.

## Department of Information Systems

### Personnel

|                              |  |
|------------------------------|--|
| <b>Chairperson:</b>          | Mohamed Nour   |
| <b>Professor:</b>            | Kuei-Fang (Leila) Hsiao  |
| <b>Associate Professors:</b> | Mohamed Nour, Samar Mouakket, Saadat Alhashmi                          |
| <b>Assistant Professor:</b>  | Amel Al Ali, Ahmed AlHamad, Iman AKour                                 |
| <b>Staff:</b>                | Amna Al-Suwaidi (Administrative assistance)<br>Fadi Jabr (Lab officer) |

### Vision

To be the Department of Information Systems (IS) of choice in the region for aspiring students, professionals, and scholars for its commitment to learning and scholarship.

### Mission

The department's mission is to prepare students for professional and careers in the business world by focusing on practical applications of information technology to business processes. It aims also to conduct research to serve the rapidly changing information technology needs of the region.

### Business Information Systems (BIS) Program Goals:

The BIS program educational objectives are to:

1. Provide students with fundamental knowledge in the field of information systems.
2. Develop the ability to apply knowledge and skills in information systems to solve business problems.
3. Acquire the ability to evaluate and develop organizational information systems.
4. Understand life cycle management of information systems projects.
5. Develop teamwork and leadership skills.

### Business Information Systems Program Outcomes:

- a. Describe basic theories in information systems.
- b. Utilize information systems to develop effective business solutions.
- c. Utilize information systems capabilities, tools, and resources to support relevant organizational decisions.
- d. Work effectively as a member of a team and on different roles within a team.
- e. Analyze, design, and build model information systems solutions.
- f. Manage project life cycle development activities.

### Graduate Career Opportunities:

BIS is an integrative field. BIS professionals are the "communication bridge" between business needs and technology. This means that you will have to understand how to figure out how things work, solve problems, communicate what you found, and learn many new things on a regular basis. It is a

dynamic field, and it takes dynamic people to do well in it. People, who can think fast, work hard, and balance many things, should really think about BIS. Here is only a sample of the kinds of BIS jobs:

- Business Analyst
- Business IT Consultant
- Systems Analyst & Designer
- IT Project Manager
- E-Health Business Analyst
- Decision Support Systems Designer & Developer
- Business Intelligence Specialist
- Database Analyst and Designer
- Electronic Commerce Applications Developer
- CRM Systems Specialist
- ERP Systems Specialist
- Knowledge Manager
- Technical Support Specialist
- IT User Liaison

#### Optional Certificates:

- Microsoft Certificates (ex. Microsoft Project Manager).
- Business networking certificate with CISCO.
- Database certificates with Oracle and Microsoft.
- Business Intelligence certificates.
- Customer Relationship Management (CRM) certificate with Microsoft Dynamics.
- Business Application Certificate.
- Project Management Certificate from Project Management Institute (PMI).

#### Program Overview

The Bachelor of Science in Business Information Systems program requires that a student complete 123 credits of course work and attain a minimum cumulative GPA of 2.00. The program consists of the categories summarized below.

| B.Sc. in Business Information Systems (123 Credits) |    |     |    |       |
|---|----|-----|----|-------|
|   | UR | CR* | PR | Total |
| Mandatory Core Credits                              | 15 | 48  | 24 | 87    |
| Electives Credits                                   | 9  | 6   | 6  | 21    |
| Minor Credits                                       | -  | -   | 15 | 15    |
| Total   | 24 | 54  | 45 | 123   |

CR\* College of Business

#### 1. University Requirements

As stated in the University Requirements section of the college catalog.

#### 2. Business Requirement Courses

Every student is required to complete 54 credit of General Business courses 48 credit hours are mandatory core courses and 6 credits elective courses. These courses consist of foundation and skill courses required of all students.

### A. Business Requirement Courses

| Course # | Title   | Cr Hrs. | Prerequisite                              |
|----------|---|---------|---|
| 301120   | Financial Accounting                                | 3       | None                                      |
| 301211   | Managerial Accounting                               | 3       | None                                      |
| 302160   | Principles of Management                            | 3       | None                                      |
| 302170   | Principles of Marketing                             | 3       | None                                      |
| 308151   | Principles of Microeconomics                        | 3       | None                                      |
| 308230   | Financial Management                                | 3       | None                                      |
| 308252   | Principles of Macroeconomics                        | 3       | 308151                                    |
| 302250   | Legal Environment of Business                       | 3       | 302160                                    |
| 302262   | Organizational Behavior                             | 3       | 302160                                    |
| 302350   | Ethics and Islamic Values in Business               | 3       | 302250                                    |
| 302361   | Operations and Supply Chain Management <sup>1</sup> | 3       | 1440264                                   |
| 302461   | Research Methods <sup>2</sup>                       | 3       | 1440264                                   |
| 302467   | Strategic Management                                | 3       | Senior Standing                           |
| 1440100  | Mathematics for Business                            | 3       | None                                      |
| 1440264  | Business Statistics                                 | 3       | 1440100                                   |
| 1503130  | Introduction to BIS                                 | 3       | None/Equivalent to Intro to MIS (0303130) |

### B. Elective Business Courses

| Course  | Title                         | Cr Hrs. | Prerequisite       |
|---------|-------------------------------|---------|--------------------|
| 1503211 | Business Analytics            | 3       | 1503130 or 0303130 |
| 1503228 | E-Business                    | 3       | 1503130 or 0303130 |
| 301327  | Taxation and Zakat            | 3       | 301120             |
| 301425  | Financial Statements Analysis | 3       | 301120             |
| 302254  | Business Communication        | 3       | 202112             |
| 302383  | Business and Government       | 3       | 302160             |
| 308334  | Real Estate Finance           | 3       | 308230             |
| 308450  | Money and Banking             | 3       | 308151             |

### 3. BIS Program Requirements

The Department of Information Systems requires students to take 30 credit hours in the specialization and 15 credit hours from an approved minor from the College of Business Administration. The specialization courses are divided into two components: 24 credits hours as mandatory courses and 6 credits of elective courses listed below:

The program requirements of 54 credit hours are divided into three major sets.

- E. BIS mandatory core courses (24 credits)
- F. BIS program elective courses (6 credits)
- G. Approved minor courses (15 credits)

### A. Mandatory Core Courses

The following tables lists the mandatory core courses:

| Course  | Title                              | Cr Hrs. | Prerequisite   |
|---------|------------------------------------|---------|--|
| 1503230 | Database Management                | 3       | 1503130 or 0303130   |
| 1503231 | Business Programming               | 3       | 1503130 or 0303130   |
| 1503330 | Systems Analysis and Design        | 3       | 1503230  |
| 1503332 | Business Data Telecom and Networks | 3       | 1503230  |
| 1503333 | Information Security               | 3       | 1503332  |
| 1503431 | Project Management                 | 3       | 1503230  |
| 1503437 | Internship in BIS                  | 3       | Students should have completed (75) credit hours and departmental approval |
| 1503439 | Project in BIS                     | 3       | 1503330 & Dept. approval   |

### B. Program Electives Courses

Each student must successfully complete 6 credit hours (two courses) from the following list of elective courses.

| Course # | Title                                    | Cr Hrs | Prerequisite      |
|----------|--|--------|-------------------|
| 1503334  | Advanced Business Programming            | 3      | 1503231           |
| 1503347  | Customer Relationship Management Systems | 3      | 1503230           |
| 1503430  | Big Data and Business Intelligence       | 3      | 1503230 & 1503231 |
| 1503441  | Enterprise Systems                       | 3      | 1503330           |
| 1503446  | Decision Support Systems                 | 3      | 1503230           |

### C. Minor Courses

Each student must successfully complete 15 credit hours from another program of the college of Business Administration.

### Study Plan

The Business Information Systems program encompasses 123 credits hours that are spread over eight semesters and could be completed in four years. The following study plan serves as a roadmap for a smooth progression toward graduation.

| Year 1, Semester 1 (15 Credits) |                          |        |               |
|---------------------------------|--------------------------|--------|---------------|
| Course #                        | Title                    | Cr Hrs | Prerequisites |
|                                 | University Requirements  | 3      |               |
| 0301120                         | Financial Accounting     | 3      | None          |
| 0302160                         | Principles of Management | 3      | None          |
|                                 | University Requirements  | 3      |               |
| 1503130                         | Intro. to BIS            | 3      | None          |



| Year 1, Semester 2 (15 Credits) |                          |        |               |
|---------------------------------|--------------------------|--------|---------------|
| Course #                        | Title                    | Cr Hrs | Prerequisites |
|                                 | University Requirements  | 3      |               |
| 0308230                         | Financial Management     | 3      |               |
| 0301211                         | Managerial Accounting    | 3      | 0301120       |
| 0302170                         | Principles of Marketing  | 3      |               |
| 1440100                         | Mathematics for Business | 3      | None          |

| Year 2, Semester 1 (18 Credits) |                              |        |                    |
|---------------------------------|------------------------------|--------|--------------------|
| Course #                        | Title                        | Cr Hrs | Prerequisites      |
| 1503231                         | Business Programming         | 3      | 1503130 or 0303130 |
| 0301151                         | Principles of Microeconomics | 3      |                    |
|                                 | University Requirements      | 3      |                    |
|                                 | University Requirements      | 3      |                    |
|                                 | Elective course              | 3      |                    |
| 1440264                         | Business Statistics          | 3      | 1440100            |

| Year 2, Semester 2 (15 Credits) |                               |        |                    |
|---------------------------------|-------------------------------|--------|--------------------|
| Course #                        | Title                         | Cr Hrs | Prerequisites      |
| 1503230                         | Database Management           | 3      | 1503130 or 0303130 |
| 0301252                         | Prin. of Macroeconomics       | 3      | 0301151            |
| 0302262                         | Organizational Behavior       | 3      | 0302160            |
| 0302250                         | Legal Environment of Business | 3      | 0302160            |
|                                 | Elective course               | 3      |                    |

| Year 3, Semester 1 (15 Credits) |                                  |        |               |
|---------------------------------|----------------------------------|--------|---------------|
| Course #                        | Title                            | Cr Hrs | Prerequisites |
| 1503332                         | Bus. Data Telecom. and Network   | 3      | 1503230       |
|                                 | University Requirement           | 3      |               |
| 0302361                         | Operations and Supply Chain Man. | 3      | 1440264       |
|                                 | Minor                            | 3      |               |
|                                 | Minor                            | 3      |               |

| Year 3, Semester 2 (18 Credits) |                                       |        |   |
|---------------------------------|---------------------------------------|--------|---|
| Course #                        | Title                                 | Cr Hrs | Prerequisites                             |
| 1503330                         | Systems Analysis and Design           | 3      | 1503230                                   |
| 1503431                         | Project Management                    | 3      | 1503230                                   |
| 0302350                         | Ethics and Islamic Values in Business | 3      | 0302250                                   |
|                                 | Minor                                 | 3      |   |
|                                 | University Requirements               | 3      |   |
| 1503437                         | Internship in BIS                     | 3      | 75 credit hours and departmental approval |

| Year 4, Semester 1 (15 Credits) |                         |        |               |
|---------------------------------|-------------------------|--------|---------------|
| Course #                        | Title                   | Cr Hrs | Prerequisites |
|                                 | University Requirements | 3      |               |
| 1503333                         | Information Security    | 3      | 1503332       |
|                                 | BIS Elective            | 3      |               |
|                                 | Minor                   | 3      |               |
|                                 | Minor                   | 3      |               |

| Year 4, Semester 2 (12 Credits) |                      |        |                          |
|---------------------------------|----------------------|--------|--------------------------|
| Course #                        | Title                | Cr Hrs | Prerequisites            |
| 1503439                         | Project in BIS       | 3      | 1503330 & Dept. approval |
| 0302467                         | Strategic Management | 3      | Senior Level             |
|                                 | BIS Elective         | 3      |                          |
| 0302461                         | Research Methods     | 3      | 1440264                  |

### College Mandatory Core Course

#### 1503130 Introduction to MIS (3-0:3)

**Prerequisite(s):** None. **Equivalent to:** 0303130 Introduction to MIS

This course is an introduction to the fundamentals of information systems and to the strategic opportunities and challenges presented by these technologies. The course is based on the belief that business opportunities and challenges are best addressed through a fundamental understanding of management and technological concepts. Topics include databases, data communications and networking, local area networking and wireless local area networking technologies, Internet technologies, enterprise systems and IT security. While there is some introduction to technical details, the real impact of this class is gained by understanding the impact of technology on how business is done.

### College Elective Core Courses

#### 1503228 E-Business (3-0:3)

**Prerequisite(s):** 1503130 Introduction to MIS, or 0303130 Introduction to MIS

The course will provide an introduction to the basics of electronic business and includes project planning, as well as marketing, customer service and business plan development. The course focuses on how business is carried out, including marketing, web design, and electronic retailing, as well as the advantages and disadvantages of this form of commerce, the infrastructures in place to support this type of electronic business, and the global economy within which it takes place.

#### 1503211 Business Analytics (3-0:3)

**Prerequisite(s):** 1503130 Introduction to MIS, or 0303130 Introduction to MIS

The course is an introduction to business analytics. This course will focus on teaching fundamental concepts and tools needed to understand the emerging role of business analytics in organisations. This course will also focus on teaching how to identify, evaluate, and capture business analytic opportunities that create value. Toward this end, students will learn basic analytic methods and analyze case studies on organisations that successfully deployed these techniques.

## MIS Mandatory Core Courses

### **1503231 Business Programming (3-0:3)**

**Prerequisite(s): 1503130 Introduction to MIS, or 0303130 Introduction to MIS**

This course introduces students to fundamental programming and basic file processing concepts as applied to business applications. Topics include problem analysis and algorithm design, programming basic statements (iteration, selection and repetition), simple data structures, data validation, functions and subroutines, arrays, and file processing. A visual programming language is used to create graphical user interfaces for business applications.

### **1503230 Database Management (3-0:3)**

**Prerequisite(s): 1503130 Introduction to MIS, or 0303130 Introduction to MIS**

This course provides students with the theoretical foundation and technical skills required to implement a database solution on a relational database management system using Microsoft Access and Oracle. Topics include Database system architecture; data modeling using the entity-relationship model; storage of databases; SQL query language; basic functional dependencies and normalization for relational database design; relation decomposition. Finally, students will learn how to build, evaluate and test a database application.

### **1503330 Systems Analysis and Design (3-0:3)**

**Prerequisite(s): 1503230 Database Management**

This course addresses the multi-phased process for developing information systems. The course covers information systems analysis, design, and development in organizations. The course concentrates on methods, techniques, and tools used to determine information requirements, create software design specifications, and to document these requirements and specifications using the Unified Process (UP) methodology.

### **1503332 Business Data Telecommunication and Networks (3-0:3)**

**Prerequisite(s): 1503230 Database Management**

This course provides a detailed coverage of system administration in both centralized and distributed information systems installation, operation and maintenance of hardware and software resources. It also presents the technology and management of computer networks, covering types of networks, protocols, and topologies.

### **1503431 Project Management (3-0:3)**

**Prerequisite(s): 1503230 Database Management**

This course covers the issues necessary for successful management of information systems projects. Technical and behavioral aspects of project management are discussed. Major topics include: Managing the project adoption issues such as selection and approval of projects, cost/benefit analysis and requirements analysis; Planning for systems development and estimation; Scheduling and implementation issues such as project organization, implementation, and control.

### **1503333 Information Security (3-0:3)**

**Prerequisite(s): 1503332 Business Data Telecommunication and Networks**

This course covers the measures that ensure the security of the computer systems and knowing how to respond to potential violations. Topics covered are computer and network attacks and defense, operating system holes, application security (web, e-mail, databases), virus, social engineering attacks, privacy, and digital rights management.

**1503439 Project in BIS****(3-0:3)****Prerequisite(s): 1503330 Systems Analysis and Design, and Dept. Approval**

This course involves a significant implementation of a business application going through the complete life-cycle of information systems development, and using proper packages/tools. The course is an integration of the coursework completed in programming, databases, systems analysis and design, and project management. Students are expected to analyze, design and implement a solution to a business problem, and present the prototype system at the end of the semester, using the skills and tools and techniques learned throughout their coursework. The project is to be undertaken in small groups to emphasize the importance of teamwork and management.

**1503437 Internship in BIS****(3-0:3)****Prerequisite(s): Students should have completed 75 credit hours and department approval**

This course aims to provide the students with practical training in Information Systems with format of reflection while they perform professional internship that enhances their ability to achieve their career objectives. Each student must complete a minimum of six weeks of full-time supervised training in an organization designated by the College in cooperation with the University training office.

**Program Elective Courses****1503310 Advanced Business Programming****(3-0:3)****Prerequisite(s): 1503231 Business Programming**

This course is designed to teach Java as a tool for business system implementation. The emphasis of the course is on programming constructs and object-oriented concepts. This course will cover; variables, arrays, control structures (if statements, select statement, loops), procedures (subroutines and functions), Object-oriented concepts - classes and objects, encapsulation, inheritance, polymorphism, Graphical User Interface – controls and event-driven programming.

**1503441 Enterprise Systems****(3-0:3)****Prerequisite(s): 1503330 Systems Analysis and Design**

The course provides an overview of enterprise systems architecture, with particular focus on integration and implementation issues. It provides detailed coverage of planning, designing, implementing, and integrating enterprise information systems. Enterprise software engineering concepts and techniques will also be covered.

**1503347 Customer Relationship Management Systems****(3-0:3)****Prerequisite(s): 1503230 Database Management**

The aim of this course is to incorporate the role in achieving good customer relationship management with a customer and/or stakeholders. Also this course will enable students to understand the key skills needed to carry out successful customer relationship management, in order to build more productive & mutually rewarding relationships with customers and/or stakeholders. The course will also cover how to identify and respond to customers & stakeholders needs, expectations & issues that both meet their needs and protects the interests of the organization. To understand the skills to communicate with and influence customers & stakeholders.

**1503430 Big Data and Business Intelligence (3-0:3)**

**Prerequisite(s): 1503230 Database Management, 1503231 Business Programming**

This course combines the Business Intelligence and Big data. It teaches how Business Intelligence is used to improve decision-making. Big data is used to store, process, analyses and making sense of huge volumes of data extracted in many formats and from many sources. Turning data into insights that deliver value - through methodologies, algorithms and approaches for big data analytics. This course will also cover how some of the world's most successful companies use big data and business analytics.

**1503446 Decision Support Systems (3-0:3)**

**Prerequisite(s): 1503230 Database Management**

This course gives a comprehensive coverage of the fundamental concepts, principles, and theories of managerial decision-making and supporting technologies. It emphasizes teaching students the methods and skills of analyzing, modeling, and solving managerial problems using available computer software support, as well as analyzing, designing, and building decision support systems.

**Minor in BIS:**

| Course # | Course Title                             | Cr Chs | Prerequisite      |
|----------|--|--------|-------------------|
| 1503230  | Database Management                      | 3      | 1503130           |
| 1503231  | Business Programming                     | 3      | 1503130           |
| 1503330  | Systems Analysis and Design              | 3      | 1503230           |
| 1503332  | Business Data Telecom & Networks         | 3      | 1503230           |
| 1503333  | Information Security                     | 3      | 1503332           |
| 1503431  | Project Management                       | 3      | 1503230           |
| 1503310  | Advanced Business Programming            | 3      | 1503231           |
| 1503347  | Customer Relationship Management Systems | 3      | 1503230           |
| 1503430  | Big Data and Business Intelligence       | 3      | 1503230 & 1503231 |
| 1503441  | Enterprise Systems                       | 3      | 1503330           |
| 1503446  | Decision Support Systems                 | 3      | 1503230           |