



CENTRAL LABS DIRECTORATE CATALOG TEACHING & RESEARCH LABORATORIES





جــامعــة الـشــارقـة UNIVERSITY OF SHARJAH

Central Labs Directorate Catalog

Teaching & Research Laboratories

2023



His Highness Sheikh Sultan Bin Ahmed Al Qasimi

Deputy Ruler of Sharjah, and President of the University of Sharjah

6 Central Laboratories Catalog

Contents

DEAN'S MESSAGE	
DIRECTOR'S MESSAGE	
INTRODUCTION	
CENTRAL LABS DIRECTORATE DUTIES AND RESPONSIBILITIES:	
TECHNICAL SUPPORT	20
EQUIPMENT MAINTENANCE	2
SPACE MANAGEMENT	23
CENTRAL LABS STORES	24
LABORATORY SAFETY	2
CENTRAL LABS POLICIES AND PROCEDURES	3.
CENTRAL LABS BUILDINGS M12-W12 LAYOUT	3
CENTRAL LABORATORIES DIRECTORATE, COLLEGES & RESEARCH INSTITUTES CONTACTS	4
COLLEGE OF ENGINEERING	4
COLLEGE OF COMPUTING AND INFORMATICS	4
COLLEGE OF SCIENCES	4
COLLEGE OF HEALTH SCIENCE	4
COLLEGE OF MEDICINE	4
COLLEGE OF PHARMACY	4
COLLEGE OF DENTAL MEDICINE	4
RESEARCH INSTITUTE OF SCIENCES & ENGINEERING	4
RESEARCH INSTITUTE OF MEDICAL & HEALTH SCIENCES (RIMHS)	4
SHARJAH ACADEMY OF ASTRONOMY, SPACE SCIENCES & TECHNOLOGY	4
COLLEGE OF ENGINEERING	
COLLEGE OF ENGINEERING LABORATORIES	5
CIVIL & ENVIRONMENTAL ENGINEERING DEPARTMENT	5
STRUCTURE LABORATORY	5
MATERIALS LABORATORY	5
GEOTECHNICAL LABORATORY	5
SURVEYING LABORATORY	6
FLUID MECHANICS & WATER RESOURCES LABORATORY	6
TRANSPORTATION LABORATORY	6
PAVEMENT LABORATORY	6
ENVIROMENTAL & SANITARY LABORATORY	7
ENGINEERING WORKSHOP	7
ELECTRICAL & ELECTRONICS ENGINEERING DEPARTMENT	7
CIRCUIT ANALYSIS LABORATORY	7
CIRCUIT ANALYSIS II LABORATORY	7
APPLIED ELECTRONICS CIRCUITS LABORATORIES	8

POWER ELECTRONICS LABORATORY	84
ELECTROMECHANICAL SYSTEMS LABORATORY	86
ELECTRIC POWER ENGINEERING LABORATORY	88
ELECTRONIC CIRCUITS LABORATORY	90
FEEDBACK CONTROL SYSTEMS LABORATORY	92
INSTRUMENTATION AND MEASUREMENTS LABORATORY	94
PRINTED CIRCUIT BOARD WORKSHOP (PCB)	96
PROGRAMMABLE LOGIC CONTROLLER (PLC) LABORATORY	97
MULTIMEDIA TECHNOLOGY LABORATORY	98
TELECOMMUNICATION SYSTEMS I LABORATORY	99
FUNDAMENTAL OF ELECTRONICS LABORATORY	101
SENIOR DESIGN PROJECT I & II LABORATORIES	103
INDUSTRIAL ENGINEERING & ENGINEERING MANAGEMENT DEPARTMENT	104
MANUFACTURING PROCESSES LABORATORY	105
ERGONOMICS, WORK & PROCESS IMPROVEMENT LABORATORY	107
INDUSTRIAL AUTOMATION LABORATORY	109
SUSTAINABLE & RENEWABLE ENERGY ENGINEERING DEPARTMENT	111
HEAT TRANSFER LABORATORY	112
ENERGY STORAGE & EFFECIENCY LABORATORY	113
WIND ENERGY LABORATORY	114
FLUID MECHANICS LABORATORY	115
PHOTOVOLTAIC (PV) LABORATORY	117
SOLAR PV/WIND ENERGY/SENIOR STUDENT PROJECTS LABORATORY	119
MECHANICAL & NUCLEAR ENGINEERING DEPARTMENT	120
THERMO-FLUIDS LABORATORY	121
SOLID MECHANICS LABORATORY	123
ELECTROSPINNING LABORATORY	125
HUMAN VIBRATION RESEARCH LABORATORY	126
RADIATION DETECTION LABORATORY	127
APPLIED RADIATION MEASUREMENT LABORATORY	129
ADVANCED NUCLEAR LABORATORY	131
ARCHITECTURAL ENGINEERING DEPARTMENT	132
MODELER AND PRINTING LABORATORY	133
SURVEYING LABORATORY	135
ARCHITECTURE AND BUILDING SCIENCES LABORATORY	136
CHEMICAL AND WATER DESALINATION ENGINEERING	137
WATER CHEMISTRY AND ANALYSIS LABORATORY	138
CHEMICAL THERMODYNAMICS LABORATORY	139
APPLIED FLUID MECHANICS LABORATORY	141
COLLEGE OF COMPUTING&INFORMATICS	142
COLLEGE OF COMPUTING AND INFORMATICS LABORATORIES	144

DIGITAL LOGIC DESIGN LABORATORY	145
COMPUTER COMMUNICATIONS AND NETWORKS LABORATORY	147
EMBEDDED SYSTEMS DESIGN LABORATORY	149
MICROPROCESSORS AND ASSEMBLY LANGUAGE LABORATORY	150
ROBOTICS AND COMPUTER VISION LABORATORY	151
HIGH PERFORMANCE CLOUD COMPUTING LABORATORY	153
SENIOR DESIGN PROJECT I & II LABORATORY	155
MICROCONTROLLER BASED DESIGN LABORATORY	156
ENGINEERING MODELING USING ARTIFICIAL INTELLIGENCE LAB	157
NETWORK PROGRAMMING LAB	159
COLLEGE OF SCIENCES	
COLLEGE OF SCIENCES LABORATORIES	162
APPLIED PHYSICS & ASTRONOMY DEPARTMENT	166
PHYSICS LABORATORY (1M)	168
PHYSICS LABORATORY (2M)	170
PHYSICS LABORATORY (3M)	172
PHYSICS LABORATORY (4M)	174
COMPUTATIONAL CAPABILITIES LABORATORY	176
PHYSICS LABORATORY (1W)	177
PHYSICS LABORATORY (2W)	178
PHYSICS LABORATORY (3W)	179
PHYSICS LABORATORY (4W)	180
PHYSICS LABORATORY (5W)	181
GEOSCIENCE /GEOPHYSICS EXPERIMENTAL LABORATORY	182
PETROLOGY (MICROSCOPY) LAB	184
RADIATION LABORATORY	186
SPECTROSCOPY LABORATORY	187
RESEARCH LABORATORY	188
CHEMISTRY DEPARTMENT	189
GENERAL CHEMISTRY (I) LABORATORY	191
GENERAL CHEMISTRY (II) LABORATORY	192
ANALYTICAL CHEMISTRY LABORATORY	193
ORGANIC CHEMISTRY (I) LABORATORY	195
ORGANIC CHEMISTRY (II) LABORATORY	197
IDENTIFICATION OF ORGANIC COMPOUNDS LABORATORY	199
INSTRUMENTAL ANALYSIS LABORATORY	200
INORGANIC CHEMISTRY LABORATORY	202
PHYSICAL CHEMISTRY (I) LABORATORY	203
PHYSICAL CHEMISTRY (II) LABORATORY	205
GENERAL CHEMISTRY LABORATORY (FOR HEALTH SCIENCES STUDENTS)	207
GENERAL CHEMISTRY LABORATORY (FOR MEDICAL SCIENCES STUDENTS)	209

ORGANIC CHEMISTRY LABORATORY (FOR HEALTH SCIENCES STUDENTS)	211
ANALYTICAL CHEMISTRY LABORATORY (FOR HEALTH SCIENCES STUDENTS)	212
CHEMISTRY STUDENTS RESEARCH (LAB 1)	214
CHEMISTRY STUDENTS RESEARCH (LAB 2)	216
APPLIED BIOLOGY DEPARTMENT	219
GENERAL BIOLOGY LABORATORY	221
GENERAL MICROBIOLOGY LABORATORY	222
IMMUNOLOGY & SERELOGY LABORATORY	223
TISSUE CULTURE & HYBRIDOMA TECHNOLOGY LABORATORY	225
MOELCULAR GENETICS LABORATORY	227
MOLECULAR BIOLOGY LABORATORY	229
GENERAL BIOCHEMISTRY LABORATORY	231
PROTEIN BIOCHEMISTRY & ENGINEERING LABORATORY	232
PLANT BIOTECHNOLOGY LABORATORY	233
MICROBIAL PROCESSING & BIOTECHNOLOGY LABORATORY	234
ENVIRONMENTAL BIOTECHNOLOGY LABORATORY	235
MICROBIAL GENETICS LABORATORY	236
COLLEGE OF HEALTH SCIENCES	238
COLLEGE OF HEALTH SCIENCES LABORATORIES	240
MEDICAL LABORATORY SCIENCES DEPARTMENT	242
BIOCHEMISTRY LABORATORY	243
BIOLOGY LABORATORY	245
BLOOD BANKING LABORATORY	247
CLINICAL CHEMISTRY LABORATORY	249
DIAGNOSTIC MICROBIOLOGY LABORATORY	251
HEMATOLOGY LABORATORY	253
HISTOPATHOLOGICAL TECHNIQUES LABORATORY	255
HUMAN ANATOMY AND PHYSIOLOGY LABORATORY	257
IMMUNOLOGY & SEROLOGY LABORATORY	259
MEDICAL MICROBIOLOGY LABORATORY	261
MOLECULAR GENETICS LABORATORY	263
PARASITOLOGY LABORATORY	265
PHLEBOTOMY LABORATORY	267
URINALYSIS LABORATORY	268
HISTOLOGY LABORATORY	270
MLS RESEARCH LABORATORY	271
MEDICAL DIAGNOSTIC IMAGING DEPARTMENT	273
INTRODUCTION TO MEDICAL DIAGNOSTIC IMAGING LABORATORY	274
PATIENT CARE AND MANAGEMENT (2) LABORATORY	276
RADIOGRAPHIC TECHNIQUE & SKELETAL RADIOGRAPHY LABORATORY	278
MEDICAL IMAGING EQUIPMENT LABORATORY	280

DIGITAL IMAGING LABORATORY	282
ULTRASONOGRAPHY LABORATORY	284
MAGNETIC RESONANCE IMAGING LABORATORY	285
COMPUTED TOMOGRAPHY LABORATORY	286
NURSING DEPARTMENT	287
PHYSICAL ASSESSMENT/ ADVANCED HEALTH ASSESSMENT LABORATORY	288
FUNDAMENTALS OF NURSING LABORATORY	289
ADULT HEALTH NURSING PRACTICUM (1 & 2) LABORATORY	291
MATERNITY AND NEWBORN HEALTH NURSING / PRACTICUM LABORATORY	293
PEDIATRIC HEALTH NURSING/ PRACTICUM LABORATORY	295
CRITICAL CARE NURSING / PRACTICUM LABORATORY	296
CRITICAL CARE NURSING / PRACTICUM LABORATORY (Adult Critical Care Nursing Master Program)	297
HEALTH ASSESSMENT FOR ADVANCED CRITICAL CARE NURSING PRACTICE LABORATORY	299
PHYSIOTHERAPY DEPARTMENT	301
PHYSICAL AGENTS LABORATORY	302
PHYSICAL EXAMINATION AND SIMULATION LABORATORY	304
PHYSIOTHERAPY SUPPLEMENTARY LABORATORY	306
ISOKINETIC ANALYSIS LABORATORY	307
POSTURE AND BALANCE ASSESSMENT LABORATORY	308
PHYSIOTHERAPY FOR NEUROLOGY LABORATORY / PEDIATRICS & EXERCISE PHYSIOLOGY LABORATORY	310
ENVIRONMENTAL HEALTH SCIENCE DEPARTMENT	312
ENVIRONMENTAL AND OCCUPATIONAL HEALTH LABORATORY	313
WATER ANALYSIS LABORATORY	315
ENVIRONMENTAL MICROBIOLOGY LABORATORY	317
CLINICAL NUTRITION AND DIETETICS DEPARTMENT	319
NUTRITION ASSESSMENT LABORATORY	320
FOOD PROCESSING AND PREPARATION LABORATORY	322
FOOD ANALYSIS LABORATORY	323
FOOD MICROBIOLOGY LABORATORY	324
COLLEGE OF MEDICINE	326
COLLEGE OF MEDICINE LABORATORIES	328
OB-GYN SKILLS LAB	329
PATHOLOGY MUSEUM	331
BIOMEDICAL LAB	332
PEDIATRIC SKILL LAB	334
COLLEGE OF PHARMACY	336
COLLEGE OF PHARMACY LABORATORIES	338
PHARMACEUTICS & PHARMACEUTICAL TECHNOLOGY DEPARTMENT	339
PHARMACEUTICS (A) LABORATORY	339
PHARMACEUTICS (B) LABORATORY	340
PHARMACEUTICS (1A) LABORATORY	341

PHARMACEUTICS (1B) LABORATORY	
PHARMACEUTICS (2A) LABORATORY	
PHARMACEUTICAL MICROBIOLOGY I LABORATORY	
PHARMACEUTICAL MICROBIOLOGY II LABORATORY	
MEDICINAL CHEMISTRY DEPARTMENT	
CHEMISTRY FOR PHARMACY LABORATORY	
MEDICINAL CHEMISTRY IA LABORATORY	
MEDICINAL CHEMISTRY IB LABORATORY	
MEDICINAL CHEMISTRY IIA LABORATORY	
MEDICINAL CHEMISTRY IIB LABORATORY	
PHARMACOGNOSY LABORATORY	
PHARMACY PRACTICE & PHARMACOTHERAPEUTICS DEPARTMENT	
PHARMACOLOGY LABORATORIES [PHARMACOLOGY (IA)]	
PHARMACOLOGY LABORATORIES [PHARMACOLOGY (IB)]	
PHARMACOLOGY LABORATORIES [PHARMACOLOGY – IIA]	
COLLEGE OF DENTAL MEDICINE	
SIMULATION (SKILLS) LABORATORIES	
DENTAL TECHNOLOGY TEACHING LABORATORY	
ORAL HISTOLOGY & CELL BIOLOGY LABORATORY	
DENTAL ANATOMY & HEAD ANATOMY LABORATORY	
HEAD AND NECK ANATOMY LABORATORY	
ORAL HISTOPATHOLOGY LABORATORY	
CLINIC D (PROSTHODONTIC CLINIC)	
CLINIC B & C (PERIODONTICS CLINIC)	
CLINIC A (ENDODONTICS CLINIC)	
RESEARCH INSTITUTE OF SCIENCES & ENGINEERING (RISE)	
RISE LABORATORIES	
ADVANCED MATERIALS RESEARCH LABORATORY	
TRANSPORTATION AND PAVEMENT RESEARCH LABORATORY	
ELECTRICAL AND ELECTRONICS WORKSHOP	
MULTI-PURPOSE, MULTI-FUNCTIONAL WORKSHOP	
GEOGRAPHIC INFORMATION SYSTEMS & REMOTE SENSING CENTER	
FUNCTIONAL NANOMATERIALS SYNTHESIS LABORATORY	
HIGH PERFORMANCE COMPUTING FACILITY	
BIOMASS ENERGY SYSTEMS LABORATORY	
PROFESSORSHIP CHAIR, GENERAL CIVIL AVIATION AUTHORITY (AVIATION CENTER OF EXCELLENCE)	
AEROSPACE CENTER OF EXCELLENCE (UNMANNED AIRCRAFT SYSTEM CENTER)	
RENEWABLE ENERGY RESEARCH LABORATORY	
RESEARCH INSTITUTE OF MEDICAL & HEALTH SCIENCES (RIMHS)	
RIMHS LABORATORIES	
MOLECULAR GENETICS LABORATORY	

ANIMAL FACILITY LABORATORY	417
IMMUNO-ONCOLOGY LABORATORY	418
TISSUE BANK LABORATORY	420
INFECTIOUS DISEASE & ANTI-INFECTIVE THERAPY LABORATORY	422
DIABETES RESEARCH LABORATORY	424
TIR ASTHMA LABORATORY	426
DRUG DESIGN AND DISCOVERY LABORATORY	428
DENTAL BIOMATERIALS LABORATORY	430
CARDIOVASCULAR RESEARCH LABORATORY	432
CHEMICAL LABORATORY	434
CONFOCAL MICROSCOPE ROOM	435
TISSUE CULTURE FACILITY (1) LABORATORY	437
GENE EDITING THERAPY LABORATORY	439
FLOW CYTOMETRY ROOM	441
WOUND HEALING & ORAL DIAGNOSIS LABORATORY	443
DRUG DESIGN AND DISCOVERY LABORATORY	445
NUTRITION AND FOOD RESEARCH LABORATORY	447
NUCLEAR MAGNETIC RESONANCE LABORATORY (NMR)	449
DRUG DELIVERY LABORATORY	450
IMMUNOLOGY LABORATORY	451
CANCER RESEARCH LABORATORY	453
MICROBIOTA RESEARCH LABORATORY	454
INTEGRATED ANALYTICAL LABORATORY	456
GEL DOCUMENTATION LABORATORY	458
SHARJAH ACADEMY OF ASTRONOMY, SPACE SCIENCES & TECHNOLOGY (SAASST)	460
SAASST LABORATORIES	462
SAASST CUBESAT LABORATORY	463
SAASST METEORITE CENTER	465
SAASST SPACE WEATHER & IONOSPHERIC LABORATORY	467
SAASST RADIO ASTRONOMY LABORATORY	469
SAASST HIGH ENERGY ASTROPHYSICS LABORATORY	470
SAASST SPACE ARTIFICIAL INTELLIGENCE LABORATORY	471



Dr. Hussein M. Elmehdi Dean of Academic Support Services

DEAN'S MESSAGE

In light of the new challenges facing post-secondary educational institutions getting ready for post Covid-19 era, Instructional Educational Laboratories (IEL) are also expected to make the necessary transformation to meet these challenges and expectations. While the objectives and expected educational outcomes remain the same, the teaching approach need to be updated to fit the new health protocols and restrictions. The latter places IEL at the forefront to revisit the distribution and management of the needed space, state-of-the-art equipment, required technologies and access to achieve the institution's strategic goals as well as achieving the expected educational outcomes. In addition, IEL need to be upgraded to serve the Flexible Hybrid Model, which is adapted by the University of Sharjah to ensure that laboratories are serving the needs of academic programs in applied sciences, engineering and medical & health sciences.

To ensure IEL's role in the educational process, the University of Sharjah has developed a unique approach where all educational laboratories are located in one central physical place under the Directorate of the Central Laboratories (DCL). This unique approach was implemented to ensure proper utilization of equipment, space and resources. The approach has proven to be effective, as highlighted in many accreditation reports, and found to be much more effective than the traditional approach where educational laboratories are scattered over various colleges and sometimes departments. The DCL was established as an entity that houses all educational and research laboratories to serve the practical needs of Applied Sciences, Engineering, Health and Medical Sciences programs including postgraduate programs.

Recently, the scope of DCL has been expanded to include supervision of the research labs, which include space management of all educational labs, the DCL mandate includes supporting academic and research programs as well as individual researchers by enriching students' practical abilities and advance knowledge through experimental verification and advanced research. DCL provides A to Z assistance to academic departments in the evaluation and procurement of major laboratory equipment; maintaining safe laboratory environment; supporting research and discovery in the fields of science, engineering, medical and health; organizing space and lab assets to maximize the efficacy of available resources; maintaining and updating inventory of laboratory assets; introducing sustainable practices responsive to environmental concerns; continuously improving the laboratory conditions and experience; and accommodating the needs of external entities in search for technical consultations and various tests. In addition to the day-to-day operations, the DCL team helps maintain the equipment and provide technical assistance to all users. Furthermore, DCL is responsible for establishing preventive maintenance programs involving licensed professionals that routinely inspect the operation and calibration of major equipment and review safety measures. DCL also provides technical training to lab supervisors on safety and risk assessment & management. One of the major and unique additions to the DCL mandate is lab safety inspection, which is conducted periodically and upon request.

Driven by the noble vision of H.H. Sheikh Sultan bin Ahmed bin Sultan Al Qasimi, Deputy Ruler of Sharjah, and President of the University of Sharjah, and the guided instructions of HE Prof. Hamid Al Nayimi, UOS Chancellor, DCL director and technical staff strive to provide the UOS and local community with state-of-the-art educational & research laboratories and provide high quality services. Such honourable vision and clear guided instructions will ensure that UOS fulfills its strategic goal in becoming one of the leading educational institutions not only in the UAE and GCC, but on the international stage as well.

This manual highlights the specialized services and capabilities provided by the educational and research laboratories across campus that support the educational and research mission of the University. In addition to listing and describing laboratory equipment available in these labs, the manual lists the range of experiments and tests that could possibly be conducted in each laboratory. The aim of the manual is to introduce existing laboratory assets and capabilities to the UOS constituencies, accrediting bodies and the public for their corresponding use.

I would like to express my sincere thanks and appreciation to Prof. Hamid Al Nayimi for his continuous support. Special thanks go to the Director of DCL, Eng. Mahmoud Abu Shammeh, for compiling the information in this manual as well as to the administrative and technical staff at the DCL for their dedication, effort and hard work.



Eng. Mahmoud Abu Shammeh Director, Central Laboratories Directorates

DIRECTOR'S MESSAGE

The Central Laboratories Directorates (CLD) at the UoS came into being at the same time the University was established in 1997. The Central Laboratories Directorate evolved over time to its current state of more than 175 labs distributed in the main campus and Medical and Health Sciences campus. Every semester more than 400 lab sessions are being taught every week.

Recently, The Central Labs Directorate played an extra important role to support the University teaching and research activities in COVID pandemic to ensure health, safety, and smooth operation in managing the crowds. The model of Central Labs Management proven to be very effective to manage the COVID challenges.

The CLD administers the teaching labs belonging to the Colleges of Sciences, Engineering, Computing and Informatics, Health Sciences, Pharmacy, Dentistry and Medicine. CLD manages all research labs in the Research Institute for Science and Engineering (RISE) and the Research Institute for Medical and Health Sciences (RIMHS). The responsibilities of the CLD include but are not limited to: managing and facilitating efficient labs space usage, providing technical support for laboratory equipment and consumables in coordination with the concerned colleges and Procurement Department, maintaining equipment, maintaining Central Labs centralized utilities, controlling inventory, instituting safety measures, providing comprehensive lab safety training courses, managing central labs stores, and participating in planning and continuous improvement activities.

The Laboratories hold more than 12,200 items of contemporary lab equipment which meet international standards and up-to-date specifications to support

program outcomes and advance the University of Sharjah's learning goals. The university takes great interest in the laboratories experience and provides annual budgets to maintain technological currency of the lab assets in meeting educational needs and faculty research. The CLD has witnessed huge development in the operation to serve students, staff and faculty members. It has developed different online management systems to facilitate the operation:

- 1. Online safety inspection system that keeps track of all inspection and corrective actions.
- 2. Online Lab Safety Training System
- 3. Online system to manage all the equipment maintenance operations and asset control.
- 4. Online Chemical Inventory System

This catalogue has been compiled by the CLD to be a useful source of information to students, faculty, researchers, external organizations, and accreditation commissions. The aim is to make the lab facilities easily accessible to the University constituencies and to improve collaborative use of the labs between programs, researchers, and external partners in order to maximize the use of university resources. This catalogue contains a detailed description of the equipment in each lab, possible learning experiments, and the types of tests and services that could be conducted for the benefit of external organizations and researchers.

The vast expansion of the CLD and its development are fully consistent with the vision of H.H. Sheikh Sultan bin Ahmed bin Sultan Al Qasimi, Deputy Ruler of Sharjah, and President of the University of Sharjah in making the University of Sharjah a leading institution of higher education offering modern research and educational facilities in the region and around the world. The continued support and trust of the University Chancellor, Prof. Hamid Al Nayimi and the Dean of Academic Support Services, Dr. Hussein Elmehdi makes Central Labs prominent, vibrant, and extremely effective in supporting the teaching/learning and research at the University of Sharjah.



INTRODUCTION

The University of Sharjah established the Central Laboratories Directorate (CLD) as a core space for practical experiments, training, and research in the fields of applied and medical sciences. Congruent with the relentless patronage and commitment to excellence of His Highness Sheikh Dr. Sultan Bin Mohammed Al Qassimi, Member of the Supreme Council, Ruler of Sharjah, President of the University of Sharjah, the Central Laboratories Directorate combines human intellect and technical ingenuity to support the academic and research process and contribute to the fulfilment of the University's mission. The Central Laboratories has expanded over time to cater to the growing needs of the University to guarantee optimal space with state-of-the-art equipment and research instruments.

The Central Laboratories Directorate administers teaching labs for the Colleges of Engineering, Sciences, Computing and Informatics, Health Sciences, Medicine, Dental Medicine and Pharmacy. The Central Labs Directorate also supports the research labs in the Research Institute of Sciences and Engineering (RISE), Research Institute for Medical and Health Sciences (RIMHS) and Sharjah Academy for Astronomy, Space Sciences and Technology (SAASST).

The Central Laboratories Directorate has different lab facilities across the UoS campus. These labs serve faculty and students for all teaching and research activities. In total, we have 175 labs: 111 teaching, 49 research and 15 labs for teaching/research. The Lab facilities are equipped with the state-of-the-art lab equipment and considered the largest at the national and regional level. The Central Labs Directorate is responsible to manage lab space, daily services, procurement of lab equipment, lab equipment maintenance, new installations, central utilities operations, lab safety, lab stores, and supply of consumables and tools. The table below shows that lab distribution in UoS campus.

Building Name	Building #	Teaching	Research	Teaching/ Research	Total
Women Central Laboratories	W12	36	13	8	57
Men Central Laboratories	M12	28	1	6	35
RIMHS	M32	4	28	-	32
College of Medicine	M27	16	-	-	16
College of Dentistry	M28	11	-	-	11
College of Health Sciences	M23	10	-	-	10
Clinical Training Center	M31	4	-	-	4
College of Sciences	W8	-	1	-	1
College of Arts, Humanities, and Social Sciences	M2	-	0	1	1
Dep. of Architecture, College of Engineering	M8	2	0	0	2
Sharjah Academy for Astronomy, Space Sciences & Technology	SAASST	0	6	0	6
Total Labs		111	49	15	175



CENTRAL LABS DIRECTORATE DUTIES AND RESPONSIBILITIES:

The duties and responsibilities of the Central Laboratories Directorate include but are not limited to the following:

1. Technical Support

- The Central Laboratories Directorate (CLD) is committed to support the scientific colleges and research institutions by facilitating the purchasing process for lab equipment and consumables (tools/ reagents...). From suggesting the appropriate suppliers/local dealers to preparing the LPO description and update about the delivery date, the Central Lab Directorate will be the technical reference for the end user.
- The Central Labs Directorate is following an approved purchasing procedure, to help the end user to get the needed items. This process is implemented in three phases:

Phase I - Pre-Assessment of the Purchasing Request

- Once received in the CLD, the technical support staff needs to pre-assess the purchasing request by:
- Checking the complete information, approvals and support documents (e.g. Sole Source Justification/ CAPEX Request Form/ drawings) in the received purchasing request. For CAPEX requests (equipment estimated cost above 100000AED), specific approval should be taken from the CAPEX approval committee
- Verifying the technical specifications of the requested items
- Verifying the non-duplication of the requested equipment
- Checking the space availability for requested equipment
- Suggesting the appropriate suppliers and local agents
- Giving the request a unique reference number and entering the details on the CLD database and CAFM system for tracking purposes
- The purchasing request is sent to procurement department for tendering only when all above mentioned settings are satisfactory.

Phase II Technical Evaluation

The technical quotations are received in CLD after tendering to prepare the Technical Evaluation Report as follows:

- Studying the technical quotes with the end user and ensuring the acceptance/rejection of the offered technical specifications from each supplier
- Contacting / meeting the suppliers for technical clarifications
- Deciding on the required quantities, accessories, and alternatives
- Highlighting any special technical requirements

The CLD sends the technical evaluations and associated reports to the Purchasing Department

for financial evaluation

Phase III - Pre- LPO Issuing

The CLD technical staff will receive the finalized financial evaluation from the Purchasing Department for:

- Verifying the financial evaluation and the correct choice of the suppliers
- Getting approvals for extra budget- if needed
- Preparing the items description to issue the LPOs
- In case of equipment purchasing, the technical officer informs the maintenance team about the selected supplier/equipment to prepare the required utilities for installation

Once the LPO is issued, a copy is sent to the end user, the database is updated accordingly and the maintenance team in CLD starts preparing the site.

Direct Orders

The technical Support Section is eager to provide the requestors (Teaching/ Research) with the best services possible. So additionally to the above described LPO process, the team is issuing "Direct Orders" for the OPEX requests below 10000AED and CAPEX requests below 5000AED. Following the same procedure of having generic specifications, requesting offers from different suppliers and performing technical and financial evaluation, the technical support section sends to the vendors delivery confirmations for approved Direct Orders quotations in very short time. That helps the end users to have the needed requirement and process the teaching and research requests promptly.

Petty Cash

Technical Support Section is supporting end users as well with Petty Cash purchase, which are for requets below 1500AED but processed in very short time. A specific online form for the Petty cash is used. It is filled, sent for budget owner, and approved by Central Labs Director by few clicks. Once received by the Technical Support team, the best suppliers are contacted to deliver promptly.

2. Equipment Maintenance

The Maintenance Team involves in all the essential operations required for maintaining the equipment within prescribed limits. The equipment maintenance function is intended to restore or retain the specified state of laboratory equipment and provide technical support for equipment installations with the help of qualified and professional maintenance team of engineers and technicians. The Central Laboratories maintenance operations are well organized with the help of maintenance management software Computer Aided Facility Management (CAFM).

2.1 CLD Maintenance Management Software - CAFM

The Central Laboratories Directorate implemented an advanced software package Computer Aided Facility Management (CAFM) that support all Central Lab equipment maintenance activities and routine operations.

The CAFM system is a well-organized online support system with instrument data base that has administrative tools which can be used to support the Maintenance Unit to track, manage, report, and plan the university equipment, instruments, and utility maintenance operations. CAFM service can be accessed through My UOS under Central Labs Portal. The advantages of CAFM implementation are as follows:

- CAFM has an updated instrument data base with the administrative tools to track, manage, report, and plan Central Lab instruments and utility maintenance operations.
- Reduce paperwork, instrument breakdowns, and improve response time.
- To check the instrument availability, location, track the service activities and reduce duplicate instrument orders.
- Easy re-allocations, increase the utilization of space & facilities and plan preventative maintenance.
- Allocation of the related technical resource to identify and rectify the issue at the earliest.
- History of all service activities from CAFM will help in future trouble shooting regarding technical problems and to decide the economic service solutions.
- Easy to use friendly interface that helps laboratory officers to raise any maintenance request within minutes and follow-up on the request as per the severity of the breakdown

2.2 CLD In-house Equipment Maintenance

The Central Labs Directorate has established a maintenance policy in which preventative maintenance, corrective maintenance and breakdown maintenance are performed as needed. The Central Lab has a qualified and dedicated maintenance team, who will receive maintenance and service requests from laboratory users through an on-line system and CLD engineers and technicians who will perform in-house equipment maintenance and are involved in the activities listed below:

- Inspection
- Testing
- Installation
- Measurement
- Calibration
- Maintenance
- Application Training
- Troubleshooting, Parts Replacement and Fabrications

2.3 External Maintenance Contracts

The Central Labs maintenance team is responsible for all external maintenance contracts for the lab equipment and utilities, which includes the following responsibilities but is not limited to:

- Assessing the need of Annual maintenance contract for critical equipment.
- Preparing the scope of works of maintenance contracts.
- Propose the best maintenance contract offer after reviewing the technical.
- Following up on the implementation of contracts and ensuring that companies are honoring provisions as stated in their contracts.

2.4 New Equipment Installations

The maintenance team is also responsible for new equipment installations and preparation of the CLD Technical Reports to complete the commissioning as per the Local Purchase Order:

- Communicate with the supplier for pre-installation requirements and visit schedule.
- Prepare the site with pre installation requirements for all new equipment.
- Contact the end users and scheduling the installation/application training.
- Follow up with companies to do the installations and training on time.
- Inspect the supplied equipment and ensure it is functional as per the Local Purchase Order.
- Ensure that suppliers are submitting the technical and warranty documents and prepare the technical report for completed installation projects.

2.5 Laboratory Buildings and Utility Maintenance

Central Laboratories maintenance team monitors the general maintenance of all Laboratory utilities and laboratory building facilities. The CLD maintenance team respond immediately for maintenance emergency that may arise in laboratories, to maintain all system in the buildings (W12, M12, W8, M23, M31, M28, M27 and M32) for the compressed air, central gas, and vacuum systems. The CLD Maintenance Unit also performs a regular inspection for all compressed gas cylinders and making it properly secured and standardized as per Health and Safety Standard policy.

3. Space Management

- Central Laboratories Directorate prepares statistics on the utilization of all labs in M12, W12, M23, M27 and M32. The CLD management provides all data and recommendations to the Central Labs Committee for the redistribution of lab space between programs to satisfy all program needs when necessary. Currently Central Labs hosts more than 450 lab sessions every week.
- Central Labs Directorate has 17labs that are declared as shared labs in which more than one program may be scheduled. CLD is responsible to coordinate the schedule preparation to avoid any conflicts.

- Central Labs manage the intercollege utilization of labs on request bases to satisfy any request for tech labs, using certain labs to complete student graduation projects or complete faculty research.
- CLD manages the lab utilization after official working hours to ensure a healthy and safe environment for students and lab staff.

4. Central Labs Stores

The Central Labs Store section provides efficient and reliable services during the receiving of materials and purchased equipment. The commitment is to support the university laboratories by ensuring a safe and prompt delivery of all supplies and materials. Central lab stores ensure that university labs are running smoothly by keeping consumables stocks available and deliverable. The stores concept is to store all items at a central place and control materials movement from this central place, the Central Labs Directorate has two types of stores:

- General Receiving Store
- Liquid Chemical Store

4.1 General Receiving Store Functions:

- Receiving, inspection and distribution of purchased orders: All purchased equipment or materials must enter through central labs stores. Central lab store officer coordinates with end-user and ensure that requested items are received correctly and in accordance with the specifications identified in purchasing request.
- Processing Payment: after successful completion of the purchase order, the store officer will prepare and submit technical report along with necessary documents to Finance department for payment processing.
- Central lab store will monitor stock level of consumables such as (tissue papers, gloves, lab coats, safety PPEs and regular spare parts) to keep University labs running smoothly. The flow chart below shows the process of receiving items in Central Labs stores:



2.4.2 Liquid Chemical Store

The proper storage of chemicals is an important safety matter in the Laboratories. The purpose of this store is to assist laboratory users in safe and compliant storage of stock quantities of chemicals in Central Laboratories. There are strict guidelines on access to this store and only authorized persons are permitted to access the chemical store.

There are three types of cabinets inside the chemical store:

• Flammables Safety Cabinets: Fire resistant metal cabinets are typically used for the storage of flammable solvents. All cabinets are OSHA compliant and meet NFPA Code 30, and most are independently fire tested and approved by FM Approvals.



• Corrosives/Acid Steel Safety Cabinets: Specially designed cabinets for safely storing corrosives in laboratories and to eliminate damage from corrosive liquids. Powder-coat finish resists acids, bases, and solvents, protecting laboratories and personnel from damaging corrosives.



• Hazardous Materials Safety Cabinets: Specially designed, code compliant cabinets for the storage of hazardous materials such as acids, bases, oxidizers, or toxic materials. All come with self-closing doors, and they are available with ChemCor[®] lining for applications that require protection from harsh corrosives.



4.2 Lab Inventory

To ensure that Laboratory equipment has properly been tracked and well-maintained, the record with full asset information has been maintained through Computer Aided Facility Management (CAFM) system. This software was designed to cater the following requirements:

- All new equipment asset data is uploaded in the CAFM Software after completing installation and training procedures.
- Fixed asset forms of all newly installed equipment are sent to the Fixed Asset Unit to be documented in their system.
- Defective equipment report is regularly updated in the CAFM Software to monitor the existing asset status
- All maintenance activities and contracts are recorded and monitored by CAFM software.

5. Laboratories Safety

The Central Laboratories Directorate is committed to provide a safe laboratory environment for faculty, staff, and students. The goal of laboratory safety is to protect the laboratory personnel from injury and illness, and the University assets from damage. The Central Laboratories Directorate takes all necessary actions to ensure that our labs are a safe working environment for teaching and research. The Central Laboratories Directorate carries out the following activities to manage health and safety:

5.1 The Central Labs Safety Training

The Central Laboratories Directorate has an online safety training management system that provides an effective and comprehensive safety training solution for students, lab staff and faculty and covers the different hazards present in our labs (chemical, biological, radiation, electrical, and many more). The system course library contains over 500 of the most effective EHS training titles available. The safety courses elaborate best practices on how to work safely in different labs as per the international standards. The Safety training enhances the safety knowledge, develop students, staff, and faculty safety skills, ensure regulatory and accreditation compliance. In addition to that it will help to ensure that they understand the risks of the hazards they are dealing with, perform work tasks in a safe manner and minimize the risks in the labs. Finally, it leads to reducing the number of incidents and creating a safer and more productive workplace. After completing the courses, trainees can print their own certificates from the system.



5.2 Lab Safety Publications:

Laboratory Safety Manual

The Central Labs Directorate has developed a Laboratory Safety Manual and distribute it in all Laboratories at University of Sharjah. The Laboratory Safety Manual provides valuable information for managing laboratory risks and gives best safe work practices for lab hazards.



• UOS Chemical Hygiene Plan

The Central Labs Directorates has developed the Chemical Hygiene Plan to define safe work practices and procedures in handling, storage and use of hazardous chemicals in the University



• Emergency Preparedness

The Central Labs Directorate has developed an "Emergency Response Guide" booklet and an "Emergency & Safety Instructions" poster to provide all lab personnel (Students, Staff and Visitors) with a quick reference guide explaining how to respond to various types of emergencies that might occur in labs and to reduce the chances of serious injury to lab personnel and minimize damage to university property. The Central Labs Directorate carries out a mock fire drill from time to time in coordination with the Facility Management and Planning Department and the Civil Defense.



5.3 Labs Safety Supplies

The Central Labs Directorate provides laboratory personnel with all appropriate personal protective equipment and tools to protect them against health and safety risks at work. The Central Labs keeps a stock of the regular safety supplies in the laboratories including lab coats, gloves (different types and sizes), masks (different types), safety glasses, first aid items and many



more, that available all the time and can be delivered immediately upon the request.

5.4 Online Chemical Inventory Management System

The Online Chemical Inventory Management System (LabcliQ) is a cloud-based software used to manage all chemicals in all locations at the University. The system is a user-friendly standardized database that simplifies data entry, ensures reliable chemical data, and provides accurate reporting in seconds rather than weeks to meet regulatory needs and improve labs safety.

Advantages of Digitizing Chemical Inventory

Digitization is the method of converting physical format to digital format. Software programs are the core of this digitization. Here are a few benefits to the digital transformation of chemical inventory.

• Increase efficiency: Digitization has the benefit of reducing errors and the time needed to

manage the process.

- Tracking updates: Automated monitoring of changes to chemical safety data sheets, accompanied with notifications.
- Improves accuracy: Provides detailed information while minimizing errors.
- SDS management: Electronically attach inventory to digital safety data sheets.
- Data Storage: Capable of storing vast amounts of data that can include entire company inventory lists yet filter to show inventory for specific locations.
- Track hazardous materials: Can easily track the key hazardous materials that are added or exceed the allowed thresholds.
- Live Inventory Monitor: Data is always live/real-time/up-to-the-minute. Ability to view live inventory at anytime and anywhere.
- Data based on specifications: Inventory reports can be run on live data, often on specific filters such as location, department, user, building, hazard type, etc.
- Easy identification: Allows for easy creation of informative labels including barcoding, QR codes, and secondary container stickers.
- Easy transfer: Useful for transfers and management of inventory from primary and secondary containers.

5.5 Labs Safety Inspection

Laboratory inspections are a vital part of our safety program. The goal of laboratory inspections is to maintain a safe workplace by reducing or eliminating hazardous conditions and to assist in compliance with the regulations. The Central Laboratories Directorate conduct formal laboratory inspections regularly using the Safety Inspection Management System (LabCliQ). Inspection reports and corrective actions are provided to the lab in-charge and reviewed by the department chair.



5.6 Hazardous Waste Management

The Central Laboratories Directorate manage the hazardous waste program in coordination with the waste disposal service provider (Wekaya) to comply with local and international environmental, health and safety laws and regulations. The CLD has 7 contracts for different entities at University of Sharjah, depending on the nature and amount of the waste generated. These contracts include:

- CL buildings W12 and M12- on call basis
- University Dental Hospital: 8 collections per month
- Research Institute of Medical Health Sciences (RIMHS)- On call basis
- Specialized Medical Center (M2): 8 collections per month
- University Medical Clinic Women (W2): 8 collections per month
- Postgraduate Dental Center (M28): 8 collections per month
- University of Sharjah Nursery Clinic- 2 collections per month.

5.7 Laboratory Safety Committee

The Laboratories Safety Committee is formed at the beginning of each academic year under the chairmanship of the Central Labs Director and consists of the representatives of the concerned colleges. They meet regularly to discuss the safety issues and approve any new safety plan or program.

5.8 Lab Safety Events and Workshops

The Central Labs Directorate organizes regular lab safety awareness seminars and workshops for lab staff to raise their awareness about any new activity/development and seek their inputs and welcoming any safety suggestions. This is leading to develop a positive health & safety culture.

6. Central Labs Policies and Procedures

The Central Labs Directorate has developed policy and procedures aligned and standardized as per international and local standards. These policies and procedures describe the operational and standard practices for faculty members, labs staff, researchers and students who are working in teaching and research laboratories and reviewed by professional external consultant and Deanship of quality assurance, Institutional effectiveness, and accreditation of University of Sharjah.

According to Chancellor Decision "Article (2): The operation Policy and Procedures shall be reviewed and updated periodically, at least once every academic year". Central laboratory directorate eagerly keep update policies and procedure to provide best road map to ensure legal compliances, decision making and streamline internal workflow for laboratory users. There is

total 27 approved policy and procedures published by central labs directorate which covers all topic related to teaching and research labs.

These Policy and procedures give guidance to all lab user for following questions but not limited to these:

- 1. What are the lab user roles and responsibilities?
- 2. How to initiate procurement process & and perform technical evaluations for request?
- 3. How to get permission for other's Equipment/laboratory during working hours and outside working hours?
- 4. How to work as per health and safety local and international regulations
- 5. How to attend Safety trainings?
- 6. How to work on online chemical inventory management system?
- 7. How to report lab incidents? If happens!
- 8. How to handle hazardous waste in laboratories?
- 9. How to deal with central lab store?
- 10. How to initiate lab equipment maintenance request?
- 11. How to initiate request for lab utilities?
- 12. How to deal with compressed gas cylinders ?

Policy No.	Policy and Procedure Title
UOS/CLD/SS/01	1. EHS Roles and Responsibilities
UOS/CLD/SS/02	2. Labs Emergency Preparedness
UOS/CLD/SS/03	3. Labs Safety Inspection
UOS/CLD/SS/04	4. Labs Safety Supplies
UOS/CLD/SS/05	5. Labs Safety Training
UOS/CLD/SS/06	6. Labs Housekeeping
UOS/CLD/SS/07	7. Chemicals Storage and Transportation
UOS/CLD/SS/08	8. Biological Material Storage and Transportation
UOS/CLD/SS/09	9. Hazardous Waste Management Policy & Procedure
UOS/CLD/SS/10	10. Student Project Lab Roles and Responsibilities
UOS/CLD/SS/11	11. Engineering Workshop Roles and Responsibilities
UOS/CLD/SS/12	12. Laboratory Incidents Reporting & Investigation
UOS/CLD/SS/13	13. Online Chemical Inventory Management System Policy & Procedure
UOS/CLD/AS/01	14. Labs Space Management
UOS/CLD/AS/02	15. Central Labs Petty Cash Handling
UOS/CLD/AS/03	16. Shared Labs Policy & Procedure

Policy No.	Policy and Procedure Title
UOS/CLD/AS/04	17. Sharing Lab Equipment by Different Departments
UOS/CLD/AS/05	18. Using Labs Outside Working Hours
UOS/CLD/AS/06	19. Central Labs Equipment Shifting
UOS/CLD/AS/07	20. Control of Documented Information
UOS/CLD/LSS/01	21. Central labs Stores policy & procedure
UOS/CLD/MS/01	22. Annual Lab Equipment Maintenance Contracts Policy & Procedure
UOS/CLD/MS/02	23. Central Labs Utilities Maintenance Policy & Procedure
UOS/CLD/MS/03	24. Lab Equipment Maintenance Policy & Procedure
UOS/CLD/MS/04	25. New Lab Equipment Installation and Training Policy & Procedure
UOS/CLD/MS/05	26. Compressed Gas Cylinders & Cryogenic Liquid Handling Policy & Procedure
UOS/CLD/TS/01	27. Technical Support for Lab Equipment & Consumables Purchasing



CENTRAL LABS BUILDINGS M12-W12 LAYOUT








F RESEARCH 213C CARDIOPULMONARY LAB PHYSIOTHERAPY FOR GERIATRICS LAB OBSTETRICS AND GYNECOLOGY LAB PETROLOGY LAB (MICROSCOPY LAB) PHYSICS 4 LAB (APH) FACULTY ROOM GEOSCIENCE/ GEOPHYSICS LAB E 2138 LAB RADIATION 213A LAB A 219A EIZ 8602 M 112 510 60Z 112 SIZ (PT) OFFICE STORE (Ld) 212 V TWC TWC A205A Ŵ 520 人 A812 OFFICE (APH) STORE (APH) IMMUNOLOGY & SEROLOGY FOR TTECHNOLOGY LAB (BIOTECH) HUMAN ANATOMY & PHYSIOLOGY LAB (MLS) PHYSICS LAB (APH) (1W) PHYSICS LAB (APH) (2W) PHYSICS LAB (APH) (3W) PHYSICS LAB (APH) (4W) OFFICE (APH) 201 1 STORE (APH) 2188 2148 (MLS) OFFICE (APH) **3**50Z ĥî STORE (SIM) LAB (PT) PHYSIOTHERAPY FOR MUSCULOSKELETAL CONDITIONS & PHYSICAL AGENT LAB (PT) . **CENTRAL LABORATORIES BUILDING** MEDICAL DIAGNOSTIC IMAGING (MDI) EN IN W12 SECOND FLOOR 202 AIOS CENTRAL LABORATORIES TECHNICAL & SAFETY TRAINING HALL MEDICAL LAB SCIENCE (MLS) BIOTECHNOLOGY (BIOTECH) APPLIED PHYSICS (APH) PHYSIOTHERAPY (PT) \$ CHEMISTRY (CH) Z ä V922 0 IDF RM. IIII 8922 ZZ F CULTURE ATSS OFFICE (MDI) N B B M 8/22 BALANCE ROOM R OFFICE (CH) ENERAL BIOCHEMISTRY & BIOTECHNOLOGY LAB (BIOTECH) MOLECULAR GENETICS & IMMUNOLOGY LAB (MLS) 2358 ORGANIC CHEMISTRY LAB (CH) INORGANIC CHEMISTRY LAB PHYSICAL CHEMISTRY LAB RESEARCH LAB (MLS) 229 OFFICE (CH) (H) PRE. RM OFFICE (CH) 1 EEZ 235A T REAL OEZ 74J 152 STORE (CH) S34 9EZ 538 232 242 λſ W W V \boxtimes <u>alala oool</u> 240A 236A GENERAL CHEMISTRY LAB (CH) GENERAL CHEMISTRY LAB (CH) CHEMISTRY STUDENTS RESEARCH LAB 2 (CH) 232A CHEMISTRY STUDENTS RESEARCH LAB 1 (CH) PRE. RM INSTRUMENT LAB (CH) 231B WC K BALANCE ROOM 232B 231C 240B 2368

Central Laboratories Directorate, Colleges & Research Institutes Contacts

#	Name	Title	Ext.	Email
1	Engr. Mahmoud Abu Shammeh	Director, Central Labs	3450	abushammeh@sharjah.ac.ae
2	Mohamed Abu El-Sood	Sr. Administrative Assistant	3453	mohamedyousef@sharjah.ac.ae
3	Aisha Burefaiah	Sr. Lab Officer	3456	aburefaiah@sharjah.ac.ae
4	Samah Belghith	Sr. Lab Officer	3433	sbelghith@sharjah.ac.ae
5	Waqar Majeed	Sr. Lab Officer	3417	wmajeed@sharjah.ac.ae
6	Bethuel Medina Reyes	Lab Officer	2428	breyes@sharjah.ac.ae
7	Sarah Qays Alhayali	Lab store officer	3431	salhayali@sharjah.ac.ae
8	Omar Haj Saleh	Store Officer	3454	ohajsaleh@sharjah.ac.ae
9	Ahmed Hassanein	Sr. Safety Officer - Lab	3428	ahassanein@sharjah.ac.ae
10	Razwan Ali	Safety Officer	3416	rizwanali@sharjah.ac.ae
11	Sancho Recalde	Team Leader/Equip. Maint.	3488	srecalde@sharjah.ac.ae
12	Prasanth Keloth	Engineer – Electronics	3451	pkeloth@sharjah.ac.ae
13	Ahmed Elhassan	Sr. Engineer – Biomedical	7675	aelhassan@sharjah.ac.ae
14	Saad Mahmood Awan	Engineer	3424	sawan@sharjah.ac.ae
15	Mohamed Habbal	Technician – Maintenance	3415	mhabbal@sharjah.ac.ae
16	Francis Fajardo	Maint. Management Officer	3447	ffajardo@sharjah.ac.ae
17	Mohamed Ramadan	Sr. Technician – Gas	3458	mghulam@sharjah.ac.ae
18	El Hadey Abou El Dahab	Sr. Clerk-Stores	3449	eeldahab@sharjah.ac.ae
19	Abdulnasir Mutakan	Employee	3459	nasaruos@sharjah.ac.ae

Central Laboratories Directorate

			9	
#	Name	Title	Ext.	Email
		Civil & Environmental Engine	ering	
1	Mohamed Qaisieh	Lab Engineer	2935	qaisieh@sharjah.ac.ae
2	Nabila A. Hawawini	Lab Engineer	2485	nabilah@sharjah.ac.ae
3	Priya S. Kaimal	Lab Engineer	3498	pkaimal@sharjah.ac.ae
4	Ahmed Shweiki	Lab Engineer	2426	ashweiki@sharjah.ac.ae
5	Loubna Chaabi	Lab Engineer	3439	lchaabi@sharjah.ac.ae
6	Tarek Al Homsi	Lab Engineer	2464	talhomsi@sharjah.ac.ae
7	Yousef Shaker	Lab Technician	2468	yusuf@sharjah.ac.ae
8	Madhu Keezhilath	Lab Technician	2447	mkeezhilath@sharjah.ac.ae
		Electrical Engineering		
1	Obaida Ali Abu-Bader	Lab Engineer	2488	obaida@sharjah.ac.ae
2	Imtinan Basem Attili	Lab Engineer	3493	iattili@sharjah.ac.ae
3	Mohammad Saad Suleiman	Lab Engineer	2449	msuleiman@sharjah.ac.ae
4	Noor Ul Misbah Khanum	Lab Engineer	3429	nkhanum@sharjah.ac.ae
5	Sol Andrew C. Domingo	Lab Engineer	2938	sdomingo@sharjah.ac.ae
6	Alya Alhammadi	Lab Engineer	2412	Alya.alhammadi@sharjah.ac.ae
		Architectural Engineerir	ng	
1	Lamees Hamid	Lab Engineer	2985	Lhamid@sharjah.ac.ae
2	Farah Al Ani	Lab Engineer	2988	falani@sharjah.ac.ae
3	Osama Hasan	Lab Engineer	2891	ohassan@sharjah.ac.ae
4	Gene Anthony Soriano	Lab Technician	2991	gsoriano@sharjah.ac.ae
	Industria	I Engineering and Engineering	g Manage	ement
1	Amer A. Yousif	Lab Engineer	3443	amer@sharjah.ac.ae
2	Omar Hassan Omar	Lab Engineer	3448	oomar@sharjah.ac.ae
3	Rasha Adnan	Lab Engineer	3936	radnan@sharjah.ac.ae
4	Faheem Akhter	Lab Technician	3443	fsoomro@sharjah.ac.ae
	Susta	ainable & Renewable Energy E	Ingineerii	ng
1	Monadhel Alchadirchy	Lab Engineer	3491	malchadirchy@sharjah.ac.ae
2	Sondos Al Qudah	Lab Engineer	3497	salqudah@sharjah.ac.ae
3	Rasha Basil Saffarini	Lab Engineer	2417	rSaffarini@sharjah.ac.ar
		Mechanical & Nuclear Engine	eering	
1	Abdel Rahman Amarneh	Lab Engineer	3438	amarneh@sharjah.ac.ae
2	Mohamed Ammar	Lab Engineer	2461	Mjouma@sharjah.ac.ae
3	Osama Taqatqa	Radiation Safety Officer	2448	otaqatqa@sharjah.ac.ae
4	Samar El Sayed	Lab Engineer	2471	selsayed@sharjah.ac.ae
5	Ahmad Ababneh	Lab Engineer	2416	aababneh@sharjah.ac.ae
	Chen	nical And Water Desalination I	Engineeri	ng
1	Mahammed Ali	Lab Engineer	3495	Mohammed.Ali@sharjah.ac.ae

College of Engineering

College of Computing and Informatics

#	Name	Title	Ext.	Email
1	Maha AlaaEddin	Engineer-Lab	3494	malaaeddin@sharjah.ac.ae
2	Hassan Vakani	Engineer-Lab	3494	htvakani@sharjah.ac.ae

College of Sciences

#	Name	Title	Ext.	Email			
Che	Chemistry						
1	Nemat Dek Al Bab	Team Leader	3477	naimat@sharjah.ac.ae			
2	Mohamed Al Farooq	Sr. Lab Officer	2470	malfarouk@sharjah.ac.ae			
3	Kifah Al-Taqaz	Sr. Lab Officer	3475	kifah@sharjah.ac.ae			
4	Hajar Ibrahim	Lab Officer	3441	habdalla@sharjah.ac.ae			
5	Reem Alteneiji	Lab Officer	3445	ralteneiji@sharjah.ac.ae			
6	Amin Hasan Botmah	Lab Officer	3470	abotmah@sharjah.ac.ae			
7	Alaa Bihi	Lab Officer	3423	abihi@sharjah.ac.ae			
8	Ali Hussam Al-Samarrai	Lab Technician	-	aalsamarrai@sharjah.ac.ae			
9	Mussab Osama Hassan	Lab Officer	2477	mahmed2@sharjah.ac.ae			
Арр	lied Physics and Astronomy						
1	Khadija Ismaeil Al Housani	Team Leader	3466	kalhousani@sharjah.ac.ae			
2	Taghrid Abdalla Abu Sheritah	Sr. Laboratory Officer	3467	tabusheritah@sharjah.ac.ae			
3	Sanoor Mannath	Sr. Laboratory Officer	2480	smannath@sharjah.ac.ae			
4	Bento Joseph	Lab Officer	2466	bjoseph@sharjah.ac.ae			
5	Faisal Abdullah Alsane	Lab Officer	2408	falsane@sharjah.ac.ae			
6	Maryam Rashed Al Naqbi	Lab Officer	3469	malnaqbe@sharjah.ac.ae			
7	Abd Elmahmoud Elsamani	Lab Officer	3457	aelgaili@sharjah.ac.ae			
Арр	lied Biology						
1	Aisha Alketbi	Sr. Lab Officer	3476	Aisha77@sharjah.ac.ae			
2	Mona Ibrahim	Lab Officer	2437	mmusa@sharjah.ac.ae			
3	Mona Al Ali	Lab Officer	2473	Muna.alali@sharjah.ac.ae			
4	Mona Mahfood	Lab Officer	2416	mmahfood@sharjah.ac.ae			
5	Mariam Ghaleb	Lab Officer	3408	malawbathani@sharjah.ac.ae			

#	Name	Title	Ext.	Email
Clini	cal Nutrition & Dietetics			
1	Salma Jamal AbuQiyas	Tutor- Clinical	7562	sabuqiyas@sharjah.ac.ae
2	Hanin Bassem Kassem	Tutor- Clinical	7567	hkassem@sharjah.ac.ae
3	Radhiya Rashid Al Rajaby	Tutor- Clinical	7574	ralrajaby@sharjah.ac.ae
Mec	lical Laboratory Sciences			
1	Maen Omar Asad	Lab Officer	3483	maen@sharjah.ac.ae
2	Nabila Hussein	Lab Officer	3485	nabila@sharjah.ac.ae
3	Said Shahwan	Lab Officer	3486	saidj@sharjah.ac.ae
4	Zeinab Abdallah Ibrahim	Lab Officer	3421	zibrahim@sharjah.ac.ae
5	Shaikha Alnaqbi	Lab tutor	3481	Shaikha. Abdalla@sharjah.ac.ae
Phys	siotherapy			
1	Sara Atef	Tutor- Clinical	7547	saali@sharjah.ac.ae
2	Asma Javed	Tutor- Clinical	7537	Ajaved@sharjah.ac.ae
3	Hanan Yousef	Tutor- Clinical	7463	halkalih@sharjah.ac.ae
4	May Tamim	Tutor- Clinical	7546	mtamim@sharjah.ac.ae
5	Amal Ahboush	Tutor- Clinical	7594	aahbouch@sharjah.ac.ae
Env	ironmental Health			
1	Badriah Ahmed	Technician- Laboratory	2476	bebrahim@sharjah.ac.ae
Nurs	sing			
1	Janisha Kavumpurath	Tutor- Clinical	7562	janisha@sharjah.ac.ae
2	Muna Salem Al tamimi	Tutor- Clinical	7543	mal-tamimi@sharjah.ac.ae
3	Amina Al Boloshi	Tutor- Clinical	7528	aalboloshi@sharjah.ac.ae
Mec	lical Diagnostic Imaging			
1	Sura Majid	Tutor- Clinical	7566	surama@sharjah.ac.ae
2	Asma Abdi	Tutor- Clinical	7561	aabdi@sharjah.ac.ae2
3	Zarmeena Noorajan	Tutor- Clinical	7563	znoorajan@sharjah.ac.ae
4	Mawadah Gibril	Sr. Tutor- Clinical	3427	mgibril@sharjah.ac.ae
5	Wijdan Attia Hamad	Tutor- Clinical	7587	whamad@sharjah.ac.ae

College of Health Science

College of Medicine

#	Name	Title	Ext.	Email
1	Maria Apellana	Lab Technician	7284	maqui@sharjah.ac.ae

#	Name	Title	Ext.	Email		
Pha	rmaceutics and Pharmaceutica	l Technology				
1	Lama Abdul Moti	Tutor- Clinical	7474	lmoti@sharjah.ac.ae		
2	Manal Abbas	Tutor- Clinical	7478	mabdelsalam@sharjah.ac.ae		
3	Faten Elgharib	Tutor- Clinical	7437	felgharib@sharjah.ac.ae		
Med	dicinal Chemistry					
4	Razan Al-Humaidi	Tutor- Clinical	7415	ralhumaidi@sharjah.ac.ae		
5	Amna Al-Ali	Lab Technician	2427	asalali@sharjah.ac.ae		
6	Shatha Khalifa	Tutor- Clinical	7415	salyammahi@sharjah.ac.ae		
Pha	Pharmacy practice and Pharmacotherapeutics					
8	Farman Khan	Laboratory Officer	7562	fkhan2@sharjah.ac.ae		
9	Chefaa Al Hourani	Tutor- Clinical	7435	calhourani@sharjah.ac.ae		

College Of Pharmacy

College Of Dental Medicine

#	Name	Title	Ext.	Email
1	Aiad Alenis	Team leader of labs unit	7616	aiad@sharjah.ac.ae
2	Prof. Natheer Al-Rawi	Professor	7313	nhabdulla@sharjah.ac.ae
3	Hiba Saad	Tutor- Dental	7359	hisaad@sharjah.ac.ae
4	Mais Abdalla	Tutor- Dental	7357	mabdalla@sharjah.ac.ae
5	Hanalory Nofal	Dental Hygienist	7352	hnofel@sharjah.ac.ae
6	Fozia Aslam	Nurse	7352	faslam@sharjah.ac.ae
7	Grepchen Abrogar	Nurse	7342	gantenor@sharjah.ac.ae
8	Florence Serrano	Nurse	7343	flagazo@sharjah.ac.ae
9	Wendelyn ularte	Nurse	7337	wularte@sharjah.ac.ae

#	Name	Title	Ext.	Email
1	Mohammed Shamir	Lab Officer	2431	mshameer@sharjah.ac.ae
2	Mohammed Irshad	Lab Officer		mirshad@sharjah.ac.ae
3	Helal Ezzat Helal	Lab Officer	3413	hhelal@sharjah.ac.ae
4	Mohammed Siraj	Lab Officer	2430	mshikhli@sharjah.ac.ae
5	Aldin Mortega	Engineer- Industrial	2443	amortega@sharjah.ac.ae
6	Mohamed Barakat	Lab Engineer	1193	mbgibril@sharjah.ac.ae
7	Fahad Faraz	Lab Officer	3411	ffahmad@sharjah.ac.ae
8	Muath Khairi Mousa	Lab Officer	7656	mmousa 2@sharjah.ac.ae
9	Padma Pavani	Lab Officer	1335	ppavani@sharjah.ac.ae

Research Institute of Sciences & Engineering

Research Institute of Medical & Health Sciences (RIMHS)

#	Name	Title	Mobile	Email
1	Vidhya Anish Nair	Technician	0526943999	vnair@sharjah.ac.ae
2	Mohamed Elwasila	Animal Facility Technician	0505941626	melhagmusa@sharjah.ac.ae
3	Jasmin Shafarin	Technician	0506987972	jsalam@sharjah.ac.ae
4	Muath Khairi	Technician	0528637857	mmousa2@sharjah.ac.ae
5	Fatima Abdillahi Hersi	Research Assistant	0557746765	fhersi@sharjah.ac.ae
6	Jobi Joseph	Technician	0559089518	jjoseph@sharjah.ac.ae
7	Manju Nidagodu	Research Assistant	050207 7965	mjayakumar@sharjah.ac.ae
8	Ward Samer Saidawi	Research Assistant	0503243347	wsaidawi@sharjah.ac.ae
9	Dinesh Kumar Dhanaseka	Research Assistant	056208 0909	ddhanasekaran@sharjah.ac.ae
10	Abdul Khader	Research Assistant	0555996010	amohammed@sharjah.ac.ae
11	Soumya Sheela	Postdoc Research Associate	058169 1248	saravind@sharjah.ac.ae
12	Fatemeh Saheb Sharif	Postdoc Research Associate	50 1829166	fsharifaskari@sharjah.ac.ae
13	Narjes Saheb Sharif	Postdoc Research Associate	504406505	nsharifaskari@sharjah.ac.ae
14	Abderrahmane Boutemin	Animal Facility Technician	0581576657	aboutemin@sharjah.ac.ae
15	Lara Bou Malhab	Postdoc Research Associate	0569660983	lara.boumalhab@hotmail.com
16	Varsha M Menon	Research Assistant	0501949265	Vmenon@sharjah.ac.ae
17	Bahgat Mohamed Ezzat	Postdoc Research Associate	0502570759	bfayed@sharjah.ac.ae
18	Yusur Mehdi Saleh Zaki	Research Assistant	0554552246	yalmusleh@sharjah.ac.ae
19	Aghila Rani Koippallil	Postdoc Research Associate	0562206252	anair@sharjah.ac.ae
20	Priyadharshini Sekar	Research Assistant	0543527080	psekar@sharjah.ac.ae
21	Ana Catarina	Postdoc Research Associate	0522384755	csamorinha@sharjah.ac.ae
22	Noha Mousaad Taha	Postdoc Research Associate	050887 0315	nelemam@sharjah.ac.ae
23	Roba Saqan	Research Assistant	0529196779	rsaqan@sharjah.ac.ae

#	Name	Title	Mobile	Email
24	Hamza Mohammad	Lab Supervisor	0562075273	halhroub@sharjah.ac.ae
25	Roberta Cagliani	Postdoc Research Associate	0524586142	croberta@sharjah.ac.ae
26	Rakhee Kizhuvappat	Postdoc Research Associate	056820 4008	rramakrishnan@sharjah.ac.ae
27	Amal Bouzid	Postdoc Research Associate	0505088754	abouzid@sharjah.ac.ae
28	Ankita Shukla	Research Assistant	0527497148	ashukla@sharjah.ac.ae
29	Venkatesha Narayanas	Postdoc Research Associate	0545726433	vnarayanaswamy@sharjah.ac.ae
30	Shirin Ali Hafezi	Research Assistant	0564460965	shaghani@sharjah.ac.ae
31	Anila Abid Hussain	Postdoc Research Associate	0551602528	aabid@sharjah.ac.ae
32	Poorna Manasa	Postdoc Research Associate	0562429008	pbhamidimarri@sharjah.ac.ae
33	Nival Ali	Research Assistant	0544290603	nali@sharjah.ac.ae

Sharjah Academy of Astronomy, Space sciences & Technology

	#	Name	Email
ĺ	1	Prof. Ilias Fernini	ifernini@sharjah.ac.ae
	2	Dr. Mubasshir Shaikh	Mshaikh@sharjah.ac.ae
	3	Dr. Antonios Manousakis	amanousakis@sharjah.ac.ae
	4	Ms. Aisha Al-Owais	aalowais@sharjah.ac.ae



COLLEGE OF ENGINEERING

CAUTION

-RAY

PHYWE

1 a 6/8 - M

AMERA'S



COLLEGE OF ENGINEERING LABORATORIES

Lab #	Functions	Utilization
W12-013	Environmental Engineering Lab	CEE Department
W12-016	Ergonomics ,Work and Process Lab	IEEM Department
W12-019	- Surveying Lab - Manufacturing Processing	- CEE Department - IEEM Department - AE Department
W12-020	Transportation Lab	CEE Department
W12-024	Heat Transfer Lab	SREE Program
W12-140	Industrial Automation	IEEM Department
W12-136	- Solid Mechanics Lab - Machine Dynamics Lab	MNE Program
W12-136B	Electrospinning Lab	MNE Program
W12-131	- Thermo-Fluids Lab - Fluid Mechanics Lab - Chemical Thermodynamics Lab	MNE Program MNE Program CWDE Program
W12-131B	Human Vibration Research Lab	MNE Program
W12-104	Digital Logic Design	EE Department
W12-105	Microprocessors and Assembly Language Lab	EE Department
W12-116	Computer Communications & Networks Lab	EE Department
W12-122	Telecommunication System I Lab	EE Department
W12-123	Electronic Circuits Lab	EE Department
W12-115	Senior Design Project I & II Laboratory (Female) Research Lab	EE Department SREE Program
W12-120	Information Security Lab	EE Department
W12-110	- Energy Storage and Efficiency Lab - Photovoltaic (PV) Lab - Fuel Cells Lab	SREE Program
W12-014	Water Chemistry and Analysis Lab	CWDE Program
M12-001	- Structure Lab - Materials Lab - Master Student Projects	CEE Department
M12-002	- Engineering Workshop - Manufacturing Processes Lab	- CEE Department - IEEM Department - ME Program
M12-006	Geotechnical Engineering	CEE Department
M12-009	Applied Radiation Measurement Lab	MNE Program
M12-010	Radiation Detection Lab	MNE Program
M12-012	Fluid Mechanics & Water Resources	CEE Department
M12-013	- Fluid Mechanics Lab for SREE - Wind Energy Systems Lab	SREE Program
M12-032	Sand Casting	IEEM Department

Lab #	Functions	Utilization
M12-108	- Applied Electronics Lab - High Performance Cloud Computing Lab	- SREE Department - CE Department
M12-113	- Electromechanical Systems Lab - Electric Power Lab	- EE Department - SREE Department
M12-115	Feedback Control Systems Lab	EE Department
M12-118	Programmable Logic Controller (PLC) Labo	EE Department
M12-107	Circuits Analysis Lab	EE Department
M12-116	Printed Circuit Board Workshop	EE Department
M12-126	Senior Design Project I & II Laboratory(Male)	EE Department
M12-129	Senior Design Project / Research Lab	SREE Department
M8-004	Modeler and Printing Lab	AE Department
M8-005	Architectural and Building Sciences Lab	AE Department

Departments' Abbreviation:

- CEE : Civil and Environmental Engineering
- EE : Electrical Engineering
- AE : Architecture Engineering

IEEM: Industrial Engineering and Engineering Management

SREE: Sustainable and Renewable Energy Engineering

MNE: Mechanical & Nuclear Engineering

CWDE: Chemical And Water Desalination Engineering

CIVIL & ENVIRONMENTAL ENGINEERING DEPARTMENT

Civil & Environmental Engineering Laboratories

Lab Name	Location	Person in Charge	Programs Served	Courses Served
Structure Lab	M12-001	Ahmed Shweiki	Civil and Environmental Engineering (BSC & MSCE & PhD)	- Material for Civil Engineering - Master Thesis
Materials Lab	M12-001	Nabila Hawawini	 Civil and Environmental Engineering (BSC & MSCE & PhD) Mechanical Engineering Architectural Engineering 	 Material for Civil Engineering Advanced Concrete Technology Advanced Materials in Construction
Geotechnical Lab	M12-006	Mohamad Qaisiah	Civil and Environmental Engineering (BSC, MSCE & PhD)	- Geotechnical Engineering - Advanced Geotechnical Engineering - Soil Improvement - Soil Dynamics
Surveying Lab	W12-019	Priya kaimal	Civil and Environmental Engineering (BSC & MSCE & PhD)	Surveying
Fluid Mechanics and Water Resources Lab	M12-012	Tarek Alhomsi	 Civil and Environmental Engineering (BSC & MSCE & PhD) Sustainable and Renewable Energy 	- Fluid Mechanics - Hydraulics - Water Resources - Hydraulic Structures - Fluvial Hydraulics
Transportation Laboratory & Pavement Lab	W12-020	Ahmed Shweiki	Civil and Environmental Engineering (BSC & MSCE & PhD)	- Transportation - Applied Traffic Operations - Pavement Design
Environmental & Sanitary Lab	W12-013	Loubna Chaabi	Civil and Environmental Engineering (BSC & MSCE & PhD)	 Introduction to Environmental Engineering Wastewater Treatment and Reuse
Engineering Workshop	M12-002	Madhu Keezhilah	Engineering College	Industrial Manufacturing serves all the College of Engineering in different student projects

#	Name	Title	Ext.	Email
1	Mohamed Qaisieh	Lab Engineer	065052935	qaisieh@sharjah.ac.ae
2	Nabila A. Hawawini	Lab Engineer	065052485	nabilah@sharjah.ac.ae
3	Priya S. Kaimal	Lab Engineer	065053498	pkaimal@sharjah.ac.ae
4	Ahmed Shweiki	Lab Engineer	065052426	ashweiki@sharjah.ac.ae
5	Loubna Chaabi	Lab Engineer	065053439	lchaabi@sharjah.ac.ae
6	Tarek Al Homsi	Lab Supervisor	065052464	talhomsi@sharjah.ac.ae
7	Yousef Shaker	Lab Technician	065052468	yusuf@sharjah.ac.ae
8	Madhu Keezhilath	Lab Technician	065052447	mkeezhilath@sharjah.ac.ae

Civil & Environmental Engineering lab Staff

STRUCTURE LABORATORY



INTRODUCTION

The Heavy Structures Lab in the Civil & Environmental Engineering Department is equipped with state-of-the-art testing machines, equipment, frames, and various data loggers, which are considered unique to the entire Arabian Gulf region. The experimental set-ups in the lab are capable of performing most standard and nonstandard tests that carried out on almost all building materials and structural elements used in construction. Such experimental capabilities and with expertise of the Civil & Environmental Engineering staff are considered a great asset to the local industry. The size of the testing machines and their variety make them ideal for teaching, research and consultancy work because of their high capacity and their capability of testing both standard and large-scale specimens under static or cyclic horizontal and vertical loads. The experimental set-ups utilizes modern data acquisition systems with versatile sensors such as LVDTs, strain gauges, accelerometers, and load cells, which all could measure many required parameters.

EQUIPMENT AND INSTRUMENTS

- Universal Testing Machine (UTM) (1500kN)
- Universal Testing Machine (UTM) (100kN)
- Portal Frame (500kN)
- Hydraulic cyclic Actuator (500kN)
- Hydraulic cyclic Actuator (1000kN)
- Hydraulic cyclic Actuator (100kN)
- Campbell CR 3000 Micro Logger
- Vishay 7000 Data Acquisition System
- DT9837 data acquisition system for dynamic signal analysis up to 105.4KS/s.
- Fiber reinforced concrete flexure testing machine 300 kN
- Two Axis shaking table 70x70cm, 100kg max payload

- Creep testing frames for ASTM concrete beams
- Drop load testing Frame and support
- Quanser Shake Table III and Smart Structure System (Stand Alone System)
- Dual Extruder 3D Printer

Students usually find it fascinating to see theory in practice. The main function of the following educational and training set-ups is to teach the students both the basic principles and the advanced concepts of structural analysis. Students put theory into practice and become more interested and involved in the subject matter.

TESTS AND SERVICES

- Tensile Test
- Bending Test
- Compression Test
- Cyclic Compression and Tension Test
- Dynamic Force, Deflection, Strain Control Tests
- Friction load tests
- Shear Force in a Beam
- Flexural Test (also Fiber Reinforced Concrete)
- Round and Square Panel with Fiber Reinforced Concrete Test
- Large Scale Specimens, Scaffoldings, Beams, Columns, Walls..etc.
- Sensor Data Acquisition
- Creep test
- Drop load test
- Earthquake simulation tests
- Active and passive damping test

MATERIALS LABORATORY



Location	Lab Staff in Charge	Contacts
M12-001	Nabila Al Hawawini	065052485

INTRODUCTION

The Materials Laboratory for the Civil & Environmental Engineering Department is located on the UOS main campus, and it has constructed over an enclosed area of 200 square meters. This facility is fully equipped and supported by a highly qualified technical staff to respond to the needs of academic institutions, researchers, engineers, and construction industries for the testing of concrete, asphalt, metals, and their related constituents.

EQUIPMENT AND INSTRUMENTS

Latest state-of-the-art equipment, mostly fitted with computerized data collection and used to perform various types of materials and durability testing to the highest standards. Some of these machines include:

- Abrasion Machines
- BS & ASTM Sieves
- Flakiness & Elongation Gauges
- Blain & Vicat Apparatus
- Concrete Gradient Analyzer
- Concrete Mixer
- Compacting & Kelly Ball Apparatus
- Slump and V-B time Apparatus
- Concrete Permeability System
- Fully Automated Compression Machine (3000 kN)
- Fully Automated Compression Machine (4000 kN)
- Flexural (Beams) Frame
- ISAT
- Bond Tester
- Rebar Location & Cover Meter

- Corrosion Mapping System
- Concrete Test Hammer
- Ultrasonic Concrete Tester
- Windsor Probe System
- Windsor Pin System
- Microscope for Crack Width Measurement
- Free Shrinkage Apparatus
- Friction Tester
- Walk in Temperature & Humidity Chamber
- Rapid Chloride Testing
- Measurement of Corrosion Activity
- Restrained Shrinkage Cracking (Ring Test)
- Calorimeter I-Cal 2000 HPC
- Heavy-duty mixer

TESTS AND SERVICES

The following are the tests that are performed in UOS Laboratories:

FRESH CONCRETE TESTINGS:

- Mix Design
- Workability
- Air Content
- Density

AGGREGATE, CEMENT & MORTAR TESTINGS:

- Sampling of Aggregate
- Specific Gravity & Water Absorption
- Abrasion of Aggregates
- Particles Size Distribution (Sieve Analysis)
- Flakiness and Elongation Indexes
- Consistency and Setting Time of Cement & Gypsum
- Cement Setting Time and Compressive Strength
- Heat of Hydration of Cement
- Setting Time Estimation & Prediction using Isothermal Calorimetry

HARDENED CONCRETE TESTINGS:

- Permeability
- Flexural Strength
- Compressive Strength
- Indirect Tensile of Concrete

- Density & Water Absorption
- Chloride Penetration
- Shrinkage of Concrete & Restrained Shrinkage Cracking

NON-DESTRUCTIVE TESTING OF HARDENED CONCRETE:

- Cracks Detection and Movement, Width Measurement
- SHMIDT Hammer Testing for Compressive Strength
- Ultrasonic Testing for Concrete
- In situ Moisture Content Measurement
- Steel Rebar Location & Cover (Cover meter)
- Chloride Ion Penetration Tester (CIP)
- Free Shrinkage Measurement
- Corrosion Activity of Rebar

GEOTECHNICAL LABORATORY



Location	Lab Staff in Charge	Contacts
M12-006	Mohamad Qaisiah	065052935

INTRODUCTION

The Geotechnical Laboratory is one of the most important laboratories in the Civil and Environmental Engineering Department. The laboratory is fully equipped with modern facilities and machines to meet local and international standards accommodating most laboratory and field soil testing. A highly qualified and experienced technical staff, not only meeting the need of quality teaching and research, but also the needs of academic institutes, industries and governmental agencies, supports this laboratory.

EQUIPMENT AND INSTRUMENTS

Major equipment fitted with computerized data collection to perform various soil analysis; the following is a list of the major equipment in the lab:

- Triaxial Machine
- Autonomous Data Acquisition Unit (ADU)
- Unconfined Compression Machine
- Direct/Residual Shear Apparatus
- Consolidation Apparatus
- Permeability Apparatus
- Automatic Compactor
- CBR Machine
- Vane Shear Test Apparatus
- Test Sieves (BS & ASTM)
- Hydrometer Test Apparatus
- Atterberg Limits Apparatus
- Cone Penetrometer
- Sand Cone Apparatus
- Soil Electrical Resistivity Meter

- Resonant Column (Torsional Shear Test Equipment)
- Vapor Sorption Analyzer (VSA Testing)
- Soil Hydraulic Conductivity Tester
- 3meter Large Scale Sandbox with 100kN loading actuator
- Unsaturated Soil testing system

TESTS AND SERVICES

SOIL STRENGTH TESTINGS:

- Unconsolidated Undrained (UU) test
- Consolidated Drained (CD) test
- Consolidated Undrained (CU) test
- Unconfined Compressive Strength test
- Direct and Residual Shear Box test
- Vane Shear test
- Dynamic Characteristics of Soils (Shear or Elastic modulus of soils) using resonant column test

ROCK TESTINGS:

- Point Load test
- Unconfined Compression test

SOIL CONSOLIDATION TESTINGS:

- One-Dimensional Consolidation test
- Measure Consolidation Characteristic test
- Soil Permeability Coefficient Determination test
- Swell/ Collapse tests

IN-SITU TESTINGS:

- Field Density test
- Manual Subsurface Boring tests
- Dynamic Cone Penetrometer test
- Digital Load Cell Penetrometer test
- In-situ and Lab Electrical Resistivity test

SOIL PERMEABILITY TESTINGS:

- Falling Head Permeability test
- Constant Head Permeability test

PARTICLE SIZE AND INDEX PROPERTIES TESTINGS:

- Grain Size Distribution by Sieve Analysis test
- Grain Size Distribution by Hydrometer Analysis test
- Liquid Limit test
- Plastic Limit test
- Shrinkage Limit test

SOIL COMPACTION TESTS:

- Standard & Modified Proctor tests
- Field Density test

SOIL AND WATER CHEMICAL TESTINGS:

- Content tests: (Sulfate, Chloride, Carbonate Organic Matter & Gypsum)
- Soil Conductivity test
- PH Measurement test

SURVEYING LABORATORY



Location	Lab Staff in Charge	Contacts
W12-019	Priya Kaimal	065053498

INTRODUCTION

The Surveying Laboratory enables students to understand the basic principles of surveying by conducting field exercises using surveying equipment. Most of the field exercises were conducted outside the laboratory room to gather field survey data using state-of-the-art surveying equipment. Reduction and calculation of the field data results that are performed in the laboratory room. Prior to the commencement of field surveys, field exercises are discussed and explained to the students by the laboratory instructor inside the surveying laboratory room. Care and proper handling of surveying equipment is also emphasized before, during and after the field survey.

The use of CAD programs and CIVIL 3D incorporated in the surveying exercises. This development helps the students to follow a fast, easy, and reliable method of survey processing.

Develop team working and writing skills through completing several field projects while working in groups and writing a report for each project. In the reports students should estimate, do analyses and correct errors in the measurement.

EQUIPMENT AND INSTRUMENTS

- Land Chain 20m & 30m
- Measuring Tape 30m & 50m
- Digital Walking Measures
- Digital Handled Laser Distance Meter
- Electronic Distance Meter (EDM)
- Double Right Angle Prism
- Stereotype Plotting Instrument
- Digital Planimeter
- Automatic Level
- Automatic Laser level

- Hand Level
- Tilting Level Model
- Optical Theodolite
- Digital Theodolite
- Total Station
- Global Positioning System (GPS Trimble R10)
- Ground penetration radar (Bridge Scan System SIR-4000)

EXPERIMENTS

- Linear Measurement by Pacing
- Tape Measurements
- Basic Principles of Linear Surveying and Offsetting
- Leveling –Introduction
- Differential Leveling
- Contour Mapping
- Two Peg test
- Profile and Cross Section Leveling
- Angle Measurements –Introduction to Theodolite (Optical Theodolite)
- Measurement of the Internal Angle of a Closed Traverse (Digital Theodolite)
- Total Station (Measurement of Internal Angle and Area Measurement of a Closed Traverse)
- Introduction to GPS (Setup, Measuring the Ground Control Points, Stake Out)

FLUID MECHANICS & WATER RESOURCES LABORATORY



Location	Lab Staff in Charge	Contacts
M12-012	Tarek Alhomsi	065052464

INTRODUCTION

The Fluid Mechanics and Water Resources Laboratory has modern instruments and apparatuses for teaching and research purposes. Some of the instruments and equipment are utilized for industrial use with minor modifications. Experienced teaching staff and technicians supervise the laboratory with services meeting the highest international standards.

EQUIPMENT AND INSTRUMENTS

- Pressure Gauges Calibrator
- Determination of Fluid Properties Apparatus
- Pelton Wheel
- Centrifugal pump apparatus
- Bernoulli's Principal Apparatus
- Center of Pressure Apparatus
- Free and Forced Vortices Apparatus
- Open Channel-Flow Visualization Bench
- Osborne Reynolds` Apparatus
- Air Flow Bench Apparatus
- Rainfall-Runoff Hydrographic Apparatus
- Rainfall Simulator Apparatus
- Field Drain filter Test Apparatus
- Network of Pipe Apparatus
- Falling Sphere Viscometer Apparatus
- Losses in Pipes and Fittings Apparatus
- Hydrostatic Force Apparatus
- Flow Measuring Apparatus
- Impact of Jets Apparatus

EXPERIMENTS

- Fluid Properties, Viscosity, Mass Density Specific Weight & Specific Gravity
- Calibration of Pressure Gauges (Bourdon Gauge Dead Weight Calibrator)
- Hydrostatic Forces and Centre of Pressure
- Vortex Flow Formation (Free and Forced Vortices)
- Verification of Bernoulli's Principle
- Horizontal Osborne Reynolds (Flow Regimes and Characteristics)
- Impact of Jets (Verification of Impulse-Momentum Theorem)
- Losses in Pipes and Fittings (Estimation of Major and Minor Losses)

TESTS AND SERVICES

- Comparing the Performance of Different Types of Pumps and Investigating Cavitation Phenomenon
- Determination of Density, and Specific Gravity, Dynamic and Kinematic Viscosity of Different Liquids
- Simulation of Hydroelectric Power Generation
- Measurement of Flows through Pipes and Open Channels
- Investigation of Flow Regimes
- Simulation of Hydroelectric Power Generation by Studying Impact of Jets on Belton Wheel

TRANSPORTATION LABORATORY



Location	Lab Staff in Charge	Contacts
W12-020	Ahmed Shweiki	065052426

INTRODUCTION

The Transportation Laboratory is furnished with a great deal of state-of-the-art equipment. This equipment used to collect and analyze data needed for the study and development of diverse types of transportation systems used on streets to major freeways. Students trained on the use of this equipment to a high level of accuracy and safety. Much of the equipment used for traffic data collection and to run traffic counts at different types of locations such as minor and major interchanges. They also can be utilized to analyze existing traffic problems, such as congestion and accidents.

EQUIPMENT AND INSTRUMENTS

- Lane Traffic Counters
- Lane Traffic Detectors
- Video Detectors
- Intersection Turning Movement Counters (Digital and Mechanical)
- Traffic Analysis Software
- Speed Radar Guns
- Digital Measuring Wheel
- Miovision traffic count system
- Wavetronix radar multilane traffic count system

EXPERIMENTS

- Traffic Surveys
- Traffic Trend Analysis
- Traffic Studies
- Traffic Impact Studies

TESTS AND SERVICES

- Highway and Roads Traffic survey
- Highway and Roads traffic studies

PAVEMENT LABORATORY



Location	Lab Staff in Charge	Contacts
W12-019	Ahmed Shweiki	065052426

INTRODUCTION

The Pavement Laboratory is equipped with a great deal of state-of-the-art equipment. This equipment used to collect and analyze asphalt binder specimens and test asphalt concrete material (Asphalt, bitumen, and asphalt mixes, etc.)

EQUIPMENT AND INSTRUMENTS

- Super pave Gyratory Compactor
- 30 kN Universal Testing Machine (UTM) with Environmental Chamber-20 to 70C
- Marshall Test Apparatus
- Digital Measuring Wheel
- Brookfield Rotational Viscometer
- Bitumen Automatic Consistency and Penetration
- Bitumen Content by Ignition Method
- Dynamic Hybrid Rheometer (DHR)
- Pressure Aging Vessel (PAV)
- Rolling Thin Film Oven (RTFO)
- Automatic Closed System Asphalt Analyzer
- Rotary Evaporation Apparatus
- Softening Point Automatic tester
- Flash point Automatic tester
- Asphalt equipment and sample washing machine
- Asphalt mixtures volumetrics setup
- Ultra-sonic mixer.
- High Shear Mixer.
- Sand Equivalent setup.
- Bending Beam Rheometer.
- Moisture Induced Sensitivity Testing- MIST

TESTS AND SERVICES

AGGREGATES:

- Specific Gravity of Coarse Aggregates
- Specific Gravity of Fine Aggregates
- Specific Gravity of Mineral Filler
- Bulk Density of Fine Aggregates
- Bulk Density of Coarse Aggregates
- Sand Equivalent Test of Fine Aggregates
- Elongation and Flakiness Index of Coarse Aggregates
- Particle Shape of Coarse Aggregates
- Particle Shape of Fine Aggregates
- Particle Shape of Mineral Filler
- Sieve Analysis of Coarse Aggregates
- Sieve Analysis of Fine Aggregates
- Lose Angeles Abrasion Test

ASPHALT CEMENT:

- Specific Gravity of Asphalt
- Penetration Test
- Softening Point Test
- Rotational Viscosity Test
- Short Term Aging RTFO
- Long Term Aging PAV
- Dynamic Shear Modulus Test
- Fatigue Test
- Multiple Stress Creep and Recovery Test MSCR
- Linear Amplitude sweep test
- Binder performance test
- Binder low performance grade using BBR.
- Ignition Oven Test for Binder Extraction
- Binder Extraction Test by Solvent
- Binder Recovery Test
- Binder mass loss using RTFO

ASPHALT CONCRETE MIX:

- Theoretical Maximum Specific Gravity Test
- Bulk Specific Gravity
- Marshal Mix Design
- Superpave Gyratory Compaction
- Dynamic Modulus Test

- Resilient Modulus Test of Asphalt Concrete
- Resilient Modulus Test of Unbounded Materials
- Triaxial Repeated Load Permanent Deformation (Flow Number) Test
- Triaxial Static Permanent Deformation (Flow Time) Test
- Uniaxial Fatigue Test
- Indirect Tensile Strength Test
- Triaxial Shear Test
- Semi-Circle Bending Test
- C* Fracture Test
- Moisture Damage Lottman Test

ENVIROMENTAL & SANITARY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-013	Loubna Chaabi	065053439

INTRODUCTION

The Environmental & Sanitary Laboratory carries out scientific investigations on fresh and marine water quality, wastewater treatment, industrial waste management, solid waste management, environmental impact monitoring, environmental information systems, geo-environmental studies and environmental site investigations.

EQUIPMENT AND INSTRUMENTS

- •Gas Chromatography/ Mass Spectroscopy (GC/MS)
- Gas Chromatography (GC)
- •Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES)
- Bench Top Stirred Pressure Reactor
- Ion- Chromatograph
- •Automatic Weather Station
- Deep Wells Water Quality & Velocity Apparatus
- Multi Parameter of Data Logger
- •Total Organic Carbon (TOC-VCPH)
- •Spectrophotometers (DR/4000, DR2800, DR/2010)
- Fast Fat Extraction System
- •Binocular Microscope
- Biotrace Uni-Lite Xcel Illuminometer
- Digestion System (Digesdahl digestion Apparatus, Microwaves Digestion)
- Jar Tester
- •PH Meter, Turbidity Meter, Conductivity Meter, Dissolved Oxygen Meter, BOD Track, COD Reactor, Furnaces, Ovens, and etc ...
- •Water, Soil and Sediment Sampling Equipment
- Deep Wells Water Quality & Velocity Apparatus

- Multi Parameter of Data Logger System
- •Automatic Weather Station

TESTS AND SERVICES

- Fresh Water, Groundwater and Marine Water Quality *pH, Salinity, Conductivity, BOD, COD, TOC, Coliform Bacteria, Nitrogen, Heavy metals, Ammonia, Sulphates, Phosphorus, Turbidity, Color, hydrocarbons, Gravimetric Analysis for Solids, Transparency, Chlorophyll ... etc.
- Water and Wastewater Treatability Testing (Physical, Chemical and Biological Treatment).
- Industrial Waste Management (Characterization, Waste Management Plans, Treatability Testing Using Physical, Chemical and Biological Processes).
- Contaminated Site Investigation and Remediation (Including Soil and Groundwater Testing, Contaminants Leach ability Testing, and Development of Appropriate Remediation Alternatives).
- Solid Waste Management (Including Planning, Landfill Process Design, Waste Characterization, and Recycling and Reuse).

The environmental laboratory is continuously upgraded and plans to expand and include air pollution monitoring that are currently being evaluated. An interdisciplinary team of staff members and from our highly equipped workshops supports research activities .

ENGINEERING WORKSHOP



Location	Lab Staff in Charge	Contacts
M12-002	Keezhilath Madhu	065052447

INTRODUCTION

The Workshop Laboratory exposes students to the practical use of industrial tools that are common in the construction and manufacturing industry. Safe and proper handling of workshop equipment and tools are emphasized before, during, and after project making. The presence of an instructor is needed to guide students in the proper operation of workshop equipment, especially during the project making for courses.

EQUIPMENT AND INSTRUMENTS

- Air Compressor
- Alumina Chip Forge
- ARC Welding Machine
- Band Saw Machines
- Bench Grinder
- Brazing Hearths
- Cutting-off Machine
- Drilling Machine
- Dust Collector
- Gas Welding Machine
- Guillotine
- Hollow Chisel Mortiser
- Lathe Machine
- MIG Welding Machine
- Pipe Bending Machine
- Planer Thicknesser
- Power Hacksaw Machine
- Shaping Machine
- Spindle Moulder
- Spot Welding Machine
- Surface Grinder
- Surface Table
- Tilt Arbor Saw Bench
- Universal Milling Machine
- Metal Sheet Binder
- Metal Binder(Pipes, Rods, Bars)

- Gear Manufacturing Practice
- Turning and Taper Turning
- Welding Practice
- Carpentry Practice

TESTS AND SERVICES

- Lathe Machine:
- This equipment is very useful in fabricating threaded, nuts and bolts for heavy equipment machinery (cars, oil drilling machineries etc.)
- Welding Machine:
- This machine is especially useful in fabricating welded steel structures like steel beams and steel columns.
- Universal Milling Machine:
- This machine could be used in the manufacture of gears, grooves, slots, and many others.

ELECTRICAL & ELECTRONICS ENGINEERING DEPARTMENT

Lab Name	Location	Person in Charge	Programs Served	Courses Served
Circuit Analysis Laboratory I&II	M12-107	- Sol Andrew Domingo - Alya Alhammadi	Electrical Engineering Sustainable & Renewable Energy Engineering Industrial Engineering & Management Mechanical Engineering	Circuit Analysis I Circuit Analysis II Applied Electronics Circuits Applied Electronics Lab for SREE
Applied Electronics Circuit Lab (Industrial Engineering+ SREE)	M12-108	- Mohammad Saad Suleiman - Imtinan Attili - Noorul Misbah Khanum	Electrical Engineering Computer Engineering Industrial Engineering & Management Sustainable & Renewable Energy Engineering Mechanical Engineering	Circuit Analysis I Circuit Analysis II Applied Electronics Circuits Applied Electronics Lab for SREE
Electromechanical Systems Laboratory Electric Power Engineering Laboratory	M12-113	- Mohammad Saad Suleiman - Alya Alhammadi	Electrical Engineering Sustainable & Renewable Energy Engineering	Electromechanical System Electric Power Engineering Lab Circuit Analysis II Electric Power for SREE
Electronic Circuits Laboratory Fundamentals of electronics Lab	W12-123	- Imtinan Attili - Noorul Misbah Khanum	Electrical Engineering Sustainable & Renewable Energy Engineering	Electronic Circuits Applied Electronics Circuits Applied Electronics Lab for SREE Fundamentals of Electronics Circuit Analysis I
Feedback Control Systems Laboratory Instrumentation and Measurement Laboratory	M12-115	- Obaida Abu Bader - Imtinan Attili - Alya Alhammadi	Electrical Engineering	Feedback Control Systems Instrumentation and Measurement
Printed Circuit Board Workshop (PCB)	M12-116	- Sol Andrew Domingo	Electrical Engineering Computer Engineering	General
Multimedia Technology Laboratory Programmable Logic Controller(PLC) Laboratory	M12-118	- Obaida Abu Bader - Noorul Misbah Khanum	Electrical Engineering Computer Engineering Industrial & Management Engineering	Programmable Logic Design Multimedia Technology Lab Introduction to ECE Lab Industrial Automation
Telecommunication Systems I Laboratory	W12-122	- Obaida Abu Bader	Electrical Engineering Computer Engineering	Telecommunication Systems I

Electrical and Electronics Engineering Laboratories

Lab Name	Location	Person in Charge	Programs Served	Courses Served
Senior Design Project I & II Laboratory	W12-115 M12-140	- Imtinan Attili - Noorul Misbah Khanum - Sol Andrew Domingo	Electrical Engineering Computer Engineering	Senior Design Project I & II
Power electronics lab	W12-105	- Mohammad Saad Suleiman	Electrical Engineering Sustainable & Renewable Energy Eng.	Power electronics lab

Electrical Engineering lab Staff

#	Name	Title	Ext.	Email
1	Obaida Abu Bader	Sr. Lab Engineer	065052488	obaida@sharjah.ac.ae
2	Imtinan Basem Attili	Lab Engineer	065053493	iattili@sharjah.ac.ae
3	Sol Andrew C. Domingo	Lab Engineer	065052938	sdomingo@sharjah.ac.ae
4	Noor ul Misbah Khanum	Lab Engineer	065053429	nkhanum@sharjah.ac.ae
5	Mohammad Saad Suleiman	Lab Engineer	065052449	msuleiman@sharjah.ac.ae
6	Alya Alhammadi	Lab Engineer	065052412	Alya.alhammadi@sharjah.ac.ae

CIRCUIT ANALYSIS I LABORATORY



Location	Lab Staff in Charge	Contacts
M12-107	Sol Andrew C. Domingo	065052938
	Alya Alhammadi	065050412

INTRODUCTION

Electrical Circuit Analysis I Laboratory is one of the most important lab in the Electrical Engineering Department. This laboratory provides students with an understanding of the basic principles of Electrical Engineering. In addition, it enables students to use testing and measuring instruments such as function generators, oscilloscope, and digital multi-meter to analyze DC and AC circuits by using different analysis techniques. These include Ohm's Law, KCL, KVL, nodal analysis, mesh analysis, Thevenin's and Norton's theorems as well as the transient analysis of RL and RC circuits. PSPICE Cadence software is also introduced for DC and AC circuits and transient analysis.

- Pro's KitMT-1820 Digital Multimeter
- ETS-7000 Digital Analog Training System
- ESCORT EDM-1635 Digital Multimeter
- PEAK ATLAS DCA Model DCA55 Component Analyzer
- TINSLEY LCR Data Bridge
- TTi LCR400 Precision Bridge
- Rigol DG1032Z Arbitrary Function Generator 2 Channel /30MHz / 200MSa/s
- Rigol DS4012 Digital Oscilloscope 2 Channel / 100MHz / 4GSa/s
- Simulators: Microsim, ORCAD Cadence PSpice Circuit Simulator
- TTi 354T Triple Power Supply 2 x 0-35VDC / 3.3-5.5 VDC 4A
- Desktop Computer Core i5
- Analogue Multi-Tester
- Wire Strippers and Pliers

- Introduction to Circuit I Lab
- Introduction to ORCAD Cadence PSPICE Part I (DC Analysis)
- Voltage Division Rule (VDR) and Current Division Rule (CDR)
- •Kirchhoff's Laws and Nodal Analysis
- Superposition for DC Circuits
- Thevenin's and Norton's Equivalents of DC Circuits
- The Function Generator and Oscilloscope
- Introduction to ORCAD Cadence PSPICE Part II (Transient Analysis)
- Transients in RC Circuits
- Phasor Domain Measurements for AC Circuits
- Introduction to ORCAD Cadence PSPICE Part III (AC Analysis)

CIRCUIT ANALYSIS II LABORATORY



INTRODUCTION

Electrical Circuit Analysis II Laboratory helps students to understand AC circuits analysis studied in the corresponding theoretical course. Through this laboratory, students become familiar with AC measurements, and are able to measure voltages, phase angles, resonance frequencies and bandwidth for circuits that consist of resistors, capacitors and inductors. They also investigate the frequency response of low pass, high pass, band pass and band stop filters. In addition, they investigate the Three-phase circuits and applications of transformers and its characteristics.

EQUIPMENT AND INSTRUMENTS

- ETS-7000 Digital Analog Training System
- ESCORT EDM-1635 Digital Multimeter and KYURITSU Model 1009
- PEAK ATLAS DCA Model DCA55 Component Analyzer
- TINSLEY LCR Data Bridge
- TTi LCR400 Precision Bridge
- Rigol DG1032Z Arbitrary Function Generator 2 Channel /30MHz / 200MSa/s
- Rigol DS4012 Digital Oscilloscope 2 Channel / 100MHz / 4GSa/s
- Simulators: LabVolt Simulation Software, ORCAD Cadence PSpice Circuit Simulator
- TTi 354T Triple Power Supply 2 x 0-35VDC / 3.3-5.5 VDC 4A
- Desktop Computer Core i5
- Analogue Multi-Tester
- Wire Strippers and Pliers

- PSpice AC Circuit Analysis
- Two-Port Networks (Orcad Cadence PSpice)
- Power in AC Circuits

- Single Phase Transformer
- Power Factor Correction
- Parallel and Series Resonance
- Three-Phase Y- Δ Connection Circuit
- •Low-Pass and High-Pass Filter Design
- Three-Phase Δ-Connection Circuit
- Band-Pass and Band-Stop Filters (PSpice)
- Two-Port Network



Imtinan Attili

065053493

INTRODUCTION

The Applied Electronics Circuits Laboratory is designed to introduce and enable industrial engineering students to comprehend the main characteristics of electronic devices. This Laboratory applies the theoretical principles of the applied electronics circuits course. In addition, it enables students to use testing and measuring instruments such as function generators, oscilloscopes and digital multimeters to analyze DC and AC circuits by using different analysis techniques. These include basic DC Circuits, General DC circuit analysis, Transient Circuits, Basic AC Circuits, Diodes and their applications, Operational Amplifiers, Basic Combinational Circuits, Decoders and Multiplexers.

EQUIPMENT AND INSTRUMENTS

- Pro's KitMT-1820 Digital Multimeter
- ETS-7000 Digital Analog Training System

M12-108

- ESCORT EDM-1635 Digital Multimeter
- PEAK ATLAS DCA Model DCA55 Component Analyzer
- TINSLEY LCR Data Bridge
- Rigol DG1032Z Arbitrary Function Generator 2 Channel /30MHz / 200MSa/s
- Rigol DS4012 Digital Oscilloscope 2 Channel / 100MHz / 4GSa/s
- TTi 354T Triple Power Supply 2 x 0-35VDC / 3.3-5.5 VDC 4A
- CAUVIN ARNOUX C.A. 5000 Analogue Multi-Tester
- Wire Strippers and Pliers
- •Software: Tinker-CAD

- Simple DC Measurements and Analysis
- Using Function Generator & Oscilloscope and Study of Charging/Discharging of a Capacitor
- Diode Circuits
- Operational Amplifiers
- Digital Logic Circuits

APPLIED ELECTRONICS CIRCUITS LABORATORY (SUSTAINABLE AND RENEWABLE ENERGY ENGINEERING)

Location	Lab Staff in Charge	Contacts
	Mohammad Saad Suleiman	065052449
M12-108	Noorul Misbah Khanum	065053429
	Imtinan Attili	065053493

INTRODUCTION

The Applied Electronics Circuits Laboratory is designed to introduce and enable SREE students to comprehend the main characteristics of electronic devices such as diodes and transistors. It also introduces the circuit simulator SPICE and its usage to carry out DC, AC & transient analysis. Practical circuits are built to test bipolar transistor, MOSFET transistors and operational amplifier circuits under DC and AC conditions as well as small signal amplifiers.

- Pro's KitMT-1820 Multimeter
- ETS-7000 Digital Analog Training System
- ESCORT EDM-1635 Multimeter
- PEAK ATLAS DCA Model DCA55 Component Analyzer
- TINSLEY LCR Data Bridge
- TTi LCR400 Precision Bridge
- Rigol DG1032Z Arbitrary Function Generator 2 Channel /30MHz / 200MSa/s
- Rigol DS4012 Digital Oscilloscope 2 Channel / 100MHz / 4GSa/s
- Simulators: ORCAD Cadence SPICE Circuit Simulator
- TTi 354T Triple Power Supply 2 x 0-35VDC / 3.3-5.5 VDC 4A
- Desktop Computer Core i5
- CAUVIN ARNOUX C.A. 5000 Analogue Multi-Tester
- Wire Strippers and Pliers

- Introduction to Applied Electronics Lab
- Introduction to Spice: DC and AC Analysis
- Function Generator and Oscilloscope
- Diode Characteristics Measurements and Applications
- BJT Characteristics and Biasing
- MOSFET Characteristics, Biasing and Applications
- Single Stage BJT Amplifier
- Single Stage MOSFET Amplifier
- PSPICE Simulation of BJT Amplifier Frequency Response
- BJT Amplifier Frequency Response
- Linear Operational Amplifier Circuits
- Spice Simulation of a DC to DC converter

POWER ELECTRONIC LABORATORY



Location	Lab Staff in Charge	Contacts
W12-105	Mohammad Saad Suleiman	065052449

INTRODUCTION

This Laboratory is versatile and its flexible training system covers many topics in power electronics application. The equipment support power electronics measurement program for multiple student and small research projects. The program converters are divided into two main sections: line-commutated - Thyristors based converters and self-commutated IGBTs or MOSFETs based converters.

EQUIPMENT AND INSTRUMENTS

- Line-Commutated Power Converter Circuits
- Three-Phase Isolating Transformers
- Power Electronics Load Set, 300 W
- Self-Commutated Converter Circuits 300W
- Convertor Drive with DC Motor 300W
- Servo Machine Test System
- Variable ISOL. Transformer Exciter
- Three-Phase Synchronous Motor
- Analogue\Digital Multimeter
- Tacho Generator

- Fundamentals of the Power Electronics Switching Elements (DIODE, SCR, TRIAC, IGBT, MOSFET)
- Diode Rectification
- Controlled Rectification: Single Phase-Control, Full-Wave Control, Burst Firing Control, Pulse Pattern Control
- Principles of Inverter Operation

- Control Principles: Pulse-Width Modulation
- Modulation of Low-Frequency AC Voltage with Pulse-Width Modulation
- Control Characteristics and Operating Graphs
- Frequency Analysis and Examination of Harmonics
- DC Chopper Controllers in 1-, 2- and 4-Quadrant Operation
- Torque-Speed Characteristics of IM
- Induction Motor V/F Control
- Induction Motor Slip Compensation Control
- Induction Motor Vector Control
- DC Motor Speed Control
- DC Motor Braking

ELECTROMECHANICAL SYSTEMS LABORATORY



INTRODUCTION

The Electromechanical Systems Laboratory offers hands-on experience with relevant aspects of single and three phase transformers, DC motors and generators, single phase and three phase AC motors.

EQUIPMENT AND INSTRUMENTS

The Lab Volt computer-based electromechanical system runs in conjunction with an IBMcompatible computer consisting of different modules connected to the computer through Data Acquisition Interface with full virtual instruments (voltmeters, ammeters, power meters, an oscilloscope and a phasor analyzer); the system has data storage and graphical presentation facilities. The modules included in the system are:

- Single-Phase Transformer Modules
- Three-Phase Transformer Modules
- Resistive, Inductive and Capacitive Power Load Modules
- Four-Quadrant Dynamometer/Power Supply
- Separately-Excited, Series Shunt and Compound DC Motors Module
- Single-Phase Induction Motor Modules
- Three-Phase Squirrel-Cage Induction Motor Module
- Three Phase Wound Rotor Induction Motor Three-Phase Synchronous Motor
- Three-Phase Synchronous Generator Module
- Synchronous Motor Starter Module
- Wattmeter/VAR Meter Module

- Autotransformer
- Transformer Regulation

- Open and Short Circuit Transformer Test
- Three phase Transformer Connections
- Prime Mover operation
- Dynamometer operation
- Separately Excited, Series Shunt and Compound DC Motors
- Three-Phase Squirrel-Cage Induction Motor
- Single-Phase Induction Motor
- Three-Phase Synchronous Motor
- Three-Phase Synchronous Generator

ELECTRIC POWER ENGINEERING LABORATORY



INTRODUCTION

The Electric Power Engineering Laboratory provides hands-on experience with relevant aspects of DC systems, single and three phase AC power systems, transformers, three phase AC generator and motors.

EQUIPMENT AND INSTRUMENTS

The Lab Volt computer-based electromechanical system runs in conjunction with an IBMcompatible computer consisting of different modules connected to the computer through Data Acquisition Interface with full virtual instruments (voltmeters, ammeters, power meters, an oscilloscope and a phasor analyzer); the system has data storage and graphical presentation facilities. The modules included in the system are:

- Single-Phase Transformer
- Resistive, Inductive and Capacitive Power Loads
- Prime Mover
- Dynamometer
- Separately-Excited, Series Shunt and Compound DC Motors
- Three Phase Wound Rotor Induction Motor
- Wattmeter/VAR Meter
- Three-Phase Squirrel-Cage Induction Motor
- Three-Phase Synchronous Generator
- Voltmeter/Ammeter
- DC Motors

- AC Voltage and Current-Part I
- AC Voltage and Current-Part II
- Watt VAR Volt-Ampere and Power Factor
- Three-Phase Star-Star Circuit
- Three-Phase Star-Delta Circuit
- Three-Phase Power Measurements
- Transformer Regulation
- Prime Mover operation
- Dynamometer operation
- Three-Phase Squirrel Cage Induction Motor
- Separately Excited DC Motor

ELECTRONIC CIRCUITS LABORATORY



INTRODUCTION

The Electronic Circuits Laboratory is designed to enable students to comprehend the main applications of electronic devices such as BJT transistors and MOSFET transistors as well as composite devices such as Op Amps. Practical circuits are built and investigated under DC and AC conditions in the lab and are also examined through simulations using AC sweep, transient analysis, DC sweep and parametric Sweep. Some of the applications examined include: BJT and MOS Amplifiers, Filters, Oscillators (relaxation and sinusoidal), A/D converters and D/A converters.

- ETS-7000 Digital Analog Training System
- Rigol DG1032Z Arbitrary Function Generator 2 Channel /30MHz / 200MSa/s
- Rigol DS4012 Digital Oscilloscope 2 Channel / 100MHz / 4GSa/s
- •EX354RT Tripple Power Supply 300W
- Desktop Computers Core i5
- LCR Data Bridge
- Pro's KitMT-1820 Multimeter
- ESCORT EDM-1635 Multimeter
- Simulators: ORCAD Cadence Simulator, PSpice Simulator
- PEAK ATLAS DCA Model DCA55 Component Analyzer
- CAUVIN ARNOUX C.A. 5000 Analogue Multi-Tester
- Wire Strippers and Pliers

- Review on Cadence AC and Transient Analysis
- Multi-Stage and feedback Amplifier circuit
- Frequency Response of CE BJT Amplifier
- Linear Op Amp Circuits
- Active Filters
- Applications of OPAMPs
- Wein Bridge Oscillator
- D/A Converters
- A/D Converters

FEEDBACK CONTROL SYSTEMS LABORATORY



INTRODUCTION

The Feedback Control Systems Laboratory covers the practical aspects of control systems analysis and design through the lab experiments. Topics vary and include modeling of Servo System, Inverted Pendulum, Magnetic Levitation System and use of MATLAB and SIMULINK for analysis and design of control systems.

The lab also has process control module where all well-known controllers (P, PI, and PID) can be implemented with the help of computer interfaced with it.

EQUIPMENT AND INSTRUMENTS

- Personal Computers with MATLAB\ SIMULINK Package
- Modular DC Servo System (FEEDBACK MS150)
- Inverted Pendulum System (PYTRONIC Pendulum Control System)
- Magnetic Levitation System (FEEDBACK 33-210)
- Process Control Module (PYTRONIC PCT-100)
- Rhode & Schwarz HM01002MAX Digital Oscilloscope
- K&H7000 A/D Trainer
- KADET DIGITAL ANALOG TRAINING SYSTEM
- Multimeters
- Computer Set (CPU & Monitor)
- Matlab 2020
- LabVIEW 2016

- MATLAB and SIMULINK for Control Systems
- DC Motor Characteristics

- Speed Control System of DC Motor
- Position Control System of DC Motor
- Frequency Response Analysis using MATLAB
- Root Locus Design GUI and SISO DESIGN TOOL
- Control of Magnetic Levitation System
- Control of Inverted Pendulum System
- Process Control Application (Flow Control, Level Control, Pressure Control, and Temperature Control)

INSTRUMENTATION AND MEASUREMENTS LABORATORY



Location	Lab Staff in Charge	Contacts
M12-115	Obaida Abu Bader	065052488
	Imtinan Attili	065053493

INTRODUCTION

The Instrumentation and Measurements Laboratory covers the practical aspect of engineering instrumentation through lab experiments. Topics vary and include LabVIEW programming, data acquisition interfacing, determination of dynamic behavior of typical sensors, signal conditioning circuits, instrumentation amplifiers, experiments on temperature, position and force measurements.

EQUIPMENT AND INSTRUMENTS

- Personal Computers LabVIEW 2016 Package
- Data Acquisition NI-USB-6215
- Different Types of Sensors: Thermocouples, Thermistors, etc.
- LabVolt Transducer Fundamental Board
- DIGIAC 1750 Transducer and Instrumentation Trainer
- Rhode & Schwarz HM01002MAX Digital Oscilloscope
- K&H7000 A/D Trainer
- KADET DIGITAL ANALOG TRAINING SYSTEM
- Multimeters
- Personal Computers
- Matlab 2020
- LabVIEW 2016

- Introduction to LabVIEW
- Modular Programming using LabVIEW
- Structures in LabVIEW: Loops, case and sequence structures

- LabVIEW Arrays and Clusters
- Data Acquisition interface using LabVIEW
- Opamps DC Characteristics
- Temperature Sensors
- Variable Capacitor and Strain Gauge
- Light Sensors
- Linear Variable Differential Transformer

PRINTED CIRCUIT BOARD WORKSHOP (PCB)



INTRODUCTION

In this workshop, the students are able to learn the procedure of making both single-sided and double-sided PCBs. Students start by drawing circuit diagrams using any suitable PCB layout software. Then they produce a drawing which is later on printed and transferred into a photo-resistant layer after exposure to UV light for a few minutes. The subject PCB is etched in a container pan with etching chemical solutions. Finally, holes are drilled for provisions on fixing and soldering the components.

The PCB workshop is of great importance to students for their senior design projects and also useful for students who are working on projects related to certain courses.

- Computer Set
- Layout Software
- PCB Board
- Etching Chemicals
- Etching Tank
- PCB Cutter
- Drilling Machine and Drill Bits
- Etching Pan
- Acetate Printing Material or Equivalent
- Laser Printer
- UV Exposure Machine
- Soldering Machine
- Wire Strippers and Pliers

PROGRAMMABLE LOGIC CONTROLLER (PLC) LABORATORY



INTRODUCTION

PLC Laboratory based on Siemens SIMATIC S7-200 is designed to reinforce the theoretical components covered in the course. This laboratory provides students with an understanding of the basic principles of Relay Logic and PLC (Programmable Logic Controllers) control; ladder programming and input/output operations; manipulate data using PLC instruction sets. Students will have the opportunity to apply their knowledge of programmable logic controller hardware and ladder logic to solve the system problems.

EQUIPMENT AND INSTRUMENTS

• PLC-200 PLC Trainer

- Introduction to SIMATIC S7-200 Development
- Basic PLC Ladder Programming
- Basic Control Circuits (Light Control, DC Motor Control)
- Programming a Counter (Car Parking System)
- Programming a Timer (Traffic Light Control, Tank Filling Control)
- Drive and Interface Multiplexing 7-Segment Display
- Various Industrial Controller Based on S7-200

MULTIMEDIA TECHNOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
M12-118	Obaida Abu Bader	065052488
	Noorul Misbah Khanum	065053429

INTRODUCTION

This Laboratory provides a hands-on experience with MATLAB in signals and systems including audio and image signals. Topics include sampling, quantization, sampling rate conversion, spectral analysis, compression, filtering, basic techniques in audio and image processing.

EQUIPMENT AND INSTRUMENTS

• Computers with licensed MATLAB Package provided by the university.

- Generate and Plot Different Types of Discrete-Time Signals in Time Domain
- Perform Elementary Operations (Add, Shift, Compress, and Flip) on Discrete-Time Signals
- Computation of DFT (Discrete Fourier Transform) using FFT Algorithms
- Design of Butterworth and Elliptic (LPF, HPF, BPF, and BSF) Digital IIR Filter
- Read, Play, and Write Sound Signals (Audio Files) using MATLAB
- Perform Elementary Operations (Shift, Compress and Concatenate) on Sound Signals
- Familiarization with Image Operations and Tools in MATLAB
- Using MATLAB to Perform Certain Geometric Operations like Resizing, Rotation, Shifting, Concatenating and Cropping

TELECOMMUNICATION SYSTEMS I LABORATORY



INTRODUCTION

The Telecommunication Laboratory bridges the gap between the theoretical concepts of telecommunication subjects and the practical experience required in the telecommunication industry.

The Laboratory's experiments are designed to cover the Analogue and Digital telecommunications principles explained in the lectures in the telecommunication systems courses. The experiments deal with the analogue communication basics such as filtering, amplitude modulation, frequency division multiplexing, frequency modulation, pulse amplitude modulation, pulse code modulation and digital signal modulation techniques such as: PSK, FSK, DPSK, QPSK, and QAM. MATLAB and Simulink are also used to simulate different telecommunication systems.

- EMONA TIMS Telecommunication-Signal & System Module
- Emona Telecoms-Trainer 101
- TutorTimsAdvanced-EMONA_ software
- Lab-Volt Digital Communication (1) + (2) Board
- Spectrum Analyzer 1.8 GHz, Tektronix 2711
- Dual trace Digital Real Time Oscilloscope 100 MHz Tektronix TDS 3012
- Function Generator 11 MHz, Tektronix CFG280
- Function Generator DG1032Z
- Dual Power Supply 0-30 V, 0-2.5 A, Metrix AX502
- Metrix MX 553 Bench Digital Multimeter
- Computer Set (CPU & Monitor)
- Matlab 2020

- Amplitude Modulation (DSBSC)
- Amplitude Modulation (DSB-LC)
- ASK- Modulation\ Demodulation
- FSK- Modulation \ Demodulation
- PSK- Modulation \ Demodulation
- QPSK Modulation \ Demodulation
- Envelope Detection
- FM Modulation \ Demodulation
- Line-Coding Encoding
- Signal Sampling & Reconstruction
- PCM Encoding- Decoding
- PAM & TDM- Modulation & Demodulation
- PCM TDM & PWM- Pulse Width Modulation

FUNDAMENTAL OF ELECTRONICS LABORATORY



INTRODUCTION

The Fundamental of Electronics Laboratory is designed to enable students to comprehend the main characteristics of electronic devices such as silicon diodes, Zener diodes, MOSFET and BJT transistors. In addition to the characteristics, the lab introduces some applications to these electronic devices which include: amplifiers, rectifiers as well as digital gates. In addition to the practical implementations under DC and AC conditions in the lab, students are also required to examine the circuits using Cadence simulation software. Simulation techniques students learn include: DC sweep, parametric sweep, AC sweep and transient analysis.

EQUIPMENT AND INSTRUMENTS

- ETS-7000 Digital Analog Training System
- Rigol DG1032Z Arbitrary Function Generator 2 Channel /30MHz / 200MSa/s
- Rigol DS4012 Digital Oscilloscope 2 Channel / 100MHz / 4GSa/s
- •EX354RT Tripple Power Supply 300W
- Desktop Computers Core i5
- LCR Data Bridge
- Pro's KitMT-1820 Multimeter
- ESCORT EDM-1635 Multimeter
- Simulators: ORCAD Cadence Simulator, PSpice Simulator
- PEAK ATLAS DCA Model DCA55 Component Analyzer
- CAUVIN ARNOUX C.A. 5000 Analogue Multi-Tester
- Wire Strippers and Pliers

- Diode Characteristic
- Full Wave Rectification

- MOS Transistor Characteristic and Biasing
- BJT Transistor Characteristic and Biasing
- Single Stage BJT Amplifier
- •Single Stage MOS Amplifier
- PSPICE Simulation of BJT Amplifier
- Bipolar Transistor as Switching Elements
- CMOS Logic Gates



SENIOR DESIGN PROJECT I & II LABORATORY

INTRODUCTION

The Electrical Engineering Department offers a project room reserved for senior and junior students for their projects. This room may also be used by students for their course projects. The department provides the needed equipment for various projects and meets student requests for any additional equipment as needed.

Subjects of students> projects are usually linked to research interests in the department or technical problems offered by local industries. In both cases, small groups of students work together to design, build, refine and test complete hardware and/or software systems.

- Digital Multimeters
- ETS-7000 Digital Analog Training System
- Rigol DG1032Z Arbitrary Function Generator 2 Channel /30MHz / 200MSa/s
- Rigol DS4012 Digital Oscilloscope 2 Channel / 100MHz / 4GSa/s
- Simulators: ORCAD Cadence PSpice Circuit Simulator
- TTi 354T Triple Power Supply 2 x 0-35VDC / 3.3-5.5 VDC 4A
- ESCORT Dual Display LCR Meter
- Soldering Machine
- Hardware Tools

INDUSTRIAL ENGINEERING & ENGINEERING MANAGEMENT DEPARTMENT

Industrial Engineering and Engineering Management Laboratories

Lab Name	Location	Person in Charge	Programs Served	Courses Served
Manufacturing Processes Lab	M12-002 W12-019 M12-032	Amer Yousef	 Multi-Function, Multi- Purpose Lab Industrial Engineering & Engineering Management Mechanical Engineering 	Manufacturing Processes
Ergonomics, Work and Process Improvement Lab	W12-016	Omar Hassan	Industrial Engineering & Engineering Management	 Ergonomics Safety Engineering Human Factors SDPI SDPII Safety Engineering Management
Industrial Automation Lab	W12-140	Amer Yousef	Industrial Engineering & Engineering Management	- Industrial Automation - SDPI - SDPII

Industrial Engineering & Engineering Management Lab Staff

#	Name	Title	Ext.	Email
1	Amer Yousif	Sr. Lab Engineer	065053443	amer@sharjah.ac.ae
2	Omar Hassan	Lab Engineer	065053448	oomar@sharjah.ac.ae
3	Rasha Adnan	Lab Engineer	065053936	radnan@sharjah.ac.ae
4	Faheem Akhter	Lab Technician		fsoomro@sharjah.ac.ae

MANUFACTURING PROCESSES LABORATORY



Location	Lab Staff in Charge	Contacts
M12-002 W12-019 M12-032	Amer Yousef	065053443

INTRODUCTION

The Manufacturing Processes Laboratory is the first hands-on lab for students in the Industrial Engineering and Engineering Management Department and Mechanical Engineering Department. The main objective of this lab is to expose students to practical usage of manufacturing processes used in the manufacturing industry including molding, bending, welding, shearing, etc. The manufacturing processes lab enables students to understand the usage of machines for their courses and projects.

EQUIPMENT, INSTRUMENTS AND SOFTWARE

- Air Compressor
- MIG Welding Machine
- Alumina Chip Forge
- Pipe Bending Machine
- Arc Welding Machin
- Planer Thicknesser
- Band Saw Machines
- Power Hacksaw Machine
- Bench Grinder
- Shaping Machine
- Brazing Hearths
- Spindle Moulder
- Cutting-off Machine
- Spot Welding Machine
- Drilling Machine

- Surface Grinder
- Dust Collector
- Surface Table
- Gas Welding Machine
- Tilt Arbor Saw Bench
- Guillotine
- Universal Milling Machine
- Hollow Chisel Mortiser
- Metal Sheet Binder
- Lathe Machine
- Metal Binder (Pipes, Rods, Bars)

- Introduction to Lab Machines
- Manual Lathe & Milling Machine
- Lab Safety & Safety Equipment
- CNC Lathe and Milling Machine
- Metrology and Gauging
- Injection Molding Machine
- Tensile Testing
- Sand Casting
- Oxeye Acetylene and Electric Arc Welding
- Wood and sheet metal project

ERGONOMICS, WORK & PROCESS IMPROVEMENT LABORATORY



Location	Lab Staff in Charge	Contacts
W12-016	Omar Hassan	065053448

NTRODUCTION

The Ergonomics, Work, and Process Improvement Laboratory introduces IEEM students to contemporary methods of work measurement and human factor engineering. This includes anthropometric measurement, workspace design, motion, and time study, evaluating workload capacity, coordination skills, occupational environmental safety and safety management systems. The main objective is to apply and test the techniques of method analysis and work measurements and to introduce many opportunities to improve the interface between the human operator and the workplace in order to improve productivity, work efficiency and performance by:

- Taking Anthropometric Measurements to Design Workstations
- Configuring Product Assembly Workstations
- Estimating Basic Times, Performing Time Study, and Developing Time Standards
- Designing Safe and Healthy Work Environments

EQUIPMENT, INSTRUMENTS AND SOFTWARE

- Anthropometric Measurement Tools: Used to Measure Various Human Body Dimensions
- Lifting Strength Evaluation System: Measures the Isometric Strength Capabilities of Major Muscles and Assesses Lifting Capacity
- Hand Dynamometers: Measures Isometric Grip & Pinch Strength Capability
- Tread Mill: Measures Workload Capacity
- Mirror Tracer: Measures Coordination Skills
- Groove Steadiness Tester: Measures Steadiness
- Various Human Body 3-D Models
- Vision and Hearing Testers
- Noise Meter, Sound Meter, Light Meter, and Radiation Measurement Device
- Digital Temperature and Humidity Measuring Devices
- Stopwatches and Scales

- JACKSON Strength Evaluation System
- Portable Surface Roughness Tester
- Brungraber>s Slip Test Mark IIIB Tribometer
- Air Quality Particle Counting Meter

- Human Health & Safety
- Anthropometric Measures
- Workspace Design
- Workstation Design
- Motion Study
- Time Study
- Work Capacity Evaluation
- Hand Tool Design
- Coordination Skills Evaluation
- Work Environment
- Sound and Light Pollution
- Gas and Radiation Pollution
INDUSTRIAL AUTOMATION LABORATORY



Location	Lab Staff in Charge	Contacts
W12-140	Amer Yousef	065053443

INTRODUCTION

The Automation Laboratory allows IEEM Students to learn how to develop and integrate new and advanced methods into the production process. These modern methods based upon the emerging technologies of computer-integrated manufacturing (CIM) and flexible manufacturing. They allow for faster development of new and improved products of high quality, shorter development and production cycles, faster delivery times, reduced production costs, and the ability to compete with the ever-changing demands of the international market.

In CIMS lab, students integrate robotics, machining, material handling and computer programming to produce a product, and they gain an understanding of subjects related to computer-aided design and manufacturing (CAD/CAM), Computer Numeric Controller (CNC), Automated Storage and Retrieval System (ASRS) and Programmable Logic Controllers (PLC). In addition, students practice Industrial Automation concepts through an Arduino-based course project.

EQUIPMENT, INSTRUMENTS AND SOFTWARE

The main component of this lab is the Computer Integrated and Manufacturing System (CIMS), which are composed of:

- Central Conveyor
- Robot
- Automated Storage and Retrieval System (ASRS)
- Computer Numeric Controller (CNC) Milling Machine
- Computer Numeric Controller (CNC) Turning Machine
- Automated and Manual Workstations
- Quality Control (QC) Vision Station
- Programmable Logic Controllers (PLC)
- CAD/CAM Software
- Arduino IDE

- Arduino Microcontroller
- CAD/CAM Software
- PLC Programming
- CNC Lathe and Milling Machines
- System Design and Integrated Production System
- Robot Programming

SUSTAINABLE & RENEWABLE ENERGY ENGINEERING DEPARTMENT

Lab Name	Location	Person in Charge Programs Served		Courses Served
Fluid Mechanics Lab	M12-013	Rasha Saffarini	- Sustainable & Renewable Energy Engineering	Fluid Mechanics
Wind Energy Lab	M12-013	Rasha Saffarini	- Sustainable & Renewable Energy Engineering Wind Energy	
Heat Transfer Lab	W12-024	Sondus Al- qudah	- Sustainable & Renewable Energy Engineering Heat Transfer	
Energy Storage and Efficiency Lab	W12-110	Monadhel Alchadirchy	- Sustainable & Renewable Energy Engineering	Energy Storage & Transmission Lab
Photovoltaic (PV) Lab	W12-110	Monadhel Alchadirchy	- Sustainable & Renewable Energy Engineering	Solar PV Systems
Solar PV/Wind Energy/Senior Student Projects Lab	W12-301	Monadhel Alchadirchy	- Electrical & Electronics Engineering - Sustainable & Renewable Energy Engineering	- Senior Design Project - Research Project

Sustainable & Renewable Energy Engineering Laboratories

Sustainable & Renewable Energy Engineering Lab staff

#	Name	Title	Ext.	Email
1	Monadhil Alchaderchi	Lab Engineer	065053491	malchadirchy@sharjah.ac.ae
2	Sondus Al-qudah	Lab Engineer	065053497	salqudah@sharjah.ac.ae
3	Rasha Saffarini	Lab Engineer	065052417	rsaffarini@sharjah.ac.ae

HEAT TRANSFER LABORATORY



Location	Lab Staff in Charge	Contacts
W12-024	Sondus Al-qudah	065053497

INTRODUCTION

Heat Transfer Laboratory offers engineering students the opportunity to learn about Heat Transfer methods and engineering exposure to other related Heat Transfer topics.

EQUIPMENT AND INSTRUMENTS

- Cross Flow Heat Exchanger Unit
- Unsteady State Heat Transfer Unit
- Thermal Conductivity of Fluids Unit
- Natural Convection and Radiation
- Thermo-Electric Heat Pump Unit
- Law of Radiant Heat Transfer Unit
- Boiling Condensing Heat Transfer Unit Forced Convection Heat Transfer Unit
 - Free and Forced Convection Unit

- Thermal Conductivity of Metals, Liquids and Gases
- Heat Conduction Measurements with Boundary and Initial Conditions
- Unsteady (Transient) Heat Conduction
- Boiling and Condensation Heat Transfer
- Analysis of Heat Exchangers
- Radiation Heat Transfer
- Calculation of Emissivity of Different Surfaces
- Experimental Proof of Stefan-Boltzman Law
- Heating Effect Analysis of Thermo-Electric Heat Pump
- Peltier–Effect Analysis
- Free or Natural Convection Heat Transfer
- Heat Transfer by Different Surfaces in Free and Forced Convection
- Forced Convection Heat Transfer

ENERGY STORAGE & EFFECIENCY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-110	Monadhil Alchaderchi	065053491

INTRODUCTION

Energy Storage and Efficiency Laboratory offers students the opportunity to learn about alternate methods of energy storage besides conventional battery banks. The challenge of storing energy, especially from current sustainable and renewable resources is a major one. The efficient storage of this energy is another challenge that will be emphasized and explored.

EQUIPMENT AND INSTRUMENTS

- Latent Energy Storage Setup
- Solar Cell Panel with Battery Storage Setup
- Potentiostat
- Fuel Cell Setup
- Pelton Impulse Turbine Setup
- Computer-Controlled Thermal Solar Energy Unit

- Characterization and Testing of Rechargeable Battery
- Photovoltaic Solar Energy Storage using Rechargeable Battery
- Energy and Power Analysis of a Polymer Exchange Fuel Cell
- Characterization and Testing of a Supercapacitor
- Latent Heat Energy Storage
- Performance of Solar Water Heat Under Thermosiphon System
- Pelton Impulse Turbine
- Buoyancy Force-Based Energy Storage System
- Performance Analysis of a Compressed Air Energy Storage System

- Set of Rechargeable Batteries
- Set of supercapacitors
- Buoyancy Energy Storage Setup
- Compressed Air Energy Storage Setup

WIND ENERGY LABORATORY



Location	Lab Staff in Charge	Contacts
M12-013	Rasha Saffarini	065052417

INTRODUCTION

Harnessing energy from the wind is a primary source of renewable, sustainable and clean energy. It is essential for an SREE student to be familiar with fundamental concepts of wind energy equipment (wind mills and their design), their efficiency and the maximum possible power generation.

EQUIPMENT AND INSTRUMENTS

- Subsonic Wind Tunnel
- Wind Turbine Performance Setup
- Wind Power Simulator
- Field Test Setup

- Measurement Lift Force Coefficient for Different Airfoil Shape of Wind Turbine Blade
- Measure Optimum the Angle of Attack and the Lift Force
- Determine the Cut-off Speed of a Wind Turbine
- Collecting Wind Data from Field (Needs Hand Held Equipment Along with Portable Station)
- Optimum Number of Blades
- Investigating Different Curved Blade Shapes
- Turbine Efficiencies
- Tuning for Maximum Power
- Simulation of Wind Energy System Including Integration to Electric Grid
- Vertical Windmill Performance
- Determine the Boundary Layer Over a Flat Plate
- Determine the Pressure Distribution and Calculating the Profile Drag
- Determine the Lift, Drag and Pitching Moment on the Two Different Length Aero-Foils

FLUID MECHANICS LABORATORY



Location	Lab Staff in Charge	Contacts
M12-013	Rasha Saffarini	065052417

INTRODUCTION

The Fluid Mechanics Laboratory experiments are set up so that experiments can be performed to complement the theoretical information taught in the fluid mechanics lecture course. This includes verification of ideas and equations developed in fluid mechanics course, so that the students will have better appreciation for fluid mechanics principles via direct quantitative and phenomenological observation.

EQUIPMENT AND INSTRUMENTS

- Pump Test Apparatus
- Pressure Gauges Calibrator
- Determination of Fluid Properties Apparatus
- Pelton Wheel
- Standard Hydraulic Bench
- Bernoulli's Apparatus
- Center of Pressure Apparatus
- Open Channel-Flow Bench
- Reynolds Apparatus
- Cavitation Demonstration Unit
- Hele-Shaw Apparatus
- Pipe Surge and Water Hammer Apparatus
- Francis Turbine Unit
- Network of Pipe Apparatus
- Viscometer Apparatus
- Friction Losses in Pipes Apparatus
- Hydrostatic Force Apparatus
- Flow Measuring Apparatus

- Impact of Jets Apparatus
- Pressure Transducer Apparatus

- Measurement of Viscosity, Density and Specific Gravity of Fluids
- Fluid Flow Visualizations
- Calibration of Flow Meters
- Calibration of Pressure Gauges
- Velocity and Pressure Measurements
- Flow Types: Laminar Flow, Transition to Turbulence, and Turbulence
- Flow Visualization using Hele-Shaw Setup
- Measurement of Head and Flow Rate Produced by a Pump
- Losses in Pipes and Fittings
- Hydraulic System and Pump Performance
- Open Channel Flow
- Effect of Pipe Surge and Water Hammer
- Cavitation Demonstration and Analysis
- Impact of Jets Analysis
- Verification of Bernoulli's Theorem
- Hydrostatic Forces and Center of Pressure
- Calculation of Efficiency and Braking Power of Turbines
- PipeWork Energy Losses

PHOTOVOLTAIC (PV) LABORATORY



Monadhil Alchaderchi

065053491

INTRODUCTION

This Laboratory introduces students to the concept of converting sunlight to electricity with photovoltaic cells. Students will familiarize themselves with these concepts through conducting a lab activity with measurements and techniques to determine the basic principle of the performance of solar panel and the effect of several variables on the output of photovoltaic panels. Complete photovoltaic system will be analyzed and tested at different conditions with different loads.

EQUIPMENT AND INSTRUMENTS

PHOTOVOLTAIC SOLAR SYSTEMS

- Photovoltaic Solar Panels
- Solar Simulator Formed by Solar Lamps

W12-110

- DC Load and Battery Charger Regulator
- Auxiliary Battery Charger
- Invertor
- Battery
- AC Loads Module
- Sensors (Temperature, Light Radiation, DC Current and DC Voltage)
- Computer Control System (SCADA)
- Grid Connection Inverter
- Clean Energy Trainer
- Solar Tracking System

PROFITEST PV ANALIZER

• Peak Power Meter

- Curve Tracer for PV Modules
- Generators up to 1000 VDC, 20 A DC, 20 W
- PV Analyzer (Wireless)

- Determination of Typical Parameters of Solar Panels
- Study the Relation Between the Generated Power and the Solar Radiation Power
- Determination of the Maximum Power Output of Solar Panels
- Study of the Temperature Influence on Solar Panels Open Circuit Voltage
- Performance Study of Solar Panels Connected in Parallel
- Performance Study of Solar Panels Connected in Series
- Functionality Study of the Parallel/Series Photovoltaic System with Connection of Different Loads and Without Energy Support from the Storage Batteries
- Functionality Study of the Parallel/Series Photovoltaic System with Connection of Different DC-Loads and AC-Loads (Optional Module) with Energy Support from the Storage Batteries
- Study the Effect of Shading on the PV Module
- Analysis of Inverter in Grid-Connected PV System
- Solar Tracking System
- Effects of Distance and Tilt Angle on PV Module Performance

SOLAR PV/WIND ENERGY/SENIOR STUDENT PROJECTS LABORATORY



Location	Lab Staff in Charge	Contacts
W12-301	Monadhil Alchaderchi	065053491

INTRODUCTION

This Laboratory introduces students to the measurements for the electrical parameters for the PV panels by using sophisticated devices, measurements for the sun irradiance, make engineering analysis for the IV curve hybrid system.

EQUIPMENT AND INSTRUMENTS

- profitest
- PV analyzer
- PV panels
- Tracking system
- Shadow ring Pyranometers

EXPERIMENTS

- Shading effects on PV panels (outdoor)
- Characterizations of PV operating outdoor
- Tracking system
- Sun light analysis
- senior projects

TESTS AND SERVICES

• Quality test and analysis

MECHANICAL & NUCLEAR ENGINEERING DEPARTMENT

Lab Name	Location	Person in Charge	Programs Served	Courses Served
Thermo-Fluids Lab	W12-131	Mohamed Ammar	Mechanical Eng.	- Thermodynamics - Advanced Thermodynamics - Advance Fluid Mechanics
Solid Mechanics Lab	W12-136	Abdel Rahman Amarneh	Mechanical Eng.	- Strength of Materials - Kinematics - Robotics
Electrospinning Lab	W12-136 B	Abdel Rahman Amarneh	Mechanical Eng.	- Senior Design Project - Research Project
Human Vibration Research Lab	W12-131 B	Prof. Naser Nawaysah	Mechanical Eng.	- Senior Design Project - Research Project
Radiation Detection Lab	M12-010	Ahmad Ababneh	Nuclear Eng.	 Nuclear Sci. Eng. Lab I Nuclear Instrum. & Meas Nuclear Engineering Materials Reactor Thermal Hydraulics Senior Design Project
Applied Radiation Measurement Lab	M12-009	Samar Ahmed	Nuclear Eng.	- Nuclear Sci. Eng. Lab II - Elements of NE and Rad. Science course - Senior Design Project
Advanced Nuclear Lab	M9-009	Ahmad Ababneh	Nuclear Eng.	 Advanced Nuclear Lab Reactor Safety Analysis Nuclear Power Reactors Reactor Thermal Hydraulics

Mechanical & Nuclear Engineering Laboratories

Mechanical & Nuclear Engineering Lab Staff

#	Name	Title	Ext.	Email
1	Abdel Rahman Amarneh	Lab Engineer	065053438	amarneh@sharjah.ac.ae
2	Mohamed Ammar	Lab Engineer	065052461	Mjouma@sharjah.ac.ae
3	Samar El-Sayed Ahmed	Lab Engineer	065052471	selsayed@sharjah.ac.ae
4	Osama Abdellatif Taqatqa	Radiation safety specialist	065052448	otaqatqa@sharjah.ac.ae
5	Ahmad Qasem Ababneh	Lab Engineer	065052413	aababneh@sharjah.ac.ae

THERMO-FLUIDS LABORATORY



INTRODUCTION

This is a state-of-the-art Laboratory which is fully equipped with the most modern and hightech laboratory equipment and apparatuses. This laboratory is designed to meet the world-class experimentation and safety standards in academics and provide an opportunity to the students for analyzing the basics as well as advanced laws and principles of Thermodynamics, Heat transfer and Fluid Mechanics. It is also equipped with computers with the latest engineering software and networking facilities. This facilitates the learning process for students to analyze their basis understanding in the most effective manner. Students learn to understand the flow diagrams of thermal systems using various laboratory systems. Finally, this laboratory consists of setups that can be used for indoor and outdoor experimentation. Thermo-Fluids laboratory introduces students to basic principles of thermodynamics, fluid Mechanics, instrumentation; experimental verification and reinforcement of analytical concepts introduced in courses of: Analytical Methods in Engineering, Heat Transfer, Thermodynamics and Fluid Mechanics. The students should be able to:

- Use Thermodynamics, Heat Transfer and Fluid Mechanics Measurements and Apparatus
- Demonstrate Understanding of Thermodynamics, Heat Transfer and Fluid Mechanics Principles
- Perform Basic Methodology in Designing Thermodynamics, Heat Transfer and Fluid Mechanics Systems
- Use Computerized Data Acquisition and Analysis Systems
- Verify Theoretical and Semi Empirical Results
- Providing the Students an Opportunity to Analyze the Basic Principles of Thermal Sciences and Fluid Mechanics
- Performing Advanced Research and Analysis of Thermal and Fluid Systems
- Providing an Understanding and Knowledge of Basic Engineering Software and Analysis
- Demonstration of Internal Structures of Mechanical Engineering Systems

EQUIPMENT AND INSTRUMENTS

- Pumps, Valves and Engine Demonstration Units
- Simple Hydraulic Apparatus
- Boyle`s Law
- Sterling Engine
- Thermo-Electric Convertor
- Vapor Compression Refrigeration Cycle Experiment
- Fiat Engine Demonstration Unit
- Turbo Jet Engine Test Stand
- Steam Motor and Energy Conversion Test Set
- Air Flow Bench
- Flow Visualization Tunnel
- Solar Energy Heater
- Temperature Measurement and Calibration Unit
- Gasoline Engine Test Bed with Data Acquisition
- Diesel Engine Test Bed with Data Acquisition
- Mechanical Heat Pump Unit
- Air-Conditioning Test and Analysis Unit
- Fluid Friction and Pipe Friction Losses Analysis Unit
- Cavitation Demonstration Unit
- Flow Meter Analysis Unit
- Network of Pipe Apparatus
- Horizontal Shaker with Seat (Sound and Vibration Measurement)

- Basic Laws of Thermodynamics, Fluid Mechanics and Heat Transfer
- Demonstration of Rankin Cycle/ Steam Engine Cycle
- Demonstration and Analysis of Refrigeration and Heat Pump Cycle
- Performance Analysis of Air-Conditioning Cycle
- Sterling Cycle / Hot Air Engine Demonstration
- Internal Combustion Engine Performance Analysis/ Otto and Diesel Cycle
- Boyle's Law/ Pascal's Law Analysis
- Gas Turbine System/ Turbo Jet Engine
- Numerical Methods in Thermodynamics
- Temperature Measuring Instrument Calibration Analysis
- Fluid Friction and Cavitation in Flow
- Solar Energy Boiler Analysis & Thermo-Electric Convertor Analysis and Demonstration
- Fluid Flow Visualization and Analysis Techniques

SOLID MECHANICS LABORATORY



Location	Lab Staff in Charge	Contacts
W12-136	Abdel Rahman Amarneh	065053438

INTRODUCTION

This Laboratory was established to analyze and study the basic principles and laws in Solid Mechanics, Material Testing and kinematics. This is a state-of-the-art laboratory fully equipped with the most modern and high-tech laboratory equipment and apparatuses. It is designed to meet world-class experimentation and safety standards in academics. The lab is divided into two distinct sections. Material Testing and Kinematics of Machine elements. This facilitates the students to analyze their basis understanding in the most effective manner. Finally, this laboratory has facilities for preparing the samples to be used in advance research and analysis.

EQUIPMENT AND INSTRUMENTS

- Universal Testing Machine (UTM)
- Charpy Impact Testing Machine
- Torsion Testing Machine
- Fatigue Testing Machine
- Creep Testing Machine
- Vickers-MicroHardness Tester
- Precision Cutting Saw
- Abrasive Cutter
- Sample Mounting Press Machine
- Polishing and Grinding Machine
- Strain Gauge Trainer with VIDAS Data Acquisition System
- Demonstration Models for Machine Dynamics and Kinematics
- Flashforge FDM 3D printer (Guider 2s)
- Flashforge FDM 3D printer (inventor 2s)
- 3D systems 3D printer (Figure 4 Model)
- Artec Space spider 3D scanner
- Tube furnace up to 1500 °C

- Determination of Mechanical Properties of Materials using Tensile, Compression and Bending Tests
- Sample preparation for Hardness testing
- Determination of materials Hardness using Vickers Harness Test
- Determination of materials Toughness using Charpy Impact Test
- Strain and deformation in Torsion Test
- Strain and deformation in Bending Test
- Creep: Comparison Between Different Materials
- Creep: Effect of Temperature
- Fatigue: Effect of Surface Roughness and Sharp Edges
- Fatigue Testing of Various Materials
- Demonstrating Various Kinematics and Dynamics Mechanisms used in Mechanical Systems

ELECTROSPINNING LABORATORY



Location	Lab Staff in Charge	Contacts
W12-136 B	Abdel Rahman Amarneh	065053438

INTRODUCTION

The Electrospinning lab is equipped with all the required devices to create nano fiber materials using electrospinning process. The nanofibers produced by electrospinning have unique properties. Electrospinning has a wide range of applications including but not limited to filtration and membrane fabrication, wound dressing, drug delivery, sensors and electronics, and energy. The process requires the preparation of the solution using various sample preparation protocols depending on the selected material for the fibers. The solution can then be electro-spined by using high voltage source, a syringe, and a fiber collector. All of the relevant equipment listed below are available in the research room located in W12-136-b

EQUIPMENT:

- Inovenso NS plus electrospinning equipment
- •2 high voltage power supply
- •2 drum collectors
- •2 syringe pumps
- •Humidifier
- •Analytical balance
- •Temperature controlled hot plate
- •Fume hood
- •Safety cabinet and refrigerator for storing chemicals
- Various size of needle diameters

HUMAN VIBRATION RESEARCH LABORATORY



Location	Lab Staff in Charge	Contacts
W12-131 B	Prof. Naser Nawayseh	065053947

INTRODUCTION

This laboratory has been established to conduct fundamental and applied research on human responses to vibration, including comfort/perception of vibration, biodynamic responses to vibration, postural stability, and seating dynamics and performance. The lab is equipped with facilities that allow measurement of whole-body vibration as well as hand-arm vibration.

EQUIPMENT AND INSTRUMENTS

- Whole-body vertical vibration machine
- Whole-body horizontal vibration shaker
- Tri-axial force and moment platform
- Tri-axial force platform
- Single-axis force platform
- Human vibration measurement and analysis meter
- Single-axis accelerometers
- Tri-axial accelerometers
- 4-Channel, 8-Channel and 16-Channel Data Acquisition systems

- Apparent mass of the human body under vertical vibration
- Apparent mass of the human body under horizontal vibration
- Transmission of vibration through the human body when exposed to vertical vibration
- Transmission of vibration through the human body when exposed to horizontal vibration
- Effect of whole-body vibration training on postural stability
- Effect of whole-body vibration training on muscle strength and activity
- Effect of vertical and horizontal vibration on comfort
- Biodynamic response of the hand-arm system to vibration
- Measurement of vibration emission from power tools
- Effect of the seating condition on the vibration transmitted through the seat pan and backrest.

RADIATION DETECTION LABORATORY



Location	Lab Staff in Charge	Contacts
M12-010	Ahmad Ababneh	065052413

INTRODUCTION

This Laboratory introduces measurements common in Nuclear Engineering. Students will learn 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 analysis of radiation. Students will become skilled at connecting the different components of a nuclear system. The laboratory also includes advanced equipment for radiation detection and material properties.

EQUIPMENT AND INSTRUMENTS

- Detectors:
- Gieger Muller
- Sodium Iodide
- Ion Implanted Detector
- Silicon Surface Barrier Detector
- High Purity Germanium
- Silicon (Li)
- NIM Modules
- Amplifier
- Gate and Delay Generator
- Time-to-Amplitude Converter
- Analog to Digital Converter
- Single Channel Analyzer
- Pulse Inverter
- Counter and Timer
- Universal Coincidence
- Preamplifier

- Liquid Scintillation Counter with Sample Oxidizer
- Alpha Beta Counter System
- Thermal Gravimetric Analysis System
- Metallurgical Optical Microscope
- Multichannel Analyzer and Spectroscopy Software
- Oscilloscope
- Radioisotopes

- Introduction to Electronic Signal Analysis in Nuclear Radiation Measurements
- Geiger Counting
- Gamma-Ray Spectroscopy Using Nal (Tl)
- Alpha Spectroscopy with Surface Barrier Detectors
- Energy Loss of Charged Particles (Alphas)
- Beta Spectroscopy
- High-Resolution Gamma-Ray Spectroscopy
- High-Resolution X-Ray Spectroscopy
- Gamma-Gamma Coincidence
- Air Monitoring
- Determination of the Tritium Concentration in Soil Samples
- Determination of Gross Alpha and Gross Beta Activities in Different Water and Food Samples
- TGA Oxidization/ Heating-Cooling Effect on Samples

APPLIED RADIATION MEASUREMENT LABORATORY



Location	Lab Staff in Charge	Contacts
M12-009	Samar Ahmed	065052471

INTRODUCTION

This Laboratory enhances the laboratory skills pertinent to Nuclear Engineering through performing experiments related to X-Ray Fluorescence, Gamma- Gamma Coincidence, halflife measurements, scattering of alpha particles, Compton scattering and pair production. The students will learn how to use the integrated detection systems that are practically used in engineering applications.

EQUIPMENT AND INSTRUMENTS

- Integrated Digital Signal Processing-Based Instrument with the Following Detectors
- Sodium Iodide Detector (2x2 inch)
- Sodium Iodide Detector (3x3 inch)
- Sodium Iodide Detector (6x6 inch)
- Sodium Iodide Detector (3x5x16 inch)
- Sodium Iodide Detector (Well Detector)
- Alpha Detector
- Broad Energy Germanium Detectors (BEGe)
- Reverse Electrode Coaxial Ge Detectors (REGe)
- X-Ray Energy Detector
- BF3 Neutron Detector
- He3 Neutron Detector
- DD Neutron Generator

The DD generator uses the D-D fusion reaction and driven by an ion beam supplied by a high current microwave ion source. The generator enclosed in a radiation shielding/moderator structure designed for high thermal neutron flux with adequate public safety from gamma and neutron radiation. The generator can be operated in both pulsed or continuous mode and Neutron yields of up to 109 n/s can be produced by the generator.

• Thermal Hydraulic Loop

The Experiment test facility is a closed two-phase flow loop that is 4m height.

- Prospect (Basic Gamma Spectroscopy Software)
- Genie 2000 (Advance Gamma Spectroscopy Software)
- ISOCS (Efficiency Calibration Software)
- Lynx (Digital Signal Analyzer)
- Osprey (Universal Digital MCA Tube Base)
- Oscilloscope
- Radioisotopes

- Time Coincidence Techniques and Absolute Activity Measurements
- X-Ray Fluorescence Analysis Calibration and Energy Resolution
- Qualitative X-Ray Fluorescence Spectroscopy for Unknown Sample
- Gamma-Gamma Coincidence
- Alpha-Gamma Coincidence
- Rutherford Scattering of Alphas from Thin Gold Foil
- Compton Scattering
- Pair Production
- Half Life Measurement
- Gamma Ray Efficiency Calibration
- Prompt Gamma Neutron Activation Analysis (PGNAA)
- Neutron Activation Analysis (NAA)
- Inelastic Neutron Activation Analysis (INAA)
- Fast and Thermal Neutron Radiography
- Prompt Gamma Coincidence Measurements

ADVANCED NUCLEAR LABORATORY



Location	Lab Staff in Charge	Contacts
M9-009	Ahmad Ababneh	2413

INTRODUCTION

In the Advanced Nuclear lab Lab; Generic Training Simulators allow students to perform complete plant startups, shutdowns, and load maneuvers, as well as realistically replicate normal and abnormal plant transients, including malfunction scenarios

EQUIPMENT AND INSTRUMENTS

Generic Pressurized Water Reactor Simulator (APR-1400)

TESTS AND SERVICES

Measurement of nuclear performance, control rod worth, critical rod location, power and flux distributions and feedback coefficients of reactivity.

ARCHITECTURAL ENGINEERING DEPARTMENT

Lab Name	Location	Person in Charge	Programs Served	Courses Served
Modeler and Printing Lab	M8-004	- Osama A. Hassan - Gene A. Soriano	Architectural Engineering	 Architectural Design Courses Senior Design Projects Department Electives Department workshops
Surveying Lab	W12-019	Farah Al Ani	Architectural Engineering	 Surveying Building Construction Drawing Courses
Architectural and Building Sciences Lab	M8-005	- Prof. Abbas Elmualim - Dr. Emad Mushtaha - Lamees Hamid	Architectural Engineering	 Architectural Design Courses Building Construction Illumination and Acoustics Department Electives

Architectural Engineering Laboratories

Architectural Engineering Lab Staff

#	Name	Title	Ext.	Email
1	Osama Atwa Hassan	Laboratory Engineer	065052891	ohassan@sharjah.ac.ae
2	Lamees Hamid	Laboratory Engineer	065052985	lhamid@sharjah.ac.ae
3	Farah Muwafaq Al-Ani	Laboratory Engineer	065052988	falani@sharjah.ac.ae
4	Gene Anthony Soriano	Laboratory Officer	065052991	gsoriano@sharjah.ac.ae

MODELER AND PRINTING LABORATORY



Location	Lab Staff in Charge	Contacts
M8-004	Osama A. Hassan	065052891
	Gene A. Soriano	065052277

INTRODUCTION

The Modeler and Printing Lab in the Architectural Engineering Department is equipped with state-of-the-art model making and Architectural design printing equipment, with a variety of new advanced equipment and services provided to the students, this includes Investigation of materials, prototyping and testing, physical mock-ups and the application of traditional and new fabrication processes in Architecture model making and research applications.

The lab works as All-in-One workshop with all the needed equipment for the students and faculty required applications in teaching and research, including large size digital printing, 3D printing (FDM, Resin, Clay and Concrete), 3D scanning, laser cutting (Plastics, wood and metal), Foam cutting, wood works and spray painting. The Lab structured as an open environment for material-based learning and research, using a wide range of materials including foam, wood, metal, plastics, clay and concrete as well as composite of smart materials.

Students and faculty of Architectural Engineering department and all programs of engineering design studies at the University of Sharjah produce scale models and full-size prototypes, real scale installations and pavilions in general.

EQUIPMENT AND INSTRUMENTS

- Universal Laser Systems VLS6.6 Laser cutter (wood, plastic, and paper)
- BOSSLASER HP 3655 Laser Cutter (wood, plastic, paper, and metal)
- Photocentric LC MAGNA Resin 3D printer Large Scale HQ
- 3 x Ultimaker S5 3D Printer Pro Set (Material station & Air manager)- (FDM plastics)
- 2 x Raise3D Pro2 Plus 3D Printer- Large scale- (FDM plastics)
- DELTA WASP 60100 3D Printer Large scale (FDM plastics and Clay & Concrete)
- DELTA WASP 2040 3D Printer (Clay & Concrete)
- Ultimaker 3 Extended 3D printer- (FDM plastics)

- Zortrax M300 3D Printer- (FDM plastics)
- 2x HP DesignJet T1500- 2x HP DesignJet T2500
- 5x Dremel 4200 Rotary tools set
- 5x Dremel Moto-Saw Fine wood works
- 12x STYRO-CUT 3D Foam cutter Professional Set
- Clarke 280 Hot Wire Cutter Large scale
- California Air Tools silent compressor Spray kit
- Matterport Pro 2 (3D Camera Capture)

TESTS AND SERVICES

- Black & White All size printing, Colored posters printing.
- 3D printing small, medium, and large size models (FDM, Resin, Clay)
- Laser Cutting boards for model making (Acrylic plastic, foam, chipboards, wood, metal)
- Foam Heated Wire Cutting
- Fine woodworks (cutting, sanding, painting)

SURVEYING LABORATORY



Location	Lab Staff in Charge	Contacts
W12-019	Priya Kaimal	065053498
	Farah Al Ani	065052988

INTRODUCTION

The Surveying Laboratory in the AE Department is equipped with state-of-the-art surveying equipment and serves to acquaint students with hands-on experience in diverse aspects of land surveying and construction surveying. The lab sessions carried out in the surveying lab expose students to the principles of land survey as they familiarize themselves with the following:

- Use of Tapes and Electronic Distance Measurements (EDM) to Obtain Precise Linear Measurement.
- Use of Automatic Level to Determine Elevations and Establish Contour Lines.
- Use of Total Station to Obtain Horizontal, Vertical, and Angular Measurements and Perform Traverse Computations.
- Use of Different Measuring Tools to Obtain As-Built Measurements of Existing Facilities and Sketch Sections, Elevations and Perspective View from Data Collected on Ground.

The surveying lab is also serving other courses in the Architectural Engineering curriculum namely, Building Construction I & II and Architectural Drawing I & II, where students and faculty borrow measuring tools to collect accurate and precise dimensions.

EQUIPMENT AND INSTRUMENTS

- NIKON DTM Electronic Total Station
- 2x GEOMAX ZTS-605 Reflector less Long-Range Total Station
- 5x SOKKIA B40-35 Automatic Level
- 5x BOSI TOOLS Posture Steel Tape 50M
- 5x Total Station Reflectors
- 5x 5m Leveling Staff
- 4x BOCH Electronic Laser measurement Device

ARCHITECTURE AND BUILDING SCIENCES LABORATORY



Location	Lab Staff in Charge	Contacts
	Prof. Abbas Elmualim	065052980
M8-005	Dr. Emad S. N. Mushtaha	065052814
	Lamees A. Hamid	065052985

INTRODUCTION

The Architectural and Building Sciences Laboratory facilitates research study of the surrounding environment including the buildings and the students. It allows students to do research on scientific and engineering approaches to improve the quality of the buildings and design a sustainable environment. The Laboratory used for experimentation, classroom demonstrations and teaching exercises that linked with building science courses.

The Lab has portable equipment for analyzing data from experiments in the field as well as in the laboratory. This equipment includes instruments to measure the ventilation in the buildings, as well as portable instrumentation for measuring the detailed thermal and luminous characteristics of building interiors (thermometry, low-speed anemometry, and sensors for humidity.

EQUIPMENT AND INSTRUMENTS

- ADVANCEDSENSE DIRECTSENSE IAQ Indoor Air Quality Meters Full Set
- CO2 Concentration meter
- 10x LS-100 Luminance Meter
- 2x Humidity Sensor/ Data Logger

CHEMICAL AND WATER DESALINATION ENGINEERING

Chemical And Water Desalination Engineering Laboratories

Lab Name	Location	Person in Charge	Programs Served	Courses Served
Water Chemistry and Analysis Lab	W12-014	Mohammed Ali	Chemical And Water Desalination Engineering	- Water Chemistry and Analysis
Chemical Thermodynamics Lab	W12-131	Mohammed Ali	Chemical And Water Desalination Engineering	- Chemical Thermodynamics
Applied Fluid Mechanics Lab	W12-131	Mohammed Ali	Chemical And Water Desalination Engineering	- Applied Fluid Mechanics

Chemical And Water Desalination Engineering Lab Staff

#	Name	Title	Ext.	Email
1	Mohammed Ali	Laboratory Engineer	065053495	Mohammed. Ali@sharjah.ac.ae

WATER CHEMISTRY AND ANALYSIS LABORATORY



Location	Lab Staff in Charge	Contacts
W12-014	Mohammed Ali	065053495

INTRODUCTION

This laboratory has been established to 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.

EQUIPMENT AND INSTRUMENTS

- Ion Chromatography for Water Applications.
- Inductively coupled plasma-mass spectroscopy for Water Applications.
- Total Organic Carbon Analyzer.
- UV Spectroscopy for Water Applications.
- Chemical Oxygen Demand Analyzer.
- Biochemical Oxygen Demand Analyzer.
- pH, Conductivity, Salinity and TDS Analyzers.
- Jar Test: Coagulation and flocculation processes.
- Turbidity Meter.
- ORP Meter.

- Qualitative and quantitative anions and cations analysis.
- Qualitative and quantitative heavy metals analysis.
- Total Inorganic and Organic Carbon analysis.
- Chemical Oxygen Demand determination.
- Biochemical Oxygen Demand determination.
- Determination the optimum coagulant dosage for clarifying different types of water.
- Determination of the Physical properties (conductivity, salinity, turbidity).
- Solid Analysis (TS, TDS, TSS, TFS, TVS).

CHEMICAL THERMODYNAMICS LABORATORY

Location	Lab Staff in Charge	Contacts
W12-131	Mohammed Ali	065053495

INTRODUCTION

This laboratory has been established to conduct chemical thermodynamics fundamental concepts experiments that will help the student during their study of the different 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

EQUIPMENT AND INSTRUMENTS

- Thermal equation of state and critical point Unit.
- Steam Engine Unit.
- Temperature Measurement & Calibration Unit
- Pressure Measurement & Calibration Unit.
- Saturation Pressure & Throttling Calorimeter Unit.
- Expansion Processes of a Perfect Gas Unit.
- Conductivity of Liquids and Gases Unit.
- Equation of state for ideal gases experiment Unit.

- Investigating the reference PRT equation and the use of correction equations.
- Utilizing a heated water-bath and an enclosed body of air to investigate the effect of a temperature differential between temperature sensors and the body being measured.
- Examining the thermoelectric properties of thermistor and thermocouple devices.
- Investigating the behavior and operation of a Bourdon gauge and Deadweight Pressure

Calibrator.

- Proving Boyle's law that absolute pressure and volume are inversely related at constant temperature.
- Studying the behavior of water during the transition between liquid and vapor phases.
- Studying the change in vapor point with increasing pressures and to watch the fluid behavior using a sight glass set into a pressure vessel.
- Measure the saturation pressure of water using a pressurized vessel.
- Studying the adiabatic reversible process (isentropic expansion).
- Studying the behavior of a perfect gas and its describing equations.
- Understanding the use of the Fourier rate equation in determining the rate of heat flow by conduction through liquids or gases.
- Measuring the constant of proportionality (the thermal conductivity k) of different liquids such as water and glycerin.

APPLIED FLUID MECHANICS LABORATORY



Location	Lab Staff in Charge	Contacts
W12-131	Mohammed Ali	065053495

INTRODUCTION

The lab demonstrates experimentally the basic concepts of flow behavior, fluid forces and analysis tools through different systems. The experiments includes: 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 Hummer, Determination of Friction Loss along Straight Pipes, bends and elbows, Packed Bed, Fluidized Bed, Pelton turbine

EQUIPMENT AND INSTRUMENTS

- Cavitation Demonstration Unit.
- Demonstration Pelton Turbine Unit.
- Fixed and Fluidized Beds Unit.
- Flow Meter Demonstration Unit.
- Pipe Network Unit.

- Verification of Pascal's law.
- Hydrostatic force and center of pressure for submerged surfaces.
- Studying the cavitation phenomenon and its association with the vapor pressure of a liquid.
- Studying the Turbine Unit Performance.
- Studying the impact of jets.
- Verification of Bernoulli's Theorem.
- Studying and Determination of pressure loss in pipe networks.





COLLEGE OF COMPUTING AND INFORMATICS LABORATORIES

Computer Engineering Laboratories

Lab Name	Location	Person in Charge
High Performance Cloud Computing	M12-108	Maha Alaa Eddin
Digital Logic Design	W12-104	Maha Alaa Eddin
Computer Communications and Networks	W12-116	Maha Alaa Eddin
Microprocessors and Assembly Language	W12-105	Hassan Vakani Tariq
Senior Design Project I & II Laboratory (Female)	W12-115	Imtinan Attili
Senior Design Project I & II Laboratory (Male)	M12-126	Sol Andrew Domingo
Network Programming	W9 /Computer Labs	Dr. Ala' Altaweel
Engineering Modeling using Artificial Intelligence	W9 /Computer Labs	Dr. Ali Bou Nassif
Microcontroller Based Design lab	W12-105	Hassan Vakani Tariq
Embedded Systems Design Lab	W12-105	Hassan Vakani Tariq
Robotics and computer Vision Lab	W12-105	Hassan Vakani Tariq

Computer Engineering

Lab Staff and Teaching Assistant	Email	Extension
Maha Alaa Eddin	malaaeddin@sharjah.ac.ae	065053494
Hassan Vakani Tariq	htvakani@sharjah.ac.ae	065053494
DIGITAL LOGIC DESIGN LABORATORY



Location	Lab Staff in Charge	Contacts
W12-104	Maha Alaa Eddin	065053494

INTRODUCTION

The Digital Logic Design Laboratory is divided into two parts. The first part teaches the students how to write Verilog programs to implement and design simple combinational circuits. Students write programs to describe logic gates and simple sequential circuits like adders, sub tractors, encoders, decoders, multiplexers, comparators, flip-flops, counters and shift registers. In the second part of the lab, students get a hands on experience to build a real circuits on the breadboard. The students start from the Boolean expressions, going through building the logic circuit and testing it. During the lab, the students will gain a good understanding of the different tools and simulation software used in designing logic circuits. The students also have to do a project of their choice.

EQUIPMENT AND INSTRUMENTS

- ETS-7000 Digital Analog Training System
- Personal Computers Loaded with QuartusII Software
- ALTERA DE2 Boards
- Logic Pulser
- Logic Probe
- Digital IC Tester
- Simulator: Circuit Maker Simulator
- Wire Strippers and Pliers

- Introduction to Hardware Description Language and Synthesis
- Basic Gates Implementation in Verilog and Configuration
- Implementation in Verilog
- Introduction to Digital Logic Design Lab Using Basic Logic Gates

- Combinational Circuits Design Using Basic TTL Gates
- Arithmetic Logic Unit and Data path Utilizing Decoders and Encoders
- Sequential Circuits Design
- Registers and Counters with Design Applications
- Group Project to Build Real Life Application

- Apply digital logic design procedures to implement digital logic circuits that meet certain specifications.
- Practice troubleshooting of the designed circuits to verify their behavior.
- Design digital circuits using Hardware Description Language.
- Ability to work in groups to conduct laboratory experiments.

COMPUTER COMMUNICATIONS AND NETWORKS LABORATORY



INTRODUCTION

This Laboratory provides hands-on experience essentials to the real understanding of computer networking and the devices used in building these networks. The goal is to teach students practical aspects of network topologies and network operating systems, including the setup of network services, DHCP, DNS, peer to peer and server based networking, switch setup and VLANs and the basics of IP addressing, sub netting and router configuration. In addition, students use the network monitor to capture and analyze data packets.

EQUIPMENT AND INSTRUMENTS

The lab consists of the following hardware and software required to meet the above objectives:

- 1. Hardware
- Cables and RJ-45 Connectors
- Repeater Hubs
- TP-link Access Points
- JUNOS Switches 2400 series
- JUNOS Switches 3400 series
- JUNOS Routers 240 series
- Cisco Switches 2960
- Cisco Routers 892
- Cisco Router 2901
- Wireless NIC Cards
- Ethernet Cable Tester
- TP-link Wireless Adapters
- Personal Computers

- 2. Software
- Packet Tracer Simulator
- Sniffer Pro: used for Explaining the Packet Structure (Microsoft Network Monitor 3.4)
- Windows 10/Advanced Server 2016: as Network Operating Systems

EXPERIMENTS

- Peer-to-Peer Local Area Network
- Network Applications
- Wired and Wireless LANs Network Topologies
- Layer II Switching- Part I
- Layer II Switching- Part II VLANs
- Network Services: DNS Service
- Network Services: DHCP Service
- Routing Basics Part I
- Routing Basics Part II
- Packet Format & Network Monitoring

- Build and test different types of Network scenarios.
- Configure various network equipment such as switches, wireless access points and routers, for simple network implementation.
- Setup network services using a server operating system.
- Ability to work in groups to conduct laboratory experiments.

EMBEDDED SYSTEMS DESIGN LABORATORY



Location	Lab Staff in Charge	Contacts
W12-105	Hassan Vakani Tariq	065053494

INTRODUCTION

This Laboratory applies the theoretical principles of the Embedded System course. It gives hands-on experience with microcontroller applications and interfacing with basic solid state input/output devices, A/D and D/A converters, LCD displays and Multiplexing seven segment LED displays.

EQUIPMENT AND INSTRUMENTS

- Personal Computers with MikroCPro for PIC Compiler
- Multifunctional PIC Microcontroller Development Board (v7 DEVELOPMENT BOARD).

EXPERIMENTS

- Introduction to the v7 DEVELOPMENT BOARD and Software Development System
- Basic Digital Input and Output Programming
- LCD Display Interfacing
- Matrix Keypad Interfacing
- Analog to Digital Converter
- Hardware Delay using Timer
- Multiplexing Seven Segments LED Displays
- Interrupts

- Design hardware and software for use in an embedded environment.
- Apply techniques needed for programming and interfacing the PIC family of microcontrollers.
- Ability to work in groups to conduct laboratory experiments.

MICROPROCESSORS	AND ASSEMBLY	LANGUAGE LABORATORY
MICHOL NOCLOSONS		

Location	Lab Staff in Charge	Contacts
W12-105	Hassan Vakani Tariq	065053494

INTRODUCTION

The Microprocessor and Assembly Language Laboratory provides students with practical experience in programming while using the Assembly Language on x86 architecture microprocessors. The lab utilizes the latest personal model computers where the students practice the skills they have learned in the classroom and explore the backward compatibility of modern microprocessors all the way back to their x86 ancestor.

EQUIPMENT AND INSTRUMENTS

Personal Computers
 Visual Studio 2019

EXPERIMENTS

- Visual Studio and MASM
- Writing an Assembly Language Program
- Addressing Modes
- Working with Arithmetic Instructions
- Working with Logic, Shift, and Rotate Instructions
- Loops
- Indexing
- 8087 Floating Point Unit
- Floating Point Instructions
- Working with Procedures and MACROS

- Ability to use assembly language development tools.
- Ability to program using a 16-bit microprocessor's assembly language using advanced features.
- Ability to work in groups to conduct laboratory experiments.

ROBOTICS AND COMPUTER VISION LABORATORY



Location	Lab Staff in Charge	Contacts
W12-105	Hassan Vakani Tariq	065053494

INTRODUCTION

Robotics is generating significant interest among the leading Entrepreneurs and Governments across the globe. Companies are constantly innovating and patenting designs to create the world's first fully autonomous machine with capabilities that will forever transform the way we do business and how we manufacture goods. It is therefore essential that the UAE, the most technologically forward country in the Middle East & North Africa region, uses the opportunities that robotics advancements can present, to remain competitive and a front runner in the technological field. Analysts predict that the early adoption of robotics technology in the UAE would significantly increase the GDP of the country and create a more knowledge-based economy thus propelling UAE as the premier destination for leading companies worldwide.

The Robotics and Computer Vision Lab at the University of Sharjah aims to empower students and researchers to work in a harmonious environment for research to develop the next generation of computer vision algorithms coupled with realistic articulated physics-based kinematics paradigms for the implementation and integration of autonomous robots for the purpose of interacting naturally with people and with each other by adapting their behavior to the requirements of the task they are given within the dynamic environment they are situated in.

EQUIPMENT AND INSTRUMENTS

- Mobile Robot Pioneer P3DX
- Robai Cyton Gamma 1500, 7 dof Manipulator
- Qbot2 Mobile Robot
- RGB-Depth Kinect Sensor
- Humanoid Nao Robot
- Qbo Robot
- ASUS RGB- Depth Sensor
- Robotis OP-2

EXPERIMENTS

- A Vision-Based Kinematic Tracking Control System Using Enhanced-PRM for Differential Wheeled Mobile Robot
- Vision-Based Robotic Velocity Tracking Control System using Reduced-PRM
- Progressively Trainable and Adaptable Intelligent Humanoid Robots for Autism Spectrum Disorders (Completed May 2016).
- Investigating Different Vision Techniques for Parasite Auto-Detection
- Real-time Object Recognition using Improved Color Histogram Techniques
- Self-Learning Robot Senior Student Project
- Autonomous Adaptive Highway-Lanes Distribution to Solve Traffic Congestions using Vision Techniques
- A Technical Solution to Enhance the Visual Perception for Color-Blind Disorders

- Demonstrate an ability to solve a practical problem of robot-vision control through software tools (e.g. Robot Programming).
- Ability to work in groups to conduct laboratory experiments.

Location Lab Staff in Charge Contacts

HIGH PERFORMANCE CLOUD COMPUTING LABORATORY

Location	Lab Staff in Charge	Contacts
M12-108	Maha Alaa Eddin	065053494

INTRODUCTION

The High-Performance Cloud Computing Laboratory provides students with practical experience in both the hardware and the software of the massively parallel processing platforms as well as the basic concepts of cloud computing. In terms of hardware, the lab utilizes a computer cluster consist of one main server and a group of processing nodes connected to build a computing farm. In terms of software, the cluster has the Message Passing Interface (MPI) parallel programming standard library as well as the multi-threaded programming POSIX thread library. Students can explore how to build a computing farm as well as get a practical programming experience with the parallel and distributed processing environment. Programming with shared-address space parallel paradigm is explored through the multi-core/multi-threaded computing nodes in the lab using the POSIX thread library. The system is built on top of an OpenStack Cloud Computing environment which allows the students to get their hands on the latest technologies in the HPC.

EQUIPMENT AND INSTRUMENTS

- Couple of Server Machines
- Group of Computing Node PCs
- High-Speed Switch and Ethernet to Connect the Machines
- File Server, DNS Server and Job Scheduler
- MPI Standard Library for Distributed System Programming
- POSIX Thread Library for Shared-Address Space Programming
- OpenStack Cloud Computing OS

- How to Configure PC Cluster
- Basic MPI Program Structure (Parallel Hello World Program)
- Blocking and Non-Blocking Point-to-Point Communication Functions and their Prototype

- Develop Parallel Program for Matrix Multiplication using MPI
- Collective Communication Functions and their Prototype
- Develop MPI Program using Collective Communication Functions
- Develop the First Multithreaded Program
- Using the Open MP Library
- Using Cloud Computing Environment

- The ability to explore different Parallel Processing designs.
- The ability to evaluate the Parallel and distributed processing system through analytical modeling.
- Ability to work in groups to conduct laboratory experiments.

SENIOR DESIGN PROJECT I & II LABORATORY



Location	Lab Staff in Charge	Contacts
W12-115	Imtinan Basem Attili	065053493
M12-107	Sol Andrew	065052938

INTRODUCTION

The Department of Electrical and Computer Engineering offers a project room reserved for senior and junior students for their projects. This room may also be used by students for their course projects. The department provides the needed equipment for various projects and meets student requests for any additional equipment as needed.

Subjects of students> projects are usually linked to research interests in the department or technical problems offered by local industries. In both cases, small groups of students work together to design, build, refine and test complete hardware and/or software systems.

EQUIPMENT AND INSTRUMENTS

- Digital Multimeters
- ETS-7000 Digital Analog Training System
- Rigol DG1032Z Arbitrary Function Generator 2 Channel /30MHz / 200MSa/s
- Rigol DS4012 Digital Oscilloscope 2 Channel / 100MHz / 4GSa/s
- Simulators: Microsim, ORCAD Cadence PSpice Circuit Simulator
- TTi 354T Triple Power Supply 2 x 0-35VDC / 3.3-5.5 VDC 4A
- ESCORT Dual Display LCR Meter
- Soldering Machine
- Hardware Tools

- Ability to apply engineering principles to design a component or a system.
- Ability to develop the management skills to oversee the design of complex systems.

MICROCONTROLLER BASED DESIGN LABORATORY



Location	Lab Staff in Charge	Contacts
W12-105	Hassan Vakani Tariq	065053494

INTRODUCTION

This Laboratory applies the theoretical principles of the microcontroller-based design course. It gives hands-on experience with microcontroller applications and interfacing with basic solid-state input/output devices, A/D and D/A converters, LCD displays and Multiplexing seven segment LED displays.

EQUIPMENT AND INSTRUMENTS

- Personal Computers with MikroCPro for PIC Compiler
- Multifunctional PIC Microcontroller Development Board (v7 DEVELOPMENT BOARD)

EXPERIMENTS

- Introduction to the v7 DEVELOPMENT BOARD and Software Development System
- Basic Digital Input and Output Programming
- LCD Display Interfacing
- Matrix Keypad Interfacing
- Analog to Digital Converter
- Hardware Delay using Timer
- Multiplexing Seven Segments LED Displays

- Writing programs for a microcontroller in C and Assembly languages.
- Utilize the on-chip peripherals of the microcontroller to implement a complex operation.
- Ability to work in groups to conduct laboratory experiments.

ENGINEERING MODELING USING ARTIFICIAL INTELLIGENCE LAB



Location	Lab Staff in Charge	Contacts
W9-001	Maha Alaa Eddin	065053494

INTRODUCTION

Artificial Intelligence Laboratory is a part of the Computer Engineering Department at the University of Sharjah. This Lab will focus on employing computer models to solve engineering problems. Such models are developed using Artificial Intelligence and advanced statistical techniques such as fuzzy logic, neural networks and advanced regression analysis. These models will be evaluated empirically using real data and appropriate statistical tests. MATLAB, Weka, Minitab, RStudio, Python and similar tools will be used in this course.

EQUIPMENT AND INSTRUMENTS

- Personal Computers
- RStudio Software
- MATLAB Software
- Weka Software
- PHSTAT Tool
- Minitab Statistical Software

- Working with data in MATLAB
- Neural networks nftool
- Neural networks nntool for Regression Problems
- Introduction to PHStat
- Introduction to Minitab (Regression)
- Introduction to Minitab (Logistic Regression)
- Introduction to WEKA (Regression)
- Introduction to WEKA (features selection / Classification)
- Introduction to R Language

- Introduction to R (Classification)
- Introduction to MATLAB (Classification)
- Mamdani fuzzy logic
- Sugeno fuzzy logic

TEST AND SERVICES

• Apply and evaluate machine Learning techniques to model engineering problems

NETWORK PROGRAMMING LAB



Location	Lab Staff in Charge	Contacts
W9-001	Maha Alaa Eddin	065053494

INTRODUCTION

Network Programming Laboratory is a part of the Computer Engineering Department at the University of Sharjah. In this lab, students will analyze the networking software for the various layers, assess the various network programming paradigms and implement UDP and TCP connections using sockets and implement single and multi-threaded peers, clients and servers.

EQUIPMENT AND INSTRUMENTS

- Personal Computers
- Oracle VM Virtual Box
- Ubuntu Operating System run as host or guest OS (over VM)
- Python 2.7.x Interpreter
- Unix networking utilities: netstat, tcpdump, Wireshark, etc.

EXPERIMENTS

- Development Environment Setting up
- Python Data Structures: Strings, Lists and Dictionaries
- Python Functions and Files
- Python: Object Oriented Programming
- Python: Network Addresses and TCP/UDP Sockets
- Python: Single and Multi-Threaded Applications
- Network Application Protocol Part1
- Network Application Protocol Part2
- Network Application Protocol Part3

- Analyze the networking software for the various layers
- Assess the various network programming paradigms.
- Implement single and multi-threaded peers, clients and servers.

COLLEGE OF SCIENCES



Lab Name	Location	Person in Charge	Programs Served	Courses Served
Physics Lab (1M)	M12-106	Sanoor Mannath	 College of Science College of Engineering 	Physics 1 LabPhysics 3 Lab
Physics Lab (2M)	M12-105	Sanoor Mannath	College of ScienceCollege of MedicineCollege of Health Science	 Physics for Medical Science Lab Physics for Medical Diagnostic Imaging lab
Physics Lab (3M)	M12-103	Bento Joseph	 College of Science College of Engineering 	 Physics 2 Lab Electronics for Experimental Physics Lab
Physics Lab (4M)	M12-102	Faisal Alsane	College of Science	 Modern Physics Lab Advanced Physics Lab
Computational Capabilities Lab	M12-106 B	Bento Joseph	College of Science	Computational Physics
Physics Lab (1W)	W12-214	Mariam Al Naqbi	 College of Science College of Engineering 	Physics 1 Lab
Physics Lab (2W)	W12-216	Mariam Al Naqbi	 College of Science College of Engineering 	Physics 1 Lab
Physics Lab (3W)	W12-218	Khadija Alhosani	 College of Science College of Medicine College of Health Science 	 Physics for Health Science Lab Physics for Medical Science Lab
Physics Lab (4W)	W12-220	Khadija Alhosani	 College of Science College of Medicine College of Health Science 	 Physics for Health Science Lab Physics for Medical Science Lab
Physics Lab (5W)	W12-213	Taghrid Abdallah	 College of Science College of Engineering 	Physics 2 Lab
Geoscience/ Geophysics Lab	W12-219	Abd Elmahmoud Elsamani	College of Science	 Stratigraphy and Structure Geology Sedimentary Rocks and Sedimentology Igneous and Metamorphic Rocks Petrology Hydrogeology
Petrology (Microscopy) Lab	W12-221	Abd Elmahmoud Elsamani	College of Science	 General Geophysics Exploration Geophysics 1 Exploration Geophysics 2
Radiation Lab	W12-213 A	Dr Hussein Elmehdi	College of Science/ Research lab	Teaching/Research lab
Spectroscopy Laboratory	W12-213 B	Dr. Hussain Al Awadhi	Research Lab	Research Lab

COLLEGE OF SCIENCES LABORATORIES

Lab Name	Location	Person in Charge	Programs Served	Courses Served
Research Lab	W12-213 C	Dr. Hafsa Khurshid	Research Lab	Research Lab
General Chemistry Lab	- W12-236 - M12-025 - M12-031	 Kifah Al-Taqaz Mussab Osama Hassan Amin Hasan 	 Chemistry Dept. College of Engineering 	General Chemistry (l) Lab
General Chemistry Lab	W12-240	Reem Alteneiji	Chemistry Dept.	General Chemistry (II) Lab
Analytical Chemistry Lab	M12-034	Mohamed Al- Farouq	Chemistry Dept.	Analytical Chemistry
Organic Chemistry Lab	W12-235	- Amin Hasan - Alaa Bihi	Chemistry Dept.	Organic Chemistry (I) Lab
Organic Chemistry Lab	W12-235	- Amin Hasan - Alaa Bihi	Chemistry Dept.	Organic Chemistry (II) Lab
Organic Chemistry Lab	W12-235	Hajar Ibrahim	Chemistry Dept.	Identification of Organic Compounds
Physical, Inorganic Chemistry lab	W12-239	 Nemat Dek AlBab Alaa Bihi 	Chemistry Dept.	Instrumental Analysis
Physical, Inorganic Chemistry lab	W12-239	Kifah Al Taqaz	Chemistry Dept.	Inorganic Chemistry Lab
General Chemistry Lab	- M12-029 - M12-031	 Hajar Ibrahim Amin Hasan 	 College of Medicine College of Dentistry 	General Chemistry Lab for Medical Sciences Students
Physical, Inorganic Chemistry lab	W12-239	Hajar Ibrahim	Chemistry Dept.	Physical Chemistry (I) Lab
Physical, Inorganic Chemistry lab	W12-239	Kifah Al Taqaz	Chemistry Dept.	Physical Chemistry (II) Lab
Instrumental Analysis Lab	W12-231D	Nemat Dak El-Bab	Chemistry Dept.	 Chemistry Senior Project Instrumental Analysis Identification of Organic Compounds Organic Chemistry 2
General Chemistry	- W12-240 - M12-031 - M12-029	Reem AlteneijiAmin HasanAlaa Bihi	 Biotechnology Dept. College of Health Sciences 	General Chemistry Lab for HS
Organic Chemistry Lab	- W12-235 - M12-029	- Amin Hasan - Hajer Ibrahim	 Biotechnology Dept. College of Health Sciences 	Organic Chemistry for HS
Analytical Chemistry Lab	M12-034	Mohamed Alfarouq	Biotechnology Dept.	Analytical Chemistry for HS

Lab Name	Location	Person in Charge	Programs Served	Courses Served
Chemistry Students Research – Lab 1	W12-231	 Prof. Raed Al Qawasmeh Prof. Ideisan Abu-Abdoun Dr. Mohamed El-Naggar 	Chemistry Dept.	Chemistry Senior Project
Chemistry Student Research – Lab 2	W12-232	 Prof. Monther Khanfar Prof. Abdelnasser Metwally Dr. Ayssar Nahle Dr. Ahmed Al- Mahdi Dr. Abdelaziz Elgamouz Dr. Kamrul Hassan 	Chemistry Dept.	Chemistry Senior Project
General Biology Lab	W12-039	Mona Al Ali	Applied Biology Dept.	General (Basic Course)
General Microbiology Lab	M12-132	Aisha Echtibi	Applied Biology Dept.	 Tissue Culture & Hybridoma Technology Molecular Genetics Plant Biotechnology Microbial Processing & Biotechnology Environmental Biotechnology
Immunology & Serology Lab	W12-205	Mona Al Ali	Applied Biology Dept.	Immunology & Serology Lab
Tissue Culture & Hybridoma Technology	M12-132	Mona Ibrahim	Applied Biology Dept.	 Tissue Culture & Hybridoma Technology Student Research Project Microbial Genetics
Molecular Genetics Lab	W12-039	Mona Ibrahim	Applied Biology Dept.	Molecular Genetics
Molecular Biology Lab	M12-131	Mona Mahfood	Applied Biology Dept.	 Molecular Biology Microbial Genetics Student Research Project M.Sc. Thesis
General Biochemistry Lab	W12-227	Mona Al Ali	Applied Biology Dept.	General Biochemistry
Protein Biochemistry & Engineering Lab	W12-039	Mona Mahfood	Applied Biology Dept.	Protein Biochemistry & Engineering Lab
Plant Biotechnology Lab	W12-039	Maryam Ghaleb	Applied Biology Dept.	Plant BiotechnologyStudent Research Project

Lab Name	Location	Person in Charge	Programs Served	Courses Served
Microbial Processing & Biotechnology Lab	W12-205	Maryam Ghalib	Applied Biology Dept.	Microbial Processing & Biotechnology
Environmental Biotechnology Lab	M12-132	Mona Ibrahim	Applied Biology Dept.	Environmental Biotechnology
Microbial Genetics Lab	M12-132	Mona Nasir	Biotechnology Department	General Biochemistry

APPLIED PHYSICS & ASTRONOMY DEPARTMENT

Applied Physics and Astronomy Laboratories

Lab Name	Location	Person in Charge	Programs Served	Courses Served
Physics Lab (1M)	M12-106	Sanoor Mannath	College of ScienceCollege of Engineering	Physics 1 LabPhysics 3 Lab
Physics Lab (2M)	M12-105	Sanoor Mannath	 College of Science College of Medicine College of Health Science 	 Physics for Medical Science Lab Physics for Medical Diagnostic Imaging lab
Physics Lab (3M)	M12-103	Bento Joseph	 College of Science College of Engineering 	 Physics 2 Lab Electronics for Experimental Physics Lab
Physics Lab (4M)	M12-102	Faisal Alsane	College of Science	 Modern Physics Lab Advanced Physics Lab
Computational Capabilities Lab	M12-106 B	Bento Joseph	College of Science	Computational Physics
Physics Lab (1W)	W12-214	Mariam Al Naqbi	College of ScienceCollege of Engineering	Physics 1 Lab
Physics Lab (2W)	W12-216	Mariam Al Naqbi	College of ScienceCollege of Engineering	Physics 1 Lab
Physics Lab (3W)	W12-218	Khadija Alhosani	 College of Science College of Medicine College of Health Science 	 Physics for Health Science Lab Physics for Medical Science Lab
Physics Lab (4W)	W12-220	Khadija Alhosani	 College of Science College of Medicine College of Health Science 	 Physics for Health Science Lab Physics for Medical Science Lab
Physics Lab (5W)	W12-213	Taghrid Abdallah	College of ScienceCollege of Engineering	Physics 2 Lab
Geoscience/ Geophysics Lab	W12-219	Abd Elmahmoud Elsamani	College of Science	 Stratigraphy and Structure Geology Sedimentary Rocks and Sedimentology Igneous and Metamorphic Rocks Petrology Hydrogeology
Petrology (Microscopy) Lab	W12-221	Abd Elmahmoud Elsamani	College of Science	 General Geophysics Exploration Geophysics 1 Exploration Geophysics 2
Radiation Lab	W12-213 A	Dr Hussein Elmehdi	College of Science/ Research lab	Teaching/Research lab
Spectroscopy Laboratory	W12-213 B	Dr. Hussain Al Awadhi	Research Lab	Research Lab

Lab Name	Location	Person in Charge	Programs Served	Courses Served
Research Lab	W12-213 C	Dr. Hafsa Khurshid	Research Lab	Research Lab

Applied Physics and Astronomy Lab Staff

#	Name	Title	Ext.	Email
1	Khadija Al Housani	Team Leader of Physics Labs Unit	065053466	kalhousani@sharjah.ac.ae
2	Taghrid Abdallah	Sr. Laboratory Officer- Physics	065053467	tabusheritah@sharjah.ac.ae
3	Sanoor Mannath	Sr. Laboratory Officer- Physics	065052480	smannath@sharjah.ac.ae
4	Bento Joseph	Laboratory Officer- Physics	065052466	bjoseph@sharjah.ac.ae
5	Faisal Abdullah Alsane	Laboratory Officer- Physics	065052408	falsane@sharjah.ac.ae
6	Maryam Al Naqbi	Laboratory Officer- Physics	065053469	malnaqbe@sharjah.ac.ae
7	Abd Elmahmoud Elsamani	Laboratory Officer- Geophysics	065053457	aelgaili@sharjah.ac.ae

PHYSICS LABORATORY (1M)



Location	Lab Staff in Charge	Contacts
M12-106	Sanoor Mannath	065052480

INTRODUCTION

This Laboratory is designed to teach students enrolled in the College of Engineering and College of Sciences. Experiments designed to teach the application of Physics fundamentals in kinematics, energy, collision, motion, properties of matter, rotational motion, basic optics and thermodynamics.

EQUIPMENT AND INSTRUMENTS

Measuring tools and devices, Electronic Timers, Force Tables, Air Tracks, Air Blowers, Frictionless Tracks, Trolleys, , Pasco Interface, Pasco sensors, CASSY Interface, Projectile Launcher, Ballistic Pendulum, Springs, Simple Pendulum, Calorimeter, Heaters, Electronic Balances, Linear Thermal Expansion Apparatus, Handheld Vacuum pump, Hot Plates.

Rotational and circular motion apparatus, Thermal expansion apparatus, vibrating string and standing waves, Speed of sound apparatus and Young's Modulus apparatus, Optical Parts like mirrors, Lenses Prisms and gratings, and Spectrometers, Laser source.

- Measuring Devices and Density
- Equilibrium of Forces at Body Joints
- Free Fall Motion
- Motion in 2-D (Projectile)
- Friction
- Uniformly Accelerated Motion
- Newton's Second Law
- Conservation of Energy
- Conservation of Momentum
- Ballistic Pendulum

- Uniform Circular Motion
- Simple Harmonic Motion
- Inertia of Different Object
- Conservation of Angular Momentum
- Young's Modulus
- Hook's Law and SHM
- Vibrating String and Standing Waves
- Buoyant Force
- Thermal Expansion
- Speed of Sound in Solids and Air
- Mirrors and Lenses
- Light Interference
- Spectrometer

PHYSICS LABORATORY (2M)



Location	Lab Staff in Charge	Contacts
M12-105	Sanoor Mannath	065052480

INTRODUCTION

This laboratory is designed to teach students enrolled in the College of Medical Sciences, College of Health Science and College of Science. Experiments designed to introduce the students about some of the applications of the concepts covered in Physics for Medical Sciences and Health Science with emphasis on motion, forces, balance and torque, basics of imaging modalities such conventional X-rays, CT, PET, Magnetic Resonance Imaging, Ultrasound and Radiation Physics.

EQUIPMENT AND INSTRUMENTS

Measuring Tools and Instruments, Force Table Sets with Accessories, Frictionless Tracks, CASSY Software and CASSY Sensors, Linear Thermal Expansion Apparatus, Calorimeters, Heaters, Pasco Interface, Laser Source, Power Amplifier, Geiger Muller Tube, Radioactive Sources, Absorption Sheets of Different Materials and Thickness.

Power Supplies, Electric Field Mapping Apparatus, Solenoids, Circular Coils, Optical Benches, Spectrometers, Laser Beams, Double Slit and Gratings, Balmer Lamps, Two-Channel Oscilloscopes, (e/m) Apparatus, Tel-X-O meter Apparatus.

- Measuring Devices and Density
- Forces at Equilibrium
- Motion Along a Straight Line: Part A
- Motion Along a Straight Line: Part B
- Force of Buoyancy
- Heat Equivalence of Electrical Energy
- Linear Thermal Expansion
- Simple DC Circuits
- Magnetic Field Due to a Current Carrying Conductor

- Reflection, Refraction and Total Internal Reflection
- Electric Field (Uniform and Non-Uniform)
- Capacitance and Dielectric
- RC-Circuit
- Oscilloscope and AC Signals
- Spectrum of Hydrogen Atom (Optical Bench & Spectrometer)
- Specific Charge of the Electron (e/m)
- Penetration and Attenuation of X-ray
- Ultrasound Waves
- Radiation Detection and Absorption Measurements

PHYSICS LABORATORY (3M)



Location	Lab Staff in Charge	Contacts
M12-103	Bento Joseph	065052466

INTRODUCTION

This laboratory is designed to teach students enrolled in the College of Sciences and College of Engineering. Experiments designed to complement the concepts taught in the theoretical component of Physics 2, which focuses on electricity and magnetism.

This Laboratory is also to introduce the concept of electronic devices, including diodes, transistors, operational amplifier, logic gates, flip-flops, registers and counters, memories, switching and filtering to students. In addition to gaining experience with typical electronic circuits that are found in common applications, including the concept of design of their own projects.

EQUIPMENT AND INSTRUMENTS

Measuring meters, Rheostats, Resistance Boxes, DC and AC Power Supplies, electronic elements (capacitors, resistors, etc.), Resistivity Apparatus, Potentiometers, Switches, Meter Bridges, Stop Watches, electroplating apparatus, electric field mapping apparatus, High Current Power Supplies, CASSY software, CASSY sensors and Boxes (force, magnetic field, etc.), Magnets, Set of Conducting Loops, Pasco Interface, Pasco sensors, Coils, Transformers, Oscilloscopes, Induction Coils.

Diodes of different types, Rectifier Diodes, transistors, integrated Circuits, Breadboards, Dual Trace Triggered Oscilloscope, Function Generator, Zener Diodes, 78xx Voltage Regulator, 7-Segment Display, 7447 Decoder, 741 Operational Amplifier, 555 timers, 2114 RAM Chip, TTL 740x Chip, Potentiometers, Soldering Iron, Circuit Board Holders, Transistor Tester.

- Circuit Construction and Measurements
- Electric Field Mapping
- Resistivity
- Ohm's Law

- Potentiometer
- Bridge Measurement
- Resistance-Capacitance Circuit
- Kirchhoff's Lows
- Electric Power Transfer
- CRO (Cathode Ray Oscilloscope)
- Magnetic Field and Magnetic Force
- Electromagnetic Induction
- Electronic Components
- Filters and RCL Circuits
- Diodes and Rectifier Circuits
- Zener Diode and Voltage Regulator
- Transistors
- Operational Amplifier (741)
- The 555 Timer
- Logic Gates
- Seven Segment Display and Decoders
- Semiconductor Memories
- Project

PHYSICS LABORATORY (4M)



Location	Lab Staff in Charge	Contacts
M12-102	Faisal Alsane	065052408

INTRODUCTION

This laboratory is designed to teach Advance level of experiments in Physics. It provides handson experience with experiments in Modern Physics and Advance Physics. The experiments cover advanced topics in physics such as Advanced Optics and Spectroscopy, Particle physics, Advanced Electricity and Magnetism, Cryogenics, Nuclear physics, Radiation Physics, Advanced thermodynamics that will help the students to expertise the advance physics topics and physics research.

EQUIPMENT AND INSTRUMENTS

High voltage and current Power Supplies, Light Transmitter and Receiver, Dual Trace Triggered Oscilloscope, Function Generator, Optical Benches, Spectrometers, Light Sources, Laser Beams, Double Slits, Balmer Lamps, Optical Instruments, Geiger – Muller Tube, Radiation Sources, (e/m) Apparatus, Tel-X-Ometer Apparatus, Pasco (h/e) Apparatus, Zeeman Effect Apparatus, Cadmium Lamp, Frank-Hertz Tube with Operating Unit, Oven with Temperature Controller, Modern interferometer, Muon physics apparatus, Noise fundamentals apparatus, Magnetic field and magnetic torque apparatus, Magnetic susceptibility apparatus, Fabry perot interferometer, Fourier methods apparatus, SQUID, digital spectrometer, Programmable Electromagnet, Comprehensive Heat Experiment Apparatus.

- Spectrum of Hydrogen Atom
- Oscilloscope and its Uses in Modern Physics Lab
- Speed of Light Measurement
- Specific Charge of Electron (e/m)
- Frank-Hertz Experiment
- Zeeman Effect

- Radiation Detection and G-M Tube
- Penetration and Attenuation of X-Rays
- Absorption of Gamma and Betta
- Michelson Interferometer
- Photoelectric Effect
- Electron Spin Resonance (ESR)
- X-Ray Diffraction
- Black Body Radiation
- Modern interferometry
- Muon physics
- Noise fundamentals
- Magnetic field and magnetic torque
- Magnetic susceptibility
- Fabry Perot Interferometer
- Fourier methods
- Super conductivity
- Study of different spectrum using digital spectrometer

COMPUTATIONAL CAPABILITIES LABORATORY



Location	Location Lab Staff in Charge	
M12-106 B	Bento Joseph	065052466

INTRODUCTION

This laboratory caters for upper-level undergraduate students and researchers. The laboratory has a full set of networked Linux computers running the latest Ubuntu equipped with PC-based data acquisition and control. It has built linux cluster and to be used mainly for atomistic and band structure calculations. Examples of parallelized software available to users include NAMD, Gromacs and XMD for molecular dynamics, and wien2k for band structure calculations. A licensed proprietary copy of Maple 13.0 and Math Lab also runs on the cluster. Also included several modern open-source compilers like Fortran 90, C++, and C. The cluster is available to all University researchers and their collaborators with access to the University of Sharjah LAN.

EQUIPMENT AND INSTRUMENTS

- Parallel Computer Modules with Large Storage and Memory
- Software:
- Parallelized Molecular Dynamics (XMD, NAMD, VMD, Gromacs, and Others)
- Wien2k: Band Structure Calculations
- Fortran, C, C++ Compilers, Python
- Parallel Maple

EXPERIMENTS

- Molecular Dynamics Simulations
- Other Modeling Experiments
- Atomistic Simulations
- Programming and simulations in Python

- Provide Computing Time to Clients
- Provide Access to Powerful Number Crunching Machine with Open-Source Software

PHYSICS LABORATORY (1W)



INTRODUCTION

This Laboratory is designed to teach students enrolled in the College of Engineering and College of Sciences. Experiments designed to teach the application of Physics fundamentals in kinematics, energy, collision, properties of matter and motion.

EQUIPMENT AND INSTRUMENTS

Measuring tools and devices, Electronic Timers, Force Tables, Air Tracks, Air Blowers, Frictionless Tracks, Trolleys, different Pasco sensors, Pasco Interface, CASSY Interface, Projectile Launcher, Ballistic Pendulum, Springs, Simple Pendulum, Calorimeter, Heaters, Electronic Balances, Linear Thermal Expansion Apparatus, Handheld Vacuum, Hot Plates.

- Measuring Devices and Density
- Equilibrium of Forces at Body Joints
- Free Fall Motion
- Motion in 2-D (Projectile)
- Friction
- Uniformly Accelerated Motion
- Newton's Second Law
- Conservation of Energy
- Conservation of Momentum
- Ballistic Pendulum
- Uniform Circular Motion
- Simple Harmonic Motion

PHYSICS LABORATORY (2W)



Location	Lab Staff in Charge	Contacts
W12-216	Mariam Rashed Al Naqbe	065053469

INTRODUCTION

This Laboratory is designed to teach students enrolled in the College of Engineering and College of Sciences. Experiments designed to teach the application of Physics fundamentals in kinematics, energy, collision, properties of matter and motion.

EQUIPMENT AND INSTRUMENTS

Measuring tools and devices, Electronic Timers, Force Tables, Air Tracks, Air Blowers, Frictionless Tracks, Trolleys, different Pasco sensors, Pasco Interface, CASSY Interface, Projectile Launcher, Ballistic Pendulum, Springs, Simple Pendulum, Calorimeter, Heaters, Electronic Balances, Linear Thermal Expansion Apparatus, Handheld Vacuum, Hot Plates.

- Measuring Devices and Density
- Equilibrium of Forces at Body Joints
- Free Fall Motion
- Motion in 2-D (Projectile(
- Friction
- Uniformly Accelerated Motion
- Newton's Second Law
- Conservation of Energy
- Conservation of Momentum
- Ballistic Pendulum
- Uniform Circular Motion
- Simple Harmonic Motion

PHYSICS LABORATORY (3W)



INTRODUCTION

This laboratory is designed to teach students enrolled in the College of Health Sciences, College of Medical Science and College of Sciences. The experiments that are direct applications of concepts covered error calculation, graphing and analyzing data, measuring devices and density measurements, application of equilibrium of forces at body joints, application of torque, motion, fluid dynamics, thermal and electrical properties of materials, basic optics.

EQUIPMENT AND INSTRUMENTS

Measuring Tools and Instruments, Geometrical Objects, Force Table Sets with Accessories, Torque Apparatus, Frictionless Tracks, CASSY Software and CASSY Sensors, Linear Thermal Expansion Apparatus, Calorimeters, Heaters, Balances, Pasco Interface, Laboratory Jacks, Power Supplies AC-DC, Electronic Elements, Geometrical Optical Sets, Laser Source.

- Measuring Devices and Density
- Equilibrium of Forces at Body Joints
- Relationship of Skeletal Muscles to Bones
- Motion Along a Straight Line (Constant Velocity & Constant Acceleration)
- Magnetic Field of Current Carrying Conductors
- Thermal Properties of Materials (Thermal Expansion & Specific Heat Capacity of Human Teeth
- Static Fluid and the Force of Buoyancy
- Simple DC Circuits
- Reflection, Refraction and Total Internal Reflection

PHYSICS LABORATORY (4W)



Location	Lab Staff in Charge	Contacts
W12-220	Khadija Alhousani	065053466

INTRODUCTION

This laboratory is designed to teach students enrolled in the College of Health Sciences, College of Medical Science and College of Sciences. The experiments that are direct applications of concepts covered error calculation, graphing and analyzing data, measuring devices and density measurements, application of equilibrium of forces at body joints, application of torque, motion, fluid dynamics, thermal and electrical properties of materials, basic optics.

EQUIPMENT AND INSTRUMENTS

Measuring Tools and Instruments, Geometrical Objects, Force Table Sets with Accessories, Torque Apparatus, Frictionless Tracks, CASSY Software and CASSY Sensors, Linear Thermal Expansion Apparatus, Calorimeters, Heaters, Balances, Pasco Interface, Laboratory Jacks, Power Supplies AC-DC, Electronic Elements, Geometrical Optical Sets, Laser Source.

- Forces at Equilibrium
- Measuring Devices and Density
- Motion Along a Straight Line: Part A
- Motion Along a Straight Line: Part B
- Force of Buoyancy
- Heat Equivalence of Electrical Energy
- Linear Thermal Expansion
- Simple DC Circuits
- Magnetic Field Due to a Current Carrying Conductor
- Reflection, Refraction and Total Internal Reflection
PHYSICS LABORATORY (5W)



Location	Lab Staff in Charge	Contacts
W12-213	Taghrid Abdallah	065053467

INTRODUCTION

This laboratory is designed to teach students enrolled in the College of Sciences and College of Engineering. Experiments designed to complement the concepts taught in the theoretical component of Physics 2, which focuses on electricity and magnetism.

EQUIPMENT AND INSTRUMENTS

Measuring meters, Rheostats, Resistance Boxes, DC and AC Power Supplies, electronic elements (capacitors, resistors, etc.), Resistivity Apparatus, Potentiometers, Switches, Meter Bridges, Stop Watches, electroplating apparatus, electric field mapping apparatus, High Current Power Supplies, CASSY software, CASSY sensors and Boxes (force, magnetic field, etc.), Magnets, Set of Conducting Loops, Pasco Interface, Pasco sensors, Coils, Transformers, Oscilloscopes, Induction Coils.

- Circuit Construction and Measurements
- Electric Field Mapping
- Resistivity
- Ohm's Law
- Potentiometer
- Bridge Measurement
- Resistance-Capacitance Circuit
- Kirchhoff's Lows
- Electric Power Transfer
- CRO (Cathode Ray Oscilloscope)
- Magnetic Field
- Magnetic Force
- Electromagnetic Induction (Lens'z Low and Faraday's Law)

GEOSCIENCE / GEOPHYSICS EXPERIMENTAL LABORATORY



Location	Lab Staff in Charge	Contacts
W12-219	Abdelmahmoud Elsamani	065053457

INTRODUCTION

The laboratory of applied geophysics supports mainly three different courses: General Geophysics (1460223), Exploration Geophysics 1 (1460312), Exploration Geophysics 2 (1460313), which are offered to the students of the Petroleum Geosciences and Remote Sensing program. The scope of this laboratory is to get the students familiar with different geophysical methods, and their fields of applications. This includes a wide range of applications such as natural resources exploration, geotechnical and engineering applications, environmental, archeological and hydrogeological investigations. The laboratory will also support ongoing research related to Geophysics, geology engineering and environmental investigations.

EQUIPMENT AND INSTRUMENTS

The laboratory is equipped for using different geophysical methods mainly the near-surface seismic methods and the Ground Penetrating Radar. Different accessories are also available like Computers, computer software, measuring tapes, hammers.... etc. The main equipment available in laboratory of applied geophysics are:

- Geode 24-channel Seismograph with 24 geophones (4.5 Hz) and accessories.
- GSSI SIR4000 GPR system with 270 MHz and 400 MHz antennas.

EXPERIMENTS

The available equipment and accessories can be used for the following experiments:

- Seismic Refraction survey.
- Seismic Reflection survey.
- Multichannel analysis of surface waves survey.
- Ground Penetrating Radar (GPR) survey.

• Seismic Refraction survey.

The main Services and Applications is:

- Mapping of the bedrock.
- Map faults in the bedrock.
- Estimate the bedrock Rippability.
- Mapping geologic strata and anomalous conditions.
- Seismic Reflection survey.

The main Services and Applications is:

- Oil and gas exploration.
- Map faults in the bedrock.
- Mapping geologic strata and anomalous conditions.
- Ground water exploration.
- Tectonic studies.
- Earthquake hazard studies.
- Multichannel analysis of surface waves survey.

The main Services and Applications is:

- Soil compaction control.
- Pavement evaluation.
- Mapping subsurface stratigraphy.
- Alternative techniques for borehole seismic techniques.
- Profile shear stiffness vs. depth.
- Predict ground deformation under loading
- Assess integrity of concrete structures
- Assess Liquefaction potential
- Ground Penetrating Radar (GPR) survey.

The main Services and Applications is:

- Locate metallic and nonmetallic pipes and utility cables.
- Delineate underground storage tanks (metallic and nonmetallic).
- Map shallow groundwater tables and soil stratigraphy.
- Map shallow bedrock topography.
- Map subsurface voids and cavities.
- Characterize archaeological site.
- Map rebar in concrete structure.

PETROLOGY (MICROSCOPY) LABORATORY



Location	Lab Staff in Charge	Contacts
W12-221	Abdelmahmoud Elsamani	065053457

INTRODUCTION

The petrology Laboratory is the first lab of newly introduced program Petroleum Geoscience and Remote Sensing (PGRS) in the Physics department, The program has serious of applied courses which require space for laboratory experiments and teaching. Newly ordered 10 teaching microscopes for rock and mineral identification and several upcoming equipment's are expected to support these lab sessions.

The courses which will be served are the following

- 1460221-Stratigraphy and Structure Geology
- 1460220-Sedimentary Rocks and Sedimentology.
- 1460225 Igneous and Metamorphic Rocks Petrology
- 1460324 Hydrogeology

EQUIPMENT AND INSTRUMENTS

- 9 Teaching microscopes
- Attenberg method baths
- Sieving stacks with vibrating base
- Precise scales (4 digits)
- Rock specimens for demonstration and teaching
- Mineral specimens for demonstration and teaching
- Glassware
- Rock crushing equipment
- Geological Hammers
- Geological compasses
- Water Infiltration drums
- GPS meters

EXPERIMENTS

- Mineral identification with Microscopy (optical properties)
- Rocks identification with Microscopy (optical properties)
- Sieving and crushing rocks
- Rock density measurements
- pH and electrical conductivity in soils and rocks
- Grain size distribution and separation of sand silt and clay
- Rocks and minerals physical properties (in specimens) like streak color, cleavage hardness, magnetism, acid reaction, mineral color.
- Infiltration tests in soil

- Grain size distribution analysis in rocks and soils
- Report on Petrology of Rocks with microscope identification
- Infiltration test in soils and sediments
- Reporting mineralogy content in rocks

RADIATION LABORATORY



Location	Lab Staff in Charge	Contacts
W12-213 A	Dr. Hussein Elmehdi	065052359/3016

INTRODUCTION

This Laboratory is utilized for teaching courses related to the nature and applications of radiation sources such as X-ray, and nuclear radiation sources, as well, as, for research into topics related to radiation, radiobiology and environmental studies.

EQUIPMENT AND INSTRUMENTS

X-ray fluorescence and X-ray diffraction equipment in addition to Scintillation detectors.

- X-ray attenuation
- X-ray Spectrometry
- X-ray diffraction
- Radiography
- Gamma spectroscopy

SPECTROSCOPY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-213 B	Dr. Hussain Al Awadhi	065052355

INTRODUCTION

The Spectroscopy Laboratory focuses on investigating intrinsic properties of novel and new semiconductors. Photo-modulation reflectivity and transmission, and photoluminescence are employed to determine the band-gap and other properties of semiconductors at temperatures down to 6K. Most of the work has been concentrated on II-VI binary, ternary, and quaternary compound semiconductors and specially diluted magnetic semiconductors in which some of the group II atoms are replaced by transition metal atoms like Mn, Fe, Co and V.

EQUIPMENT AND INSTRUMENTS

- Liquid Nitrogen and Closed Cycle Helium Cryostats for Low Temperature Measurements
- Computer Controlled Spectrometers and Mono chromator With Multiple Gratings Optimized for Different Spectral Regions
- Solid State Detectors That Cover the Spectral Region From UV to IR
- Different Lasers
- Lock-in Amplifier for Low Level Signal Detection

EXPERIMENTS

- Reflectivity, Absorption and Transmission in the Range of 300-1700nm
- Photoluminescence using Blue, Green and Red Lasers
- Bandgap Measurement of Semiconductors at Low Temperatures

- Reflectivity, Absorption and Transmission of Solids and Liquids in the Range of 300-1700nm (Around Room Temperature
- Reflectivity, Absorption and Transmission of Solids at Low Temperature (Down to 6K)

RESEARCH LABORATORY



Location	Lab Staff in Charge	Contacts
W12-213 C	Dr. Hafsa Khurshid	065053420

INTRODUCTION

Materials synthesis lab- The focus of this lab is to synthesize Iron-gold nano rods, Iron oxide and nickel oxide nanoparticles that can be used for a wide range of applications.

EQUIPMENT AND INSTRUMENTS

- Electronic weighing balance
- Fume hood
- Bath Sonicator
- Desiccator
- Small Refrigerator
- Lab glass wares
- Hot plate
- Temperature controller
- Step up and step-down stabilizer
- DC power supply

EXPERIMENTS

- Synthesis of iron-gold nano rods by electrochemical deposition
- Synthesis of iron oxide and nickel oxide nanoparticles
- Functionalization of Iron oxide nanoparticles by FITC

TESTS AND SERVICES

The iron-gold nano rods, iron oxide and nickel oxide nanoparticles are being synthesized in the lab, they will be used for bio-medical, and optoelectronic applications as all these nanoparticles show high biocompatibility and optical properties. These particles are very safe, non-toxic, and non-radioactive.

CHEMISTRY DEPARTMENT

Chemistry Laboratories

Lab Name	Location	Person in Charge	Programs Served	Courses Served
General Chemistry Lab	- W12-236 - M12-025 - M12-031	 Kifah Al- Taqaz Mussab Osama Hassan Amin Hasan 	Chemistry Dept.College of Engineering	General Chemistry (l) Lab
General Chemistry Lab	W12-240	Reem Alteneiji	Chemistry Dept.	General Chemistry (II) Lab
Analytical Chemistry Lab	M12-034	Mohamed Al- Farouq	Chemistry Dept.	Analytical Chemistry
Organic Chemistry Lab	W12-235	- Amin Hasan - Alaa Bihi	Chemistry Dept.	Organic Chemistry (I) Lab
Organic Chemistry Lab	W12-235	- Amin Hasan - Alaa Bihi	Chemistry Dept.	Organic Chemistry (II) Lab
Organic Chemistry Lab	W12-235	Hajar Ibrahim	Chemistry Dept.	Identification of Organic Compounds
Physical, Inorganic Chemistry lab	W12-239	 Nemat Dek AlBab Alaa Bihi 	Chemistry Dept.	Instrumental Analysis
Physical, Inorganic Chemistry lab	W12-239	Kifah Al Taqaz	Chemistry Dept.	Inorganic Chemistry Lab
General Chemistry Lab	- M12-029 - M12-031	- Hajar Ibrahim - Amin Hasan	College of MedicineCollege of Dentistry	General Chemistry Lab for Medical Sciences Students
Physical, Inorganic Chemistry lab	W12-239	Hajar Ibrahim	Chemistry Dept.	Physical Chemistry (I) Lab
Physical, Inorganic Chemistry lab	W12-239	Kifah Al Taqaz	Chemistry Dept.	Physical Chemistry (II) Lab
Instrumental Analysis Lab	W12-231D	Nemat Dak El-Bab	Chemistry Dept.	 Chemistry Senior Project Instrumental Analysis Identification of Organic Compounds Organic Chemistry 2
General Chemistry	- W12-240 - M12-031 - M12-029	 Reem Alteneiji Amin Hasan Alaa Bihi 	 Biotechnology Dept. College of Health Sciences 	General Chemistry Lab for HS
Organic Chemistry Lab	- W12-235 - M12-029	- Amin Hasan - Hajer Ibrahim	 Biotechnology Dept. College of Health Sciences 	Organic Chemistry for HS
Analytical Chemistry Lab	M12-034	Mohamed Alfarouq	Biotechnology Dept.	Analytical Chemistry for HS

Lab Name	Location	Person in Charge	Programs Served	Courses Served
Chemistry Students Research – Lab 1	W12-231	 Prof. Raed Al Qawasmeh Prof. Ideisan Abu-Abdoun Dr. Mohamed El-Naggar 	Chemistry Dept.	Chemistry Senior Project
Chemistry Student Research – Lab 2	W12-232	 Prof. Monther Khanfar Prof. Abdelnasser Metwally Dr. Ayssar Nahle Dr. Ahmed Al-Mahdi Dr. Abdelaziz Elgamouz Dr. Kamrul Hassan 	Chemistry Dept.	Chemistry Senior Project

Chemistry Lab Staff

#	Name	Title	Ext.	Email
1	Nemat Dek Al Bab	Team Leader	065053477	naimat@sharjah.ac.ae
2	Mohamed Al Farooq	Sr. Lab Officer	065052470	malfarouk@sharjah.ac.ae
3	Kifah Al-Taqaz	Sr. Lab Officer	065053475	kifah@sharjah.ac.ae
4	Hajar Ibrahim	Lab Officer	065053441	habdalla@sharjah.ac.ae
5	Reem Alteneiji	Lab Officer	065053445	ralteneiji@sharjah.ac.ae
6	Amin Hasan Botmah	Lab Officer	065053470	abotmah@sharjah.ac.ae
7	Alaa Bihi	Lab Officer	065053423	abihi@sharjah.ac.ae
8	Ali Hussam Al-Samarrai	Lab Technician	065052477	aalsamarrai@sharjah.ac.ae

GENERAL CHEMISTRY (I) LABORATORY



Location	Lab Staff in Charge	Contacts
W12-236	Kifah Al-Taqaz	065053475
M12-025	Mussab Osama Hassan	065052477
M12-031	Amin Hasan	065053470

INTRODUCTION

This Laboratory is designed to teach students at the College of Engineering and College of Sciences the basic qualitative and quantitative aspects of General Chemistry.

EQUIPMENT AND INSTRUMENTS

• Analytical Balances

- Ovens
- Heating and Cooling Systems
 Centrifuges

EXPERIMENTS

- The Scientific Methods: Measurements and Significant Figures
- Determination of the Density of Liquids and Solids
- Melting Point and Boiling Point
- Separation of a Mixture
- Composition of Hydrated Salt
- Heat of Reaction
- Determination of the Gas Constant R
- Qualitative Analysis of Anions
- Qualitative Analysis of Cations
- Paper Chromatography
- Acid Base Titration

- Determining the Density of Solids & Liquids
- Determining the Melting & Boiling Point
- Qualitative Determination of Anions and Cations

GENERAL CHEMISTRY (II) LABORATORY



Location	Lab Staff in Charge	Contacts
W12- 240	Reem Alteneiji	065053445

INTRODUCTION

This Laboratory course is designed to teach various practical methods such as spectrophotometric methods, PH measurements, titration methods, thermodynamics, and kinetics.

EQUIPMENT AND INSTRUMENTS

- Analytical Balances
- Heating and Cooling Systems
- Ovens PH Meters

• Spectrophotometer

- Different Ions Selective Electrodes
- Conductometers

EXPERIMENTS

- Molecular Geometry and Bonding
- Colligative Properties- Freezing point Depression
- Factors affecting Reaction Rate-Concentration and Temperature
- Determination Rate of Reaction and the order of the reaction
- Hydrolysis pH meter, Buffers
- Vinegar Analysis
- Acids, Bases and Neutralization Reactions-Antacid Analysis.
- Determination of an Equilibrium Constant
- Solubility (Solutions and Concentrations- Determining the Solubility Rules of Ionic Compounds) Chemical Quantities and Aqueous Reactions Solution Concentration and Dilution
- Solubility Product of Lead Iodide
- Electrolytic Cells, Galvanic Cells and the Nernst Equation

TESTS AND SERVICES

• Titration Methods

ANALYTICAL CHEMISTRY LABORATORY



Location	Lab Staff in Charge	Contacts	
M12-034	Mohamed Al-Farouq	065052470	

INTRODUCTION

This Laboratory introduces students to the concepts of basic Practical Analytical Chemistry and develops advanced laboratory skills in Analytical Chemistry. Students learn the standard methods of volumetric and gravimetric analysis.

EQUIPMENT AND INSTRUMENTS

- PH Meters
- Conducto-meters
- Different Selective Electrodes
- Potentiometers
- Ovens
- Digital Voltmeters
- Analytical Balance
- Muffle Furnace

- Precision of Measurements
- PH Instrumentation and Measurements
- Buffers
- PH Titration
- Standardization of NaOH and Determination of an Unknown Acid
- Determination of a Carbonate Unknown
- Complexometric Titration of Zinc
- Titration of Chloride Unknown Solution by Volhard Method
- Analysis of Solid Specimen of Iron
- Gravimetric Determination of Nickel

- Gravimetric Determination of Iron as Iron (III) Oxide
- Gravimetric Determination of Calcium as CaC2O4.H2O

- Preparation of Standard Solutions
- Quantitative and Qualitative Analysis of Ions and Metal

ORGANIC CHEMISTRY (I) LABORATORY



Location	Lab Staff in Charge	Contacts
W12- 235	Amin Hasan	065052470
	Alaa Bihi	065053423

INTRODUCTION

This Laboratory course is designed to teach Practical Organic Chemistry for Chemistry students. This course covers various topics in the practical methods of separation, purification, extraction and synthesis of organic compounds as well as their identification.

EQUIPMENT AND INSTRUMENTS

- Analytical Balances
- Ovens
- Fractional Distillation
- Heating and Cooling Systems
- Melting Point Apparatus
- Water Purification System Type-1
- BET Sorptometer

- Measuring Melting Points of Compounds and Mixtures
- Boiling points and Distillation (Simple & Fractional)
- Recrystallization of benzoic acid
- Extraction of Caffeine from Tea with Methylene Chloride
- Separation of a Mixture of Cyclohexane and Toluene by Fractional Distillation
- Nitration of Bromobenzene
- Oxidation of Alcohols Preparation of Cyclohexanone
- Preparation of an Alkene from an Alcohol
- Steam Distillation Isolation of an essential oil
- Separation by acid base extraction

- Oxidation of Alcohols Preparation of Adipic Acid
- Identification of an Unknown Carbonyl Group
- Molecular Modeling

- Measuring Melting Points of Organic Compounds and Mixtures
- Thin Layer Chromatography Analysis of Analgesic Drugs
- Isolation of Essential Oil

ORGANIC CHEMISTRY (II) LABORATORY



Location	Lab Staff in Charge	Contacts
W/12 225	Amin Hasan	065052470
VV 12- 235	Alaa Bihi	065053423

INTRODUCTION

This Laboratory course is designed to teach advanced Practical Organic Chemistry to Chemistry students. This course covers various syntheses of organic compounds and basic spectroscopic techniques for the identification of organic compounds.

EQUIPMENT AND INSTRUMENTS

- Distillation Systems
- Heating and Cooling Systems
- Melting Point Apparatus
- Spectroscopic Instruments
- NM Ready Spectrometer

- Benzil from Benzoin from Benzaldehyde
- Benzylic acid from benzil
- Cannizzaro reaction
- Diels-Alder Reaction
- Nitration of Bromobenzene
- Benzoic acid by haloform/Benzoic acid from Nitrile hydrolysis
- Reduction of nitrobenzene to aniline
- Dibenzalacetone by Aldol Condensation
- Borohydride Reaction of Benzil
- Synthesis of Stilbene from Benzoin
- Heterocyclic synthesis: benzimidazole synthesis
- Derivatives of 1,2-Diphenylethane a Multi-Steps Synthesis

• IR and NMR Spectroscopy

- Synthesis of Organic Compounds
- Identification of Organic Compounds by Spectroscopic Techniques

IDENTIFICATION OF ORGANIC COMPOUNDS LABORATORY



Location	Lab Staff in Charge	Contacts
W12- 235	Hajar Ibrahim	065053441

INTRODUCTION

This course covers various physical properties, purity determination, molecular formulas, and classification by solubility, spectrometric methods, functional groups by chemical tests, preparation of derivatives and separation of mixtures are covered.

EQUIPMENT AND INSTRUMENTS

- Analytical Balances
- Distillation Systems
- Heating and Cooling Systems
- Melting Point Apparatus
- Spectroscopic Instruments
- NMR

EXPERIMENTS

- Identification of Unknowns Preliminary Examination, Physical Properties, and Elemental Analysis
- Classification of Organic Compounds by Solubility
- Spectrometric Methods
- Chemical Tests for Functional Groups
- The Preparation of Solid Derivatives
- Separation of Mixtures
- Structural Problems Solution Methods and Exercises

- Synthesis of Organic Compounds and their Derivatives
- Identification of Organic Compounds by Spectroscopic Techniques
- Separation of Organic Mixtures

INSTRUMENTAL ANALYSIS LABORATORY



Location	Lab Staff in Charge	Contacts
W12- 231D	Nemat Dek AlBab	065053477
	Alaa Bihi	065053423

INTRODUCTION

This course is designed for Chemistry majors. Topics chosen to give a range of experiments in order to provide students with a solid background in practical instrumental analysis, which includes spectroscopic, electroanalytical and chromatographic methods.

EQUIPMENT AND INSTRUMENTS

- UV-Visible Spectrophotometer
- ICP-OES
- HPLC
- GC-FID
- Atomic Absorption Spectroscopy
- GC-MS
- Flame Photometry
- Cyclic Voltammetry
- Flourophotometry Spectroscopy
- Automated Flash Chromatography
- Double Beam Spectrophotometer with Peltier system

- The Quantitative Determination of the Aspirin Content of Tablets Using UV Wavelength Spectroscopy
- Molecular Fluorescence, analysis of vitamin B2, riboflavin, by measuring its native fluorescence
- Determination of Water Hardness by Inductively Coupled Plasma (ICP) Optical Emission

Spectrometry (OES)

- Introduction to Mass Spectrometry, MALDI-TOF, analysis of high molecular weight proteins
- Determination of Sodium and Potassium in Fruit Juice by Flame Photometry
- Determination of Lead in Soil by Flame Atomic Absorption Spectrometry Flame Atomic Absorption
- Electrochemistry: Cyclic Voltammetry of Platinum in Ferro- / Ferri-Cyanide Solution
- Gas-Liquid Chromatography (GC): Analysis of Hydrocarbon Mixture
- Gas-Liquid Chromatography (GC): Analysis of Alcohols Mixture
- High-Performance Liquid Chromatography (HPLC): Determination of Caffeine in Beverages

- Metals Determination
- Characterization and Identification of Chemical Compounds Mixtures

INORGANIC CHEMISTRY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-239	Kifah Al Taqaz	065053475

INTRODUCTION

This course includes experiments that aim to develop the student's laboratory skills and demonstrate many important techniques in inorganic chemistry. Experiments based upon synthesis and physical measurements of coordination and organometallic compounds.

EQUIPMENT AND INSTRUMENTS

- Analytical Balances
- UV-Visible Spectrophotometer
- Hot Plates with Stirrers
- Gouy Balance

- Preparation of [Hexaamminenickel (II)] Chloride, [Ni(NH3)6]Cl2
- Preparation of Hexaaminecobalt (III) Chloride, [Co(NH3)6]Cl3
- Preparation of Carbonatotetraaminecobalt (III) Nitrate, [Co(NH3)4CO3]NO3
- Preparation of [Chloropentaamminecobalt(III)] Chloride by two Methods, [Co(NH3)5Cl]Cl2
- Nitritopentaamminecobalt(III) Chloride & Nitropentaamminecobalt(III) Chloride [Co(NH3)50N0]Cl2 & [Co(NH3)5N02]Cl2
- Synthesis of Cis-Potassium Diaquabis(Oxalato)Chromate(III) Dihydrate: Cis- K[Cr(C2O4)2(H2O)2].2H2O
- Synthesis of Cis-Potassium Diaquabis(Oxalato)Chromate(III) Dihydrate: Cis- K[Cr(C2O4)2(H2O)2].2H2O
- Magnetic Susceptibility, Magnetism
- UV-Vis Spectra for Transition-Metal Complexes
- Preparation of Cis and Trans Bis (Glycinato)Copper(II).Hydrate
- Preparation of Metal Acetylacetonato Compounds

PHYSICAL CHEMISTRY (I) LABORATORY



Location	Lab Staff in Charge	Contacts
W12- 239	Hajar Ibrahim	065053411

INTRODUCTION

This course covers the necessary laboratory techniques for physical measurements, error analysis and statistics through conducting experiments on gases, calorimetry, equilibrium and phase changes.

EQUIPMENT AND INSTRUMENTS

- Analytical Balances
- Viscometer
- Barometers
- Manometer
- Water Bath
- Temperature Sensor
- Shakers
- Pressure Sensor
- Bomb Calorimeter
- Gas Gauge
- Refractometer
- Differential Scanning Calorimeter (DS

- Fundamentals: Error Analysis and Data Collection
- Heat Capacity Ratios for Gases
- Bomb Calorimeter (Heat of Formation of Sucrose and Naphthalene)
- The Vapor Pressure and Heat of Vaporization of Liquids
- Determination of Resonance Energy of Benzene
- Adiabatic Flame Calorimeter

- The Vapor Pressure and Heat of Vaporization of Liquids
- Determination of pKa of methyl Red (Spectroscopic Analysis)
- Liquid-Vapor Phase Diagram: Calibration using Refractive Indices
- Liquid-Vapor Phase Diagram: Constructing the Phase Diagram
- Molecular Weight and Monomer Linkage Properties of Poly (Vinyl Alcohol)
- Phase Diagram of Tertiary System
- Dissociation of Ammonium Carbamate
- DSC

• Thermal Analysis

PHYSICAL CHEMISTRY (II) LABORATORY



Location	Lab Staff in Charge	Contacts
W12- 239	Kifah Al Taqaz	065053475

INTRODUCTION

Physical Chemistry (II) Laboratory introduces students to advanced laboratory skills and techniques to study chemical reactions kinetics and mechanisms.

EQUIPMENT AND INSTRUMENTS

- Analytical Balances
- Viscometer
- Ovens
- Manometer
- Oxygen Gas Sensors
- Pressure Sensor
- Gas Sensors
- Temperature Sensor
- Conductometer

- Measurements, Precision and the Treatment of Experimental Data in the Physical Chemistry Laboratory
- Surface Tension. Properties of Liquids
- Study the Effect of Temperature on the Surface Tension of Water
- Viscosity of Liquids: Low Viscosities. The Flow Times of each of (Methanol/Water) and (Toluene/P-Xylene) Solutions at 25oC
- The Flow Times of P-Xylene at Different Temperatures
- Viscosity of Liquids: High Viscosities. Using Falling Ball Viscometer: Measuring the Falling Times of Glycerol vs. Temperature
- Determination of Collision Diameters from Gas Viscosities

- Enzyme Action: Testing Catalase Activity in Different Conditions; Enzymatic Hydrolysis of Hydrogen Peroxide by Peroxidase
- Enzymatic Hydrolysis of Hydrogen Peroxide by Peroxidase. Testing the Effect of Temperature
- Kinetics and Mechanism of Heterogeneous Reaction: Oxidation of Magnesium by Hydrochloric

• Gas and Liquid Viscosity Determination

GENERAL CHEMISTRY LABORATORY (FOR HEALTH SCIENCES STUDENTS)



Location	Lab Staff in Charge	Contacts
W12-240	Reem Alteneiji	065053445
M12-031	Amin Hasan	065053470
M12-029	Alaa Bihi	065053423

INTRODUCTION

This Laboratory is designed to teach General Chemistry for the College of Health Sciences. The main purpose of this lab is to provide students with a strong practical basis in the principles and practices of Chemistry to conduct various qualitative and quantitative experiments.

EQUIPMENT AND INSTRUMENTS

- Analytical Balances
- Heating and Cooling Systems
- Ovens
- PH Meters
- Heating Cabinets
- Hot Plates with Stirrers
- Centrifuges

- The Scientific Methods: Measurements and Significant Figures
- Determination of the Density of Liquids and Solids
- Melting Point and Boiling Point
- Determination of the Gas Constant R
- Quantitative Yield of a Redox Reaction
- Composition of Hydrated Salt
- Qualitative Analysis of Anions
- Qualitative Analysis of Cations
- Quantitative Analysis: Acid-Base Titration

- Hydrolysis
- Paper Chromatography
- Heat of Reaction

- Density of Liquids and Solids Determination
- Melting and Boiling Point Determination
- Qualitative Determination of Anions and Catio

GENERAL CHEMISTRY LABORATORY (FOR MEDICAL SCIENCES STUDENTS)



Location	Lab Staff in Charge	Contacts
M12-029	Amin Hasan	065053470
M12-031	Hajar Ibrahim	065053441

INTRODUCTION

This Laboratory course is designed to teach Practical General Basic and Organic Chemistry to medical students. This course covers various topics in the practical methods of purification, identification, chromatography and synthesis of organic compounds. It also covers qualitative and quantitative aspects of the General Chemistry Laboratory.

EQUIPMENT AND INSTRUMENTS

- Heating and Cooling Systems
- Analytical Balances
- Ovens
- Centrifuges
- Suction Filtration
- Hot Plates with Stirrers
- UV/Vis

- Qualitative Analysis of Anions and Cations
- Purification by Recrystallization
- Liquid-Liquid Extraction- Cellulose recovery from a mixture of caffeine, cellulose, and benzoic acid
- Synthesis of Aspirin
- Oxidation of Alcohols: Preparation of Benzoic Acid
- Identification of Alcohols
- Identification of Aldehydes and Ketones
- Quantitative Analysis: Acid-Base Titration

- Thin Layer Chromatography of phenol, benzoic acid, and butyl phenyl ether. Effect of solvent composition
- Quantitative analysis of Amino acids using UV-VIS

- Qualitative Analysis of Anions and Cations
- Acid-Base Titration

ORGANIC CHEMISTRY LABORATORY (FOR HEALTH SCIENCES STUDENTS)



Location	Lab Staff in Charge	Contacts
M12-029	Amin Hasan	065053470
W12-235	Hajar Ibrahim	065053441

INTRODUCTION

This Laboratory course is designed to teach Practical Organic Chemistry to Health Sciences students. It covers various topics in the practical methods of separation, purification, identification and synthesis of organic compounds.

EQUIPMENT AND INSTRUMENTS

- Rotatory Evaporator
- Hot-Plates with Magnetic Stirrers
- Distillation System
- Ovens

EXPERIMENTS

- Purification by Recrystallization
- Isolation of Caffeine from Tea Leaves
- Synthesis of Aspirin
- Identification of Alcohols and Phenols
- Properties of Carboxylic Acids and Esters
- Properties of Amines and Amides

- Analytical Balances
- Melting Point Apparatus
- Heating and Cooling Systems
 - Synthesis of Polymers
 - Nitration of Methyl Benzoate
 - Oxidation of Alcohols
 - Identification of Aldehydes and Ketones
 - Preparation and Properties of Soap
 - Structure in Organic Compounds

TESTS AND SERVICES

• Separation, Purification and Identification of Organic Compounds.

ANALYTICAL CHEMISTRY LABORATORY (FOR HEALTH SCIENCES STUDENTS)



Location	Lab Staff in Charge	Contacts
M12-034	Mohamed Al-Farouq	065052470

INTRODUCTION

This Laboratory is designed to teach Practical Analytical Chemistry to Health Sciences students. It covers the concepts of basic practical analytical chemistry. Students learn the standard methods of volumetric and gravimetric analysis.

EQUIPMENT AND INSTRUMENTS

- PH Meters
- Conductometers
- Different Selective Electrodes
- Potentiometers
- Ovens
- Digital Voltmeters
- Analytical Balances
- Muffle Furnace

- Precision of Measurements
- PH Instrumentation and Measurements
- Buffers
- Potentiometric Titration
- Standardization of NaOH and Determination of an Unknown Acid
- Determination of a Carbonate Unknown
- Complexometric Titration of Zinc
- Titration of Chloride Unknown Solution by Volhard Method
- Analysis of Solid Specimen of Iron
- Gravimetric Determination of Nickel

- Gravimetric Determination of Iron as Iron (III) Oxide
- Gravimetric Determination of Calcium as CaC2O4.H2O
- Redox Titration of Vitamin- C (Iodometric Method)

- Preparation of Standard Solutions
- Quantitative and Qualitative Analysis of Ions and Me

CHEMISTRY STUDENTS RESEARCH (LAB 1)



Location	Lab Staff in Charge	Contacts
W12-231	Prof. Raed Al Qawasmeh	065051718
	Prof. Ideisan Abu-Abdoun	065053810
	Dr. Mohamed El-Naggar	065053816

INTRODUCTION

Several types of Polymers and Organic Chemistry Research are carried out in this lab such as:

- Extraction of Various Organic Natural Products
- Synthesis biologically relevant compounds
- Synthesis of new organic scaffolds
- Application of Ne methodology in organic synthesis
- Synthesis of Different Water-Soluble Polymers and Polymer Blend
- Identification of Major Organic Functional Groups
- Catalysis
- Polymer Characterization and Analysis
- Forensic Chemistry
- Synthesis of gold nanoparticles

EQUIPMENT AND INSTRUMENTS

- High Performance Liquid Chromatography (HPLC)
- UV/Visible Spectrometer
- ATR-IR
- Various Types of Glassware
- Rotary Evaporator
- Refractometers
- Shakers
- Heating Mantles
- Magnetic Stirrer Hotplates
- General Purpose Water Bath

- Vacuum Oven
- Analytical Balances
- Viscometer
- Electrochemical workstation
- Gas Chromatograph Mass Spectrometer Shimadzu

- Offering Consultancy on Polymer Synthesis, Characterization and Analysis
- Separation and Identification of Natural Products
- Custom synthesis for any organic compounds

CHEMISTRY STUDENTS RESEARCH (LAB 2)



Location	Lab Staff in Charge	Contacts
W12-232	Prof. Monther Khanfar	065051731
	Prof. Abdelnasser Metwally	065166707
	Dr. Ayssar Nahle	065053812
	Dr. Ahmed Almehdi	065053813
	Dr. Abdelaziz Elgamouz	065051769
	Dr. Kamrul Hassan	065051768

INTRODUCTION

Several types of Analytical and Bioanalytical Chemistry Research are carried out in this lab such as:

- Industrial Analysis
- Water Analysis and Treatment
- Corrosion and Protection of Metals
- Electrochemistry
- Bioanalytical Assays
- Protein Analysis
- Lipids Analysis

EQUIPMENT AND INSTRUMENTS

- Electrochemical Workstation
- Impedance Spectrometer
- Ultrasonic Water Bath
- Various Types of Glassware
- Analytical Balances, Conductometers, PH Meters, etc.
- Rotary Evaporator
- UV-Vis
TESTS AND SERVICES

- Offering consultancy in:
- Corrosion Protection & Control
- Industrial Processing
- Environmental Analysis
- Waste Products Analysis
- Techniques Validation
- The following may be analyzed:
- PH of Soil
- Water Soluble Sulfate in Ground Water and Soil Extracted
- Water Soluble of Chloride in Ground Water and Soil Extracted
- Acid Soluble Chloride in Soil
- Acid Soluble of Sulfate in Soil
- Water Soluble Chloride in Aggregate
- Specific Gravity and Eater Absorption in Cores Aggregate
- Specific Gravity and Water Absorption of Fine Aggregate
- Acid Soluble Chloride in Aggregate
- Acid Soluble Sulfate in Aggregate
- Water Soluble Sulfate in Aggregate
- Acid Soluble Materials in Fine Aggregate
- Chloride Content of Cement
- PH Value in Water
- Chloride Content in Water
- Sulfate Content in Water
- Total Dissolved Solids in Water
- PH Value of Water and Wastewater
- Conductivity of Water and Wastewater
- Total Dissolved Solids in Water and Wastewater
- Suspended Solids in Water and Wastewater
- Total Solids in Water and Wastewater
- Acidity in Water and Wastewater
- Alkalinity in Water and Wastewater
- Nitrate Nitrogen in Water and Wastewater
- Nitrite Nitrogen in Water and Wastewater
- Sulfate in Water and Wastewater
- Chloride in Water and Wastewater
- Volatile Solids in Water and Wastewater
- Heavy Metal Analysis (Hg, Pb, Cd, Cu, Cr, Co, Zn, Mn)

- Some techniques commonly used in bioanalytical studies include:
- HPLC (High Performance Liquid Chromatography)
- GC-MS (Gas Chromatography)
- TGA (Thermal Gravimetric Analysis
- DSC (Differential Scanning Calorimetry)
- Thin Layer Chromatography
- Electrophoresis
- Ligand Binding Assays
- ELISA (Enzyme-linked Immunosorbent Assay)
- Nuclear Magnetic Resonance
- Determination of the Physico-Chemical Parameters of Drinking Water and Groundwater (Cl-, NO3-, NO2-, SO42-, NH4+, pH, Electrical Conductivity, DCO, Hydrocarbons, Bacteria etc.) and (Na+, K+, Mg2+, Ca2+, Pb2+, Cd2+...etc)
- Volumetric, Gravimetric, Flame Atomic Absorption Spectrometry
- Bacterial Testing Including Test for Total Coliforms, Fecal Coliforms, Streptococcus, Vvibrio Cholerae and Salmonella
- Preparing Liquid Media and Solid Media (Loryl, Roth, Vert brilliant, Litsky, Tergitol 7 Agar, Slanetz, Kligle,...)
- Protein Content
- Lipids Content
- Derivatization of Fatty Acids
- Ash Measurements
- DPPH Scavenging Activity
- Hydroxyl Radical Scavenging Activity
- Metal Chelating
- Polyphenol and Flavonoid Content
- Reducing Power Method (RP)
- Hiobarbituric Acid Reactive Substances (TBARS)
- Protein Carbonyl Measurements

APPLIED BIOLOGY DEPARTMENT

Applied Biology Laboratories

Lab Name	Location	Person in Charge	Programs Served	Courses Served
General Biology Lab	W12-039	Mona Al Ali	Applied Biology Dept.	General (Basic Course)
General Microbiology Lab	M12-132	Aisha Echtibi	Applied Biology Dept.	 Tissue Culture & Hybridoma Technology Molecular Genetics Plant Biotechnology Microbial Processing & Biotechnology Environmental Biotechnology
Immunology & Serology Lab	W12-205	Mona Al Ali	Applied Biology Dept.	Immunology & Serology Lab
Tissue Culture & Hybridoma Technology	M12-132	Mona Ibrahim	Applied Biology Dept.	 Tissue Culture & Hybridoma Technology Student Research Project Microbial Genetics
Molecular Genetics Lab	W12-039	Mona Ibrahim	Applied Biology Dept.	Molecular Genetics
Molecular Biology Lab	M12-131	Mona Mahfood	Applied Biology Dept.	 Molecular Biology Microbial Genetics Student Research Project M.Sc. Thesis
General Biochemistry Lab	W12-227	Mona Al Ali	Applied Biology Dept.	General Biochemistry
Protein Biochemistry & Engineering Lab	W12-039	Mona Mahfood	Applied Biology Dept.	Protein Biochemistry & Engineering Lab
Plant Biotechnology Lab	W12-039	Maryam Ghaleb	Applied Biology Dept.	Plant BiotechnologyStudent Research Project
Microbial Processing & Biotechnology Lab	W12-205	Maryam Ghalib	Applied Biology Dept.	Microbial Processing & Biotechnology
Environmental Biotechnology Lab	M12-132	Mona Ibrahim	Applied Biology Dept.	Environmental Biotechnology
Microbial Genetics Lab	M12-132	Mona Mahfood	Biotechnology Department	General Biochemistry

Applied Biology Lab Staff

#	Name	Title	Ext.	Email
1	Aisha Alketbi	Sr. Lab Officer	065053476	Aisha77@sharjah.ac.ae
2	Mona Ibrahim	Sr. Lab Officer	065052437	mmusa@sharjah.ac.ae
3	Mona Al Ali	Lab Officer	065052473	Muna.alali@sharjah.ac.ae
4	Mona Mahfood	Lab Officer	065052416	mmahfood@sharjah.ac.ae
5	Mariam Ghaleb	Lab Officer	065053408	malawbathani@sharjah.ac.ae

GENERAL BIOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-039	Mona Al Ali	065052473

INTRODUCTION

Experiments involve the use of the microscope detailed parts and functions. Furthermore, the chemical and physical characteristics of macromolecules will be illustrated, as well as the structure and composition of plant and animal cells. A section of this lab will also be devoted to respiration, cell division and genetics. Finally, the last section will mainly focus on the study of animal tissues in addition to human anatomy.

EQUIPMENT AND INSTRUMENTS

- Light compound microscope
- Dissecting microscope
- Water bath
- Microcentrifuge
- U.V. light
- Electrophoresis Apparatus and gel documentation system

- Microscopy
- Biomolecules of Living Cells
- Enzyme Action
- Respiration and Photosynthesis
- Cell Division
- Human Genetics
- Extraction of DNA
- Animal Tissues & Anatomy

GENERAL MICROBIOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
M12-132	Aisha Echtibi	065053476

INTRODUCTION

This Laboratory is designed to provide practical and hands-on experience of a variety of microbiological techniques. Laboratory work includes microscopy, staining, aseptic and sterile transfer techniques, assessment of morphological and biochemical properties of microorganisms and microbial identification.

EQUIPMENT AND INSTRUMENTS

- Compound microscopes
- water-baths
- visible spectrophotometer
- Incubators, orbital shaker
- Phase contrast Research Inverted Microscope,
- Cytoflex system
- Countess Autocell counter

- Lab Safety
- Microcopy and Simple Staining
- Culturing and Isolation Techniques
- Selective and Differential Staining of Microbes
- Microbial Morphology
- Selective and Differential Media & Demonstration of Bacterial Culture Characteristics
- Control of Microorganisms by Physical & Chemical Factors
- Bacterial Growth Curve
- Microbial Control
- Biochemical Testing
- Identification of Unknown

IMMUNOLOGY & SERELOGY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-205	Mona Al Ali	065052473

INTRODUCTION

This course is designed to prepare the student to function at the career-entry skill level in the immunology laboratory. This course presents basic principles of immunological and serological techniques. The experiments were designed to study the immune response, principles of antigenantibody reactions and the principles of serological procedures. The lab includes other areas of study concerning the fundamentals of immunity and the immune response such as antibody structure and interactions, the complement system, hypersensitivity reactions and disorders of the immune response.

EQUIPMENT AND INSTRUMENTS

- Compound light microscopes
- Fluorescent microscope with digital camera and PC
- Elisa plate reader
- Incubator
- Serum electrophoresis apparatus and flow cytometer

- Concept of Different Types of Dilutions in Immunology and their Importance in Clinical Laboratory
- Introduction to the organs of Immune system and observation through different tissue slides (Bone marrow, lymph node, blood cells, thymus, spleen)
- Observation of blood cells using compound light microscope by preparing blood smear using wright field stain
- Qualitative and semi quantitative Latex Agglutination (Rheumatoid Factor Latex Test and C Reactive Protein Test)
- Indirect Hemagglutination Agglutination

- Immunochromatography (Mononucleosis as an example)
- Precipitation Reactions using Double Immunodiffusion technique.
- ELISA (Enzyme Linked Immunosorbent Assay)
- Allergy Screening Test

TISSUE CULTURE & HYBRIDOMA TECHNOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
M12-132	Mona Ibrahim	065052437

INTRODUCTION

This course is designed to establish, maintenance and subculture animal cells will. The course will also introduce the student to basic hybridoma technology and isolation of monoclonal antibodies.

EQUIPMENT AND INSTRUMENTS

- Inverted microscope with digital camera and PC
- Automated colony counter
- Flow cytometer
- Phase contrast microscope with digital camera
- Incubators
- Biological safety cabinets class II
- Fluorescent microscope with digital camera and PC
- Fridge,-80 °C freezer,
- Liquid nitrogen freezer
- PCR, SDS-PAGE apparatus and water bath.

- Lab Safety & Aseptic Techniques
- Introduction to Cell Culture: Media & Cell Types
- Subculturing, Cell Quantification & Viability Studies
- Cell Differentiation
- Detection & Control: Mycoplasma & Bacteria
- Cryopreservation
- Isolation of Primary Cells
- Culturing Primary Cells

- Growing Hybridoma
- Isolation of Monoclonal Antibody

MOELCULAR GENETICS LABORATORY



Location	Lab Staff in Charge	Contacts
W12-039	Mona Ibrahim	065052437

INTRODUCTION

This course is an introduction to many areas of modern genetics and emphasizes the principles of genetics in each of two main areas, transmission and molecular genetics. Different model organisms will be studied and analyzed by students to understand the segregation of mendelian genes. Moreover, experiments of the two main modes of gene's transfer in bacterial genetics (conjugation and transduction) conducted. Some sections of this lab will arm students with good experience in karyotyping. Moreover, bacterial mutagenesis is covered in this lab. The last section of students will apply bimolecular engineering using PCR; site directed mutagenesis, to introduce or create a mutation at a defined site into target known DNA sequence. It leads to changing the naturally occurring amino acid to another or terminating the polypeptide in order to identify information on the role of the amino acid that has been replaced at the functional level (phenotypes).

EQUIPMENT AND INSTRUMENTS

- Dissecting microscope
- PCR machine
- Electrophoresis equipment
- Gel documentation system
- Compound microscopes
- Agilent 2100 bioanalyzer

- Introduction, Probability & Statistics
- Independent Assortment and Gene Interaction in Maize
- Drosophila Familiarization
- Mendelian Inheritance in Drosophila

- Sex-Linked Inheritance in Drosophila
- Crossing over in Drosophila
- Salivary Gland Chromosomes of Drosophila
- Mutations in Bacteria
- Ames Test
- Karyotyping
- Bacterial conjugation
- Transduction
- Transformation
- PCR & Site-Directed Mutagenesis
- Sequencing

MOLECULAR BIOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-131	Mona Mahfood	065052416

INTRODUCTION

This course is designed to enhance the preparation of students for careers in research, biotechnology and science education. The laboratory experience will introduce students to the field of molecular biology where they will learn all the basic methodologies and instrumentation commonly used in biotechnology and molecular biology laboratories. Students will learn bacterial transformation, plasmid DNA purification, restriction digestion and ligation along with gel electrophoresis, polymerase chain reaction (PCR), cloning DNA fragments, and selection of recombinants. This course will give students who plan a career in research or biotechnology practical experience that mimics the realities of the laboratory setting.

EQUIPMENT AND INSTRUMENTS

- Agarose gel electrophoresis apparatus
- Microcentrifuges
- Mini centrifuges
- Refrigerated centrifuges
- Gel documentation system
- NanoDrop one
- PCR machines
- Agilent 2100 Bioanalyzer
- Quantitative real-time PCR
- Tissuelyser
- Automated Microbiology Identification & Susceptibility System
- Cryoplus storage System
- SAS-1 Plus Gel Eelctrophorosis machine
- Microvoulume Spectro/Flurometer
- Autocell counter

- Chemidoc Imaging system
- Microplate Spectrophotometer and Nano Drop One Spectrophotometer

- DNA Isolation from Prokaryotic Cells
- RNA Isolation from Eukaryotic Cells
- DNA and RNA Concentration Calculations, Purity
- Recombinant DNA Technology
- Restriction Enzyme Digestion and Ligation
- DNA Gel Electrophoresis
- DNA Basics: Bacterial Transformation
- Selection of Recombinants: Antibiotic Resistance and Blue White Screening
- Designing Primers for PCR Amplification
- Classical and Real Time PCR
- cDNA synthesis

GENERAL BIOCHEMISTRY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-227	Mona Al Ali	065052473

INTRODUCTION

The aim of this Laboratory course is to introduce general laboratory techniques routinely used in Biochemistry with an emphasis on the qualitative as well as quantitative aspects of biochemical experiments. The course deals with principles and practices of Biochemistry such as titration and chromatography for the investigation of amino acids, quantitative determinations by spectroscopic methods of protein concentration and introductory experiments about kinetics of enzyme action. The course also covers basic protein purification methods and SDS-PAGE analysis.

EQUIPMENT AND INSTRUMENTS

- pHmeter,
- Visible spectrophotometer,
- Microcentrifuge,
- SDS-PAGE apparatus

- Laboratory Calculations and Instrumentation
- Preparation of solutions
- pH Measurement and Buffer Preparation
- Titration of Unknown Amino Acid
- Chromatographic Analysis of Amino Acids
- Spectrophotometers and Protein Determination
- Enzyme Kinetics
- Determination of Protein Isoelectric Point
- Protein Purification and Analysis on SDS-PAGE

PROTEIN BIOCHEMISTRY & ENGINEERING LABORATORY



Location	Lab Staff in Charge	Contacts
W12-039	Mona Mahfood	065052416

INTRODUCTION

This course covers basic biochemical principles of proteins along with a comprehensive survey of products currently available or under development by the protein biotechnology industry.

EQUIPMENT AND INSTRUMENTS

- SDS-PAGE apparatus
- refrigerated centrifuges
- ultra-low freezer
- incubator shaker, digital dry bath, vortex mixers, balances
- visible spectrophotometer
- Speed Vac, sonicator
- pH meter
- Chemi Doc imaging system and turbo transfer system

- Protein Purification
- Salting Out
- Dialysis
- Gel Filtration
- Expression and Characterization of a Recombinant Enzyme in E. coli
- SDS Gel Electrophoresis, Molecular Weight Measurements
- Protein Gel Staining (Including the Whole Cell Homogenates)
- Western Blotting Concepts

PLANT BIOTECHNOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-039	Maryam Ghaleb	065053408

INTRODUCTION

This course will introduce the students to the subject of plant biotechnology. The biotechnological methods involved in the production of transgenic plants will be described – plant tissue culture and plant genetic engineering. The application of these techniques to improve the important agricultural species.

EQUIPMENT AND INSTRUMENTS

- Laminar air- flow hood
- Autoclave
- Magnetic stirrer
- Microcentrifuge
- ice maker-thermal cycle
- agarose gel electrophoresis
- Plant growth Chamber
- Vapor Pressure Osmometer
- Tissuelyser

- Aseptic Techniques and Introduction to Plant Tissue Culture
- Nutrient Media Preparation for Plant Tissue Culture
- Seed Sterilization- Seed Germination
- Plant Response to Hormones
- Plant Regeneration by Organogenesis
- Leaf Disc Transformation by Agrobacterium
- RNA Extraction from Plants
- cDNA synthesis and PCR for candidate genes in plant.

MICROBIAL PROCESSING & BIOTECHNOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-205	Maryam Ghaleb	065053408

INTRODUCTION

The course focuses on the vast array of applications of microorganisms, aimed to highlight the potential of wild or genetically modified microorganisms such as cell factories to produce goods and services. It introduces the student to the new era of biotechnology & familiarizes the student with the several areas of industrial application of microorganisms: medical and pharmaceutical, protein production (enzymes, yeast, and single cell protein), production of biochemicals (primary/secondary metabolites), food and beverage technology, agriculture and environmental technologies and alternative energies (bioengineering)

EQUIPMENT AND INSTRUMENTS

Incubator

- Fermenter
- Water bath shaker
- Vortex mixers
- Compound microscopes
- Fridge

• pH meter

• VITEK 2 Bacteria Identification System

- Laboratory characteristics of microorganisms used in biotechnology and industry (Bacteria and Fungi).
- Isolation of Streptomycetes from Soil Samples and Testing their Potential to Produce Antibiotics.
- Standardization of Antimicrobial Susceptibility Testing of New Antibiotics
- Pickle Fermentation
- Using Chymosin to Make Cheese
- Fermentation
- Testing quality of milk
- Detection of Antibiotic-resistant Strains using VITEK 2 Bacteria Identification System

ENVIRONMENTAL BIOTECHNOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
M12-132	Mona Ibrahim	065052437

INTRODUCTION

This course gives an overview of how biotechnical tools are applied in waste handling, prevention and removal. The specific application of metabolic capability and molecular biology of microorganisms to degrade environmental contaminants and remediate environmental media emphasized. The course format is a combination of lecture, laboratory, visits, projects and oral presentations. The labs will be field-based hands-on experiences designed with a goal to acquaint the students with some of the concepts that are critical to understanding issues in environmental management. The course will focus on topics that range between environmental monitoring, sewage treatment, bioremediation and clean technology to renewable energy and biofuels. One or two field trips that will highlight the application of biotechnology to reverse environmental problems will also be included.

EQUIPMENT AND INSTRUMENTS

- Incubator
- Compound microscopes
- PCR machines
- Spectrophotometer

- Shaker incubator
- Gel documentation system
- pH meter
- VITEK 2 Bacteria Identification System

- Introduction to Contaminants in UAE
- Identifying Bacterial Consortium in Soil Contaminated with Crude oil
- Identification of hydrocarbon degrading bacteria using Vitek® Bacterial Identification System
- Examination of Treated Sewage Water: Coliform MPN Test Experiment
- Composting, Building Your Own Bioreactor
- The Ability of Bacteria to Degrade Diesel Fuel
- Using Alkane Hydroxylase B (alkB) Gene as a Biomarker for Hydrocarbon Degradation
- Preparation of Biodiesel from Cooking Oil

MICROBIAL GENETICS LABORATORY



INTRODUCTION

In this laboratory, students will develop their practical skills on genetic complexity & the Lateral/ Horizontal genetic transfer (LGT/HGT) processes in bacteria such as conjugation, transformation and transduction, CRISPR-Editing, & visit to the human insulin production unit in Julphar, industry. The practical training includes microbial DNA isolation, purification, quantitation, standardization, optimization, restriction mapping, cloning & expression using Lux-gene cluster (vibrio fischeri) & GRP-gene cluster (Aquaria victoria) with different plasmids such as pVIP, pGLO, pBR322.

EQUIPMENT AND INSTRUMENTS

- Compound Microscopes
- Nanodrop
- Incubators
- Bunsen Burners
- Loops And Needles
- Agarose Gel Electrophoresis Apparatus
- Microcentrifuges
- Gel Documentation System
- Incubator Shaker
- Vortex Mixers
- Microwave
- Agilent 2100 Bioanalyzer
- Quantitative Real-Time PCR
- Heating Blocks

EXPERIMENTS

• Introduction to Laboratory Safety

- DNA Isolation & quantification from E. coli
- Plasmid extraction and purification from E. coli
- DNA Standardization (construction of standard curve of DNA using microbial DNA Bacteriophage model).
- Restriction mapping of microbial DNA
- Engineering of Transgenic E. coli by cloning and transformation.
- Bacterial Conjugation
- Bacterial transduction using Enterobacteria phage
- 16S rDNA gene (1448 bp) sequencing for bacterial phylogenetic-ID.
- Gene-Editing of staphylococcus epidermidis and its phage Andhra using CRISPR-Cas9 defense system.

COLLEGE OF HEALTH SCIENCES



COLLEGE OF HEALTH SCIENCES LABORATORIES

Lab #	Functions	Utilization/ Remarks
W12-005	 Environmental Occupational & Hygiene Labs, Water Analysis, Food Safety Analysis, MSc EH lab courses, Centre of Excellence for Food and Nutrition Science 	 College of Health Sciences: Environmental Health Science (BSc. & MSc programs) Clinical Nutrition & Dietetics Depts. Centre of Excellence for Food and Nutrition Science
W12-031	 Hematology (1&2), Clinical Chemistry (1&2) Biochemistry 	 College of Health Sciences: Medical Lab Sciences Nursing Clinical Nutrition & Dietetics Depts. College of Sciences: Applied Biology Dept.
W12-035	- Biology - Phlebotomy	 College of Health Sciences: All Depts. College of Sciences: Applied Biology Dept.
W12-040	X-Ray	College of Health Sciences: Medical Diagnostic Imaging Dept.
W12-141	 General Microbiology Medical Microbiology Diagnostic Microbiology Food Microbiology 	 College of Health Sciences: Medical Lab Sciences Clinical Nutrition & Dietetics Depts. Colleges of Medicine Colleges of Dentistry Colleges of Pharmacy College of Sciences: Applied Biology Dept.
W12-144	Nutrition Assessment	- College of Health Sciences: - Clinical Nutrition & Dietetics Dept.
W12-146	Food Processing & Preparation	 College of Health Sciences: Clinical Nutrition & Dietetics Dept.
W12-145	 Histology Histopathological Techniques and Clinical Parasitology 	 College of Health Sciences: Medical Lab Sciences Dept. (This is an Open Lab; students may utilize this lab throughout the week to follow up with their Histopathological Techniques)
W12-203	 Clinical skills (Therapeutic Exercise) Assessment & Musculoskeletal Physiotherapy 	- College of Health Sciences: - Physiotherapy Dept.
W12-204	 Clinical skills (Therapeutic Modalities) Orthotics Musculoskeletal & Sports Physiotherapy Assessment 	- College of Health Sciences: - Physiotherapy Dept.
W12-205	 Biology and Human Anatomy Physiology 	 College of Health Sciences: All Depts. College of Sciences: Applied Biology Dept.

Lab #	Functions	Utilization/ Remarks
W12-209	 Clinical skills-Respiratory and Cardiovascular Obstetrics & Gynecological Rehabilitation Geriatrics Therapeutic Exercise 	- College of Health Sciences: Physiotherapy Dept.
W12-227	 CHS Research Lab, Molecular Genetics, Immunology & Serology, Blood Banking, Urinalysis & Body Fluids Student Research Projects 	 College of Health Sciences: Medical Lab Sciences Dept. College of Medicine College of Sciences: Applied Biology Dept.
W12-139	CT/MRI Simulators and PACS lab	- College of Health Sciences: Medical Diagnostic Imaging Dept.
M12-033	X-Ray & Ultrasound	- College of Health Sciences: Medical Diagnostic Imaging Dept.
M12-130	 Environmental Microbiology Food Microbiology Food Safety and Quality 	 College of Health Sciences: Environmental Health Science (BSc and MSc programs) Clinical Nutrition & Dietetics Dept. Community College: Medical Health Sciences Diploma Students College of Pharmacy College of Sciences: Applied Biology Dept.
M23-158	 Maternity & Child Health Nursing, BLS Lab Pediatric Health Nursing 	 College of Health Sciences: Nursing Dept. All Depts. (Open lab hours are allocated to students upon arrangements with course instructors and clinical tutors)
M23-159	 Fundamentals of Nursing Adult Health Nursing Practicum1 &2, Advanced Health Assessment Physical Examination 	- College of Health Sciences: - Nursing Dept. (Open lab hours are allocated to students upon arrangements with course instructors and clinical tutors)
M23-161	 Physical Assessment & Critical Care Nursing Advanced Health Assessment Physical Examination 	 College of Health Sciences: Nursing Dept. (Open lab hours are allocated to students upon arrangements with course instructors and clinical tutors)
M23-041/039	 Clinical Skills (Neurology) Pediatrics Exercise Physiology, Medical and Surgical Conditions 	- College of Health Sciences: Physiotherapy Dept.
M23- 034/035	Research LabResearch Project	 College of Health Sciences: Physiotherapy Dept.

MEDICAL LABORATORY SCIENCES DEPARTMENT

Medical Laboratory Sciences Laboratories

Lab Name	Location	Person in Charge	Courses Served
 Hematology Clinical Chemistry Biochemistry 	W12-031	Nabila Hussein	 Hematology (I) Clinical Chemistry I & II Biochemistry Phlebotomy Graduate Students Research Projects
- Biology Lab	W12-035	Maen Al Asad	BiologyHematology IIBlood Bank
- Microbiology Lab	W12-141	Said Shahwan	 General Microbiology Medical Bacteriology Diagnostic Microbiology Graduate Students Research projects
 Histology, Parasitology Histopathological Techniques Lab 	W12-145	Zainab Abdallah Ibrahim	 Histology Histopathological Techniques Parasitology Urinalysis & Body Fluids Graduate Students Research Projects
- Human Anatomy and Physiology Lab	W12-205	Maen Al Asad	- Human Anatomy & Physiology
- Molecular Genetics & Immunology Lab	W12-227	Shaikha Alnaqbi	 Molecular Genetics Immunology Faculty research Graduate Students Research Projects

Medical Laboratory Sciences Lab Staff

#	Name	Ext.	Email
1	Maen Omar Asad	065053483	maen@sharjah.ac.ae
2	Nabila Hussein	065053485	nabila@sharjah.ac.ae
3	Said Shahwan	065053486	saidj@sharjah.ac.ae
4	Zeinab Abdallah Ibrahim	065053421	zibrahim@sharjah.ac.ae
5	Shaikha Alnaqbi	065053481	Shaikha. Abdalla@sharjah.ac.ae

BIOCHEMISTRY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-031	Nabila Hussein	065053485

INTRODUCTION

This Laboratory introduces students to basic experiments and techniques used in the biochemistry Laboratory. Initially, emphasis is placed on the buffer concept and preparation. The principle of kinetic analysis of enzymes is covered with experiments to show the effect of pH, temperature, and substrate concentrations on the activities of enzymes. Experiments on carbohydrates, lipids and vitamins are also conducted.

EQUIPMENT & INSTRUMENTS

- Spectrophotometers
- pH Meters
- Centrifuges
- Electrophoresis Complete System
- Automatic Pipettes
- Analytical Balance
- Water Bath
- Balances
- Glassware and Test Tubes
- Refrigerator

- Basic Calculations, Dilution, and Spectrophotometric Concepts, Components, and Utilization (2 Sessions)
- Determination of Unknown Concentration Using Spectrophotometer
- Buffer Preparation and Titration of a Weak Acid with Strong Base
- Effect of PH on the Salivary Amylase Activity
- Effect of the Substrate Concentration Upon the Rate, Velocity, of an Enzymatic Reaction

- Determination of the Iodine Number of Fat
- Estimation of Blood Cholesterol
- Determination of Vitamin C in Various Fruit Drinks
- Identification & Determination of Carbohydrates (Monosaccharides, Disaccharides & Polysaccharides)

TESTS & SERVICES

- Training students utilizing the machines and equipment in the lab on their Graduation project.
- Participating in activities inside and outside the University performing clinical lab testing at the site.

BIOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-035	Maen Al Asad	065053483

INTRODUCTION

This Laboratory is designed to introduce the student to the laboratory safety rules, scientific method, microscopy, cell chemistry and basic laboratory studies of structure, function and interactions of living organisms including cells, tissues and organ systems. In addition to the principle of DNA structure, genetics and heredity.

EQUIPMENT & INSTRUMENTS

- Safety tools
- Compound Light Microscopes
- Stereomicroscope Microscopes
- Prepared Microscope Slides
- Dyes (Iodine, Benedict, Biuret)
- Charts (Body Systems)
- Hematocrit Centrifuges and Readers
- Blood grouping reagents
- Hemocytometers
- Scale for weight and height measurement
- Deep Freezer (-80 Deg. Centigrade)

- Introduction to Laboratory Safety, Orientation, Laboratory Basic Instruments and Tools, Metric System, the Scientific Experimental Method, and Temperature Conversion
- Identifying Parts of the Light and Stereo Microscopes, Focusing, Preparing Wet Mounts, and Prepared Slides Observation
- Chemical Composition of Cells
- Human Body Tissues: Classification & Identification of Epithelial, Connective, Muscular, and

Nervous Tissues

- Systemic Homeostasis
- Hematocrit & Blood Grouping
- Red blood cell count
- White blood cell count
- Mitosis: Stages of Mitosis in Onion Root Tips
- Meiosis: Stages of Oogenesis & Spermatogenesis (Prepared Slides)
- DNA extraction
- Ideal body weight, BMI and BMR calculation

BLOOD BANKING LABORATORY



Location	Lab Staff in Charge	Contacts
W12-035	Nabila Hussein	065053485

INTRODUCTION

This Laboratory introduces students to basic techniques and procedures used in blood banking. Emphasis is placed on quality control and quality assurance to make sure that donor blood is compatible with the recipient blood. Tests include ABO grouping and Rh typing, compatibility and cross matching, antibody screening and antibody identification, and the Coombs Test.

EQUIPMENT & INSTRUMENTS

- Automated Blood Group System (ID- Centrifuge 24)
- Centrifuges
- Incubator 37°C (ID-Incubator 37 S II)
- Rh View Box
- ABO/D+ Reverse Grouping Cards
- Blood Banking Reagents
- Microscopes
- Refrigerator

- Preparation of Normal Saline and 2-5% Cell Suspension Washed RBC Cells
- Preparation of Check Cells
- Test Tube Determination of ABO Grouping, Both Forward and Reverse
- Determination of Rh Typing Including Du
- Performing Crosshatching and Compatibility Testing
- Performing the Antibody Screening Test
- Determining Antibody Titer and Score
- Combs' Test, Both Direct and Indirect
- Determination of Secretor Status

TESTS & SERVICES

- ABO Grouping
- Rh Typing
- Cross Matching and Compatibility
- Antibody Screening and Antibody Identification
- Antibody Titer and Score
- Comb Tests (Direct & Indirect)
- Preparation of 3% whole blood in saline solution

CLINICAL CHEMISTRY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-031	Nabila Hussein	065053485

INTRODUCION

This Laboratory introduces students to the manual procedures and techniques commonly conducted in the clinical chemistry Laboratory. Clinical significance and interpretation of lab results is highly emphasized. Investigations included in this lab are the liver function tests, kidney function tests, lipid profile, carbohydrate metabolism, electrolytes tests, and endocrine function tests. Experiments cover subjects in both Clinical Chemistry 1 and 2.

EQUIPMENT & INSTRUMENTS

- Spectrophotometers
- Semi-Automated Chemistry Analyzer
- Centrifuges
- Automatic Pipettes
- Chemical Reagents and Kits
- Complete Electrophoresis System
- Densitometer
- Refrigerator

- Determination of Uric Acid and Creatinine in Serum and Urine
- Determination of Fasting Blood Sugar
- Kinetic Measurement of Lipase and or Alpha Amylase
- Kinetic Determination of Creatine Kinase
- Determination of Total Bilirubin, Conjugated and Unconjugated Bilirubin
- Determination of Albumin and Total Protein in Plasma
- Kinetic Determination of Alanine Aminotransferase
- Determination of Total Cholesterol

- Determination of HDL- Cholesterol and Calculation of HDL- Cholesterol
- Body water and electrolytes
- Acid-base disorder and acid-base control
- Determination of total calcium
- Colorimetric Determination of Chloride in Serum
- Determination of Iron and TIBC
- Determination of Zink

TESTS & SERVICES

- Liver Function Tests (AST, ALT, Bilirubin, etc.)
- Kidney Function Tests (Uric Acid, and Creatinine, Urea)
- Cardiac Enzymes (CPK, AST)
- Iron & TIBC & Blood Sugar
- Albumin, Total Protein and more

DIAGNOSTIC MICROBIOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-141	Said Shahwan	065053486

INTRODUCTION

This Laboratory introduces students to various techniques and procedures used in the isolation and identification of infectious agents of human diseases including pathogenic bacteria, fungi according to body systems. The labs concentrate on the analysis of clinical specimens in cases when infectious diseases are suspected and how to accurately the labs results. General investigations will be carried out for urine, stool and body fluids (i.e., spinal, synovial, pleural, pericardial, abdominal, and seminal fluid)

EQUIPMENT & INSTRUMENTS

- Incubators
- Autoclaves (fixed and portable)
- Anaerobic Jars
- pH Meters
- Ovens
- Colony Counters
- Balances
- Refrigerators
- Laminar flow
- Water bath
- Compound microscopes
- Distillation

- Collection and Proper Preparation of Routine Specimens for Testing
- Preparation, Sterilization, Labeling and Storing Culture Media and Reagents used in Clinical Microbiology Lab

- Biochemical Testing to Identify Bacteria
- Examination of Sputum
- Examination of Fecal and Urine Specimens

TESTS & SERVICES

- Isolation and Identification of Infectious Agents of Human Diseases
- General Investigations for Urine, Stool & Body Fluids
HEMATOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-031 W12-035	Nabila Hussein	065053485

INTRODUCTION

This Laboratory introduces students to the basic techniques used in the evaluation and investigation of blood disorders. Manual and automated procedures are conducted in this Laboratory. Students perform manual and automated CBC, which includes the red blood cell count, white blood cell count, and platelet count. Students are also exposed and trained to identify normal and abnormal disorders related to red cells and white blood cells. The homeostatic part of this course deals with the assessment of the clotting factors and the concept and measurement of PT, PTT, fibrinogen and D-Dimer. Experiments conducted in this Laboratory cover the subjects Hematology 1 and Hematology 2.

EQUIPMENT & INSTRUMENTS

- Automated Cell Analyzer
- Cell Analyzer CA5309
- 10 terminals Teaching Microscope
- Microscopes
- Hemocytometers
- Hematocrit Centrifuges
- Centrifuges
- Semi-Automated Coagulation Machine
- Refrigerators

- Manual White Blood Cell Count
- Manual Red Blood Cell Count
- Manual Determination of Hematocrit and ESR

- Measurement of CBC using Fully Automated Cell Counter
- Preparing and Staining Peripheral Blood Smears
- Supra-Vital Staining for Reticulocytes
- RBC and WBC Morphology, Normal and Abnormal
- Osmotic Fragility Test and G6PD
- Sickle Cell Screening
- Determination of Prothrombin Time
- Determination of Partial Thromboplastin Time and D-Dimer
- Bleeding Time

- Complete Blood Count (CBC) and Differential Count (Manual and Automated)
- Manual Hematocrit
- Erythrocyte Sedimentation Rate
- Reticulocyte Count, PT, PTT, D-Dimer

HISTOPATHOLOGICAL TECHNIQUES LABORATORY



Location	Lab Staff in Charge	Contacts
W12-145	Zainab Abdallah Ibrahim	065053421

INTRODUCTION

This Laboratory includes a thorough grounding in all aspects of histopathological techniques such as tissue fixation, grossing and preparation, processing, embedding, microtome section cutting, staining and microscopic examination of tissue samples. Other techniques including frozen sections and bone decalcifications are demonstrated.

EQUIPMENT & INSTRUMENTS

- Automatic Tissue Processor
- Tissue Embedding Station (Histocenter)
- Rotary Microtome
- Section Floating- Out Bath
- Tissue Block Storage Cabinets
- Cryostat
- Binocular Microscopes
- Demonstration Microscope with Large LCD Screen
- Base-Sledge Microtome
- Dissection, Fixation, and Staining Tools
- Automatic Knife Sharpener
- Centrifuges
- Refrigerators
- Freezers

- Sample Collection (Rabbit Dissection)
- Fixation, Grossing and Sample Accession
- Manual Tissue Processing

- Paraffin Embedding and using the Tissue Center/Station
- Automatic Tissue Processing
- Microtomy- Introduction to the Instrument
- Microtomy- Practical Section Cutting
- Cryostat, Frozen and Related Sections
- Hematoxylin and Eosin Staining, Mounting and Cover Slipping
- Bone Decalcification and Processing

- Histological Techniques of Fixation
- Grossing, Processing (Dehydration, Clearing, Impregnation)
- Embedding, Section Cutting (Microtomy) and Staining Procedures

HUMAN ANATOMY AND PHYSIOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-205	Maen Al Asad	065053483

INTRODUCTION

The laboratory course focuses on the fundamentals of human anatomy and physiology with emphasis on the human body systems in addition to teaching basic techniques and clinical measurements in physiology. Students are exposed to the gross anatomy and practicing different techniques of the functions of different systems of the human body, like vision tests, hearing tests, ECG, pulmonary function tests, pulse and blood pressure measurement, urinalysis, and blood sugar test.

EQUIPMENT & INSTRUMENTS

- Microscopes
- Ice Maker
- Spirometers (Automated and Manual)
- Kymographs
- ECG Machines
- Stethoscopes and Sphygmomanometers
- Stop Watches
- Human Body Models and Charts (Heart, Body Systems, Torso, etc.)
- Exercise Bicycles
- Tuning Forks & Mallets
- Visual Testing Charts
- Snellen Charts
- Ophthalmoscopes
- Flashlights
- Water Bath
- Fume Hoods
- Dissecting Sets

- Plasticated Models (of Human Organs)
- Refrigerator
- Glucometers
- Digital blood pressure machines
- Human body skeleton (plastic)

- Orientation & Lab Safety
- Neuron Anatomy & Physiology
- The Special Senses: The Eye Anatomy & Visual Tests
- Special Senses: Ear Structure and Hearing Tests
- The Cardiovascular System: Heart Anatomy, Blood Pressure & Pulse
- The Cardiovascular System: Cardiac Cycle & Electrocardiograph (ECG)
- Anatomy of the Respiratory System, Respiratory System Physiology Spirometer
- Functional Anatomy of the Digestive System: Structure & Anatomy and digestive enzymes
- The Urinary System: Anatomy and Urinalysis
- The Endocrine System: Functions, and Blood Glucose Testing

IMMUNOLOGY & SEROLOGY LABORATORY



Location	Lab Staff in Charge	Contacts	
W12-227	Shaikha Alnaqbi	065053481	

INTRODUCTION

This Laboratory introduces students to the manual, semi-automated and automated procedures and techniques commonly conducted in the Immunology and Serology Laboratory. The course provides the students with solid knowledge on principles of antigen-antibody reactions, and the principles of serological procedures as well as quality control, quality assurance, and lab safety. Many skills and hands-on experience are acquired, including, but not limited to specimen handling, experiment design and equipment setup, in addition to results interpretation and troubleshooting. The laboratory serves two diagnostic purposes: First, it helps in the diagnosis of infectious diseases and second, it assesses the immune status of the patient. Interestingly, this course utilizes test methods for research applications and recently, cell culture facility is part of the lab and a variety of advanced immunological techniques is performed accordingly.

EQUIPMENT & INSTRUMENTS

- ELISA microplate washer and reader machines
- Inverted fluorescence microscope
- Colony counter
- Centrifuges
- Incubators (both CO2 and O2)
- Water Baths
- Compound Light Microscopes
- Analytical Balance

- Dilutions and serial dilutions in different proportions and mechanism of immunological reactions.
- Rheumatoid Factor (RF) latex agglutination test

- C- Reactive Protein (CRP) latex agglutination test
- Precipitation Test: Radial Immuno-diffusion (RID) assay
- In Vitro Phagocytosis
- Cell viability test (Trypan blue exclusion method): Hemocytometer cell count and Trypan blue cell viability test
- Enzyme Linked Immunosorbent Assay (ELISA): Qualitative and semiquantitative detection of hepatitis B virus surface antigen (HBsAg) in human serum sample.
- Western Blotting
- Flow cytometry

- Rapid latex agglutination tests
- Hepatitis B virus ELISA
- Antibody Profile

MEDICAL MICROBIOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-141	Said Shahwan	065053486

INTRODUCTION

This lab introduces students to the basic techniques in microbiology (i.e., staining, culturing, asceptic transfer, smear preparation). Practical sessions cover methods of isolation and identification of pathogenic bacteria that cause human disease by using rich, selective and differential culture media. Other biochemical and serological methods for diagnosis are also used.

EQUIPMENT & INSTRUMENTS

- Autoclaves
- Balance
- Anaerobic Jars
- Refrigerators and Freezers
- Culture Media, Diagnostic Kits, and Reagents
- PH Meters, Centrifuges
- Microscopes
- Oven
- Colony Counters
- Water Bath
- Magnetic stirrer
- Laminar flow
- Distillation unit
- Bacterial staining kits

EXPERIMENTS

• Grow Bacterial Cultures on Appropriate Media and Discuss the Significance of Quality Control in a Microbiology Lab

- Morphology of Microorganisms: Wet Mount Preparation, Smear Preparation, and Simple Staining
- Differential Staining: Gram Stain, Acid-Fast Stain and Capsular Stain
- Staphylococcus, Streptococcus, Enterococcus and Pneumococcus Identification
- Enterobacteriaceae Identification
- Pseudomonas and other Aerobic Bacilli Identification
- Antimicrobial Sensitivity Testing

- Isolation and Lab Diagnosis of Pathogenic Bacteria
- Antibiotic Sensitivity and MIC for Bacteria
- Laboratory Diagnosis of Different Types of Bacteria by using Various Bacteriological, Serological and Biochemical Methods to Diagnose Pathogenic Bacteria

MOLECULAR GENETICS LABORATORY



Location	Lab Staff in Charge	Contacts
W12-227	Shaikha Alnaqbi	065053481

INTRODUCTION

Experiments are designed for students to be familiar with calculations, micro pipetting, reagent preparation, biological safety methods, advanced techniques like DNA, RNA Electrophoresis from human blood samples, plasmid DNA isolation, competent cells preparation, PCR amplification etc.

This course provides the students with basic biological lab safety knowledge and advanced micro techniques, and how to handle biological samples, set up molecular biology experiments, basic trouble shooting and interpretation of results.

EQUIPMENT & INSTRUMENTS

- Autoclave
- Centrifuges
- UV Trans Illuminator
- Balances
- Micropipettes
- Electrophoresis Apparatus
- Water Bath
- Microwave Oven
- Conventional PCR
- Nano drop
- qPCR
- Karyotyping testing
- Cloning and DNA recombinant system
- Inverted fluorescent Microscope

EXPERIMENTS

- Calibration
- Preparing Laboratory Solutions
- DNA Extraction from Whole Blood
- DNA Purification & Gel Preparation and Electrophoresis
- Preparation and Transformation of Competent Cells
- Plasmid Isolation
- Use of Restriction Enzymes
- Action of Ligase
- RNA Extraction from Whole Blood
- Polymerase Chain Reaction (PCR and qPCR)
- Karyotyping protocols
- Southern Blot

- Isolation of DNA and RNA from Various Tissues
- Production of cDNA Mutagenesis of Cloned Genes
- Specific Gene Detection using PCR Technique and Cloning

PARASITOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-145	Zainab Abdallah Ibrahim	065053421

INTRODUCTION

Laboratory sessions are designed to expose students to the morphology of different diagnostic stages of medically important parasites and introduce the skills for proper lab procedures for collection, handling and identification of most common protozoal and worm infections.

EQUIPMENT & INSTRUMENTS

- Microscopes
- Glassware
- Prepared Parasitology Slides
- Slides and Cover Slips
- Centrifuges
- Charts and Models
- Test Tubes

- Collection of Specimens and Types of Potential Sources of Errors in Laboratory Procedures
- Wet mount preparation for fecal samples.
- Microscopic Identification of Flagellated Protozoa: Trypanosoma Brucei Rhodesiense, Trypanosoma Brucei Gambiense, Trypanosoma Cruzi, Leishmania Species, Giardia Lamblia, Trichomonas Vaginalis and Non-Pathogenic Trichomonads
- Concentration Techniques for Recovery of Intestinal Parasites. Sarcodina: Entamoeba Histolytica, E. coli, E. Hartmanni, Iodamoeba Butschlii, Endolimax Nana
- Preparation of Thin and Thick Blood Films. Giemsa Staining Technique for Blood Smears
- Identification of Malaria Parasites in Stained Blood Smears
- Identification of Different Eggs and Larval stages of Medically Important Worms

- Microscopic Fecal Examination for Detection of Eggs and Cysts of Parasites of the Digestive Tract
- Concentration Techniques for Parasites
- Blood Smear to Detect Blood Parasites

PHLEBOTOMY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-031	Nabila Hussein	065053485

INTRODUCTION

This Laboratory offers students the necessary theoretical and practical training to perform proper venous and micro capillary blood collection, solve common phlebotomy complications and understand the phlebotomists role as an effective member of the healthcare team. In addition, safety and infection control measures, quality assurance and total quality improvement, and ethical standards and professional conduct are introduced.

EQUIPMENT & INSTRUMENTS

- Phlebotomy training arms
- Vacutainer Systems
- Butterfly System
- Glass Slides
- Puncture Proof Containers
- Disposable Gloves
- Phlebotomy carts

EXPEIMENTS

- Specimen Handling & Labeling
- Performing Blood Drawing using the Venipuncture Method
- Performing Blood Drawing using the Syringe Method
- Performing Blood Drawing using butterfly needles
- Performing Capillary Puncture Techniques

TESTS & SERVICES

• Drawing blood from the circulatory system of a person

- Hematocrit Centrifuges
- Syringe System
- Vein viewer
- Tourniquets
- Biohazard Bags
- Auto-Lancets

URINALYSIS LABORATORY



Location	Lab Staff in Charge	Contacts
W12-145	Maen Al Asad	065053483

INTRODUCTION

This Laboratory exposes and trains students on the most performed body fluids tests including Urine, CSF, Synovial fluid and others. Routine and special tests are emphasized in this laboratory. Students perform complete urinalysis and examine urine sediments and identify all abnormal findings such as crystals, WBC, RBC, bacteria, parasites, and urine casts.

EQUIPMENT & INSTRUMENTS

- Centrifuges
- Reagent Test Strips
- Confirmatory reagents
- Blank Glass Slides, Disposable Pipettes, and Cover Slips
- Biohazard bags
- Test tubes and urine containers
- Disposable Gloves
- Siemens Multistix 10 SG Urinalysis Machine
- Refractometer

- Physical Examination of Urine: Color, Appearance
- Measurement of Specific Gravity
- Chemical Examination of Urine: pH, Protein, Sugar, Ketone, Bilirubin, Bacteria
- Confirmatory test for bilirubin, proteins, and glucose
- Microscopic Examination of Urine sediment and identification of Blood cells, Crystals, Parasites, Yeast, Bacteria, and Casts
- Screening for Ascorbic Acid
- Screening for Phenylketonuria

- Screening for Aminoaciduria
- Investigation of Other Body Fluids: CSF, Synovial Fluid, Peritoneal Fluid

- General examination of urine samples and other body fluids.
- Training students to identify all abnormal finding.

HISTOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-145	Zainab Abdallah Ibrahim	065053421

INTRODUCTION

Histology laboratory focuses on the identification of the basic structures of the human (Lab animals) cells, tissues and organs.

EQUIPMENT AND INSTRUMENTS

- Microscopes
- Microscope connected with smart TV screen

EXPERIMENTS

Microscopic examination of the main body tissues

- Epithelial tissue
- Connective tissue
- Muscular tissue
- Nervous tissue

Microscopic examination of the body systems organs

- Cardiovascular and Integumentary system
- Digestive system
- Respiratory system
- Urinary system
- Reproductive system

TESTS AND SERVICES

Knowledge of the structures of the body tissues and major organ systems.

MLS RESEARCH LABORATORY



Location	Lab Staff in Charge	Contacts
W12-227	Shaikha Alnaqbi	065053481

INTRODUCTION

The objectives of this Laboratory are to conduct research projects for Bachelor and master's degree students and faculty members, achieve scientific outcomes, improve the quality of research, acquire a variety of advanced equipment related to research, attract significant funding for research projects and encourage collaborative scientific research among experts and researchers.

- To expand the horizon of scientific knowledge through extensive and profound research.
- To advance University research, education, and training in the field of Molecular Genetics, Immunology, and tissue culture as well as other different scientific disciplines.
- To promote and enhance the quality and innovative nature of scientific research, where outcomes reflect well on the academic community and lead to more accomplishments.

EQUIPMENT AND INSTRUMENTS

- Thermal Cyclers for PCR & qPCR
- UV Light Documentation System
- Gel Electrophoresis Station
- ELISA microplate washer and reader machines
- Inverted Immuno-fluorescence microscope
- Tissue culture facility (Fully equipped)
- Cytology and Cytogenetics Facility.
- Trans-Illuminator
- Thermal Shaker
- Fume hoods
- Biosafety Cabinets
- Fridges & Freezers
- Colony counter

- Centrifuges
- Incubators (both CO2 and O2)
- Water Baths
- Compound Light Microscopes
- Analytical Balance

TESTS AND SERVICES

- Prepare highly competent medical laboratory scientists to serve their patients.
- Uphold the principles of Ethics and Medical Law in diagnostics and research
- Specific Gene Detection using PCR Technique and Cloning.
- Isolation of DNA and RNA from Various Tissues.
- Enzyme-Linked Immunosorbent Assay (ELISA).
- Preparing a cytogenetic lab for research purposes.
- Preparing a tissue culture lab for research purposes.

MEDICAL DIAGNOSTIC IMAGING DEPARTMENT

Lab Name	Location	Person in Charge	Programs Served	Courses Served
X-ray Lab	W12-040	 Mawadah Mubarak Zarmeena Noorajan Sura Majid 	Medical Diagnostic Imaging Dept.	 Introduction to MDI Patient Care and Management (2) Skeletal Radiography Radiographic Technique Medical Imaging Equipment Digital Imaging
CT/MRI Simulators and PACS lab	W12-139	- Mawadah Mubarak - Asma Abdi	Medical Diagnostic Imaging Dept.	 Computed Tomography Magnetic Resonance Imaging
Ultrasound and Radiographic Skills Iab	M12-033	 Mawadah Mubarak Zarmeena Noorajan Wijdan Attia 	Medical Diagnostic Imaging Dept.	 Introduction to MDI Patient Care and Management (2) Skeletal Radiography Radiographic Technique Medical Imaging Equipment Digital Imaging Ultrasonography

Medical Diagnostic Imaging Laboratories

Medical Diagnostic Lab Staff

#	Name	Ext.	Email
1	Sura Majid	065057566	surama@sharjah.ac.ae
2	Asma Abdi	065057561	aabdi@sharjah.ac.ae
3	Zarmeena Noorajan	065057563	znoorajan@sharjah.ac.ae
4	Mawadah Gibril	065053427	mgibril@sharjah.ac.ae
5	Wijdan Attia Hamad	065057587	whamad@sharjah.ac.ae

INTRODUCTION TO MEDICAL DIAGNOSTIC IMAGING LABORATORY



Location	Lab Staff in Charge	Contacts
	Mawadah Mubarak	065053427
W12-040	Zarmeena Noorajan	065057563
× M12-033	Sura Majid	065057566
	Wijdan Attia	065057587

INTRODUCTION

This course provides the foundation for all following MDI courses. It provides an insight into the field of Medical Imaging Technology, including plain radiography, ultrasound, computerized tomography, magnetic resonance imaging and radionuclide imaging. It provides the student with an understanding of the role of diagnostic imaging in health care, and an understanding of the place of modern medical diagnostic technology within the hospital health care team.

EQUIPMENT & INSTRUMENTS

- General X-Ray Machine
- Portable X-Ray Machine
- Radiographic Image receptors
- Whole Body Phantoms with Internal Anatomy
- Automatic Film Processor
- RTI Piranha Dosimeter
- DR System
- Dosimeter

- Orientation to MDI Labs
- X-Ray Machine and Operating Steps
- Digital Radiography System
- X-Ray Films and Cassettes
- Automatic Film Processor

- Imaging Accessories
- MDI Department Workflow and patient request forms
- Imaging Modalities
- Basic Radiation Protection (Distance)
- Basic Radiation Protection (Shielding)
- Basic Radiation Protection (Time)
- X-ray Beam Penetration
- Effect of KVp on X-ray Quantity
- Effect of Technical Factors on X-ray Beam Intensity and Exposure Indicator Numbers
- Effect of kVp on Radiographic Contrast
- Field Size Effect on Density and Contrast

PATIENT CARE AND MANAGEMENT (2) LABORATORY



Location	Lab Staff in Charge	Contacts
	Mawadah Mubarak	065053427
W12-040	Zarmeena Noorajan	065057563
м M12-033	Sura Majid	065057566
	Wijdan Attia	065057587

INTRODUCTION

This Laboratory deals with taking care of the patient in the Medical Diagnostic Imaging Department including infection control intravenous techniques, contrast agents and basic patient care procedures common at the Radiology Department. Departmental organization and issues of practice in an imaging department are examined together with medical-legal issues and local rules on regulation governing practices.

EQUIPMENT & INSTRUMENTS

- General X-Ray Machine (DR)
- Portable X-Ray Machine
- Whole Body Phantoms with Internal Anatomy
- Hand Washing Sink
- Stretcher
- Transfer Board
- Wheelchair
- Preparation trolley
- PPE items (gowns, gloves, masks, head covers, goggles... etc.)

- Infection Control- Hand Washing Technique
- Infection Control- Contact Precaution Technique
- Aseptic Techniques
- Pharmacology Interpreting Medication Leaflet

- Patient Transfer Techniques
- Drug Administration
- Vital Signs

- Patient contact precaution awareness.
- Training to prevent spreading Infectious disease in Medical Imaging Section.

RADIOGRAPHIC TECHNIQUE & SKELETAL RADIOGRAPHY LABORATORY



Location	Lab Staff in Charge	Contacts
	Mawadah Mubarak	065053427
W12-040	Zarmeena Noorajan	065057563
× M12-033	Sura Majid	065057566
	Wijdan Attia	065057587

INTRODUCTION

Skeletal Radiography Laboratory begins the 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.

Radiographic Technique completes the examination of the fundamentals of practical radiography. It continues development of the foundations of the skills necessary for the examination of patients, and for producing actual radiographs. This Laboratory provides practical experience for the theory of the axial skeleton and skull imaging technique.

Students build technical skills as well as confidence in practicing radiography within the laboratory setting before engaging with real patients at clinical sites.

EQUIPMENT & INSTRUMENTS

- PACS (Picture Archiving and Communication System) with Post Processing and Viewing System
- General X-Ray Machine
- General X-Ray Machine with Tomography
- Portable X-Ray Machine
- X-Ray Films and Cassettes
- Automatic Film Processor
- CR (Computed Radiography) System
- Dry Film Processor
- Whole Body Phantoms with Internal Anatomy
- Viewing Boxes

EXPERIMENTS

- Chest Radiography
- Bony Thorax Radiography
- Upper Extremities Radiography
- Lower Extremities Radiography
- Skull Radiography
- Abdomen Radiography
- Spine Radiography
- Special Procedures Radiography

TESTS & SERVICES

• Radiographic technique and Quality workshop

MEDICAL IMAGING EQUIPMENT LABORATORY



Location	Lab Staff in Charge	Contacts
	Mawadah Mubarak	065053427
W12-040	Zarmeena Noorajan	065057563
м M12-033	Sura Majid	065057566
	Wijdan Attia	065057587

INTRODUCTION

Medical Imaging Equipment Laboratory provides laboratory experiments that demonstrate the features of X-ray radiographic systems and introduces students to the concept of quality control by performing QC procedures on the X-ray system.

EQUIPMENT & INSTRUMENTS

- General X-Ray Machine
- Portable X-Ray Machine
- CR (Computed Radiology) System
- Dry Film Processor
- Whole Body Phantoms with Internal Anatomy
- QC (Quality Control) Test Tools
- Digital Dosimeter (Piranha)
- Rad check plus
- Test stand
- Collimator test tool
- Beam alignment test tool
- Pinhole camera test stand
- 0.4 & 0.8 Aluminum filters
- Viewing Boxes

EXPERIMENTS

• Visual and Manual Quality Control

- Heel Effect
- Focal Spot Size Measurement
- Half Value Layer Measurement
- kVp Accuracy Test
- Time Accuracy Test
- Milliampere and Exposure Time Linearity and Reciprocity
- Alignment of X-ray field and Image Receptor, and Beam Alignment Test

- Quality Assurance and Quality Control Tests and Services for X-Ray Machines
- Laboratory Sessions in Quality Assurance and Quality Control Tests for Different Hospitals

DIGITAL IMAGING LABORATORY



Location	Lab Staff in Charge	Contacts
	Mawadah Mubarak	065053427
W12-040	Zarmeena Noorajan	065057563
× M12-033	Sura Majid	065057566
	Wijdan Attia	065057587

INTRODUCTION

The Digital Imaging Laboratory introduces students to the photographic processes involved in the production of radiographs. Quality control issues are also examined. It involves practical work using the film processor and accessory equipment while applying the principles of film storage, safety and mixing in darkrooms.

The contents are designed to impart an understanding of the components, principles and operation of digital imaging systems found in diagnostic radiology. Computed Radiography, Digital Radiography and Digital Dynamic Imaging, are introduced. Guidelines for selecting exposure factors and evaluating images within a digital system assist students in bridging between film-based and digital imaging systems. Principles of quality management including quality assurance and quality control are studied and carried out in the lab.

EQUIPMENT & INSTRUMENTS

- PACS (Picture Archiving and Communication System) with Post Processing and Viewing System
- General X-Ray Machine
- X-Ray Films and Cassettes
- Automatic Film Processor
- CR (Computed Radiology) System
- DR (Digital Radiology) System
- Dry Film Processor
- Whole Body Phantoms with Internal Anatomy
- Viewing Boxes

EXPERIMENTS

- Automatic Film Processor: Component and Function
- Characteristic Curve
- Darkroom Safelight Test
- Image Artifact
- The Air Gap Technique
- The Effect of Heel Effect on Image Quality
- Field Size: Effects on Density & Contrast
- The Effect of kVp on Contrast
- Introduction to Computed Radiography
- Introduction to Digital Radiography
- The Effect of Alignment on Shape Distortion
- The Effect of Distance on Shape Distortion
- Post Processing Images

- Quality Assurance and Quality Control Tests and Services for X-Ray and Tomography Machines
- Laboratory Sessions in Quality Assurance and Quality Control Tests for Different Hospitals

ULTRASONOGRAPHY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-040	Mawadah Mubarak	065053427
&	Zarmeena Noorajan	065057563
M12-033	Wijdan Attia	065057587

INTRODUCTION

This Laboratory provides students with basic concepts and terminology as well as scanning protocols, instrumentation and techniques for the ultrasound examination of different body parts, together with sufficient practice to enable them to play a useful role in the health system. The Laboratory prepares students so that with further study they will be ready to acquire international recognition as registered ultrasound technologists. Students practice on life-size models as well as on each other to gain the skills needed to practice Ultrasonography.

EQUIPMENT & INSTRUMENTS

- Diagnostic Ultrasound Machine
- Ultrasound Phantoms
- Ultrasound Simulator

EXPERIMENTS

- Ultrasound knobology
- Transducer and image display modes
- Doppler Ultrasound
- Spleen and Pancreas Ultrasound
- Biliary System Ultrasound
- Gynecology Ultrasound

TESTS & SERVICES

• General Ultrasound Scanning

- Patient care and preparation in Ultrasound
- Image Artifact
- Liver Ultrasound
- Thyroid Ultrasound
- Renal Ultrasound
- Obstetric Ultrasound



MAGNETIC RESONANCE IMAGING LABORATORY

INTRODUCTION

The content of this course is designed to provide students with basic MRI knowledge. This course provides the physical principles of MRI, instrumentation, image formation with emphasis on pulse sequences, and image artifacts. The course also provides and demonstrates the knowledge base necessary to perform standard magnetic resonance imaging procedures. Normal anatomy and pathological conditions, contrast administration, angiography (MRA), and MRI safety will be discussed throughout the course. Among the advanced imaging procedures, functional imaging technique (fMRI), diffusion weighted imaging (DWI), and technical developments in MRI will be introduced.

EQUIPMENT & INSTRUMENTS

• MRI Simulator

- Brain MRI
- Cervical Spine MRI
- Lumbar Spine MRI
- Spine MRI
- Knee MRI

COMPUTED TOMOGRAPHY LABORATORY



Location	Lab Staff in Charge	Contacts
14/12 120	Mawadah Mubarak	065053427
W12-139	Asma Abdi	065057561

INTRODUCTION

With the help of CT simulator software, the students will have clinical hands- on training for basic Computed Tomography clinical examinations within the classroom. This lab helps the students to understand the basic concepts related to the acquisition and scanning protocols. It will also enable the students to be introduced into a clinical scenario. Further, it helps them to understand how to screen a patient before undergoing a CT examination. With further practice and knowledge in the health care settings equip them to practice as a CT technologist.

EQUIPMENT & INSTRUMENTS

• The Simulator Software

SIMULATED TRAINING ON:

- CT Head
- CT Chest
- CT Neck
- CT Abdomen & Pelvis
- CT Lumbar Spine
- CT Wrist

NURSING DEPARTMENT

Nursing Laboratories

Lab Name	Location	Person in Charge	Programs Served	Courses Served
 Maternity & Child Health Nursing & Basic Life Support (BLS) Skills Lab 	M23-158	Muna Al -Tamimi	Nursing Dept.Physiotherapy Dept.	 Pediatric Health Nursing Maternity & New Born Health Nursing BLS Training
- Fundamentals of Nursing	M23-159	Muna Al-Tamimi	Nursing Dept.	 Fundamental of Nursing Consolidation of Nursing Practice Mental Health Nursing
- Adult Health Nursing Skills Lab	M23-199D	Janisha Kavumpurath	Nursing Dept.	 Adult Health Nursing Practicum 1&2 Consolidation of Nursing Practice
 Physical Assessment & Critical Care Nursing Skills Lab 	M23-161	Amina Alblooshi	Nursing Dept.	 Critical Care Nursing Physical Assessment Advanced Health Assessment Consolidation of Nursing Practice

Postgraduate Master Program

Lab Name	Location	Person in Charge	Programs Served	Courses Served
Physical Assessment & Critical Care Nursing Skills Lab	M23-161	Amina Alblooshi	- Nursing Dept. Master program	 Advanced Adult Critical Care Nursing practicum 1 & 2 Health Assessment for Advanced Critical Care Nursing Practice

Nursing Lab Staff

#	Name	Ext.	Email
1	Janisha Kavumpurath	065057562	janisha@sharjah.ac.ae
2	Muna Salem Al tamimi	065057543	mal-tamimi@sharjah.ac.ae
3	Amina Al Boloshi	065057528	aalboloshi@sharjah.ac.ae

PHYSICAL ASSESSMENT/ ADVANCED HEALTH ASSESSMENT LABORATORY



Location	Lab Staff in Charge	Contacts
M23-161	Amina Alblooshi	065057528

INTRODUCTION

Students registered in the Physical Assessment course and Advanced Health Assessment course are trained in the Physical Assessment Skills Laboratory. These courses are designed to train students on the principles and skills used for the comprehensive health assessment of individual adults, families and communities.

EQUIPMENT & INSTRUMENTS

- Simulators: Ear Examination Trainer, Kyoto Lung Sound Auscultation Trainer, Kyoto Cardiology Patient Simulator K, Multiple Heart Breath Sound Tutor
- Models: Torso Model, Skull, Reproduction, Breast Cancer, Shoulder, Hip, Arm, Knee, Ear, Heart
- Tools: Ophthalmoscopes, Illuminating Ear scope, Otoscope Tuning Forks
- Machines: Electronic Height and Weight Scale, Electronic Patient Beds, Television, CD Player, Projector

EXPERIMENTS, SKILLS AND PROCEDURES

- Interviewing Health History
- Physical Assessment Techniques: Inspection, Percussion, Palpation, Auscultation
- Physical Examination: Skin, Hair, Nails, Chest and Lung, Heart, Abdomen, Nervous System, Circulatory System

- Screening Activities (Visual Acuity)
- Heart and Lung Auscultation
- Chest Anatomical Landmarks
FUNDAMENTALS OF NURSING LABORATORY



Location	Lab Staff in Charge	Contacts
M23-159	Muna Al-Tamimi	065057543

INTRODUCTION

Students registered in the Fundamentals of Nursing course are trained in the Fundamental of Nursing Skills Laboratory. The course is designed to train students in basic clinical skills to prepare them for practice. Students are required to demonstrate the skills in the laboratory and in the clinical setting.

EQUIPMENT AND INSTRUMENTS

- Simulators: Vital Signs Monitoring
- Mannequins: Nursing Skills Training
- Models: Nasogastric Intubation, Ostomy Care
- Tools: Adult Sphygmomanometers, Stethoscopes, Thermometers, Transfer Boards, Crutches, Wheelchairs, Nasogastric Tubes
- Machines: Electronic Thermometers, Aneroid Electronic Sphygmomanometers

EXPERIMENTS, SKILLS AND PROCEDURES

- Vital Signs
- Body Mechanics
- Hand Washing
- Safety
- Isolation Precautions
- Active and Passive Range of Motion Exercise
- Positioning, Moving, Turning and Transferring
- Changing an Unoccupied Bed
- Changing Surgical Bed
- Changing an Occupied Bed
- Bathing an Adult Client

- Providing Hair Care
- Providing Perineal-Genital Care
- Providing Foot Care
- Brushing and Flossing the Teeth
- Providing Special Oral Care for the Unconscious Client
- Assisting Client with Meal
- Inserting and Removing Nasogastric Tube
- Enteral Feeding (Nasogastric, Gastrostomy or Jejunostomy)
- Giving and Removing a Bedpan
- Administering an Enema
- Collecting a Stool Specimen
- Applying External Urinary Catheter
- Collecting Specimen (Gastric Aspiration, Urine Specimen and Stool Specimen)
- Assessing and Measuring Urinary Output and Changing a Urinary Drainage Bag
- Collecting a Urine Specimen for Culture and Sensitivity (C&S) from a Foley's (Retention) Catheter or Drainage Tube
- Nursing Process
- Nursing Documentation

- Assessment of Vital Signs (Body Temperature, Respiration, Pulse and Blood Pressure)
- Positioning, Moving and Transferring Clients
- Nasogastric Tube (Insertion and Feeding)
- Feeding (Gastrostomy and Jejunostomy)
- Urine Test (Albumin, Sugar, Ketones and pH)
- Urinary Catheter Care

ADULT HEALTH NURSING PRACTICUM (1 & 2) LABORATORY



Location	Lab Staff in Charge	Contacts
M23-199-D	Janisha Kavumpurath	065057562

INTRODUCTION

Students registered in the Adult Health Nursing (1)/ Practicum course and Adult Health Nursing (2)/ Practicum course are trained in the Adult Health Nursing Skills Laboratory. These courses are designed to train students' clinical skills related to nursing care of adult/ elderly clients in acute care settings.

EQUIPMENT & INSTRUMENTS

- Simulators
- Mannequins: KERI Nursing Skills Training, Delux Nursing Skills Training
- Models: Wounds and Drains Care, Ostomy Care, Urinary Catheterization, Surgical Bandaging, Injection Trainers
- Tools: Aneroid and Electronic Sphygmomanometers, Electronic Thermometer, Wheelchairs and Crutches, Glucometers, Peakflow Meters, Spirometers, Pulse Oximeters
- Machines: Intravenous Fluid Administration Pumps, Suction Machines, Oxygen Cylinders

EXPERIMENTS, SKILLS AND PROCEDURES

- Medical and Surgical Asepsis
- Wound and Drain Care
- Ostomy Care (Urinary and Bowel Diversions)
- Preparing (Drawing a Medication from a Vial or Ampoule) and Administering Medications (Oral, Topical, Inhaler, Intradermal, Subcutaneous, Intramuscular and Intravenous Routes)
- Oxygen Therapy
- Chest Physiotherapy and Postural Drainage
- Nasopharyngeal Suctioning
- Collecting Specimens for Diagnostic Tests
- Inserting Internal (Indwelling) Urinary Catheter

- Monitoring of Blood Glucose Level Using Glucometer
- Wound Care (Sterile Dressing Techniques, Suture and Staple Care and Removal and Drain Care and Removal
- Preparation and Administration of Parenteral Medications (Intradermal, Intramuscular, Subcutaneous and Intravenous

MATERNITY AND NEWBORN HEALTH NURSING / PRACTICUM LABORATORY



Location	Lab Staff in Charge	Contacts
M23-158	Muna Al-Tamimi	065057543

INTRODUCTION

Students registered in the Maternity and Newborn Health Nursing/ Practicum course are trained in the Maternal and Newborn Health Nursing Skills Laboratory. The course is designed to train students in clinical skills that prepare them for the care of pregnant women during antenatal, labor, and postnatal periods, together with rendering care to newborn babies in the clinical setting.

EQUIPMENT & INSTRUMENTS

- Simulators: Maternal Neonatal Birthing
- Mannequins: Obstetrical and Gynecological Trainers
- Models: Fetal Skull with Female Pelvis, Breast Milk Expression, Female Pelvic Examination, Female Pelvic Organs, Anal Sphincters, Abdominal Palpation, Episiotomy Suturing, Baby Care
- Tools: Sphygmomanometers, Digital Thermometers, Vaginal Speculums
- Machines: Electronic Neonatal Weight and Height Measuring Scales, Electronic Pediatric Sphygmomanometers

EXPERIMENTS, SKILLS AND PROCEDURES

- Maternal Health Assessment (Computing Expected Date of Delivery and Abdominal Contractions, Fundus Height Measurement, Fetal Presentation and Lie Identification, Vaginal Examination, Uterine Involution and Lochia Assessment)
- Assisting with Labor and Delivery
- Cardiotocography and Fetal Monitoring
- Breast Feeding and Lactation
- Neonatal Health Assessment: Vital Signs (Body Temperature, Apical Pulse, Respiratory Rate, Blood Pressure), Growth Parameters (Height, Weight, Head and Chest Circumferences, Reflexes)

- Handling and Draping Neonates
- Neonate Bathing and Cord Care
- Conducting Health Education

- Assessment of Maternal Health (Computing Expected Date of Delivery, Fetal Monitoring)
- Assessment of Maternal and Neonatal Vital Signs
- Screening Activities (Growth, Urine Tests for Albumin, Glucose, Ketones and pH)
- Educating on Antenatal, Intranatal and Postnatal Exercises

PEDIATRIC HEALTH NURSING/ PRACTICUM LABORATORY



Location	Lab Staff in Charge	Contacts
M23-158	Muna Al-Tamimi	065057543

INTRODUCTION

Students registered in the Pediatric Health Nursing/ Practicum course are trained in the Child Health Nursing Skills Laboratory. The course is designed to train students in clinical skills that prepare them for the care of children and their families in clinical settings.

EQUIPMENT & INSTRUMENTS

- Simulators: Newborn Pedi Simulator, Pediatric HAL
- Mannequins: Pediatric Nursing Skills Trainers
- Tools: Pediatric Sphygmomanometers, Digital Thermometers, Pediatric Oximeters
- Machines: Electronic Height and Weight Measuring Scales, Electronic Pediatric Sphygmomanometers

EXPERIMENTS, SKILLS AND PROCEDURES

- Physical Examination of Children: Vital Signs (Body Temperature, Pulse, Respiratory Rate, Blood Pressure), Growth Parameters (Height, Weight, Head and Chest Circumferences)
- Pediatric Medication Administration (Oral, Otic, Ophthalmic and Rectal Medications, Nebulizers, Intradermal and Intramuscular Injections)
- Positioning and Restraining of Children
- Enteral Tube Feeding Administration (Nasogastric, Gastostomy)
- Obtaining Samples (Specimens) for Diagnostic Procedures (Capillary Puncture, Sputum, Urine and Stool Specimens)
- Conducting Health Education

- Assessment of Vital Signs for Children (Body Temperature and Blood Pressure)
- Screening Activities (Growth)
- Preparation and Administration of Pediatric Medications (Intradermal and Intramuscular)

CRITICAL CARE NURSING / PRACTICUM LABORATORY



Location	Lab Staff in Charge	Contacts
M23-161	Amina Alblooshi	065057528

INTRODUCTION

Students registered in Critical Care Nursing/ Practicum course are trained in the Critical Care Nursing Skills Laboratory. The course is designed to train students in advanced clinical skills that prepare them for the care of critically- ill adults and elderly clients in critical care settings.

EQUIPMENT & INSTRUMENTS

- Simulator: HAL S1020 Articulating Adult Simulator, Laerdal ALS Skill Master Simulator, Code Blue Adult Simulator with Defibrillator
- Models: Intra Venous Training Arm, Tracheostomy Care Trainer
- Tools: Ambu Bag, Airways, Pulse Oximetry, Oxygen Cylinders, Emergency Trolley, IV Stands, Trolleys
- Machines: Suction Machines, Infusion Pumps, Cardiac Monitor, Syringe Pump, ECG Machine

EXPERIMENTS, SKILLS AND PROCEDURES

- Endotracheal/ Tracheostomy Tube Suctioning
- Endotracheal/ Tracheostomy Tube Care
- Initiating Cardiac Monitor
- Interpreting ECG Strip (Identifying Dysrhythmias Arising from the SA Node, Atria, Ventricles, and AV Block)

- Suctioning Artificial Airways
- Care of Artificial Airways
- Basic Life Support & AED
- Arterial Blood Sampling

CRITICAL CARE NURSING / PRACTICUM LABORATORY

(Adult Critical Care Nursing Master Program)



Location	Lab Staff in Charge	Contacts
M23-161	Amina Alblooshi	065057528

INTRODUCTION

Master students registered in Adult Critical Care Nursing/ Practicum course (Master Program) are trained in the Critical Care Nursing Skills Laboratory. The course is designed to provide provide master students with the opportunity to apply knowledge gained from the theory in the management of complex problems and deliver holistic care to critically ill patients and family using a multidisciplinary approach.

EQUIPMENT & INSTRUMENTS

- Simulator: HAL S1020 Articulating Adult Simulator, Laerdal ALS Skill Master Simulator, Code Blue Adult Simulator with Defibrillator
- Models: Intra Venous Training Arm, Tracheostomy Care Trainer
- Tools: Ambu Bag, Airways, Pulse Oximetry, Oxygen Cylinders, Emergency Trolley, IV Stands, Trolleys, ETT
- Machines: Suction Machines, Infusion Pumps, Cardiac Monitor, Syringe Pump, ECG Machine

EXPERIMENTS, SKILLS AND PROCEDURES

- Endotracheal/ Tracheostomy Tube intubation
- Endotracheal/ Tracheostomy Tube Care
- Initiating Cardiac Monitor
- Interpreting ECG Strip (Identifying Dysrhythmias Arising from the SA Node, Atria, Ventricles, and AV Block)

TESTS & SERVICES

• Airways Management

- Care of invasive lines
- Defibrillation & Cardioversion
- Advanced cardiac Life Support
- Cardiac Pacemakers
- Hemodynamic Monitoring
- Peritoneal lavage
- ICP monitoring
- Esophagogastric Tamponade Tube
- Trauma management simulation

HEALTH ASSESSMENT FOR ADVANCED CRITICAL CARE NURSING PRACTICE LABORATORY



Location	Lab Staff in Charge	Contacts
M23-161	Amina Alblooshi	065057528

INTRODUCTION

Master students registered in the Health Assessment for Advanced Critical Care Nursing Practice course are trained in the Physical Assessment Skills Laboratory. This course is designed to help critical care nurses develop advanced clinical assessment skills, focusing on the essential technology and procedures utilized in the management of the critically ill. During laboratory/ clinical experiences psychomotor skills and the use of advanced technologies will be developed, this course also enables the students to differentiate abnormal from normal findings using advanced assessment techniques.

EQUIPMENT & INSTRUMENTS

- Simulators: Ear Examination Trainer, Kyoto Lung Sound Auscultation Trainer, Kyoto Cardiology Patient Simulator K, Multiple Heart Breath Sound Tutor
- Models: Torso Model, Skull, Reproduction, Breast Cancer, Shoulder, Hip, Arm, Knee, Ear, Heart
- Tools: Ophthalmoscopes, Illuminating Ear scope, Otoscope Tuning Forks
- Machines: Electronic Height and Weight Scale, Electronic Patient Beds, Television, CD Player, Projector

EXPERIMENTS, SKILLS & PROCEDURES

- Interviewing Health History
- Physical Assessment Techniques: Inspection, Percussion, Palpation, Auscultation
- Physical Examination: Skin, Hair, Nails, Chest and Lung, Heart, Abdomen, Nervous System, Circulatory System

- Screening Activities (Visual Acuity)
- Heart and Lung Auscultation
- Chest Anatomical Landmarks

PHYSIOTHERAPY DEPARTMENT

Physiotherapy Laboratories

Lab Name	Location	Person in Charge	Programs Served	Courses Served
Physical Agents Lab	W12-204	Hanan Youssef	Physiotherapy Dept.	 Therapeutic Modalities Orthotics and Prosthetics Cardio-Res-pulmonary Conditions Exercise Physiology
Physiotherapy Supplementary Laboratory	W12-203	Hanan Youssef	Physiotherapy Dept.	 Physiotherapy for Musculoskeletal Conditions Therapeutic Modalities Cardiopulmonary Conditions Exercise Physiology
Physical Examination and Simulation Lab	W12-209	Asma Javed	Physiotherapy Dept.	 Physiotherapy for Obstetrics & Gynecology Physiotherapy for Geriatrics Selected Topics in Physiotherapy Physiotherapy for Musculoskeletal Conditions
lsokinetic Analysis Lab	- M23-039 - M23-040	Sara Atef	Physiotherapy Dept.	 Physiotherapy for Pediatrics Assessment in physiotherapy Therapeutic Exercise
Posture and Balance Assessment Lab	- M23-34 - M23-35	May Tamim	Physiotherapy Dept.	 Physiotherapy for Medical & Surgical Conditions Physiotherapy for Neurological Conditions Research
 Physiotherapy for neurology lab Pediatrics & exercise physiology lab 	M23- 039	Sara Atef	Physiotherapy Dept.	 Physiotherapy for Pediatric conditions Assessment in Physiotherapy Therapeutic Exercise.

Physiotherapy Lab Staff

#	Name	Ext.	Email
1	Sara Atef	065057547	saali@sharjah.ac.ae
2	Asma Javed	065057537	Ajaved@sharjah.ac.ae
3	Hanan Yousef	065057463	halkalih@sharjah.ac.ae
4	May Tamim	065057546	mtamim@sharjah.ac.ae
5	Amal Ahbouch	065057594	aahbouch@sharjah.ac.ae

PHYSICAL AGENTS LABORATORY



Location	Lab Staff in Charge	Contacts
W12-204	Hanan Yousef	065057463

INTRODUCTION

This Laboratory is utilized in teaching a variety of clinical skills in Physiotherapy that serves the following laboratory courses: Therapeutic Modalities, Orthotics, Cardiopulmonary Conditions, & Exercise Physiology. W12-204 is a wet lab that contains valuable equipment used in hospitals and Physiotherapy clinics.

EQUIPMENT & INSTRUMENTS

- Different Types of plinths and hospital beds that are used to mimic a hospital or a clinical setting. (E.g., Wooden Beds used during Electrotherapy sessions, Adjustable hospital Beds and Traction Beds).
- Electrotherapy Equipment (Portable and Non-Portable) including Ultrasound machines, Interferential therapy machines, Shockwave therapy machines, Laser, Ultraviolet & Infrared lamps.
- Hydrotherapy Units such as Whirlpools.
- Cryotherapy and Thermotherapy including, but not limited to hot packs, cold packs, and paraffin baths.
- CPM Machine (Continuous Passive Movement) and Weights Cart.
- Gait and Ambulation Training Equipment (e.g., Parallel Bars, Stairs of Different Heights, Ramp, Wheelchairs etc.
- Variety of Assessment Tools including Sensory assessment equipment, Range of Motion assessment tools, etc.
- Treatment Tools for Sports Rehabilitation Such as Kinesiotape and rigid sports tapes.
- Different types of aids and Assistive devices (crutches, walkers, and wheelchairs).
- Orthotic Equipment (Casting Material, Orthotics Material, Thermal Baths)
- A variety of teaching Charts, skeletons and body anatomy Models.
- The lab is also fully equipped with audiovisual Tools used in the teaching process as computer,

LCD, slide projector and movable white boards.

EXPERIMENTS

• Teaching assessment and treatment techniques.

- Certain electrotherapy modalities can be used for treating some cases for symptomatic pain reduction, spasm and swelling reduction and tissue healing which helps to restore optimal function
- diagnostic/therapeutic muscle stimulation and re-education for denervated muscles
- Generating Strength duration curve to detect innervation status of the muscles
- Chronaxia and Rheobase

PHYSICAL EXAMINATION AND SIMULATION LABORATORY



Location	Lab Staff in Charge	Contacts
W12-209	Asma Javed	065057537

INTRODUCTION

This Laboratory is specialized in teaching a variety of courses such as, Physiotherapy for Obstetrics & Gynecology, Physiotherapy for Geriatrics, Selected Topics in Physiotherapy, and Physiotherapy for Musculoskeletal Conditions. It contains all the required equipment for assessment and treatment of geriatrics, musculoskeletal and gynecological conditions among other topics.

The laboratory equipment and resources available at this lab include Physiotherapy mats, medical beds, movable plinths, anatomical models, medical charts, Obstetrics & Gynecology treatment tools, demonstration manikins, cardiovascular rehabilitation and pediatrics treatment equipment (such as therapy balls, rolls, etc.)

The lab is readily equipped with an office and a storage room that contain the equipment needed for the mentioned specializations. The storage area is well equipped and serves all our physiotherapy students across all levels.

EQUIPMENT AND INSTRUMENTS

- Different types of beds (Tilting Table, Adjustable Hospital Beds, Manual Therapy Beds, Hoists)
- ICU Equipment (e.g., Adult and Pediatric Simulated Manikins for Suctioning, CPR and other ICU Tools)
- Cardiovascular and Pulmonary teaching equipment (e.g., Manikin for Breathing and Heart Sounds, Rehabilitation equipment, Pulmonary Functional Test, Pulse oximeter, Neonatal Precursors, Respiratory Exercisers, Lymphedema Drainage Machine, ABI Doppler Flow Meter
- Obstetrics and Gynecology Models, Fetus Development Models, Exercise Tools and Charts (Pelvic Floor Exercise Tools, etc.)
- Rehabilitation Equipment (Finger Ladder, Shoulder Wheel, Pulleys, Ergometer, Suspension Cage, Different Types of Balance Boards, Multi-Purpose Cart with Weights and Audiovisual Materials for Teaching)

- Fully Equipped with Audiovisual Tools used in Learning Process as Computer, Printer, LCD, Slide Projector, and Movable White Boards
- Aqua therapy equipment (flip eggs, paddles, kick boards)
- Geriatric Aids (Reacher, Non-slip mats, Modified ADL Equipment)
- Neurological Rehabilitation tools (sliding boards, Roho cushion, fine motor Rehab. Tools)

EXPERIMENTS

• Teaching assessment and treatment techniques.

PHYSIOTHERAPY SUPPLEMENTARY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-203	Hanan Yousef	065057463

INTRODUCTION

This Laboratory specializes in teaching several Physiotherapy courses that include Physiotherapy for Musculoskeletal Conditions, Therapeutic Modalities, Cardiorespiratory Conditions, Exercise Physiology.

Currently, this room contains few equipment and is used as a supplementary lab for other labs 204/224 and 209, especially when separation of female and male students for application of practical skills is needed.

EQUIPMENT & INSTRUMENTS

- Wooden Beds
- Magneto-Therapy Units
- Quadriceps Bench
- Traction Bed
- Treadmill
- Weighing Scales (Body Mass Analyzer)
- Measurement tools (Skin fold Calipers)

EXPERIMENTS

• Teaching assessment and treatment techniques.

- Assessment of body fat, lean muscle mass and Body mass index
- Measuring of subcutaneous fat

ISOKINETIC ANALYSIS LABORATORY



INTRODUCTION

This Laboratory specializes in teaching several physiotherapy courses including Physiotherapy for Pediatric conditions, Assessment in Physiotherapy, and Therapeutic Exercise.

The available laboratory equipment and resources include therapeutic mats, hospital beds, teaching models, Exercise physiology equipment, manikins, pediatric dolls used in simulation and pediatrics treatment equipment such as therapeutic balls, wedges, rolls, etc.

EQUIPMENT & INSTRUMENTS

- Biodex Equipment
- Assessment equipment (e.g., Goniometers, Pedometer, Scoliometer, Reflex hammer)
- Neurological Assessment and Treatment Equipment (Motor Functional Testing Tools, Occupational Therapy Tools, Working Table for Adults, Mats, Standing Frame and Balance Board)
- Pediatrics Corner for Assessment and Treatment Tools (Corner Chair, Working Table for Pediatrics, Balls, Wedges, Rolls, Balance Playing Board, Rockers)
- IT and Audiovisual Tools such as Computer, Camera, LCD and White Board

EXPERIMENTS

This Laboratory is used in specializations related to research in the areas of Isokinetic. In addition, it serves as a teaching lab for the above-mentioned courses during theoretical and practical sessions.

TESTS & SERVES

Isokinetic Dynamometer to assess the strength of muscles around joints as part of a rehabilitation exercise program to improve the strength of various body joints. There are 5 modes that can be applied while using this machine: Isokinetic Resistance, Reactive Eccentric, Passive Motion, Isometric and Isotonic movements.

POSTURE AND BALANCE ASSESSMENT LABORATORY



INTRODUCTION

This Laboratory is dedicated for the purpose of research that is carried out by the faculty and students of the Physiotherapy department in the University of Sharjah. The lab is well equipped with the latest, recognized modern devices used in studies and research in the field of rehabilitation and physiotherapy. The lab utilizes and caters a group of studies conducted by the physiotherapy department faculty and students and continues to serve its purpose in providing the most modern techniques used in the current field.

This lab is a teaching lab. Some of the courses taught are the following but not limited to: Physiotherapy for Medical & Surgical Conditions, Physiotherapy for Neurological Conditions and for Research.

EQUIPMENT & INSTRUMENTS

- DIERS Formetric 4D/3D Spine and Posture Analysis Machine
- Neuro-MEP-Micro (EMG) device
- Treadmill
- Biodex Balance System
- Pulmonary Function Testing Device

EXPERIMENTS

- Research in the areas of:
- Posture analysis
- Gait analysis
- Flat foot examination
- Static balance assessment
- Nerve conduction velocity assessment

- Neuro-MEP-Micro
- DIERS Formatric 4D/3D Spine and posture analysis
- Tests for Pulmonary function like lung volume, vital capacity, rates of flow and gas exchange
- Static Biodex Balance system to assess neuromuscular control (fall risk, athletic single leg stability, limits of stability and postural stability).

PHYSIOTHERAPY FOR NEUROLOGY LABORATORY / PEDIATRICS & EXERCISE PHYSIOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
M23-039	Sara Atef Ali	065057547

INTRODUCTION

Isokinetic Analysis Lab

This Laboratory specializes in teaching several physiotherapy courses including Physiotherapy for Pediatric conditions, Assessment in Physiotherapy, and Therapeutic Exercise.

The available laboratory equipment and resources include therapeutic mats, hospital beds, teaching models, Exercise physiology equipment, manikins, pediatric dolls used in simulation and pediatrics treatment equipment such as therapeutic balls, wedges, rolls, etc.

EQUIPMENT AND INSTRUMENTS

- Biodex Equipment.
- Assessment equipment (e.g., Goniometers, Pedometer, Scoliometer, Reflex hammer)
- Neurological Assessment and Treatment Equipment (Motor Functional Testing Tools, Occupational Therapy Tools, Working Table for Adults, Mats, Standing Frame and Balance Board)
- Pediatrics Corner for Assessment and Treatment Tools (Corner Chair, Working Table for Pediatrics, Balls, Wedges, Rolls, Balance Playing Board, Rocker)
- IT and Audiovisual Tools like Computer, Camera, LCD, White Board and interactive screen.

EXPERIMENTS

This Laboratory is used in specializations related to research in the areas of Isokinetic. In addition, it serves as a teaching lab for the above-mentioned courses during theoretical and practical sessions.

TESTS AND SERVICES

• Isokinetic Dynamometer (Biodex, system 4 pro): This machine is used to assess the strength of muscles around joints as part of a rehabilitation exercise program to improve the strength of various body joints. There are 5 modes that can be applied while using this machine: Isokinetic Resistance, Reactive Eccentric, Passive Motion, Isometric and Isotonic movements.

ENVIRONMENTAL HEALTH SCIENCE DEPARTMENT

Lab Name	Location	Person in Charge	Programs Served	Courses Served
Environmental & Occupational Health Lab	W12-005	Badria Ahmed	 Environmental Health Science Dept. Clinical Nutrition & Dietetics Dept. 	 Environmental & Occupational Hygiene Measurement Water and Wastewater Sanitation Practical Food Analysis Graduate Projects
Water Analysis Lab	W12-005	Badria Ahmed	 Environmental Health Science Dept. Clinical Nutrition & Dietetics Dept. 	 Environmental & Occupational Hygiene Measurement Water and Wastewater Sanitation Practical Food Analysis Graduate Projects
Environmental Microbiology Lab	M12-130	Badria Ahmed	 Environmental Health Science Dept. Clinical Nutrition & Dietetics Dept. College of Pharmacy 	 Water and Wastewater Sanitation Food Safety and Quality Environmental Microbiology Practical Food Analysis Graduate Projects Pharmacy Labs

Environmental Health Science Laboratories

Environmental Health Science Lab Staff

#	Name	Ext.	Email
1	Badria Ahmed	065050476	bebrahim@sharjah.ac.ae

ENVIRONMENTAL AND OCCUPATIONAL HEALTH LABORATORY



Location	Lab Staff in Charge	Contacts
W12-005	Badria Ahmed	065052476

INTRODUCTION

This Laboratory enables students to learn the operating principles, advantages and limitations of various types of equipment used to evaluate environmental and occupational hazards.

EQUIPMENT & INSTRUMENTS

- Sound Level Meter
- Logging Noise Dose Meter
- Integrating Dose Meters
- Sound Survey Meter
- Dust Scan Scout Model 3020 Monitor
- Global Thermometer Digital Thermo-Anemometer
- Digital Thermo-Hygrometer
- Area Heat Stress Monitor Hs-32
- Gas Detector (OMNI 4000)
- Luminous Intensity Meter (545)
- Spirometer Vitalograph 2120
- Radiation Meter Tracerco T401
- Personal Air Sampler APEX
- Personal Air Monitor AFC123
- Miran Sapphire Analyzer
- TWL-1S Heat Stress Monitor
- Extech HT200 Heat Stress WBGT Meter
- PCXR8 Universal Sample Pump

EXPERIMENTS

All experiments are conducted according to the standard methods for environmental and occupational hazards sampling, analysis and measurements.

- Noise Assessment
- Environmental Dust Assessment
- Thermal Environment Assessment
- Environmental Gas Assessment
- Environmental Light Assessment
- Pulmonary Function Indices Assessment
- Radiation Detection
- Air Sampling and Analysis

WATER ANALYSIS LABORATORY



Location	Lab Staff in Charge	Contacts
W12-005	Badria Ahmed	065052476

INTRODUCTION

This Laboratory enables students to conduct all routine analysis for drinking water, surface waters, recreational waters, municipal wastewater and industrial/agricultural waters.

EQUIPMENT & INSTRUMENTS

- Hach DR 2800 Spectrometers
- Digital Titration systems
- Thermo-Orion 4 Star Meters
- Ion Selective Electrode for Measurements of Ammonia, Nitrates, Fluorides
- Dissolved Oxygen Meter Equipped with BOD Measurement Kit
- Oxidation Reduction Potential Meter
- Portable Residual Chlorine Meter
- PH Meter
- Turbidity meter
- Membrane filtration microbial testing system
- Ovens
- Analytical/benchtop balances
- Nitrate Meter
- Ammonia Meter
- Conductivity Meter
- Vacuum Suction Filter Filtration Kit
- Jar tester

EXPERIMENTS

All experiments are conducted according to the standard methods for examination of water and wastewater and USEPA standard methods.

TESTS & SERVICES

Measurements of the Following Parameters:

- PH and Turbidity
- Color and Conductivity
- Alkalinity, Chlorides and Fluorides
- Hardness, Nitrate, Nitrite, Ammonia, Iron and Manganese, Dissolved Oxygen, BOD, COD
- Solids, suspended solids, dissolved solids, volatile and fixed solids
- Microbiological assessment of water

ENVIRONMENTAL MICROBIOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
M12-130	Badria Ahmed	065052476

INTRODUCTION

The Environmental Microbiology Laboratory exposes students to actual field settings through applying the standard methods for aseptic techniques for microbiological sample collection, preservation and examination. The Environmental Microbiology Laboratory offers the opportunity for students to identify, enumerate and isolate different microorganisms relevant to the environmental health field (e.g. water, wastewater, indoor and outdoor air samples

EQUIPMENT & INSTRUMENTS

- Autoclaves
- Anaerobic Jars
- Centrifuges
- Refrigerators
- Freezers
- Oven
- Water Bath
- Balance
- Incubator
- Microscopes
- Colony Counters
- Stomacher
- PH Meter
- Media, Chemicals, Diagnostic Kits, APE-20 and Reagents
- Air Sampler "Microflow"
- Biosafety Cabinet Class II

EXPERIMENTS

• All experiments are conducted according to the standard methods for air, water, and food examination

- Heterotrophic Plate Count
- MPN of Total Coliforms
- MPN of Feacal Coliforms
- MPN of Enterococci
- Microorganisms in Food Samples
- Indoor and Outdoor Microbial Air Count
- Microbiological Survey of Food Contact Surfaces
- Intrinsic and Extrinsic Parameters of Food

CLINICAL NUTRITION AND DIETETICS DEPARTMENT

Clinical Nutrition and Dietetics Laboratories

Lab Name	Location	Person in Charge	Programs Served	Courses Served
Nutrition Assessment Lab	W12-144	Salma Abu Qiyas	Clinical Nutrition & Dietetics Dept.	Nutrition Assessment
 Environmental Microbiology Lab Food Microbiology Lab Food Safety and Quality Lab 	M12-130	Hanin Kassem	Clinical Nutrition & Dietetics Dept.	Food Microbiology
Food Processing & Preparation Lab	W12-146	Hanin Kassem	Clinical Nutrition & Dietetics Dept.	Food Processing & Preparation
Food Analysis Lab	W12-005	Radhiya Alrajaby	Clinical Nutrition & Dietetics Dept.	Food Analysis

Clinical Nutrition and Dietetics Lab Staff

#	Name	Ext.	Email
1	Salma Jamal Abu Qiyas	065057562	sabuqiyas@sharjah.ac.ae
2	Hanin Bassem Kassem	065057567	hkassem@sharjah.ac.ae
3	Radhiya Rashid Al Rajaby	065057574	ralrajaby@sharjah.ac.ae

NUTRITION ASSESSMENT LABORATORY



Location	Lab Staff in Charge	Contacts
W12-144	Salma Jamal Abu Qiyas	065057562

INTRODUCTION

Laboratory sessions complement the theory taught regarding different aspects of nutritional assessment such as: anthropometric, laboratory, clinical and dietary assessments including an evaluation of their strengths and limitations. The lab provides development of practical skills and active application of tools and techniques used for assessment of nutritional status.

EQUIPMENT & INSTRUMENTS

- Weighing Scale
- Height Meter
- Skin Fold Calipers
- Measuring Tapes
- Body Composition Analyzer (BCA Machine) and Lookin' Body Basic Software
- Stethoscope
- Blood Pressure Instrument
- Stop Watch
- Diet Sheets/ Questionnaires/ Formats
- Simulated Food Models
- Step for Fitness Test
- ESHA Software for Nutrient Analysis
- Infantometer

EXPERIMENTS

- Body Measurements: Standing Height, Circumferences (Head, Mid-Upper Arm, Chest, Waist, Hips, Wrist)
- Body Mass: Weight
- Body Composition: Skin Fold Thickness (Biceps, Triceps, Sub-Scapular, Supra-Iliac); Body

Composition Through BCA Machine

- Blood Pressure
- Pulse Rate
- Nutritional Assessment Through Anthropometric Indices (Weight for Height, Height for Age and Weight for Age, Body Mass Index- BMI, Ideal Body Weight, Adjusted Body Weight, Body Frame Size, Waist Hip Ratio, Head to Chest Ratio)
- Nutritional Assessment in Hospitalized Condition and Weight Changes
- Energy Expenditure: Basal Energy Expenditure (BEE) Using Harris Benedict and Mifflin Equations
- Dietary Intake: 24-Hour Recall, Diet History, Food Frequency, Observation, Weighment Methods
- Nutrient Intakes Calculations Based on the Dietary Intake
- Functional Test Using a Step to Assess Fitness
- Clinical Assessment Through Examination of Clinical Signs from Head to Toe
- Hospital Visits to Collect Information on the Important Biochemical Parameters Used in Nutritional Assessment and Their Normal Ranges
- Effective Counseling: Demonstration of Nutritional Counseling and Mock Sessions

- Body Composition Analysis
- Nutritional Assessment

FOOD PROCESSING AND PREPARATION LABORATORY



Location	Lab Staff in Charge	Contacts
W12-146	Hanin Bassem Kassem	065057567

INTRODUCTION

The Food Processing and Preparation Laboratory has a range of equipment and tools used for undergraduate student teaching. Practical training is combined with theoretical knowledge to equip students with the skills and scientific applications for food processing and preparation.

EQUIPMENT & INSTRUMENTS

Kitchenette- working stations for students equipped with the tools required in the kitchen for processing and preparing food.

EXPERIMENTS

- Measuring Techniques
- Methods of Cooking Including Moist Heat, Dry Heat & Microwave Cooking
- Sanitation in Food Processing and Preparation
- Vegetable's Cooking
- Cereals Cooking
- Fruit Cooking
- Meat and Poultry Cooking
- Milk and Milk Products
- Eggs and Custards
- Yeast Leavened Breads
- Butter Type Cakes

TESTS & SERVICES

• Development of New Products

FOOD ANALYSIS LABORATORY



Radhiya Alrajaby

065057574

INTRODUCTION

The Food Analysis Laboratory is a special laboratory used for teaching undergraduate students. This lab introduces students to the methods of food chemistry analysis, its use and limitations. Procedures and instruments for the analysis of specific food components are demonstrated and practiced. Practical training focuses on the analysis of various food groups for their major and minor food components including their chemical separation, identification and quantification using classical and modern instrumental food analysis techniques.

EQUIPMENT & INSTRUMENTS

W12-005

- pH Meter
- Ovens
- Muffle Furnace
- Fiber Tech System
- Digital Colorimeter

EXPERIMENTS

- PH and Total Soluble Solids
- Ash
- Water Activity
- Carbohydrates
- Carbonyurates
- Minerals

Vacuum Oven

• Analytical Balances

- Complete Soxhelt UnitDigital Refractometer
- Moisture
- Freezing Point
- Lipids
- Fiber
- Color

TESTS & SERVICES

• Analysis of Food Composition

FOOD MICROBIOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
M12-130	Hanin Bassem Kassem	065057567

INTRODUCTION

The Food Microbiology Laboratory is used for teaching undergraduate students. This lab orients students to the basic activities in food microbiology and detection of specific microorganisms in food like bacteria, molds and yeast. Experiments include preparation of microbial culture, staining techniques, disinfection and sterilization, isolation of microbial cultures in specific foods. The students will learn how to enumerate and confirm a variety of food-borne bacteria and develop an understanding of factors affecting micro-flora of foods.

EQUIPMENT & INSTRUMENTS

- PH Meter
- Normal Incubators
- CO2 Incubators
- Autoclave
- Stomacher
- Laminator Cabinet
- Analytical Balances

EXPERIMENTS

- Food Sample Preparation
- Gram Staining
- Micro-Flora of Air
- Aerobic Counts in Foods
- Coliforms Detection
- Yeasts and Moulds in Foods
- Salmonella in Poultry
- Microbiology of Water
- Processed Foods Examination: Canned Food, Cold, Frozen, and Fresh Foods
- Spore Forming Bacteria in Dried Foods

TEST & SERVICE

• Microbial Analysis

COLLEGE OF MEDICINE



Lab Name	Location	Person in Charge	Programs Served	Courses Served
OB-GYN SKILLS LAB	M27-149			Ob-gyn simulation workshop
PATHOLOGY MUSEUM LAB	M27-150			
BIOMEDICAL LAB	M27 039 & 040	Maria Apellana	Clinical Sciences Dept.	-Human Biology 1&2 (Foundation) -Microbiology (Year 1,2 & 3) -Biochemistry Year 1,2 & 3) -Modern Techniques in Molecular Biology (Master Students)
PEDIATRIC SKILL LAB	M27-035B			Pediatric simulation workshop

Medicine College Laboratories

Medicine College Lab Staff

#	Name	Ext.	Email
1.	Maria Apellana	065057284	maqui@sharjah.ac.ae

OB-GYN SKILLS LAB



Location	Lab Staff in Charge	Contacts
M27-149	Maria Apellana	065057284

INTRODUCTION

Students are trained for the basic Ob-Gyn clinical skills in the College of Medicine simulation and clinical skill laboratory. Both high fidelity and low fidelity models are available to support the training of students. Basic and cores skills are first demonstrated by the tutor and then practiced by students individually under supervision. Other more advanced skills are demonstrated by the tutor with the involvement of students.

PURPOSE

For students to gain hands on experience and get involved in skills possibly difficult to handle in hospitals due to patients refusal or procedures being advance to their level.

EQUIPMENT & INSTRUMENTS

- CAE Lucina birthing simulator: High-fidelity birthing simulator. Awireless childbirth simulator with validated, integrated maternal-fetal physiology and interchangeable static cervices to train on all the stages of delivery and the rare emergency scenario.
- Prompt Flex Cervical Dilatation & Effacement Module: It allows for training in management of both the latent and active first stages of labor.
- Task Trainers manikin: Allows the students to practice the vaginal assessment, Leopold's maneuver and normal to breech delivery.
- Pelvic Anatomy model with or without fetus: Allows student to study the anatomy.
- Clinical Female Pelvic Trainer Advanced: Ideal platform for hands-on examination for student to practice with the pelvis because it is anatomically accurate and tactile representation of the female pelvis.
- Instrumental Delivery (Vacuum/Forceps): It allows student to practice on how to handle difficult delivery by using the device.
- Ob-Gyn Basic Surgical Instruments: A tools that student can practice suturing, cutting, and holding.

- Obstetric Examination
- Assessment of Labor Progress
- Vaginal Delivery (Cephalic)
- Abnormal Labour and Delivery (Shoulder Dystocia and Breech delivery)
- Bimanual examination
- Speculum examination/Papsmear/Vaginal swab
- OBG Basic surgical instruments
- Contraceptive methods
- Instrumental Delivery (Vacuum/Forceps)

PATHOLOGY MUSEUM



Location	Lab Staff in Charge	Contacts
M27-150	Maria Apellana	065057284

INTRODUCTION

It contains a unique and valuable collection of surgical specimens covering a wide range of diseases that affect the human body. Most of the specimens were generously donated by the Pathology Department of "AL Baraha hospital", MOH.

The displayed specimens in the Pathology Museum represent an important learning resource for medical students that enables them to visualize and appreciate the different morphological abnormalities underlying disease processes. Each displayed specimen is accompanied with a small note describing its history as well as its final diagnosis.

MUSEUM FUNCTIONS

- The Pathology Museum features a collection of diseased specimens (organ tissue) complete with histories from different regions of the human body. The facility is a resource available to staff and students and is regularly utilized for scheduled classes including practical examinations and personal study. Specimens retained in our museum are used in the teaching of our undergraduate medical students. Several specimens are also used for presentations to high schools students.
- Integrate the teaching of histology and histopathology, introducing students to the microscopic features of tissues and organs, and giving them the opportunity to compare the normal with the abnormal in various disease states. Students explore the histological features of tissues, identify the changes in various pathological states, and recognize their relationship to clinical manifestations.

MUSEUM FACILITIES

- Post-surgical specimens representing a variety of diseases, preserved in 10% buffered formalin, in glass jars. The jars are arranged in cupboards.
- Ten-headed microscopes, equipped with a camera and software and attached to a PC and projector (Equipment provided by Leica, a Germany company)

BIOMEDICAL LAB



Location	Lab Staff in Charge	Contacts
M27-039 & 040	Maria Apellana	065057284

INTRODUCTION

The Biomedical Laboratory is designed in the College of Medicine M27(39-40), it is one of the most important laboratories in the College of Medicine. The Biomedical Laboratory is composed of three sub-laboratories: Human Biology, Microbiology, and Biochemistry. The laboratory is fully equipped with modern facilities and modern medical lab equipment to meet local and international standards that will help the students in scientific progress and scientific research.

PURPOSE

Biomedical Laboratory is established to introduce the undergraduate and postgraduate medical students to basic experiments and Bo- techniques used in the medical field.

EQUIPMENT AND INSTRUMENTS

- Bench top centrifuge
- Absorbance Microplate Elisa Reader
- Spectrophotometer
- Microscopes
- Precision balance
- Vortex Mixer
- Thermal Cycler
- Water Distiller
- Micro Litre Centrifuge
- Lab Refrigerator
- Vertical Gel Electrophoresis
- -20 Freezer
- Cell Density Meter

- Microbiological Incubator
- Vertical Loading Autoclave
- Shaking Water Bath
- Hematocrit Centrifuge
- Benchtop Orbital Shaker with Incubation
- Biosafety Cabinet (Class II Type A2)
- Refrigerated Micro Centrifuge
- ECG Machine
- Flammable Cabinet
- Blood pressure simulator
- Blood pressure device
- Gel documentation system

- Human Biology 1 &2
- Microscope
- Osmosis and tonicity
- Micro-pipetting
- Total white blood cell count / Hemocytometer
- Differential white blood cell count
- Hematocrit / Packed Cell Volume (PCV)
- Hemoglobin concentration
- Erythrocyte Sedimentation Rate (ESR)
- Blood typing (ABO Rh)
- Platelets- Bleeding time & Coagulation time
- Microbiology
- Staining and Microscopy (Gram Staining)
- Culture Media
- Antibiotic Sensitivity
- Serology
- Molecular Methods
- Identification of Bacteria (Biochemical tests)
- Biochemistry
- Blood cholesterol determination
- Glucose measurement
- Uria measurement

PEDIATRIC SKILL LAB



Location	Lab Staff in Charge	Contacts
M27-035B	Maria Apellana	065057284

INTRODUCTION

The pediatrics simulation lab is the theater where all Medicine 4 students learn, practice and demonstrate the systematic approach to the management of a pediatric patient. They also practice good team dynamics and understand its importance in the efficient management of the patient. Cases are usually related to 4 main pediatric emergencies: Respiratory, shock, cardiac rhythm disturbances and arrest. Every session starts with an overview of the subject and a review of the systematic approach to managing a pediatric patient. The learning outcomes are then defined so that the students have a clear understanding of the skills that they are required to demonstrate and retain in each session. Every session is followed by a debriefing session and take home messages.

PURPOSE

It is the theater where medical students practice management of pediatric basic and advanced life support. This will develop their analytical reasoning and uncover the gaps in their knowledge. They will also have hands on the required skills in pediatrics. Students learn how to recognize a patient who needs help and the systematic approach to his management. They practice and execute the steps which allows them to see the results of their actions. Debriefing is also conducted where the students analyze their own actions as well as the actions of their team. This allows them to develop improvement plans and optimizes their clinical reasoning.

EQUIPMENT AND INSTRUMENTS

- Pediatric HAL High Fidelity Simulator.
- debriefing system.

SKILLS

The simulation sessions are conducted during the pediatrics rotation. They complement the hospital bedside teaching. These simulation sessions enable our students to practice relevant pediatric scenarios and acquire basic pediatric care skills which are mainly summarized below:

- Systematic approach to the management of a sick pediatric patient
- Primary impression
- Primary and secondary assessment of a sick patient
- Recognizing a patient who needs help
- Practicing good team dynamics
- High quality CPR
- Improving teamwork and building team-leading skills
- Enhancing communication skills
- Developing and improving critical-thinking skills
- Practicing new procedures or testing new equipment
- Administering medications safely and based on pediatric dosing
- Improving patient assessment and bedside decision making
- Enhancing competency-based assessment skills
- Practicing infrequently used emergency treatment skills





Lab Name	Location	Person in Charge	Programs Served	Courses Served
Pharmaceutics (A & B)Laboratories	M12-127	Faten Elgharib	-Pharmaceutics A -Pharmaceutics B	-Bachelor of Pharmacy
Pharmaceutics (1A & 1B) Laboratories	M12-024	Lama Abdul Moti	Bachelor of Pharmacy	-Pharmaceutics 1A -Pharmaceutics 1B
Pharmaceutical Microbiology (I & II) Laboratories	M12-130	Manal Abbas	Bachelor of Pharmacy	-Pharmaceutical Microbiology I -Pharmaceutical Microbiology II
Medicinal Chemistry Lab	M12-128	-Shatha Khalifa -Razan Al-Humaidi	Bachelor in pharmacy Program & Department of Medicinal Chemistry	-Chemistry for Pharmacy. -Biochemistry. -Medicinal Chemistry IB. -Organic Chemistry I.
Medicinal Chemistry Lab	M32-G26	Shatha Khalifa	Bachelor in pharmacy Program & Department of Medicinal Chemistry	-Medicinal Chemistry IA. -Medicinal Chemistry IIA. -Medicinal Chemistry IIB. -Organic Chemistry II.
Medicinal Chemistry Lab	M32-DF33	-Shatha Khalifa -Razan Al-Humaidi	Bachelor in pharmacy Program & Department of Medicinal Chemistry	-Pharmacognosy. -Phytotherapy & Alternative Medicine. -Graduation Projects.
Pharmacology Lab	M32-G025	-Farman Khan -Chefaa Al Hourani	Bachelor of Pharmacy	-Pharmacology IA -Pharmacology IB -Pharmacology IIA

Pharmacy Laboratories

Pharmacy Lab Staff

#	Name	Title	Ext.	Email
Pha	rmaceutics and Pharmaceutica	l Technology		
1	Lama Abdul Moti	Tutor- Clinical	7474	lmoti@sharjah.ac.ae
2	Manal Abbas	Tutor- Clinical	7478	mabdelsalam@sharjah.ac.ae
3	Faten Elgharib	Tutor- Clinical	7437	felgharib@sharjah.ac.ae
Med	licinal Chemistry			
4	Razan Al-Humaidi	Tutor- Clinical	7415	ralhumaidi@sharjah.ac.ae
5	Amna Al-Ali	Lab Technician	2427	asalali@sharjah.ac.ae
6	Shatha Khalifa	Tutor- Clinical	7415	salyammahi@sharjah.ac.ae
7	Rama Al-Sabbagh	Tutor- Clinical	7476	ralsabbagh@sharjah.ac.ae
Pharmacy practice and Pharmacotherapeutics				
8	Farman Khan	Laboratory Officer	7562	fkhan2@sharjah.ac.ae
9	Chefaa Al Hourani	Tutor- Clinical	7435	calhourani@sharjah.ac.ae

PHARMACEUTICS & PHARMACEUTICAL TECHNOLOGY DEPARTMENT PHARMACEUTICS (A) LABORATORY



Location	Lab Staff in Charge	Contacts
M12-127	Faten Elgharib	065057437

INTRODUCTION

The goal of the Laboratory is to provide students with the necessary skills in performing pharmaceutical calculations and to promote students learning by performing full experimental work on physical pharmacy topics covered in this course such as partition phenomena, phase equilibria and solubility. This lab will provide the students with practical training in the formulation of oral liquid dosage forms such as syrups, effervescent solutions, infusions, decoctions, mouthwashes, elixirs and aromatic waters.

EQUIPMENT & INSTRUMENTS

• Pycnometer

- UV Spectrophotometer
- Separating Funnel
- pH Meter
- Thermometers
- Hot plate

• Water bath

- Pharmaceutical Calculations Density, Specific Gravity and Specific Volume of Liquids.
- Preparation of Pharmaceutical Buffered Solutions and Determination of Buffer Capacity.
- Preparation of Simple Syrup, Effervescent Solutions and Drought.
- Preparation of Cough Syrup, Infusion of Senna.
- Preparation of Strong Iodine Solution (Lugol's Solution), Washes and Aromatic Waters.
- Determination of Critical Solution Temperature of Phenol/ Water System.
- Phase Diagram of Three-Component Mixture System.
- Determination of Partition Coefficient of Iodine between Two Immiscible Phases.
- Determination of the Effect of Temperature and Electrolytes on the Solubility of Benzoic Acid.

PHARMACEUTICS (B) LABORATORY



Location	Lab Staff in Charge	Contacts
M12-127	Faten Elgharib	065057437

INTRODUCTION

The goal of the Laboratory is to promote student's learning by performing full experimental work on physical pharmacy topics covered in this course such as determination of colligative properties of pharmaceutical solutions, measurement of surface and interfacial tension of disperse systems, use of surfactants in micellar solubilization, determination of rheological properties of pharmaceutical preparations and determining optical and electric properties of colloids.

EQUIPMENT & INSTRUMENTS

- Osmometer
- Stalagmometer
- Ostwald Viscometer
- Brookfield Viscometer
- Microscope

- Determination of Colligative Properties of Solutions Osmotic Pressure.
- Effect of Adding Hypotonic or Hypertonic Solutions on Red Blood Cells.
- Determination of Colligative Properties of Solutions- Freezing Point and Boiling Point.
- Determination of Surface Tension and Interfacial Tension between Two Immiscible Phases.
- Determination of Critical Micelles Concentration of Surfactants.
- Micellar Solubilization of Water-Insoluble Drugs.
- Adsorption of Oxalic Acid on Charcoal.
- Preparation and Characterization of Colloids.
- Determination of Rheological Properties of Different Pharmaceutical Dosage Forms.

PHARMACEUTICS (1A) LABORATORY



Location	Lab Staff in Charge	Contacts
M12-024	Lama Abdul Moti	065057474

INTRODUCTION

The goal of the Laboratory is to provide students with practical training in formulating and preparing dosage forms such as suspensions, emulsions, microemulsions, gels, ointments and suppositories. Students will be able to interpret, calculate, extemporaneously prepare these dosage forms and apply basic scientific principles to the art and technology of formulation.

EQUIPMENT & INSTRUMENTS

- Brookfield Viscometer
- Conductometer
- Suppositories Molds
- Mortar & Pestle
- Thermometer

- Formulation and Characterization of Suspensions.
- Physical Stability Testing of Suspensions.
- Formulation and Characterization of Emulsions.
- Formulation of Microemulsions, Physical Stability of Emulsions.
- Formulation of Gels.
- Formulation of Cosmetic Creams.
- Formulation of Medicated Creams.
- Formulation of Ointments.
- Formulation of Suppositories (Oily Bases).
- Formulation and Characterization of Suppositories (Hydrophilic Bases).
- Formulation of Pessaries.

- Centrifuge
- Microscope
- Ice Maker
- Ointment tile

PHARMACEUTICS (1B) LABORATORY



Location	Lab Staff in Charge	Contacts
M12-024	Lama Abdul Moti	065057474

INTRODUCTION

The goal of the Laboratory is to provide students with practical training on how to formulate and characterize different solid dosage forms such as powders, tablets and capsules. The lab is designed to teach the students 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.

EQUIPMENT AND INSTRUMENTS

- Korsch Tablet Press Machine
- Kaleva Spray Coating Machine
- V-Blender
- Sieve Shakers/ Retsch Sieves
- Disintegration Testing Apparatus
- Dissolution Apparatus USP
- Friability Testing Apparatus
- Thickness and Hardness Apparatus
- Flow Meter
- Tapped Density Tester
- Capsule Filling Machine
- Lyophilizer
- Malvern Zeta Sizer
- Stability Chamber
- UV-Spectrophotometer
- Magnetic Hot Plate
- Desiccator
- Oven

- Centrifuge
- Weighing Scale
- Thermometer

- Determination of Powder Flow Properties.
- Determination and Characterization of Particle Size of Powders.
- Preparation and Quality Control Testing of Effervescent Granules.
- Formulation, Preparation and Quality Control Testing of Paracetamol Capsules.
- Formulation, Preparation and Quality Control Testing of Immediate Release Paracetamol Tablets.
- Formulation, Preparation and Quality Control Testing of Sustained Release Paracetamol Tablets.
- Formulation, Preparation and Quality Control Testing of Tablets Prepared by Wet Granulation.
- Testing of Enteric Coated Tablets.
- Effect of Compression Force on Tablet Properties.
- Tablet Coating using Spray Coating Technique.
- Detection and Characterization of Tablet Defects.

PHARMACEUTICS (2A) LABORATORY



Location	Lab Staff in Charge	Contacts
M12-024	Lama Abdul Moti	065057474

INTRODUCTION

The goal of the Laboratory/Tutorial is to provide students with practical training in performing bioequivalence studies. The lab offers hands on training on how to design, perform, analyze and interpret results and write reports of bioequivalence studies. The lab/tutorial also aims to complement the core course in providing essential knowledge regarding fundamental factors affecting pharmacokinetics parameters of drugs by using means of practice problems, computer simulation program and group project work.

EQUIPMENT AND INSTRUMENTS

- HPLC
- Centrifuge
- Vortex
- Centrifuge Tubes
- Bath Shaker
- UV Spectrophotometer
- USP Dissolution Tester
- Freezer
- WinNonlin/Phoenix Software
- SPSS Software

- Problem Solving Rates and Orders of Processes (Zero and First-order) using Phoenix Software, Excel and Graph Paper.
- Problem Solving Relative and Absolute Bioavailability.
- Problem Solving on One-Compartment IV Bolus Model using Phoenix Software, Excel and Graph.

- Bioequivalence (BE) Definition and Performance of BE studies and Introduction to the Group Project.
- Problem Solving on One-Compartment IV Infusion Model; using Phoenix Software, Excel and Graph.
- Compartmental and Non-Compartmental Analysis using Phoenix Software.
- Assessment of BE using Phoenix Software and Excel.
- Problem Solving on One-Compartment Extravascular Administration (Oral); using Phoenix Software, Excel and Graph.
- Problem Solving on Two-Compartment IV Bolus Model; using Phoenix Software, Excel and Graph.

PHARMACEUTICAL MICROBIOLOGY I LABORATORY



Location	Lab Staff in Charge	Contacts
M12-130	Manal Abbas	065057478

INTRODUCTION

The goal of the Laboratory is to provide students with the necessary skills in performing fundamentals of microbiology and microbiological concepts and the pathogenicity of microorganism in human being. The lab is designed to promote student's learning by performing full experimental work on Pharmaceutical microbiology and the topics covered in this course such as proper use and care of microscope, preparation of culture media and transferring of bacteria in aseptic manner, identify the bacteria by gram staining and API-Rapid detection test, select a particular media and isolation of bacteria, check the factors affecting the optimal growth of bacteria, understand the immune response to microorganism, Antibiotic susceptibility test, bacterial transformation and finally detection of genetically modified DNA by PCR.

EQUIPMENT AND INSTRUMENTS

- Biosafety Cabinet II
- Light Microscope
- Autoclave
- Automated colony counter
- Manual colony counter
- Anaerobic jar
- Vortex
- Thermocycler
- Gel Electrophoresis
- Densichek
- Incubator
- Deep Freezer
- Microplate Reader

- Use and Care of the Microscope.
- Handling Bacteria: Preparation and Inoculation of Culture Media.
- Transfer of Bacteria: Aseptic Technique.
- Preparation of Smears, Simple Staining and Gram Staining.
- Cultivation of Bacteria, Isolation of Bacteria by Dilution Techniques.
- Special Media for Isolating Bacteria.
- Oxygen and the Growth of the Bacteria.
- Immunology- Antigen-Antibody Reactions.
- Antibiotic Susceptibility Test.
- Rapid Bacterial Identification-API.
- Bacterial Transformation.
- Detect the Genetically Modified Food by Polymerase Chain Reaction.

PHARMACEUTICAL MICROBIOLOGY II LABORATORY



Location	Lab Staff in Charge	Contacts
M12-130	Manal Abbas	065057478

INTRODUCTION

The goal of the Laboratory is to promote students with the necessary microbiological skills required in the production, handling, and managing of pharmaceutical sterile dosage forms. The lab is designed to nurture students learning by performing full experimental work especially on the microbiological aspect in manufacturing of pharmaceutical sterile dosage forms and the topics covered in this course such as sources of contamination, chemical and physical control of microorganism by disinfectant, antibiotics, heat and UV radiation, validation of sterilization, bioburden determination and finally LAL test for pyrogen.

EQUIPMENT AND INSTRUMENTS

- Incubator
- Biosafety Cabinet Class II
- Autoclave
- Hot air Oven
- Water bath
- Densichek
- UV Chamber
- Portable UV lamp
- Plate rotator
- Vortex
- Bunsen burner
- Portable air sampler
- Bowie dick tape
- Membrane filtration Unit

- Sources of Microbial Contamination.
- Chemical Methods of Control: Disinfectants and Antiseptics.
- Factors Affecting the Antimicrobial Activity of Disinfectants.
- Physical Methods of Microbial Growth: Heat & UV radiation.
- Validate the Sterilization Process- Biological and Chemical Indicator.
- Chemical Methods of Microbial Control- Antimicrobial Drugs.
- Traditional Gel Clot Limulus Amebocyte Lysate (LAL) Test-Test for Bacterial Endotoxin.
- Membrane Filtration Method-Test for Bioburden Determination.

MEDICINAL CHEMISTRY DEPARTMENT

Medicinal Chemistry Lab Staff

#	Name	Ext.	Email
1	Razan Al-Humaidi	7415	ralhumaidi@sharjah.ac.ae
2	Amna Al-Ali	2427	asalali@sharjah.ac.ae
3	Shatha Khalifa	7415	salyammahi@sharjah.ac.ae

CHEMISTRY FOR PHARMACY LABORATORY



Location	Lab Staff in Charge	Contacts
M12-128	Razan Al-Humaidi Shatha Khalifa	065057415

INTRODUCTION

This course covers experiments on qualitative and quantitative aspects of general chemistry and their applications in the pharmaceutical field, such as separation, identification, determination, purification and extraction procedures.

EQUIPMENT AND INSTRUMENTS

- Analytical Balances
- Hot Plates and Stirrer
- Ice Flaking Machine
- Centrifuge
- Separatory Funnel
- Rota Evaporator

- Laboratory Safety & Measurements
- Qualitative Analysis of Anions
- Qualitative Analysis of Cations
- Physical Properties of Chemicals: Melting Point, Sublimation, and Boiling Point
- Water of Hydration
- Caffeine Extraction
- Analysis of Vinegar by Titration
- Purification Techniques & Recrystallization
- Water hardness & Analysis
- Hybridization, Isomerism & Stereochemistry
- Paper Chromatography; Separation of Plant Pigments
- Analysis of Ascorbic Acid by Oxidation Reduction Titration

- Top Loading Balances
- Oven
- Water Bath
- Vacuum Pump
- Melting Point Apparatus

MEDICINAL CHEMISTRY IA LABORATORY



Location	Lab Staff in Charge	Contacts
M32-G26	Razan Al Humaidi	065057415

INTRODUCTION

This course introduces the basic concepts of medicinal chemistry, including study of the molecular and chemical structures of organic molecules using molecular models, functional groups reactions and identification of organic compounds, as well as the synthesis of some chiral compounds and the techniques used for enantiomeric separation.

EQUIPMENT AND INSTRUMENTS

- Analytical Balances
- Hot Plates and Stirrers
- Rotatory Evaporators and Vacuum Pumps
- Distillation Apparatuses
- Melting Point Apparatuses
- Water Baths
- Ultrasonic Bath
- Ovens

- Molecular Models and Stereochemistry
- Factors Affecting Nucleophilic Substitution (SN1) Reaction
- Factors Affecting Nucleophilic Substitution (SN2) Reaction
- Oxidation of Benzyl Alcohol to Benzoic Acid
- Resolution of Racemic Mixture of α-Methylbenzylamine (Part-I)
- Resolution of Racemic Mixture of α-Methylbenzylamine (Part-II)
- Synthesis of dibenzyl acetone: (Claisen-Schmidt reaction)

MEDICINAL CHEMISTRY IB LABORATORY



INTRODUCTION

This course is concerned with the theory and practice of the preparation of some active ingredients in pharmaceutical preparation as well as the classical and instrumental methods for the separation, identification and quantitative analysis of chemical substances. Satisfactory completion of this course affords students a working knowledge of analytical instrumentation typically employed in pharmaceutical and biochemical research laboratories. It also provides students with an appreciation of the relative strengths and limitations of different instrumental-based analysis methods.

EQUIPMENT AND INSTRUMENTS

- UV-VIS Spectrophotometer
- GC-MSMS
- GC-FID and GC-ECD
- HPLC-UV
- Analytical Balances
- Hot Plates and Stirrers
- Rotatory Evaporators and Vacuum Pumps
- Water Baths
- Ultrasonic Bath
- Ovens

- Qualitative Analysis of Functional Groups (Alcohols, Phenols & Carboxylic Acids)
- Qualitative Analysis of Functional Groups (Aldehydes, Ketones, Ester, Amines & Amides)
- Chromatographic Principles & Drugs Mixture Separation using TLC
- Separation of Caffeine and Paracetamol Mixture using HPLC

- Separation and Identification of Hydrocarbon Mixture using GC-FID & GC-MSMS
- Determination of Unknown Concentration using UV-Visible Spectrophotometer

TESTS AND SERVICES

- Development and Validation of Analytical Methods for Analysis of Active Ingredients and Related Substances.
- Routine Quality Control of Pharmaceutical Products.
- Accelerated and Real Time Stability Study of Pharmaceuticals.
- Heavy Metal Content Determination in Pharmaceutical Samples.

MEDICINAL CHEMISTRY IIA LABORATORY



Location	Lab Staff in Charge	Contacts
M32-G26	Shatha Alyammahi	0650577410

INTRODUCTION

The practical part of the course covers experiments on the synthesis of organic and heterocyclic compounds and the different methods for their analysis including purification, assessment and structural elucidation techniques.

EQUIPMENT AND INSTRUMENTS

- Analytical Balances
- Hot Plates and Stirrer
- Water Bath
- Vaccum Pump
- Polarimeter
- Reflux apparatus
- Separator Funnel
- UV Cabinet

- Top Loading Balances
- Oven
- Thermometer
- IR- Spectrophotometer
- Ice Flaking Machine
- Melting Point Apparatus
- Rotatory Evaporator
- Thin Layer Chromotography Tanks

EXPERIMENTS

- Friedel-Crafts Alkylation
- Nitrating Methyl Benzoate: Electrophilic Aromatic Substitution
- Synthesis of 3-Methylpyrazole-5-One
- Synthesis of Acetanilide
- Diel's Alder Reaction

TESTS AND SERVICES

- Compound purification and purity check.
- Structural Elucidation and characterization.

MEDICINAL CHEMISTRY IIB LABORATORY



Location	Lab Staff in Charge	Contacts
M32-G26	Shatha Alyammahi	065057410

INTRODUCTION

The practical part of this course deals with experiments on the synthesis of some pharmaceutically active compounds (examples of drug molecules) and their corresponding purification, detection, characterization and stability /biological activity assessment. Experiments cover the study their chemical and pharmaceutical properties as well as the application of molecular modeling to study the three-dimensional structures of drugs and their structure activity relationship (SAR).

EQUIPMENT AND INSTRUMENTS

- Analytical Balances
- Top Loading Balances
- Hot Plates and Stirrer
- Oven
- Water Bath
- Thermometer
- Centrifuge
- Vaccum Pump
- UV-Vis Spectrophotometer
- Polarimeter
- Ice Flaking Machine
- Reflux apparatus
- Melting Point Apparatus
- Separator Funnel
- Rotatory Evaporator
- UV cabinet
- Thin Layer Chromotography Tanks

EXPERIMENTS

- Synthesis of Sulfasalazine
- Synthesis of 5,5-Diphenylhydantoin (Phenytoin)
- Multicomponent Reactions (MCR's) The Biginelli and Passerini Reactions (Part-I).
- Multicomponent Reactions (MCR's) The Biginelli and Passerini Reactions (Part-II)
- Synthesis and Chemical Analysis of Penicillin's
- Structural Data: The Bases for Molecular Modeling (Molecular Docking).

TESTS AND SERVICES

- To have Preliminary Idea about the Active Ingredients and their Concentration in the Drug Dosage Forms
- Toxic Elements Detection and Measurement in Food, Water, Soil and other Specimens (With the Help of ICP)

PHARMACOGNOSY LABORATORY



Location	Lab Staff in Charge	Contacts
M32-DF33	Razan Al-Humaidi Shatha Khalifa	065057415

INTRODUCTION

Plant materials are used throughout all countries from all around the world as home remedies, over the counter which is using drug products and raw materials for the pharmaceutical industry. It is therefore essential to ensure the quality of medicinal plant products by using several techniques and applying suitable standards. One of the most important techniques to authenticate a crude plant drug is the microscopy-based examination of the crude plant or the plant powder. The plant material is prepared for a microscopy examination and the anatomical features of the powdered drugs are recorded in order to compare the structures present with those drawn and described in the relevant monographs. At the end of the lab course, students can interpret the morphological and anatomical descriptions of the crude plant in order to clearly identify it. On the other hand, significant number of drugs present in the market with unique medical applications are of natural origin or inspired from natural origin. Therefore, students are trained on the phytochemical investigations and several discovery approaches that can be employed in the discovery of novel drugs.

- The Morphological and Microscopical Identification/ Authentication of the Herbal Leaves such as Senna Leaves; Peppermint Leaves; Thyme Leaves
- The Morphological and Microscopical Identification/ Authentication of the Herbal Seeds and Flower Drugs such as Black Mustard Seeds, Fenugreek Seeds, Cardamom Seeds, Clove Flower, Chamomile Flower
- The Morphological and Microscopical Identification/ Authentication of Herbal Fruits such as Anise Fruit, Coriander Fruit, Fennel Fruit, Capsicum Fruit
- The Morphological and Anatomical Identification/ Authentication of Herbal Underground Parts (Barks; Rhizomes) such as Cinnamon Bark, Liquor ice, Ginger Rhizome, Rhubarb

Rhizome, Ginger

- Extraction of Volatile Oil including chamazulene using Steam Distillation Apparatus and Introduction of Techniques for Commercial Production of Volatile Oil from Plant Source
- Extraction of capsaicin from Plant Source using Soxhlet Apparatus
- Phytochemical Investigation of anthraquinone Glycosides
- Phytochemical Investigation of tropane Alkaloids
- Phytochemical Investigation of Carbohydrates
- Extraction of Tannins/ Caffeine from Tea leaves followed by phytochemical investigation of caffeine and industrial application of tannins
- Hytochemical Investigation of Flavonoids

EQUIPMENT AND INSTRUMENTS

- Hot Plates and Stirrer
- Clinical Compound Microscope
- Water Bath
- Vacuum Pump
- Separator Funnel, test tubes and other glass wares
- Rotatory Evaporator
- UV Cabinet
- Distilled Water Machine
- Thin Layer Chromatography Tanks
- Thin layer chromatography plates and sheets
- Steam Distillation Apparatus
- Soxhlet Apparatus
- Gas Chromatography Machine
- HPLC

TESTS AND SERVICES

- This course gives the pharmacists the skills to identify herbal medicines and detect any adulteration in the herbal products in the market through microscopic examinations.
- Students learned to identify the phytochemical constituents in plant sources which are essential for natural drug discovery and industrial applications.

PHARMACY PRACTICE & PHARMACOTHERAPEUTICS DEPARTMENT

Lab Name	Location	Person in Charge
Pharmacology Lab	M32-G025	- Farman Khan - Chefaa Al Hourani

Pharmacy Practice & Pharmacotherapeutics Lab Staff

#	Name	Ext.	Email
1	Farman Khan	7431	fkhan2@sharjah.ac.ae
2	Chefaa Al Hourani	7435	calhourani@sharjah.ac.ae
PHARMACOLOGY LABORATORIES [PHARMACOLOGY (IA)]



Location	Lab Staff in Charge	Contacts
M32-G025	Farman Khan	065057431
	Chefaa Al Hourani	065057435

INTRODUCTION

Pharmacology of drugs, their mechanisms of action; therapeutic uses, adverse effects and drug interaction are covered in theoretical classes. However, to appreciate such principles and the importance of testing drugs for their effects, practical classes aim to illustrate such effects on isolated and whole animal preparations. In this laboratory classes, students learn how to handle animals, how to use syringes & adjust the doses and learn the pharmacokinetic principles. In addition, students investigate some of the responses of guinea pig ileum preparation to several drugs, ranging from dose-response, compare between different agonists & studies to demonstration of selective antagonism. In addition, they learn about effects of drugs on Rabbits eye to understand autonomic pharmacology. The sympathetic and parasympathetic control of pupil size diameter and how pupil diameter changes in response to a change in ambient light & how to measure IOP. Neuro-muscular Blockers and drugs effects on skeletal muscle preparations are also covered. The effect of drugs on the slow muscle fibers of Toads abdominis muscle is also examined by simulated program, how to differentiate between the spastic and flaccid paralysis by studying the Neuro-muscular Blockers effect on chick. Simulated lab programs are used to demonstrate these principals in addition to the wet lab according to availability of animals and suitable species to be used.

EQUIPMENT AND INSTRUMENTS

- Water Still W4000
- Electronic Balances
- Thermostatic Bath
- Microscope
- Oven UNB
- UV Lamp Bench Type

- PH Meter
- Precision Triple Beam Balance
- Centrifuges
- Refrigerator
- Chest Freeze
- Hot Plates
- Vortex Mixer
- Melting Point Apparatus
- Mettle Toddler Microbalance
- Thermo Circulator
- Rat, Mice & Rabbits Cages
- Animal Temperature Recorder
- Rat Restrainer Adjustable Length
- Rabbit Restrainer Adjustable Length
- Dissecting Set
- Harvard Apparatus Oscillographs
- Small Animal Ventilator
- Single Heated Tissue- Organ Bath
- Operator Table for Animal
- Homoeothermic Control Units for Medium & Small Animals
- Rat, Mice & Rabbits Cages
- Desiccator
- AD- Instrument

- Introduction to Safety Regulations
- Experimental Animals and their Methods of Handling
- Syringes Preparation & Dose Calculation
- Different Routes of Drug Administration
- Drug Drug Interactions "Principle of Enzyme Inducers and Enzyme Inhibitors"
- Identification of Unknown Drug
- The Effect of Autonomic Drugs on Rabbit's Eye "Pupil Size, Accommodation, Light & Corneal Reflex."
- Guinea Pig Ileum Preparation "Dose Response Relationship, Comparison Between Different Agonist, Effect of the Agonist in the Presence of Antagonists".
- Neuromuscular Junction Blockers & Frogs Rectus Abdominis Muscles
- Anterior Tibalis Sciatic Nerve Preparation
- Finkleman Preparation

PHARMACOLOGY LABORATORIES [PHARMACOLOGY (IB)]



Location	Lab Staff in Charge	Contacts
M32-G025	Farman Khan	065057431
	Chefaa Al Hourani	065057435

INTRODUCTION

This course will introduce the basic concepts of Cardiovascular Pharmacology to students & will investigate aspects of muscle function and drug effects in diverse isolated tissues and whole animal preparations including:

- Cardiac Muscle Function
- Vascular Tissue (Rat Coronary Artery & Rabbit Blood Pressure). All experiments expose students to techniques including Equipment Set-up, Force Transducer Calibration, Tissue Dissection and Mounting, and Dose-response Assays and Analysis

The following experiment uses a small mammal, rabbit & albino rats to investigate the actions of various pharmacological agents on the arterial blood pressure and also the effects of drugs on the isolated rabbit heart, using a Langendorff apparatus in which the heart is perfused via its coronary arteries with oxygenated physiological solution, which keeps the cardiac muscle viable in vitro for a few hours. The student will explore the effects of various neurotransmitters and drugs on the heart. Simulated lab program & short video animation used to demonstrate these principals in addition to the wet lab according to availability of animals and suitable species to be used.

EQUIPMENT AND INSTRUMENTS

- Blood Pressure Transducer
- AD Instrument
- Heart Mammalian Perfusion System
- CODA System
- Blood Pressure Monitor Mercury
- Harvard Apparatus Oscillographs

- Cardiovascular Anatomy & Physiology
- Dissection of Mice (Heart & Kidney Location)
- Electrophysiology of the Heart and ECG
- Working Heart Model
- Effects of Drugs on the Perfused Isolated Rabbits Heart Langendorff Isolated Heart Perfusion
- Rat Blood Pressure Preparation In vivo
- Blood Coagulation

PHARMACOLOGY LABORATORIES [PHARMACOLOGY – IIA]



Location	Lab Staff in Charge	Contacts
M32-G025	Farman Khan	065057431
	Chefaa Al Hourani	065057435

INTRODUCTION

This course will introduce the basic concepts of CNS Pharmacology, including experimental Parkinsonism, Screening Analgesic of NSAID, and Differentiation between CNS Stimulants & Depressants In vivo.

How to Design Antidepressant Model Experiment? – Forced Swim Test. Local anesthetic agents and induction of physical dependence using morphine.

EQUIPMENT AND INSTRUMENTS

- Rat Restrainer Adjustable Length
- Rabbit Restrainer Adjustable Length
- VERSAMAX Analyzer
- Hot Plate Analgesia Meter Harvard
- Animals Training Wheel
- Stereotaxic Apparatus
- Animal Activity Monitor + Acer Monitor + Computer Set

- Experimental Parkinsonism
- Differentiation between CNS Stimulants & Depressants.
- How to Design Antidepressant Model Experiment? Forced Swim Test.
- Opioid Analgesia in Animals, Thermal & Mechanical Methods
- Non-steroidal Anti Inflammatory Analgesics Screening Activities, Chemical & Electrical Methods
- Induction of Physical Dependence with Morphine
- Effect of Local Anesthetic Agents on Rabbits Eye

COLLEGEOF DENTAL MEDICNE

1



SIMULATION (SKILLS) LABORATORIES



Location	Lab Staff in Charge	Contacts
- M28-104 - M28-105 - M28-108 - M28-108A	Hanalory Nofal	065057352
	Fozia Aslam	0507868220

There are two simulation laboratories dedicated to the preclinical training of the undergraduate and postgraduate students. One is specifically for the undergraduate students with 86 simulated manikin patients on which students can practice many of the psychomotor skills required in dentistry prior to performing these procedures in clinical patient care.

The simulation laboratories are mostly used by Dental Clinical Practice 1, Dental Clinical Practice 3 students. The other simulation laboratory is the first fully digital high-definition system of its kind. Here postgraduate students will practice more advanced dental procedures including implant dentistry. It will also be used for faculty to acquire and practice new skills in hands-on courses. It is adapted for digital dentistry to allow for first class preclinical and clinical digital dentistry educational experiences.

DENTAL TECHNOLOGY TEACHING LABORATORY



Location	Lab Staff in Charge	Contacts
F-152	Aiad Alenis	065057616

Undergraduate dental students in enrolled in Dental Clinical Practice 2 and Dental Clinical Practice 3 receive instructions and gain hands-one experience in laboratory procedures to strengthen their understanding of removable prostheses fabrication and learn good communication skills with dental technicians. One laboratory station is available for every student scheduled for each laboratory session. Student stations are designed and equipped for students to work while seated and include adequate ventilation and lighting, necessary utilities, and dust collection equipment.

ORAL HISTOLOGY & CELL BIOLOGY LABORATORY



INTRODUCTION

The Oral Histology and Cell biology lab is basically dedicated to the BDS1 & BDS 2 students. It is broadly divided into 2 subdivisions. Basic cell histology and general histology for BDS1 and Embryology and Oral histology for BDS2 students. The labs are related to the study of the development and detailed functional histology of the oral tissues, including the teeth and their supporting structures in this laboratory.

EQUIPMENT AND INSTRUMENTS

- Computer system with projector
- Teaching microscope adapted with a camera
- Compound light microscopes
- Prepared histological glass slides
- Document projector with camera

- Human Cell Biology & Histology
- Introduction to Lab safety
- Compound microscopy and applications
- Tissue processing for compound microscopy
- Blood cell morphology
- Cell cytoplasm and nucleus morphology
- Microbiology- Identification of Bacteria
- Basic histology of Epithelium
- Basic histology of Connective tissue
- Basic histology of Nervous tissue
- Basic histology of Cartilage

- Basic histology of Bone
- Basic histology of Muscle
- Basic histology of Skin
- General Embryology
- Embryology and Oral Histology
- Embryology of head and neck
- Histology of Tooth Development
- Histology of Enamel & Dentin
- Histology of Pulp
- Histology of Periodontium
- Histology of oral Mucosa
- Histology of Salivary gland

DENTAL ANATOMY & HEAD ANATOMY LABORATORY



Location	Lab Staff in Charge	Contacts
M28-034	Dr. Mais Abdalla	065057357

INTRODUCTION

The Dental Anatomy labs are specifically dedicated to the BDS1 students. These labs introduce them to various aspects of oral and dental anatomy throughout the academic year. They explore detailed anatomy of individual teeth, by studying large and life size tooth models. Further these labs also provide drawing exercises and tooth carving exercises to the students using wax blocks to enhance their knowledge of the intricate details of a given tooth. The students are also trained in age estimation exercises using radiographs and models. In addition, basics of skull osteology, TMJ and muscles of mastication are also introduced to the students in this laboratory.

EQUIPMENT AND INSTRUMENTS

- Permanent dentition tooth models (Big size)
- Permanent dentition tooth models (Life size)
- Primary dentition tooth models (Life size)
- Upper and lower big jaw models
- Permanent dentition set models in occlusion
- Mixed dentition set models in occlusion
- Primary dentition set models in occlusion
- Human skull models (white & color coded)
- Human skull models with muscles of mastication
- Printed copies of radiographs (OPG)
- Wax block for tooth carving
- Document projector

- Notation systems of teeth
- Landmarks of teeth

- Age estimation
- Identification of teeth
- Carving teeth
- Drawing teeth
- Skull Osteology
- TMJ and muscles of mastication

HEAD AND NECK ANATOMY LABORATORY



Location	Lab Staff in Charge	Contacts
M28-034	Dr. Mais Abdalla	065057357

INTRODUCTION

The head and neck anatomy lab are part of the Human Biology 2 stream of the Bachelor of Dental Surgery program at the college of dental medicine. It provides the undergraduate students with the necessary resources to practically view and understand the gross human head and neck anatomy. Sessions are held to demonstrate to the students the relevant structures and landmarks following the theoretical lectures

EQUIPMENT AND INSTRUMENTS

- Compound light microscope
- 3D high-resolution scanner / camera for online sessions
- Data show projector and Computer system with internet accessibility.
- Plastic models of head and neck region.
- Human skull models
- Human skeleton model
- Cervical vertebrae
- Cartilages and muscles of larynx
- The ear
- The eye and orbital region
- Tongue and oral cavity
- Plastinated human parts of different regions of the head and neck
- Illustrative anatomy diagrams and charts

HEAD AND NECK ANATOMY SESSIONS

- Orientation and Lab Safety
- Skull's osteology
- The face, parotid region, and meninges

- The nasal cavity and paranasal sinuses
- The orbital region
- The temporal, infratemporal fossa, and pterygopalatine fossa
- The oral cavity
- Neck triangles and cervical fascia
- Cervical vertebrae
- The pharynx and larynx
- TMJ and muscles of mastication
- The ear

ORAL HISTOPATHOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
M28-103A	Dr.Natheer Al-Rawi	065057313

INTRODUCTION

The oral histopathology lab at the College of Dental Medicine, serves the Dental Health Sciences 3 and Dental Health Sciences 4 streams. It provides the undergraduate students with an opportunity to practically view and identify oral pathological conditions previously given in theoretical sessions using prepared tissue slides under light microscopy. In addition, seminars are conducted to discuss contemporary topics distributed to the students pertaining to oral pathology and diagnosis.

EQUIPMENT AND INSTRUMENTS

- Compound Light Microscopes
- Prepared tissue slides
- Tissue slides holders
- Microscopic camera

SESSIONS / EXPERIMENTS

- Dental Pathology
- Bone Pathology
- Odontogenic cysts
- Odontogenic tumors
- Oral white lesions
- Soft tissue lesions
- Salivary gland tumors
- Oral Cancer

CLINIC D (PROSTHODONTIC CLINIC)



Location	Lab Staff in Charge	Contacts
M28-007,011	Gretchen Abrogar Antenor	065057342

INTRODUCTION

MDS Prosthodontic clinic is a post graduate training clinic. Patients are treated with fixed and removable prosthodontic appliances and implant prosthodontics.

EQUIPMENT AND INSTRUMENTS

- Dental chair (16 units)
- BP Apparatus (1unit)
- Crash Cart (1 unit)
- AED Machine (1unit)
- Weighing Scale (1unit)

TESTS AND SERVICES

The treatments in this clinic provide patients with fixed and removable prosthodontic appliances and implant prosthodontics.

CLINIC B & C (PERIODONTICS CLINIC)



Location	Lab Staff in Charge	Contacts
M28-109	Florence Serrano Lagazo	065057343

INTRODUCTION

MDS Periodontology clinic is a post graduate training clinic. The treatments in this clinic include non-surgical and surgical therapies for various periodontal problems. Such as scaling and root planning, gingivectomy, flap surgeries, clinical crown lengthening surgery, mucogingival surgeries, and guided tissue regenerations.

EQUIPMENT AND INSTRUMENTS

- Dental chair (10 units)
- DSLR Camera (1 unit)
- Satelec Scalers (5 units)
- Implant Motor (1 unit)
- Periotron Machine (1unit)
- BP Apparatus (1unit)
- Crash Cart (1 unit)
- AED Machine (1unit)
- Weighing Scale (1unit)
- Laser Machine (1unit)
- Airflow Handpiece (3pcs)
- Infrared Thermometer (1pc)

TESTS AND SERVICES

The treatments in this clinic include non-surgical and surgical therapies for various periodontal problems.

CLINIC A (ENDODONTICS CLINIC)



Location	Lab Staff in Charge	Contacts
M28-110/112A	Wendelyn Ularte	065057337

INTRODUCTION

The Endo Post Grad Clinic is mainly handling difficult cases for root canal treatment, such as root canal retreatment, removal of broken instruments, treating calcified canals and tooth perforation repair using advanced equipment which includes Surgical Microscopes, Calamus and different kind of motors for root canal treatment.

EQUIPMENT AND INSTRUMENTS

- Dental chair (10 units)
- Global Ceiling Microscope (5 units)
- Global Portable Surgical Microscope (1 unit)
- Zumax Portable Surgical Microscope (5 units)
- Xray Machines (7 units)
- Digora Machine (1 unit)
- Smart TV (5 units)
- DSLR Camera (8 units)
- Calamus (4 sets)
- Gutta Smart (2 sets)
- XSmart Protaper (2 sets)
- Waveone Motors (10 units)
- Portable Ultrasonic Scalers (7 units)
- Endo Activator (1 Pc)

- Assessment of different rotary motors
- Assessment of different irrigation systems
- Assessment of healing of periapical tissues

TESTS AND SERVICES

The Endo Post Grad is providing root canal treatment for the patient especially those who have difficult cases, such as root canal retreatment, removal of broken instruments, treating calcified canals and tooth perforation repair.

RESEARCH INSTITUTE OF SCIENCES & ENGINEERING (RISE)



RISE LABORATORIES

Lab Name	Location
Advanced Materials Research Laboratory	M12-125
Transportation And Pavement Research Laboratory	W12-020
Electrical And Electronics Workshop	W12-103
Multi-Purpose, Multi-Functional Workshop	M12-002
Geographic Information Systems & Remote Sensing Center	Sharjah Academy of Astronomy, Space sciences & Technology
Functional Nanomaterials Synthesis Laboratory	W12-016, W12-013, M12-125
Integrated Analytical Laboratory	M32- DG-47
High Performance Computing Facility	M11 – 221 (IT center – server Room)
Biomass Energy Systems	W12-024C
Professorship Chair, General Civil Aviation Authority, Aviation Center of Excellence	W12-124
Aerospace Center Of Excellence / Unmanned Aircraft System Center	W12-125
Renewable Energy Research Laboratory	W12-305

RISE Lab Staff

#	Name	Lab	Email	Ext.	
1	Mohammed Shamir	Advanced Materials Decearch Laboratory	mshameer@sharjah.ac.ae	2421	
2	Mohammed Irshad	Advanced Materials Research Laboratory	mirshad@sharjah.ac.ae	2431	
3	Mohammed Siraj	Electrical And Electronics Workshop	mshikhli@sharjah.ac.ae	2430	
4	Aldin Mortega	Multi-Purpose, Multi-Functional Workshop	amortega@sharjah.ac.ae	2443	
5	Fahad Faraz	Renewable Energy Research Laboratory	ffahmad@sharjah.ac.ae	3411	
6	Mohamed Barakat	Geographic Information Systems & Remote Sensing Center	mbgibril@sharjah.ac.ae	1193	
7	Sefeera Sadik	Functional Nanomaterials Synthesis	safeeraayyaril@sharjah.ac.ae	22	
8	Fahad Hassan	Laboratory	fahad.hassan@sharjah.ac.ae	rř	
9	Muath Khairi Mousa		mmousa 2@sharjah.ac.ae		
10	Yusur Mehdi Almusleh	Environmental Analytical Laboratory	yalmusleh@sharjah.ac.ae	7656	
11	Padma Pavani	High Performance Computing Facility	ppavani@sharjah.ac.ae	1335	

ADVANCED MATERIALS RESEARCH LABORATORY



N412 12E	Mohammed Shamir	065050421
1117-122	Mohammed Irshad	003050431

INTRODUCTION

The Advanced Materials Research Laboratory is a general user facility for material synthesis, characterization, and testing. It houses a number of high-end machines for XRD, XRF, and micro-Raman, AFM, and SEM analysis. The lab specializes in dry and non-destructive analysis in areas such as cultural heritage and archaeometry, as well as Nano and micro-scale materials for energy and environmental applications. The lab provides training opportunities for researchers and technicians in different analytical techniques. It also engages the community by providing consultation and training services to municipalities, forensic labs, environmental agencies, museums, and the energy sector, among others.

EQUIPMENT AND INSTRUMENTS

- Environmental Scanning Electron Microscopy
- Scanning Electron Microscopy
- Atomic Force Microscopy
- Electrospinning Machine
- Stereo Microscopy
- X-ray Diffraction
- X-ray Fluorescence Spectrometer
- Raman Spectrometer
- Fourier Transform Infrared Spectroscopy
- Thin Film Deposition
- UV-Vis Spectrometry
- Prism Coupling System
- Spin Coater
- Sample Preparation Facilities

- Carbon Evaporation System
- Profilometer
- Polishing Machine
- Sputter System
- SP-200 Potentiostat
- Planetary Ball Mill PM100
- Automated Tensiometer Gonimeter
- Fiber-optic Spectrometer
- Universal Anti Static Kit with U Electrode

- Elemental analysis (solids, powders, liquids)
- Investigation of chemical composition (dyes, oils, paints)
- Crystallinity measurements (geological samples, cement, building materials)
- Nano and Microscopy (biological samples, metal surfaces, semiconductor devices, ceramics)
- Environmental pollution studies (water, soil, aerosols)

TRANSPORTATION AND PAVEMENT RESEARCH LABORATORY



Location	Lab Staff in Charge	Contacts
W12-020	Helal Ezzat Helal	065053413

INTRODUCTION

The Transportation and Pavement Research Laboratory is being developed as a world-class research facility equipped with advanced testing machines, devices and innovative technology to address transportation Research, pavement performance analysis, design, rehabilitation, and management; advanced material testing and characterization; development of new and sustainable materials; as well as the development and dissemination of sustainable transportation and pavement practices.

EQUIPMENT AND INSTRUMENTS

- Automatic Close System Asphalt Analyzer
- Laser PIV system
- Pressure Aging Vessel (PAV)
- Versatile Flexural Testing Machine
- HM921 ATS Vacuum Degassing Oven
- Rotary Evaporation Apparatus
- Industrial Ultrasonic Path
- Overhead Stirrer
- Wavetronix SmartSensor HD Mounted on a Mobile Trailer Powered by Solar Panels
- Lane Traffic Counters
- Lane Traffic Detectors
- Video Detectors
- Intersection Turning Movement Counters (Digital and Mechanical)
- Traffic Analysis Software
- Speed Radar Guns
- Digital Measuring Wheel

- 63X Series Sound Level Meter
- LVDTs and Accelerometers (Sensors) Software
- Automated Universal Asphalt Saw
- Pivot Automatic Penetrometer
- Ball and ring softening point tester
- Lab High Shear Mixer
- Superpave Gyratory Compactor
- 30 kN Universal Testing Machine (UTM) with Environmental Chamber-20 to 70C
- Marshall Test Apparatus
- Digital Measuring Wheel
- Brookfield Rotational Viscometer
- Bitumen Automatic Consistency and Penetration
- Bitumen Content by Ignition Method
- Dynamic Hybrid Rheometer (DHR)
- Rolling Thin Film Oven (RTFO)
- Softening Point Automatic tester
- Flash point Automatic tester
- Asphalt equipment and samples washing machine
- Asphalt mixtures volumetrics setup
- Ultra-sonic mixer.
- Sand Equivalent setup.
- Bending Beam Rheometer.

- TRAFFIC AND TRANSPORTATION
 - Highway and Roads Traffic survey
 - Highway and Roads traffic studies
- AGGREGATES
 - Specific Gravity of Coarse Aggregates
 - Specific Gravity of Fine Aggregates
 - Specific Gravity of Mineral Filler
 - Bulk Density of Fine Aggregates
 - Bulk Density of Coarse Aggregates
 - Sand Equivalent Test of Fine Aggregates
 - Elongation and Flakiness Index of Coarse Aggregates
 - Particle Shape of Coarse Aggregates
 - Particle Shape of Fine Aggregates
 - Particle Shape of Mineral Filler

- Sieve Analysis of Coarse Aggregates
- Sieve Analysis of Fine Aggregates
- Soil Shear Modulus using DHR.
- ASPHALT CEMENT
 - Specific Gravity of Asphalt
 - Penetration Test
 - Softening Point Test
 - Rotational Viscosity Test
 - Short Term Aging RTFO
 - Long Term Aging PAV
 - Dynamic Shear Modulus Test
 - Fatigue Test
 - Multiple Stress Creep and Recovery Test MSCR
 - Linear Amplitude sweep test
 - Binder performance test
 - Binder low performance grade using BBR.
 - Ignition Oven Test for Binder Extraction
 - Binder Extraction Test by Solvent
 - Binder Recovery Test
 - Binder mass loss using RTFO
- ASPHALT CONCRETE MIX
 - Theoretical Maximum Specific Gravity Test
 - Bulk Specific Gravity
 - Marshal Mix Design
 - Superpave Gyratory Compaction
 - Dynamic Modulus Test
 - Resilient Modulus Test of Asphalt Concrete
 - Resilient Modulus Test of Unbounded Materials
 - Triaxial Repeated Load Permanent Deformation (Flow Number) Test
 - Triaxial Static Permanent Deformation (Flow Time) Test
 - Uniaxial Fatigue Test
 - Indirect Tensile Strength Test
 - Triaxial Shear Test
 - Semi-Circle Bending Test
 - C* Fracture Test
 - Moisture Damage Lottman Test

ELECTRICAL AND ELECTRONICS WORKSHOP



Location	Lab Staff in Charge	Contacts
W12-103	Mohammed Siraj	065050430

INTRODUCTION

Electrical and Electronics Workshop is research support facilities/ fabrication workshop for specialized research activities under the Research Institute of Sciences and Engineering (RISE). The Workshop actively contributes to the applied researches in the different fields of electrical and electronics including analog-digital, sustainable-renewable energy, circuits and systems design besides considering scientific consultancy services.

EQUIPMENT AND INSTRUMENTS

- WSD 81i soldering station 230V
- Real time controller NI cRIO-9025
- Programmable DC Power Supply Model 62024P-100-50 Chroma
- DC Electronic Load Module Chroma
- DC Electronic Load 63204 5.2KW/100A/600V Chroma
- PCB prototyping station auto-lab
- Tektronix MDO3104 Mixed Domain Oscilloscope
- Coordinate Measuring Machine
- Planetary Micro Mill Premium Line
- SP-300 Potentiostat

- Group/Program A: Electrical & Electronics Manufacturing:
 - Mechatronics Mechanisims Automation
 - Printed Circuit Board Fabrication (Fab. of PCB)
 - Repairing PCB
 - Satellite Receiver LNB/TVRO receivers
 - Miniature Models and Simulation Solutions

- Group B/Program B: Technical Solutions:
 - Electronic Circuits
 - Industrial Automation and Control Systems
 - Laser Scanning Modeling
 - Satellite Communication
 - System Integration
 - Simulation and Active Modeling
 - Communication Solution
 - Network Solutions
 - Embedded Systems
 - Instrumentation and Sensors Network
- Group C/Program C: Training and Knowledge Exchange:
 - Ardiuno Systems
 - PCB
 - Networks for Integration
 - Applied Electronics
 - Planning and Engineering Management
 - Professional Development

MULTI-PURPOSE, MULTI-FUNCTIONAL WORKSHOP



Location	Lab Staff in Charge	Contacts
M12-002	Aldin Mortega	065050443

INTRODUCTION

The purpose of establishing the workshop is to provide researchers with a facility capable of manufacturing a wide range of experimental setups and small equipment. The workshop has two divisions, a fabrication division and electrical/electronic division. The fabrication division provides researchers who require customized fixtures to contact the dedicated experience technician and use the state-of-the-art machinery. The computer-numerical control (CNC) milling and turning centers are capable of producing parts that are designed on CAD software, which ensures narrow tolerances on all types of conceivable materials. The workshop is also expected to help graduate and undergraduate students with their projects that require specialized machining.

EQUIPMENT AND INSTRUMENTS

- CNC Milling Machine
- CNC Lathe Machine
- Coordinate Measuring Machine
- 3D Printer Ultimaker S5
- Semi-automatic Band saw Variable Speed
- Mechanical Cutting Shear
- Pipe and Profile Bending Machine
- Motorized 3-Roll Bending Machine
- Melting Furnace

- Drilling, Cutting, Tapping, Pocketing (wood, aluminum, steel)
- Cutting internal and external cylinder, End surface, taper surface, arc surface, screw thread
- Measuring physical geometrical characteristics of an object
- Printing solid objects

- Cut metal & aluminum materials with different shapes and profiles
- Cut metal sheets
- Rolling metal tube
- Rolling sheet metal
- Melting aluminum and Copper
- Sheet Metal Forming
- Pipe Forming
- Aluminum Casting

GEOGRAPHIC INFORMATION SYSTEMS & REMOTE SENSING CENTER



INTRODUCTION

The mission of Geographic Information system and Remote Sensing center is to develop a spatial information technology that serves the community and provide interdisciplinary leadership through research, education, and outreach. The center provides spatial knowledge and expertise for multidisciplinary areas related to environmental monitoring, water resources management, transportation, natural hazard and risks management as well as geo-petroleum industry. The center's ambition is to acquire a respectful status within the UAE and the region as a credible research center through developing and spreading scientific knowledge related to satellite images and geospatial technology.

EQUIPMENT AND INSTRUMENTS

- Integrated GNSS Systems (R10 Trimble) & TRIMBLE TSC3 data controller
- High Accuracy GNSS handhelds/Trimble Geo7 Series
- Field Spectroradiometry
- Fixed-wing drone equipped with multispectral and thermal cameras
- Handheld thermal camera
- Trimble S7 Total Station
- Digital Level
- Digital Camera
- Precision Tower 5810 Workstation
- Designijet Z6200 Photo Production Printer
- HP Laser Jet Enterprise Printer
- Digital A3 Flatbed Scanner

TESTS AND SERVICES

• Establishing ground control points using geodetic global positioning systems.

- Collecting ground-truth data using various spectral and survey equipment
- Acquiring very high resolution drone-based images and digital surface models
- Processing satellite, aerial and drone-based images for various earth-related applications
- Establishing geospatial data from multiple geospatial sources
- Performing advanced spatial and multi-criteria analysis
- Applying and developing advanced artificial intelligence approaches to support various earth-related studies
- Producing thematic maps

FUNCTIONAL NANOMATERIALS SYNTHESIS LABORATORY



Location	Lab Staff in Charge	Contacts
W12-016 W12-013 M12-125	Fahad Hassan	0507304696

INTRODUCTION

The laboratory mission is to support the diverse and vigorous research interests in materials, specifically those of the Nano size, and to help broaden international collaboration in this growing research field. The laboratory caters to the needs of researchers involved in discovery of nanoparticles science and real-world applications in the various science, engineering, environmental, health and medical fields. Overall, the laboratory is comprehensive in synthesis and characterization of Nano materials, including nanofibers, nanocomposites and Nano films.

EQUIPMENT AND INSTRUMENTS

- Scanning Electrochemical Microscope
- Nanofiber Electrospinning Unit
- Rolling-ball Viscometer
- Refrigerated Centrifuge
- Glove box
- NANOTRAC WAVE II
- Spray Mate
- Contact Angle Goniometer and Tensiometer
- Fluorescence Lifetime Spectrometer
- Differential Scanning Calorimeter TA DSC25
- Spin Coater Midas
- BET
- DLS LITESIZER 500
- Thermal conductivity meter
- Xenon Photocatalytic reactor
- Elementar
- Viscosity meter

TESTS AND SERVICES

- CV and local electrochemical activity of sample in solution
- Nanofiber synthesis
- Contact angle and surface tension
- Heat capacity and melting point
- Surface area and pore size analysis
- Zeta potential and particle size
- Thermal conductivity for nanofluids
- Visible light photocatalytic activity

HIGH PERFORMANCE COMPUTING FACILITY



Padma Pavani

065050355

INTRODUCTION

Delivering the best possible service, starting with a stable, reliable, sustainable and efficient computing resources and services to facilitate the use of high performance computing that meets the computational research demands of the research community in the university. Including expert system administration. HPC Facility aims to develop solutions that maximize shared computational resources.

EQUIPMENT AND INSTRUMENTS

M11-221

FAHAD CLUSTER:

- One storage/head node with two Intel Xeon Gold 5120 CPU @ 14Cores- 2.20GHz each, 128 GB RAM and 60 TB Storage.
- One login node with two Intel Xeon Silver 4110 CPU @ 8Cores 2.10GHz each and 96 GB RAM.
- 12 compute nodes with 2 Intel Xeon Gold 6140 CPU @ 18Cores 2.3GHz each and 192 GB RAM.
- Each compute node and login node has 240 GB SATA HDD.
- Mellanox ConnectX-4 Mezzanine card with one EDR/100Gbps Port.
- Centos 7.8 operating system and Qlustar-11.0 for cluster management.

SAQR CLUSTER:

- One master node and 4 compute nodes (CNs)
- Two Intel Xeon E5 Processors (16 core, 2.3 GHz) per CN for a total of 32 CPU-core/CN
- 8 NVidia K80 GPU cards per CN for a total of 20,000 GPU-core/CN
- 96 GB of GPU memory and 256 GB of system memory per CN
- 1 TB of local SSD storage per CN
- 54 TB of secondary SAN storage.
- 56 Gbp/s Infiniband switch, 16 Gbp/s FC switch and 1G Ethernet switch.

- Ubuntu 16.04 operating system and Bright Computing- 8.1 for cluster management. MAHA CLUSTER:

- Four HP Z840 workstations
- Two Intel Xeon E5 processors (12-core, 2.6GHz) per node
- 480 GB of total system memory.
- 10 TB of NAS storage
- 10 Gbp/s Ethernet switch.

TESTS AND SERVICES

A number of high-end applications are installed on Fahad, Saqr and Maha to support the needs of the research community at the University of Sharjah:

- Lammps
- Vasp
- Matlab
- Ansys,
- Abinit
- Gaussian
- Tensor flow
- darknet
- Intel compilers
- Origin
- Quantum Espresso
- ROOT
- Gromacs
- NAG
- Nvidia- cuda and FHI-AIMS.

BIOMASS ENERGY SYSTEMS LABORATORY



Location	Lab Staff in Charge	Contacts
W12-024C	Fahad Faraz Ahmad	065053411

INTRODUCTION

Biomass Energy Systems Laboratory is a testing and supporting facility for research and development activities related to biomass such as bioenergy and biofuels – hydrogen, biogas, syngas, bio-oil, and biodiesel. This Laboratory is actively handling collaborative research projects between academia, government agencies and industry in the Biomass Energy Systems.

EQUIPMENT AND INSTRUMENTS

- 6400 Automatic Isoperibol Calorimeter
- Computer Controlled Biogas Process Unit- EBGC
- Distek Model 2500 Dissolution Test System
- Infracal 2 Biodiesel Blend Analyzer
- Automatic Methane Potential Test System (AMPTS II)
- 3000 Micro Gc Gas Analyzer (INFICON)
- KD-2 Pro Thermal Properties Analyzer
- LC 100 Spectrocolorimeter
- Sonorex Digiplus Ultrasonic Bath For Aqueous Fluids
- Brookfild Viscometer DV2T
- Haake Viscotester IQ
- Portable Density / Specific Gravity Meter
- Highland Portable Balance
- Super Critical Fluid Extractor
- Digital Rotary Evaporator
- Heating Mantle
- Digital Muffle Furnace
- Portable Data Acquisition Logger (TITAN S8)
- Power Pallet- PP20 (GEK GASIFIER KIT)

- Dynomite Pro Small Engine Reaction Test Kit
- Ems Portable Exhaust Gas Analyzer

EXPERIMENTS

- Heat of combustion measurement
- Biogas production and analysis
- Biodiesel production and analysis
- Bio-oil production and analysis
- Biodiesel blend analysis
- Pyrolysis and gasification of material
- Dissolution tests
- Syngas production and analysis
- Biogas (biochemical methane) potential (BMP) test through anaerobic digestion
- Rapid analysis of gas streams (Fixed Gases and Light hydrocarbons)
- Measurement of thermal properties of a material: thermal conductivity, thermal resistivity, volumetric specific heat capacity, and thermal diffusivity.
- Measurement of spectral reflectance, transmittance, or relative irradiance of a color sample
- Sonication of aqueous fluids.
- Measurement of viscosity, shear rate, and shear stress of fluid and semi-solid materials.
- Measurement of density and specific gravity of liquid
- Precision weighing up to readability of 0.01 g
- Extraction of bioactive compounds from food products
- Extraction of oil compounds from food products and herbs
- Distillation of solvents, Condensation of solution and suspension
- Ash-determination, Enameling, Fusion and Ignition.
- Determining the power characteristics of a machine
- Engine performance test and exhaust gas analysis

TESTS AND SERVICES

- Testing and analyses of physical and chemical properties of biomass.
- Studying the potential energy content of biomass.
- Converting biomass into clean energy (biofuels: i.e. biodiesel, biogas, syngas, bio-oil).
- Design and Consultancy Services

PROFESSORSHIP CHAIR, GENERAL CIVIL AVIATION AUTHORITY AVIATION CENTER OF EXCELLENCE



Location	Lab Staff in Charge	Contacts
W12-124	- Prof. Qassim Nasir - Dr. Manar Abu Talib - Dr. Ali Bou Nassif - Dr. Sohail Abbas	065052410

INTRODUCTION

The OpenUAE Research & Development Group is the first of its kind in the country, providing new research opportunities related to the successful adoption of Open-Source Software (OSS) in the region. The group will engage students (undergraduate and graduate at universities and other interested parties) to conduct research on the deployment of OSS in many sectors to serve multiple purposes i.e., Blockchain, Artificial Intelligence cyber security, smart cities, Internet of Things, ... etc. The group provides the necessary training, develops ICT solutions based on OSS, evaluates and assesses these solutions and provides consultancy services to enable governmentwide, as well as private sector access, to OSS. The group initiative is aligned with the mission of the University of Sharjah as well as the economic vision of the UAE 2021.

EQUIPMENT AND INSTRUMENTS

- High Computational Machines.
- Internet of Things Products.
- Microcontrollers
- Routers and servers.

EXPERIMENTS

- Breast Wearable Biosensors Intelligent System for Early Detection of COVID-19 using Data Science Techniques.
- Locational Management for Healthcare Facilities during COVID-19 Pandemic: An Artificial Intelligence Approach.

- Breast Cancer Detection Using Statistical and Deep Learning Techniques.
- Data-Driven False Data Injection Attacks Detection in Smart Grid using state estimation.
- Digital Twin for Building Energy Consumption Forecasting using Deep Learning.
- Blockchain Networks for Building Integrated Microgrids and Solar PV Electric Vehicles Charging Station to Support and Foster Clean Energy Transition.
- Disaster recovery in smart cities.
- Design and Implement Inter Blockchain Communication between Heterogeneous Blockchain Networks.
- IoT Security Testbed
- Blockchain Performance Evaluation.

TESTS AND SERVICES

- Research
- Training & Workshops
- Development and Solutions
- Awareness & Seminars
- Consultancy

AEROSPACE CENTER OF EXCELLENCE (UNMANNED AIRCRAFT SYSTEM CENTER)



Location	Lab Staff in Charge	Contacts
W12-125	 Prof. Qassim Nasir Dr. Manar AbuTalib Dr. Raouf Fareh Dr. Sofiane Khadraoui Sally Idhis Mahmoud Elbeltagy Khawla Hassan 	NA

INTRODUCTION

The Aerospace Center of Excellence (ACoE) was established in January 2020 by the General Civil Aviation Authority (GCAA) at the University of Sharjah. The center promotes the Unmanned Aerial Vehicle (UAV) technology in UAE and modernizes the regulatory framework governing the operation and certification of UAVs to strengthen the position of UAE as a global contributor in the establishment of standards and recommended practices at the international level. This center aims to improve the future of aviation by developing anti-drone systems and a safety reporting system.

EQUIPMENT AND INSTRUMENTS

- Fleet of Drones
- FPGA
- VR Table
- Servers
- Software-Defined Radios (SDRs)
- Antennas

EXPERIMENTS

- SDR-Radar for UAV detection and Localization
- ROSI Dashboard
- Blockchain with drones

• Path planning and control of quadcopters

TESTS AND SERVICES

- Research
- Training Wrokshops
- Development and Solutions
- Awareness Seminars
- Consultancy

RENEWABLE ENERGY RESEARCH LABORATORY



Location	Lab Staff in Charge	Contacts
W12-305	Fahad Faraz	065053411

INTRODUCTION

The Renewable Energy Research Laboratory (RERL) is a supporting facility for renewable energy and energy efficiency research and development activities specialized in future energy technologies (clean, innovative, sustainable, smart, reliable and cost effective energy systems): Renewable Energy: solar (solar PV, solar thermal, bifacial solar PV), wind, biomass (bioenergy and biofuels – hydrogen, biogas, syngas, bio-oil, and biodiesel), geothermal, hydro, and ocean; Energy Efficiency (Buildings, industrial applications and transportation), Energy Management and control, Energy Modeling and Simulation, and Energy Forecasting using AI and ML. The RERL is actively serving as a testing facility for collaborative research projects between academia, government agencies and industry in the energy field. It provides training opportunities for students and consultation services for innovative and sustainable energy solutions and the development of international energy research collaboration.

EQUIPMENT AND INSTRUMENTS

- Profitest Photovoltaic Panel Analyzer
- Hot Wire Anemometer (PEC-009)
- HIOKI Wireless Logging Station (LR8410-20)
- Pyranometer: Infrared and Full Spectrum Sensor (PMA 2144 Class II)
- Data Logging Radiometer/Photometer PMA 2100
- Programmable Ac/Dc Electronic Load (Chroma 63804)
- DustIQ (Kipp & Zonen)
- Logbox SE Data Logger (Kipp & Zonen)
- Power & Energy Meter (PEL-103)
- Allied Vision Prosilica Ge 1650 Camera
- Multiple Wavelength Portable Specular Reflectometer

- Infrared Thermometer (Fluke 62 Max)
- Humidity & Temperature Data logger (Extech-RTH20)
- Building Energy Monitor (WEM2)
- PEM Water Electrolysis Cell
- Soldering Station
- Cole-Parmer G2 Heavy-Duty Turbine Flowmeter/Totalizer (S05t), 3/4"
- 7 Inch Dual Axis Combined Slew Drive Worm Gear For Sun Energy
- 3 Inch Slew Worm Gear Box With 12v / 24v Dc Motor
- Eco-Worthy Single Axis Solar Panel Tracker, 340lbs, 12 Volt Dc, With 12" Solar Tracker Multi-Purpose Linear Actuator

EXPERIMENTS

- IV Characteristics Curve testing of PV Panels
- Measurement of relative humidity, air velocity and temperature
- Data logging from different sensors
- Solar Irradiance measurement
- Measurement of the specular reflectivity
- Power and energy measurement
- Electrolysis and hydrogen production
- AC/DC Programmable Electronic load simulation
- Transmission Loss and Soiling ratio measurement
- Non-contact temperature measurements
- Liquid flow rate measurement

TESTS AND SERVICES

- Testing and supporting facility for renewable energy and energy efficiency research
- Modeling and Simulation of Energy Systems
- Energy Forecasting (Supply and Demand)
- Energy Planning and Climate Change Mitigation Assessment
- Design and Consultancy Services

408 Central Laboratories Catalog

RESEARCH INSTITUTE OF MEDICAL & HEALTH SCIENCES (RINIHS)

0.5X



RIMHS LABORATORIES

Lab Name	Location
Molecular Genetics	M32-DF49
Animal Facility	M32- AN/2
Immuno-Oncology	M32-DF22
Tissue Bank	M32-DF23/24
Infectious Disease & Anti-Infective Therapy	M32-DF27
Diabetes Research	M32-DF35
TIR Asthma	M32-DF35
Drug Design and Discovery	M32-DF41/42
Dental Biomaterials	M32-DF48
Cardiovascular research	M32-DF51
Chemical Lab	M32-DF50
Confocal Microscope Room	M32-DF67
Tissue culture Facility 1	M32-DF71
Gene Editing Therapy	M32-DF72
Flow cytometry Room	M32-DF73
Wound Healing & Oral Diagnosis	M32-DF75
Drug Design and Discovery	M32-DF77
Nutrition and Food Research	M32-DF78
Nuclear Magnetic Resonance (NMR)	M32-DG39
Drug delivery	M32-DG40
Clinical Chemistry	M32-DG42
Immunology	M32-DG43
Cancer Research Lab	M32-DG44
Microbiota Research Lab	M32-DG45
Integrated Analytical Lab	M32-DG47
Gel Documentation Lab	M32-GelDoc
X-Ray Lab	M32- X-Ray

RIMHS Lab Staff

#	Name	Job Title	Contacts	Email
1	Mohamed Elwasila Elhag Musa	Animal Facility Technician	050-5941626	melhagmusa@sharjah.ac.ae
2	Hamza Mohammad Abdallah Al Hroub	Lab Supervisor	056-2075273	halhroub@sharjah.ac.ae
3	Soumya Sheela Aravind	Post-Doc Research Associate	058-169 1248	saravind@sharjah.ac.ae
4	Fatemeh Saheb Sharif Askari	Post-Doc Research Associate	050 1829166	fsharifaskari@sharjah.ac.ae
5	Narjes Saheb Sharif Askari	Post-Doc Research Associate	504406505	nsharifaskari@sharjah.ac.ae
6	Lara Bou Malhab	Post-Doc Research Associate	056-9660983	lara.boumalhab@hotmail.com
7	Bahgat Mohamed Ezzat Bahgat Fayed	Post-Doc Research Associate	050-2570759	bfayed@sharjah.ac.ae
8	Aghila Rani Koippallil Gopalakrishnan Nair	Post-Doc Research Associate	056-2206252	anair@sharjah.ac.ae
9	Ana Catarina De Carvalho Samorinha	Post-Doc Research Associate	052-2384755	csamorinha@sharjah.ac.ae
10	Noha Mousaad Taha Hassen Elemam	Post-Doc Research Associate	050-887 0315	nelemam@sharjah.ac.ae
11	Roberta Cagliani	Post-Doc Research Associate	052-4586142	croberta@sharjah.ac.ae
12	Rakhee Kizhuvappat Ramakrishnan	Post-Doc Research Associate	056-820 4008	rramakrishnan@sharjah.ac.ae
13	Amal Bouzid	Post-Doc Research Associate	050-5088754	abouzid@sharjah.ac.ae
14	Venkatesha Narayanaswamy	Post-Doc Research Associate	054-5726433	vnarayanaswamy@sharjah.ac.ae
15	Anila Abid Hussain Ansari	Post-Doc Research Associate	055-1602528	aabid@sharjah.ac.ae
16	Poorna Manasa Bhamidimarri	Post-Doc Research Associate	056-2429008	pbhamidimarri@sharjah.ac.ae
17	Wafaa S. H. Ramadan	Post-Doc Research Associate	056-9183556	wframadan@sharjah.ac.ae
18	Anil Ravi	Post-Doc Research Associate	052-6373152	aravi@sharjah.ac.ae
19	Rouba Zeidan	Post-Doc Research Associate	058-9894244	rzeidan@sharjah.ac.ae
20	Hezlin Marzook Kaidal	Post-Doc Research Associate	052-4218076	hkaidal@sharjah.ac.ae
21	Balachandar Selvakumar	Post-Doc Research Associate	050-2812173	selvakumar@sharjah.ac.ae

#	Name	Job Title	Contacts	Email
22	Dana Mazen Zaher	Post-Doc Research Associate	050-1167409	dzaher@sharjah.ac.ae
23	Alexander Giddey	Post-Doc Research Associate	058-6565185	agiddey@sharjah.ac.ae
24	Noor Akbar	Post-Doc Research Associate	056-4322869	nakbar@sharjah.ac.ae
25	Falak Khan Mahib Ullah Zeb	Post-Doc Research Associate	052-4236417	fzeb@sharjah.ac.ae
26	Bilal Ahmad Rah	Post-Doc Research Associate	050-8696592	BRah@sharjah.ac.ae
27	Fatima Abdillahi Hersi	Research Assistant	055-7746765	fhersi@sharjah.ac.ae
28	Manju Nidagodu Jaykumar Jayakumar	Research Assistant	050-207 7965	mjayakumar@sharjah.ac.ae
29	Dinesh Kumar Dhanasekaran	Research Assistant	056-208 0909	ddhanasekaran@sharjah.ac.ae
30	Abdul Khader Mohammed	Research Assistant	055-5996010	amohammed@sharjah.ac.ae
31	Varsha M Menon	Research Assistant	050-1949265	Vmenon@sharjah.ac.ae
32	Priyadharshini Sekar	Research Assistant	054-3527080	psekar@sharjah.ac.ae
33	Roba Saqan	Research Assistant	052-9196779	rsaqan@sharjah.ac.ae
34	Ankita Shukla	Research Assistant	052-7497148	ashukla@sharjah.ac.ae
35	Shirin Ali Hafezi Haghani	Research Assistant	056-4460965	shaghani@sharjah.ac.ae
36	Nival Ali	Research Assistant	054-4290603	nali@sharjah.ac.ae
37	Jayalakshmi Jagal	Research Assistant	055-286 3009	jjagal@sharjah.ac.ae
38	Alaa Mohamed Hamad Mohamed	Research Assistant	058-9771516	Alaa.mohammed@sharjah.ac.ae
39	Shahenaz Shaban Salih Mohamed Nour	Research Assistant	050-3499808	snour@sharjah.ac.ae
40	Dana Nabeel Abdel-rahim	Research Assistant	056-1452284	DAbdel-rahim@sharjah.ac.ae
41	Hanan wael Gadelmawla Mohamed Abdullah	Research Assistant	058-5069366	hanan.abdullah@sharjah.ac.ae
42	Jasmin Shafarin	Sr. Technician	050-6987972	jsalam@sharjah.ac.ae
43	Vidhya Anish Nair	Technician	052-6943999	vnair@sharjah.ac.ae
44	Jobi Joseph	Sr. Technician	055-9089518	jjoseph@sharjah.ac.ae

MOLECULAR GENETICS LABORATORY



Location	Lab Staff in Charge	Contacts
M32-DF49	Dr. Poorna Manasa	056-2429008

INTRODUCTION

The Molecular genetics laboratory provides expertise in DNA and RNA testing, which is apparent in many settings, such as autoimmune diseases, inherited disorders, risk assessment for familial cancer and the diagnosis of many neurologic disorders. Our team members are continually striven to develop new methods to identify novel biomarkers for several inflammatory diseases (Asthma, Diabetes) and cancers. In collaboration clinicians and researchers, we continually work to improve assays for identifying the SNPs using in house methodology using Next generation sequencing assays. Likewise, the facility is highly utilised to study the transcriptomic profiling of human genome in varied disease conditions.

EQUIPMENT AND INSTRUMENTS

- ION S5 XL -SEMI CONDUCTOR SEQUENCER, THERMO FISHER SCIENTIFIC
- ACCESS ARRAY, FLUIDIGM
- QUANT STUDIO 3-qRT PCR, APPLIED BIOSYSTEMS
- BIOANALYSER 2100, AGILENT TECHNOLOGIES
- THERMAL CYCLER- VERITI, APPLIED BIOSYSTEMS
- QUBIT FLOUROMETER, INVITROGEN
- Refrigerated Centrifuge
- Trans blot turbo transfer system
- Analytical Balance

- The Next Generation Sequencing Ion torrent technology will be used in various fields of scientific research
- Cancer genomics and transcriptomics
- Identify single nucleotide variants (SNVs), indels, copy number variants (CNVs), and gene

fusions Perform analysis on small archived formalin-fixed, paraffin-embedded (FFPE) solid tumor and fine needle aspirate research samples

- Infectious diseases
- Targeted sequencing of viruses, bacteria, or fungi from biological materials without culturing.
- Targeted approaches based on the 16S RNA gene or other specific genes or regions of viral, bacterial, and fungal genomes have provided a highly effective strategy to identify organisms without the requirement for host nucleic acid subtraction
- Liquid Biopsy Research
- To enable multibiomarker analysis at low mutation frequencies to identify primary tumor drivers and resistance mutations
- Inherited Disease Research
- Detection of inherited disease research, and carrier screening
- Pharmacogenomics research
- Characterization of the effect of drugs on biological cells. The role that genetic variation plays in drug metabolism can be investigated
- Targeted epigenetics of disease
- Targeted methylation of different genes involved in various diseases
- Deciphering disease mechanism using transcriptomics
- Automate amplicon-based library preparation with the Access Array[™] system for up to 48 samples per processing run. Access Array generates next-generation sequencing (NGS)-ready libraries compatible with multiple sequencing platforms including Illumina[®], Ion Torrent[™], and other NGS systems
- Real-time PCR is used for many applications including targeted gene expression analysis, microRNA analysis, SNP genotyping and CNV analysis. Gene expression analysis is the most commonly used application for qPCR.
- The Agilent 2100 Bio-analyzer system represents the first microfluidic lab-on-a-chip platform for the electrophoretic analysis of DNA, RNA, and proteins and the flow-cytometric analysis of cells.
- Veriti is a fast thermal cycler, which can run up to six precise and independent temperatures to determine the optimal annealing temperature for cycle sequencing or endpoint PCR. VeriFlex Blocks maintain their thermal characteristics between optimizing and isothermal conditions, minimizing the need optimization.
- The Qubit fluorimeter is a small instrument used for quantification of dsDNA, oligos, total RNA, microRNA, and protein, template bead quality of prepared NGS library.

ANIMAL FACILITY LABORATORY



Location	Lab Staff in Charge	Contacts
M32- AN/2	Mohamed El Wasila	050-5941626

INTRODUCTION

The animal facility is a specially designed building type, which accommodates controlled environments for the care and maintenance of experimental animals. In addition, the facility contain different labs to conduct experiments on animals.

EQUIPMENT AND INSTRUMENTS

- Fridge
- Fume hood
- Freezer
- IVIS Lumina
- Biosafety cabinet
- Changing station
- Wiflow
- Cages Washer
- Bedding Station
- DS36
- Water Station
- Steam Sterilizer
- Flex Vent

- Animals breeding
- Animals Husbandry
- Disinfection and sterilization of animals cages/water bottles/bedding
- Provide support for all research groups in UOS

IMMUNO-ONCOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
M32-DF22	Dr. Noha Elemam	050-887 0315

INTRODUCTION

The "Immuno-Oncology" group is the first group that is established in the UAE focusing on understanding the cancer microenvironment and the crosstalk among cancer cells and innate immune cells. There is a great prevalence of breast cancers as well as esophago-gastric cancers particularly among obese patients in the UAE. However, understanding how these cancers spread is not clear. Several similar centers have been established in the USA, Canada, Europe and Japan but we are lagging behind, despite the prevalence and relevance of these cancers in the UAE and the Middle East, The main objective of the group is to understand how these cancers avoid detection by the immune system and how to potentiate cells of innate immunity to fight breast cancer cells and esophago-gastric cancers. The Immuno-Oncology group at UoS examines therapeutic modalities for cancer and autoimmune disorders with an emphasis on the role of natural killer (NK) cells in ameliorating these diseases. EQUIPMENT AND INSTRUMENTS

- Bio Plex-200 Multiplex System
- Cytoflex flow cytometer
- LS55 Spectrophotometer
- Synergy HTX Reader
- XCelligence RTCA System
- CO2 Incubators
- Refrigerated Centrifuges
- Inverted Microscope
- CFX384 Touch Real-Time PCR Detection System
- SDS-PAGE and Trans Blot System

- Calcium mobilization assay
- Chemotaxis assay

- Real-time quantitative PCR
- Western blot
- Cell culture of adherent and suspension cells
- Multiplex assay for soluble cytokines and growth factors
- Flow cytometry protein quantification
- Fluorescence and luminescence-based assays
- Immunohistochemistry and immunofluorescence
- Migration and proliferation real-time assays

TISSUE BANK LABORATORY



INTRODUCTION

The Tissue Bank is a common facility designed to support projects in the medical campus as well as other colleges within the University of Sharjah. It is divided into two sections; histopathology and molecular pathology. The histopathology section retrieves and recovers all types of tissues for the purposes of biomedical research and education. Within the Tissue Bank we carry out tissue processing, microtomy, immunostaining, hematoxylin and eosin, immunohistochemistry and frozen sectioning using cryostat. In addition, we routinely carry out single-cell analysis using laser capture microscopy which when combined with molecular pathology analysis can be used to identify the molecular basis of various diseases.

EQUIPMENT AND INSTRUMENTS

- Laser microdissection microscope (LMD6)
- Automated Microtome
- Ductless fume hood
- Tissue Embedding Station
- Tissue Processor
- Cryostat
- Inverted Microscope with camera
- Bright field microscope
- Multi-header microscope
- Omni Bead Ruptor 24 Homogenizer
- Q500 Sonicator
- Autoclave
- Thermocycler
- CELL Ink INKREDIBLE / 3D Ink
- CO2 Incubator

- Hematoxylin and Eosin.
- Special stain
- Tissue processing
- Frozen section
- Immunofluorescence
- Immunohistochemistry
- Microdissection using laser capture.
- Autoclaving.
- Tissue culture.
- DNA and RNA extraction from archival and normal tissue



INFECTIOUS DISEASE & ANTI-INFECTIVE THERAPY LABORATORY

Location	Lab Staff in Charge	Contacts
M32-DF27	Dr. Bahgat Fayed	0502570759

INTRODUCTION

The human body is susceptible to infections by many pathogens. Pathogens can include bacteria, viruses, parasites and fungi. Diseases such as malaria, measles, leprosy, hepatitis and tuberculosis, and more recent infections due to HIV, EBOLA, Zika, dengue fever, and COVID-19 are posing serious threat to mankind with unacceptable mortality and morbidity. Infectious diseases not only cause illness and death, but also can disrupt the socioeconomic progress of countries.

Our laboratory supports research to control and prevent diseases caused by human infectious agents as infectious diseases continue to be among the most serious public health problems around the world including the UAE because of (i) There is no updated surveillance systems maintained in large parts of the world in particular the developing countries, (ii) International travel and migration in particular in the Gulf region, and (iii) Numerous outbreaks of drug-resistant microbes were documented around the world (IV) The outbreak of the current global pandemic caused by the spread of an evolved severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2; COVID-19)

EQUIPMENT AND INSTRUMENTS

- T100[™] Thermal Cycler from Bio-Rad
- Biosafety Cabinet
- CO2 Incubator
- Sonicator
- Shakers
- Ice Maker
- Colony Counter

TESTS AND APPLICATIONS

1. Accurate epidemiological and statistical analysis:

This will provide support to national and local capabilities to improve the process of detection and the analysis of changes in the frequency and distribution of common, newly emerging and re-emerging infectious diseases and to implement proper prevention and control activities.

2. Investigation of pathogenesis mechanisms:

To accurately investigate and discover new pathogenesis and resistance mechanisms used by the pathogens in particular those mediated with virulent factors and toxins and to evaluate the changes in the immunity/ inflammatory responses in the patient due to microbial infections.

3. Discovery and development of antimicrobials including anti-SARS-CoV-2:

To develop and discover effective antimicrobials including chemical therapeutics (natural or synthetic) and/ or antibodies and vaccines to target specific virulence factors that is contributing to the pathogenesis of the microbe. In addition, we aim to identify optimal antimicrobial dosing protocols in order to achieve precise and targeted therapy. Further, we are working to discover novel drugs against SARS-CoV-2.

4. Diagnosis:

To develop cost-effective measures to prevent and control infectious diseases, to be used as future diagnostic kits.

DIABETES RESEARCH LABORATORY



Abdul Khader Mohammed

055-5996010

INTRODUCTION

M32-DF35

Diabetes is distinctly the most important health concern of current time. Our mission is to conduct excellent multi-disciplinary research aimed to bring down diabetes mellitus and its related complications". We in the diabetes and metabolic syndrome research group are trying to understand the disease cause well enough for designing novel treatment strategies. The members of diabetes and metabolic research group are targeting the diabetes and its complications in all angles. Our research aims to understand the prevalence, predictors, prevention, treatment and management of diabetes and its complications at local, regional and international levels. The major initiative taken by Diabetes and Metabolic Research Group was UAE National Diabetes and Lifestyle Study (UAEDIAB), a study that describes the prevalence obesity, diabetes and metabolic syndrome and provided the comprehensive picture about the trends and patterns of chronic diseases in UAE nationals and non-nationals immigrants. Diabetes research group has so far identified several novel genes that plays a crucial role in insulin secretion and pathogenies of T2D using different approaches including systems biology or global correlations. Currently, we are investigating whether these genes can be used as diagnostic target. One of our recent finding showed GPR183 agonist plays a role in beta cell survival and insulin secretion making it as promising gene for targeted therapy. Moreover, Diabetes and metabolic syndrome research group uphold a huge database/biobank of serum/plasma/DNA/RNA samples. We also are investigating the allelic variants related to T2D using Next-Generation Sequencing and identify potentially interesting gene variants that influence the response to diabetic drug treatment.

EQUIPMENT AND INSTRUMENTS

- The ELx808 Absorbance Microplate Reader
- Freezer
- Centrifuge

- DNA, RNA and microRNA extraction.
- Gene expression analysis
- Insulin secretion assay
- Western blot analysis
- siRNA gene silencing
- ELISA

TIR ASTHMA LABORATORY



Location	Lab Staff in Charge	Contacts
M32-DF35	Narjes Sharif Askari	050-4406505

INTRODUCTION

The TIR group combines a multidisciplinary team interested in understanding the molecular mechanisms regulating tissue injury during chronic inflammation. We specially focus on chronic inflammatory diseases prevalent in UAE such as Asthma, Cancer, Metabolic disorders, and cardiovascular diseases. Additional focus of TIR group is examining different aspect of primary immunodeficiency disorder and inborn error of immunity. During the COVID-19, pandemic efforts were directed towards determining inborn errors of immunity associated with life-threatening SARS-CoV-2 infections in previously healthy young individuals.

Our specific aims include:

- Understand UAE genetic and environmental factors regulating, at the molecular level, the processes of tissue injury and repair.
- Discover specific diagnostic and prognostic biomarkers for asthma.
- Develop new immune-related therapeutic modalities for Asthma, cancer, and autoimmune diseases, to improve the tissue repair process.

An important aspect of the investigation is to understand the influence of epigenetic and tissue microenvironment on tissue remodeling and the response to medications; as well as developing 3D scaffold free models of related tissue types for tissue regeneration and drug testing.

The integrative and complementary nature of our research interests is a major part of our strength. It enables our group to address the homeostasis and regeneration processes at the cellular and tissue levels, consequently, we utilize cell culture techniques, human tissues, and animal models to address that. For this purpose, our team has already established extensive networking and collaborations with other experts at the UOS, nationally within the UAE, as well as a number of world-leading institutions around the world such as Canada, USA, Italy, and France.

Targeted-Focused Areas:

- Understand UAE genetic and environmental factors regulating tissue injury and repair during asthma
- Immunomodulation of Chronic Inflammation using novel drug delivery tools
- Primary immunodeficiency disorder
- Understand mechanism of immune dysregulation predisposing to severe COVID-19 disease.
- Cancer invasion and tissue remodeling
- Metabolic disorders and tissue repairs

EQUIPMENT AND INSTRUMENTS

- Quant Studio 3 PCR
- Biosafety Cabinet
- CO2 Incubator
- Bimolecular Imager

- Real-time PCR
- Tissue culture
- Western blotting and ELISA
- Flow cytometry
- Immunohistochemistry and immunofluorescence

DRUG DESIGN AND DISCOVERY LABORATORY



Location	Lab Staff in Charge	Contacts
M32-DF41/42	Jobi Joseph	055-9089518

INTRODUCTION

This is a chemistry part of Drug Design and Discovery lab. Here we perform novel organic reactions and prepare new molecules of biological interest. Next, these molecules are screened for their biological activity, which includes anti-cancer, anti-microbial and anti-malarial studies.

EQUIPMENT AND INSTRUMENTS

- Semi-Prep HPLC (Agilent)
- Interchim Puriflash
- Rotavapour
- Recirculating Cooler
- Analytical Balance
- Oven

- Semi-Prep-HPLC-Agilent
- Purity determination(Area%) and semi preparative purification(fraction collections) of organic reaction mixtures by UV detection(200-400nm) using reverse phase and normal phase mobile phases using compatible columns and mobile phases adopting either gradient or isocratic elution methods.
- Interchim Puriflash
- Flash column chromatography is a method of chemical separation that is used to purify chemical/organic mixtures. The specialized technique utilizes compressed gas like nitrogen or air to move the solvent through a column filled with a pure, solid medium that is usually silica gel or alumina powder. It is also known as flash purification,

- Rotavapour with Recirculating Cooler
- A rotary evaporator is a device used in chemical laboratories, for the efficient and gentle removal of solvents from samples by evaporation. Recirculating cooler is a part of the rotary evaporator machine that provides required cooling to the condenser coils for further fastening the evaporation process.
- Analytical Balance
- To weigh chemicals and compounds to the desired quantity.
- Oven
- To dry chemicals and compounds and to dry required glassware.

DENTAL BIOMATERIALS LABORATORY



Location	Lab Staff in Charge	Contacts
M32-DF48	Dr. Soumya Aravind	058-1691248

INTRODUCTION

Dental biomaterials is an interdisciplinary research group at the Research Institute for Medical and Health Sciences and College of Dental Medicine, University of Sharjah. A major focus of this research group is the development of an enhanced understanding of reasons for the clinical success or failure of oral and craniofacial biomaterials and thereby restoring oral health for patients through materials science study and interactions. The key goals of the group include:

- Development of new biomaterials and novel therapies to replace and repair tooth structures and supporting systems
- Surface modifications of available dental materials to enhance the properties of the tissue and biointerfaces.
- Characterization and evaluation of anticipated performance of newly introduced dental materials by using clinical simulation and measurement technology.

EQUIPMENT AND INSTRUMENTS

- Tinius Oslen Material testing machine
- Table-Top Microtensile Tester
- Table-Top Shear Bond tester
- Isomet 1000 Precision Saw
- Thermocycler
- Chewing Simulator CS-4 machine
- Polisher/Grinder Machine
- Trans blot turbo transfer system
- Eppendorf Micro centrifuge
- Analytical Balance
- pH meter
- Digital dry bath

- Mini agarose gel electrophoresis apparatus
- Vertical gel electrophoresis system
- Mini Digital Incubator

TESTS AND APPLICATIONS

The main tests performed in the laboratory include:

- Mechanical testing of the available or newly developed dental and bone materials Main application include in bone and dental tissue regenerative studies for measuring the tension, compression, flexure, and shear strength of biomaterials.
- Biocompatibility analysis and functional studies of the developed material with primary mammalian cells to check the efficacy of the material to be used in regenerative endodontics and other dental disciplines.

CARDIOVASCULAR RESEARCH LABORATORY



Location	Lab Staff in Charge	Contacts
M32-DF51	Dr. Firdos Ahmad	054-4750051

INTRODUCTION

Poorly defined molecular mechanisms of CVDs largely responsible for the limited therapeutic efficacy of the available pharmacological intervention. This necessitates the need of detail pathomechanisms investigation and, novel molecular targets to design better therapies to combat CVDs. The aim of the cardiovascular Research (CVR) group is to plug in the gap in our understanding of CVDs by performing detailed phenotypic and molecular characterization of these diseases in various pathological settings.

EQUIPMENT AND INSTRUMENTS

- Biosafety Cabinet
- CO2 Incubator
- Microscope
- Water bath incubator
- Shaker

TESTS AND APPLICATIONS

The broader aim of CVR group is to investigate the molecular mechanisms involved in CVDs such as hypertension, vascular dysfunction, atherosclerosis, thrombosis, and ischemia- and hypertension- induced cardiac remodeling and heart failure. Moreover, considering several structural and functional similarities in cardiac and skeletal muscles, CVR group is additionally focusing on investigating the potential molecular mechanisms causing coupling of cardiac and skeletal muscle dysfunction. The group has following specific aims:

• Identify genes and genetic defects and, delineate the underlying molecular mechanisms to enhance our understanding of CVDs including various types of cardiomyopathies, thrombotic and vascular disorders including endothelial dysfunction, familial hypercholesterolemia and inherited bleeding disorders.
- Perform detailed phenotypic and molecular characterization of patients with major CVDs.
- Establish potential circulating biomarkers for early risk assessment and treatment of CVDs.
- Identify and characterize the novel drug targets employing in vitro and in vivo mouse models.
- Delineate the molecular mechanisms causing coupling of cardiac and skeletal muscle dysfunction and, evaluate the effects of microgravity on cardiovascular remodeling.
- Screen the small molecule inhibitors to design better therapies against CVDs.

To address the aims of this group we perform following research experiments:

- Culture of cardiac cells
- Protein, RNA, DNA isolation for molecular testing
- Knockdown and overexpression of genes to assess the gene function in cardiomyopathy
- Western blotting to assess the protein expression and function
- Flow cytometry to determine the level of cell surface receptor expression, and to evaluate the level of cell deaths in a variety of cardiovascular disease models
- Immunofluorescence staining

CHEMICAL LABORATORY



Location	Lab Staff in Charge	Contacts
M32-DF51	Vidhya Anish Nair	0526943999

INTRODUCTION

Chemical lab is a common lab in SIMR, where all the researchers can access and use all the equipment's that are located in this lab to perform analysis for their samples.

EQUIPMENT AND INSTRUMENTS

- Oven
- Millipore water system Type 1 and Type 2
- Balance
- Heating block
- Nano drop

TESTS AND APPLICATIONS

• In chemical lab, the researchers are allowed to use the purification water system, pH meter for checking the solutions, heating block or dry bath for heating the protein samples, an oven for drying the lab container. Nano drop for checking the Nucleic acid concentration and chemical storage of chemicals.

CONFOCAL MICROSCOPE ROOM



INTRODUCTION

The SIMR Microscopy Core Facility is state of the art shared resource facility for high-quality imaging and cell analysis. Facility houses two microscopes (Olympus BX51 fluorescence microscope and Nikon Eclipse Ti confocal) and a dedicated offline workstation for image analysis. These powerful systems permit capture of high-quality images of fixed or living tissues, cells and molecules. Facility provides high quality services in initial project planning, panel design and optimization, instrument operation, data analysis. Additionally, to the regular services facility also provide instrument and software training. The core facility is open to all colleges and departments of the UOS, as well as to researchers from external academic, industrial, and governmental institutes.

The confocal microscopy facility provides researchers with the ability to visualize a variety of samples, from monolayers and small organisms, such as developing fly and fish embryos, to dental biomaterials and biofilms, to very thick sections from brain and other organ tissues. Facility can accommodate a variety of specimens and assist a broad range of users.

EQUIPMENT AND INSTRUMENTS

- Confocal Microscopy machine
- Fluorescence Microscope

TESTS AND APPLICATIONS

 Nikon Eclipse Ti is a powerful inverted confocal microscope with Nikon's NIS-Elements imaging software equipped with four LASERs that provide access to different applications from high resolution fluorescence imaging, Live cell imaging, high-performance spectral confocal imaging, 3D reconstruction, Co-localization, Translocation, multi-dimensional timelapse imaging, Z-stacking/optical sectioning, High Content Analysis (HCS), photobleaching/ photo activation studies, FRET, FRAP, FLIP, etc. • Olympus BX51 is a high magnification upright fluorescence microscope equipped with 6-position fluorescence turret and mercury power supply capable of darkfield, brightfield, DIC, polarized light, and fluorescence microscopy. The filter turret has capacity for six filters that can be easily exchanged. The BX 51 is equipped with a DP72 high sensitivity color camera with a peltier cooled CCD detector allowing for good image capture in low light conditions.

TISSUE CULTURE FACILITY (1) LABORATORY



Location	Lab Staff in Charge	Contacts
M32-DF71	Vidhya Anish Nair	0526943999

INTRODUCTION

Tissue culture facility 1 is the common lab for the SIMR researchers; it has two tissue culture labs for doing cell culture in sterile condition with a class II cabinet, CO2 incubator, and Microscope. There is also a Hypoxia station, Gel documentation instrument and a Sonicator.

EQUIPMENT AND INSTRUMENTS

- Gel documentation
- Tissue culture facility labs 2
- Hypoxia station
- Sonicator
- Centrifuge
- Water bath
- Class II tissue culture cabinet
- CO2 incubator
- Refrigerators

- Tissue culture LABS: APPLICATION: GROWING the cancer, normal of all HUMAN, MICE, fibroblasts, CHONDRIOCYTES CELLLINES, maintain it and used in in-vitro studies
- Gel DOCUMENTATION: For detection of protein AND NUCLEIC ACIDS usING uv trans illuminator
- Hypoxia STATION: Hypoxia is a cell culture incubator and hands-on workstation that accurately mimics and maintains true physiological oxygen conditions, as well as maintaining temperature, humidity and CO2 conditions like any standard cell culture incubator.
- SONICATOR: Sonication is the act of applying sound energy to agitate particles in a sample, for various purposes such as the extraction of multiple compounds from plants, microalgae

and seaweeds. ... In the laboratory, it is usually applied using an ultrasonic bath or an ultrasonic probe, colloquially known as a sonicator.

- Centrifuge: Centrifugation is a technique of separating substances, which involves the application of centrifugal force. The particles are separated from a solution according to their size, shape, density, the viscosity of the medium and rotor speed.
- Water Bath: water bath is laboratory equipment made from a container filled with heated water. It is used to incubate samples in water at a constant temperature over a long period of time.
- Class II cabinet: Class II cabinets protect the worker, the environment and the samples. Air is HEPA-filtered as it is drawn into the cabinet and is also filtered upon exhaust. Because filtered air is circulated throughout the cabinet, aseptic procedures can be performed preventing contamination of samples
- CO2 Incubator: CO2 incubators are sealed, climate-controlled boxes used in life science laboratories to grow biological cell cultures. They are required to maintain the same conditions as inside the human body. These three numbers create the optimal conditions for biological cell growth.

GENE EDITING THERAPY LABORATORY



Location	Lab Staff in Charge	Contacts
M32-DF72	Dr. Burcu Yener	050-6895456

INTRODUCTION

The long-term goals of the Gene Editing & Therapy research group are to advance biomedical research at the University of Sharjah and to develop the infrastructure and the expertise for future clinical applications involving highly promising and fast-growing gene-editing technologies. To this end, the group propose five objectives:

- Develop CRISPR-Cas9-based platform to allow with high accuracy and effectiveness:
 - The identification of novel therapeutic target genes in various types of cancer using genome-wide screen with sgRNA libraries.
 - The development of novel therapeutic approaches by targeting the products of identified genes.
- Employ CRISPR system to correct, modify, or delete aberrant genes to address their functional roles in various human diseases including cancer, diabetes, cardiovascular or respiratory diseases, among others.
- Identifying key signaling networks of cell growth metabolism and pathogenesis that are perturbed in diseases such as cancer, diabetes, cardiovascular or respiratory diseases.
- Developing new methodology to deliver gene-editing molecules into different tissues to precisely target and correct genetic defects using ultrasound-targeted microbubble and photodynamic targeted technologies.
- Develop the infrastructure for gene therapy that provides support for various research groups at the Research Institute of Medical & Health Sciences (RIMHS) and allow the RIMHS to acquire the knowledge and the expertise in such highly advanced gene editing technology that would serve as a basis for future clinical applications.

EQUIPMENT AND INSTRUMENTS

- Bench top centrifuge
- micro-centrifuge
- Biosafety cabinet
- protein transfer apparatus
- Gel Electrophoresis apparatus
- Water bath
- UV Trans illuminator
- PH Meter.
- Binocular Inverted Microscope
- orbital Shaker
- Balance
- High precision scale
- Cell counter
- Glomax
- Dry heat block
- Magnetic stirrer

- Cell viability tests
- Drug treatment of cancer cells
- Deletion or modification of targeted genes

FLOW CYTOMETRY ROOM



Location	Lab Staff in Charge	Contacts
M32-DF73	Manju NJ	050-2077965

INTRODUCTION

The flow cytometry core facility at SIMR is state of the art shared resource facility for multiparameter cell analysis and cell sorting. The facility provides high quality services in initial project planning, panel design and optimization, instrument operation, data analysis. Additionally, to the regular services we also provide cytometry education, instrument and software training. The core facility is open to all colleges and departments of the UOS, as well as to researchers from external academic, industrial, and governmental institutes.

Flow cytometry is a technology that simultaneously measures and then analyzes multiple physical characteristics of single particles, usually cells, as they flow in a fluid stream through a beam of light. The properties measured include a particle's relative size, relative granularity or internal complexity, and relative fluorescence intensity. Tens of thousands of cells can be quickly examined and the data collected are processed by computer software.

Fluorescence Activated Cell Sorting (FACS[™]) allows for analysis, counting or sorting of cell/particle of interest from a heterogeneous mixture of sample/cells. Based on their physical, chemical and fluorescent characteristics using a flow cytometer. Cells displaying the desired characteristics can be identified, counted and sorted. For cell sorting, the fluid stream is divided into numerous microscopic droplets. Droplets which contain a cell of interest are electrically charged and diverted into different receptacles by an electric field. The collected cells can subsequently be cultured, investigated via e.g. microscopy, biochemical and functional experiments.

EQUIPMENT AND INSTRUMENTS

- FACSAria III Sorter
- Accuri C6 flow cytometer

- Multicolor phenotyping
- Cell cycle
- DNA/RNA analysis
- Cell trafficking/ tracking/proliferation
- Apoptosis
- Cell viability
- Cytokine analysis
- Cytometric bead array (CBA), legendplex
- GFP/RFP assays
- Surface and intracellular marker studies
- Changes in intracellular pH
- level of ROS, lipid, calcium flux, drug and glucose uptake assays
- Nanoparticle studies
- Stem cell sorting
- Single cell sorting

WOUND HEALING & ORAL DIAGNOSIS LABORATORY



Location	Lab Staff in Charge	Contacts
M32-DF75	Dr. Aghila Rani Nair	056-2206252

INTRODUCTION

The Wound healing and oral diagnosis research group headed by Prof. AB. Rani Samsudin is interested in researching the basic biological processes of bone healing and remodeling employing advanced tissue engineering concepts. The fundamental concept under investigation is to develop biocompatible bone scaffolds of xenogenic origin as a promising substitute in bone grafting surgeries by developing in vitro constructs made up of cells, biomolecules and biocompatible scaffolds. A biocompatible bone graft decorated with stem cells and appropriate osteoinductive signals would be an ideal alternative for stimulating bone regeneration in situations where bone has lost its self-healing capacity. The knowledge gain can be applied in solving the whole range of dental issues that include dento-facial defects, TMJ derangement, dental implants, periodontal regeneration, pulp healing and several other bone restoration surgeries. The group's research activity is also focused on the search of the molecular mechanisms of osteoporosis, the developmental origins of osteoporotic fracture and exploring the crucial role of reactive oxygen species using several laboratory and interventional studies. Salivary diagnostics is another important research forte that plays a major role in discovery of biomarkers for the diagnosis of oral and systemic diseases. The diagnosis of systemic diseases from substances present in saliva, gingival crevicular fluid (GCF), oral swabs, dental plaque, and volatiles by assessing biomarkers in samples obtained from the oral cavity depends on the biochemical nature of the marker, the source and type of sample being taken, and the mechanism by which the marker enters the oral cavity.

EQUIPMENT AND INSTRUMENTS

- Biosafety cabinet
- Table-Top centrifuge
- Water bath
- Inverted microscope
- CO2 incubator
- PCR cabinet

- Development of biocompatible bone scaffolds of xenogenic origin for bone tissue engineering applications
- In vitro and in vivo evaluation of bone scaffolds for delivery of mesenchymal stem cells for bone healing and other wound healing applications
- Investigation of the role of oxidative stress in bone remodeling events and osteoporosis.
- Identification of factors responsible for wound healing within the oral cavity and maxillofacial region.
- Identifying biomarkers in saliva that are sensitive and specific, enough for early detection of many systemic diseases like diabetes, CVD and cancers.

DRUG DESIGN AND DISCOVERY LABORATORY



Location	Lab Staff in Charge	Contacts
M32-DF77	Fatima Hersi	055-7746765

INTRODUCTION

The research group Drug Design and Discovery is directed towards the discovery and development of new therapies. Through multidisciplinary approach, where structure-guided and target driven methods are employed to identify potent and selective new therapeutic agents. Through the generation, integration, and translation of scientific knowledge and studying the signaling proteins that contributes to biological dysfunctions with a focus on discovery of anti-cancer and anti-Alzheimer agents. We are also interested in identifying a novel approach to sensitize cancer cells to chemotherapy and immunotherapy through targeting different pathways such as DNA damage response and metabolism. The aim of interdisciplinary team is to blend computational drug design, medicinal chemistry, cell biology, toxicology, and preclinical assessment to identify and validate new and/or improved classes of therapeutics for diseases.

EQUIPMENT AND INSTRUMENTS

- Varioskan Flash
- Multiskan GO
- Protein simple
- Cell Counter
- Accuri C6 flow cytometer
- Biosafety Cabinets
- CO2 Incubators
- Autoclave
- Inverted Microscope
- Refrigerated Centrifuge
- Oven
- Sonicator
- Gel electrophoresis of proteins system

- Transblot turbo transfer system
- Analytic balance
- Digital block heater
- Eppendorf microcentrifuge
- Agarose gel electrophoresis
- PH meter

- High throughput enzymatic screening of compounds in multiple disease settings (cancer, COVID-19, Alzheimer).
- In-vitro testing of developed molecules and investigating their molecular mechanisms
- Functional Investigating mechanisms of resistance to anticancer agents
- Safety and efficacy assessment of most potent leads in a preclinical disease models (mice)

NUTRITION AND FOOD RESEARCH LABORATORY



Location	Lab Staff in Charge	Contacts
M32-DF78	Dr. Dinesh Kumar	056-2080909

INTRODUCTION

- Integrate recent developments in the field of clinical nutrition for uncovering association between nutrition and chronic disease in UAE.
- Promote the interests of local community to be involved in studying food intake patterns and life style practices among school children and adolescents for better food choices.
- Explore the field of infant feeding practices and its association with childhood obesity in United Arab Emirates.
- Examine the nutritional components and pathogenic organisms of traditional foods and dishes.
- Seek health prevention policies based on effective nutrition interventions and programs that reduce the risk of chronic diseases in early life.
- Investigate the effect of medical interventions on the nutritional status, biomedical and psycho-social health of the patients

EQUIPMENT AND INSTRUMENTS

- Real Time PCR (Applied Bio systems Step one PCR systems)
- Olympus Microscope- IX73 (Research Inverted Microscope with reflected fluorescence system)
- Biosafety Cabinet
- CO2 Incubator
- Autoclave
- Oven
- Hot air sterilizer
- Freezer
- Analytical Balance
- Body Composition Analyzer.

- Safety of food products by applying quality control systems.
- Thermal and non-thermal inactivation of foodborne pathogens in food system.
- Detection of foodborne pathogens in animal origin products.
- Microbial safety of fresh produces (leafy vegetables and fruits).
- Role of nutrition in cancer etiology, chemo preventive foods against cancer, health implications for Ramadan fasting.
- Role of Mediterranean diet, sustainable food system in human health.
- Nutrition, Weight management and physical fitness for Mother & child nutrition.
- Role of Metabolic syndrome, Diabetes, Obesity, Adipocytokines, and oxidative stress in human health.

NUCLEAR MAGNETIC RESONANCE LABORATORY (NMR)



Location	Lab Staff in Charge	Contacts
M32-DG39	Jobi Joseph	055-9089518

INTRODUCTION

NMR is used to detect NMR active(magnetically active which will possess a net 'spin').Nuclei like Proton(1H),Carbon(13C),Fluorine(19F),Phosphorous(31P),Notrogen(15N) etc. are detected by this technique. Our magnet is used for liquid NMR studies. Samples are dissolved in deuterated solvents by the respective departments and submitted for experiments. It makes use of the interactions of these nuclei with a static magnetic field in determining different properties of the molecule. Proton and carbon are the most widely studied.

EQUIPMENT AND INSTRUMENTS

• NMR Magnet (Bruker 500MHz ,Advance-III)

TESTS AND APPLICATIONS

- 1D Experiments:
- Proton (1H), Carbon (13C), Fluorine (19F), Phosphorous (31P), Nitrogen (15N)
- 2D Experiments:
- COSY, TOCSY etc make use of direct proton-proton correlation.
- NOESY -makes use of interactions through space.
- HSQC and HMBC-makes use of proton-carbon correlation.

Both 1D and 2D combined can be used for structure determination of organic molecules. Used for reaction monitoring, synthetic chemistry support, drug development etc.

DRUG DELIVERY LABORATORY



Location	Lab Staff in Charge	Contacts
M32-DG40	Dr. Roberta Cagliani	052-4586142

INTRODUCTION

The laboratory research is based on the synthesis and characterization of different compounds (nanoparticles, nanocrystals, nanofibers, tablets) for different bio-medical applications (cancer, pediatric use)

EQUIPMENT AND INSTRUMENTS

- Freeze Dryer
- DLS
- Plate reader
- pH meter
- Franz cells
- Dissolution tester
- Microfluidizer
- Co2 Incubator for cell lines
- Balances
- Centrifuges
- Homogenizer
- Sonicator

- Synthesis of monodisperse nanoparticles,
- Evaluation of nanoparticles, nanocrystals ecc size and surface charge,
- Evaluation of cells viability after the treatment with different compounds,
- Permeability studies,
- Dissolution test of tablets

IMMUNOLOGY LABORATORY



Location	Lab Staff in Charge	Contacts
M32-DG43	Jasmin Salam	050-6987972

INTRODUCTION

The main focus of Iron biology research group (IMMUNOLOGY LAB) was to investigate the role of estrogen signaling in iron metabolism in different clinical settings. The current application builds on previous and ongoing research work in our lab regarding the role of estrogen in iron metabolism in cancer, autoimmunity and diabetes. Understanding the regulatory mechanisms and the signaling cascades involved in iron homeostasis (both systemic and intracellular) and investigating how estrogen figures out in this process Investigating the patterns of and mechanisms underlying disturbed iron homeostasis in cancer (colon and breast cancer in particular). Assessing the ability of estrogen to deplete intracellular iron and the therapeutic potential of estrogen as an iron-depleting agent in iron-loaded cancers. The role of haptoglobin and other extracellular anti-oxidant systems on iron management under the influence of estrogen will also be evaluated. Assessing the role of estrogen in iron homeostasis as it relates to the development, regulation and differentiation of adaptive immunity and immune check points. Investigating the underlying mechanisms of anti-diabetogenic effects of estrogen. Analyzing estrogen-mediated gene (and protein)

EQUIPMENT AND INSTRUMENTS

- Thermal cycler
- HOMOGENISER
- Biosafety Cabinet
- Cell counter
- CO2 Incubator
- Inverted Microscope
- Refrigerated Centrifuge
- Shaking water bath
- Freezer

TESTS AND APPLICATIONS

According to our research methodology, we are focusing the different protein level expressions in different cell line using western blotting. To confirm this protein expression level, we are doing cell surface staining to detect cell membrane proteins and intracellular staining by flow cytometry. Some projects we are mainly focusing on the gene level expression, which can be measured by using Real Time PCR. To study the intracellular colocalisation of proteins by doing immunofluorescence and detect by confocal and fluorescent microscopy. In most of the projects the level of protein in serum and cell supernatants are measured by using different ELISA KITS and reading taken by ELISA READER.

CANCER RESEARCH LABORATORY



Location	Lab Staff in Charge	Contacts
M32-DG44	Vidhya Anish Nair	052-6943999

INTRODUCTION

Cancer research lab is focused on attaining a better understanding of the initiation, maintenance and progression of tumors (breast and colon cancer) and their response to current therapies towards improving future treatment strategies. Currently, our research aims to understand the environmental causes of cancers and the resistance of cancer cells to therapy with a focus on the role of environmental pollutants and obesity in carcinogenesis.

EQUIPMENT AND INSTRUMENTS

- CO2 INCUBATOR
- Refrigerated Centrifuge
- Class II cabinet
- Microscope
- Fume hood

- CENTRIFUGE
- PH Meter
- Heating block
- Bio-Rad Cell Counter
- Normal Incubator

- Western blot: We are doing the cell culture of all normal and cancerous cell lines mainly focused on colon and breast cancer, the protein work is done by Bio-Rad western blot apparatus which includes a transfer apparatus, shaker , heating block (denaturation).
- Nucleic Acid work: All the RNA work is done aseptically on the bench to perform PCR by both quantitative and qualitative method.
- MTT assay: We also focus on several drugs to study the cytotoxic effect on different cell lines.
- H & E, Immunohistochemistry: the specific technique to identify the antigens antibody reaction in tissue, here we use the fume hood for doing the staining techniques.
- We also does some other techniques like pull down assay, Migration assay, Immuno fluorescence, Invasion assay.

MICROBIOTA RESEARCH LABORATORY



Location	Lab Staff in Charge	Contacts
M32-DG45	Dr. Priyadharshini Sekar	054-3527080

INTRODUCTION

The microbiota research laboratory conducts studies that focus on skin, oral and gut microbiota among the UAE population. Several research studies indicate that there is a strong bi-directional link between microbiota and its' genes and host genetic make-up, which reflects in the wellbeing of humans and affects or contributes to diseases and disorders. This is observed in multiple inflammatory, metabolic, infectious and neurodegenerative diseases. The microbiota research laboratory is primarily involved in studies that investigate the role of microbiota in the pathogenesis of common diseases in the UAE; explore the influence of the host genome on the composition of skin, oral and gut microbiota and how host gene-microbiota interactions contribute to the pathogenesis of these diseases. Additionally, we aim to identify bacterial "probiotic" species and their products that could be used as a therapeutic agent for commonly encountered diseases in the UAE.

EQUIPMENT AND INSTRUMENTS

- Block Digital dry bath
- Vortex Mixer
- Vortex Mixer
- CO2 incubator
- Inverted microscope
- biosafety cabinet
- Refrigerator

TESTS AND APPLICATIONS

• Testing for oral microbiota composition on titanium implants harvested from subjects, by fluorescent microscopy, real time PCR and 16SRRNA SEQUENCING (NGS) to study the changes in the oral microbiota in patients with titanium dental implants.

- Testing for effect of certain gut bacterial metabolites on specific human cell lines by various cell culture assays, to understand host-gut bacteria interactions.
- Testing for specific metabolites synthesized and secreted by gut bacteria that are identified to influence certain disease progression eg:-psoriasis, obesity or asthma, by metabolomics.
- Culturing and testing uncultured bacteria isolated from soil, by bacterial culturing techniques, antimicrobial sensitivity testing, PCR AND 16SRRNA sequencing, to identify its potential use as an antimicrobial agent.

INTEGRATED ANALYTICAL LABORATORY



Yusur Mehdi Almusleh

INTRODUCTION

The Integrated Analytical Laboratory is a state of the art laboratory with a wide range of high resolution and sensitivity instruments including LC MS/MS, GC MS/MS, HPLC, ICP, TOC, I.R, U.V., and other instruments. The laboratory is meant to support researchers from a variety of disciplines, including but not limited to water and environment, chemistry, applied biology, energy, health sciences, and medical sciences. The laboratory has facilities that can be used to conduct sensitive analyses supporting research and studies in the areas of environmental quality and pollution, food and product quality and contamination, drug development and evaluation, along with performance of chemical and biological pollution treatment and production systems. In addition, the lab supports studies meant to assure safety and efficacy of pharmaceutical products for human use and studies addressing risk associated with hazardous pollutants in the environment and developing treatment systems to control environmental pollution.

EQUIPMENT AND INSTRUMENTS

- Liquid Chromatography Mass Spectroscopy (LC-MS)
- High Performance Liquid Chromatography (HPLC-FLD/ECD/UV)
- Gas chromatography mass spectroscopy (GC-MS)
- Ion chromatography (IC)
- Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES)
- Total Organic Carbon (TOC)
- Other facilities in Integrated Analytical Lab (IAL):
- Gas Chromatography (GC-ECD/FID)
- Fourier transform infrared spectroscopy (FTIR)
- UV-Vis spectrometry
- Automatic polarimeter

- Automatic liquid extraction
- Automatic Solid Phase Extraction
- Karl-Fischer Titrator
- Auto Flex Max LIN
- Size/Zeta Analyzer
- Ultrasonic Cleaner

TESTS AND SERVICES

- Water Quality testing
- Biotherapeutic Analysis
- Biomarker Discovery
- Microbial Identification
- Amino acid analysis
- Analysis of vitamins
- Heavy metals scanning
- Pharmacokinetics in biological fluids
- Pharmaceutical analysis
- Environmental monitoring
- Forensic toxicology to find poisons, steroids in biological specimens
- Petrochemical Analyses
- Metallurgical analyses
- Geological analyses
- Determination of sugar and salt content in foods
- Proteins scanning
- Metabolites scanning
- Pesticides Scanning
- Food, beverage, and fragrance analysis.
- Natural extracts screening
- Polymer Analysis

GEL DOCUMENTATION LABORATORY



Location	Lab Staff in Charge	Contacts
M32-GelDoc	Vidhya Anish Nair	052-6943999

INTRODUCTION

Chemi-Doc imaging system is an instrument for imaging and analyzing DNA gels and Immuno (western) blots. It is designed to do western blotting, stain free technology imaging, nucleic acid gels. Nano drop is a machine used to detect the nucleic acid purity and concentration it is a very sensitive instrument.

EQUIPMENT AND INSTRUMENTS

- CHEMI DOC
- NANO DROP

- CHEMI –DOC:
 - The Chemi- doc, also known as a gel documentation system, gel image system or gel imager, refers to equipment widely used in molecular biology laboratories for the imaging and documentation of nucleic acid and protein suspended within polyacrylamide or agarose gels. It is designed to address multiplex fluorescent wstern blotting, chemi luminescence detection, general gel documentation and stain free technology imaging needs.
- NANO DROP:
 - The Nano drop machine is a full-spectrum, UV-Vis spectrophotometers used to quantify and assess purity of DNA, RNA, Protein and more. The Nano Drop 2000 and 2000c are the only micro volume spectrophotometers with patented sample retention technology that measure sample volumes as small as 0.5µL.
 - Nucleic acid concentration and purity of nucleic acid samples up to 3700 $ng/\mu l$ (dsDNA) without dilution

- Purified protein analysis (A280 nm) up to 100 mg/ml (BSA):
 - Bradford Assay analysis of protein
 - BCA Assay analysis of protein
 - Lowry Assay analysis of protein
 - Pierce Protein 660 nm analysis
 - Cell density measurements
 - General UV-Vis spectrophotometry
 - Custom methods

SHARJAH ACADEMYOF ASTRONOMY, SPACE **SCIENCES**& TECHNOLOGY (SAASST)



SAASST LABORATORIES

Lab Name	PERSON IN CHARGE	EMAIL
SAASST CubeSat Laboratory	Prof. Ilias Fernini	ifernini@sharjah.ac.ae
SAASST Meteorite Center	Prof. Ilias Fernini	ifernini@sharjah.ac.ae
SAASST Space Weather & Ionospheric Laboratory	Dr. Mubasshir Shaikh	Mshaikh@sharjah.ac.ae
SAASST Radio Astronomy Laboratory	Prof. Ilias Fernini	ifernini@sharjah.ac.ae
SAASST High Energy Astrophysics Laboratory	Dr. Antonios Manousakis	amanousakis@sharjah.ac.ae
SAASST Space Artificial Intelligence Laboratory	Ms. Aisha Al-Owais	aalowais@sharjah.ac.ae

SAASST CUBESAT LABORATORY



INTRODUCTION

The SAASST CubeSat program aims to develop and operate small satellites, while incorporating cross-disciplinary teamwork, making the student experience challenging and exciting. Numerous students have been involved in curriculum-based projects and have participated in outreach activities thus far. Students have also participated in the International CanSat competition and rocket building competitions with the help of faculty members and researchers.

EQUIPMENT AND INSTRUMENTS

Ground station:

The SAASST Ground Station is essential for communicating with SharjahSat-1 to facilitate receiving telemetry and sending commands. In support of the mission and future missions, a full-fledged ground station has been established. The ground station is currently operating on UHF/VHF frequency bands. It implements an ICOM IC9700 transceiver and YAESU G-5500 Rotator with a YAESU G-5500 Elevation, Azimuth dual controller, and YAESU GS-232B Rotator control interface.

Cleanroom:

The SAASST Cleanroom is utilized for the assembly and integration of CubeSats. It is designed to maintain extremely low levels of contaminants and environmental pollutants as well as a specific humidity level. The existing cleanroom is ISO 6 certified, which ensures that the integration of CubeSat components is carried out according to sanitary regulations and that sensitive electronics and instruments are protected.

TESTS AND SERVICES

Main Objectives:

- To be a leading institute in building CubeSat technology spacecraft.
- To educate students and involve them in the design, testing, and integration of CubeSats.

SharjahSat-1

SharjahSat-1 is the first CubeSat mission being developed by the SAASST team. The aim of the mission is to build competencies and expertise of significant value to future CubeSat missions. The 3U+ CubeSat will implement an improved X-ray Detector (iXRD), as the primary payload, and a secondary payload, which is a system including two optical cameras. The two primary observing objectives are to:

- 1. Observe solar coronal holes and their effects on space weather conditions.
- 2. Observe different spectral types of stars and compare their X-ray emissions to better understand stellar evolution

SAASST METEORITE CENTER



INTRODUCTION

- To conduct meteorites search and analysis in the United Arab Emirates.
- To develop a Space Situational Awareness (SSA) program in the United Arab Emirates

EQUIPMENT AND INSTRUMENTS

The Meteorite Center is the first of its kind in the Gulf region. It includes several sections:

a) Meteorite Analysis Laboratory:

Sample meteorites are examined for their authenticity. The laboratory has four main instruments:

- Petrothin Thin Sectioning System,
- IsoMet 1000 Precision Saw,
- Olympus Polarizing Microscope,
- Nikon Stereoscopic Zoom Microscope, and
- Handheld/portable XRF Spectrometer.

The laboratory conducts some preliminary tests before sending its samples to the University's Advanced Science Materials Laboratory to run advanced tests such as XRF, XRD, and Raman tests to derive the exact mineral composition of the samples. These tests are crucial to determining whether the sample constitutes a meteorite or a stone/rock.

- Analysis Instruments:

Handheld/Portable XRF Spectrometer:

XRF stands for X-ray fluorescence, a powerful, nondestructive technique that has the capability to quantify or qualify the elemental composition of a sample. A portable device can be used either in the lab or directly in the field. The analyzer emits X-rays that hit the sample and cause the elements in the sample to fluoresce and travel back to the analyzer's X-ray detector. The analyzer counts them and makes mathematical calculations to generate a result.

- IsoMet 1000 Precision Saw:

This is a precision-sectioning saw designed for cutting various types of materials. It offers the appropriate blade size, load, and increased controlled speed to cut samples quickly and with less damage.

- PetroThin Sectioning System:

The PetroThin Sectioning System is easy and precise for resectioning and thinning a wide variety of samples, such as rocks, minerals, ceramics, cement, etc. in order to perform materials characterization.

- Olympus Polarizing Microscope:

The Olympus polarizing microscope ensures secure, operational, and outstanding optical performance. It provides optimal performance for polarized light applications, using a combination of UIS2 infinity-corrected optics and distinctive optical design. An extended line of compatible compensators makes this microscope flexible enough to handle observation and the measuring of applications in practically any field.

- Nikon Stereoscopic Zoom Microscope:

This powerful stereo microscope provides both excellent optical performance, such as highmagnification, high-zoom ration, and high-resolution images, as well as advanced operability. The expandability of parallel optics makes this microscope ideal for a wide range of uses.

b) UAE Meteor Monitoring Network:

- This network consists of three identical towers placed at three locations (Sharjah, Yahar, and Liwa) to cover the entire UAE sky. Each tower consists of 17 cameras that span the sky from sunset to sunrise to observe any possible meteors or human-made falling satellite debris. Once a meteor is detected, the network will analyze and determine its orbit, magnitude, and whether a meteor belongs to a specific type of shower.
- Description Each tower consists of three sections. The ground-based section is where the computer rack is placed. The second is used for storage. The top section is where the cameras are mounted in a ring-like structure.

c) Machine Learning:

Since the area where a meteorite might fall is vast, a drone is used to search for the possible location of fallen meteorites. Functioning with machine-learning applications, the drone is instructed on how to distinguish authentic meteorites from similar-looking fallen objects.

TESTS AND SERVICES

- To Analyze rocks to identify them as meteorites or not.
- To develop a Space Situational Awareness (SSA) program in the United Arab Emirates



SAASST SPACE WEATHER & IONOSPHERIC LABORATORY

INTRODUCTION

The Space Weather and the Ionosphere (SWI) laboratory is working to build an ionospheric research laboratory and develop its activities. The purpose of the laboratory is to perform scientific research related to solar-terrestrial interaction and the study of ionospheric effects on radio systems.

Main Objectives:

- To conduct space weather research in order to better understand the role of the Sun in space communications.
- To develop and promote space weather research systems and programs in the Arab Gulf region and United Arab Emirates.

EQUIPMENT AND INSTRUMENTS

GNSS Receiving Station with Scintillation Monitoring:

The ability to measure and monitor GNSS signal quality is critical to assessing GNSS system usability and performance. GNSS receiver technology relies on signals broadcast from satellites orbiting 20,000 km above the Earth at a frequency of approximately-163 dBW or about the strength of a single tree ornament bulb. This makes GNSS signals susceptible to interference from many sources.

Advanced Digital Ionosonde:

The Canadian Advanced Digital Ionosonde (CADI) is a low cost, state-of-the-art, flexible, full-featured ionosonde ideal for both routine ionospheric monitoring and research. CADI provides sounding capability using high-power radio frequency pulses at vertical incidence.

TESTS AND SERVICES

Space weather refers to the environmental conditions in Earth's magnetosphere, ionosphere, and thermosphere related to the Sun and the solar wind, which can influence the functioning and reliability of space borne and ground-based systems and services and/or endanger property or human health.

The lab observes the influence of the solar wind on the ionosphere. The data generated by the two instruments is used for GNSS applications.
SAASST RADIO ASTRONOMY LABORATORY



INTRODUCTION

The main objectives of the laboratory are to:

- Conduct radio observations of the Universe at different radio wavelengths.
- Promote a radio astronomy program at the University of Sharjah.

EQUIPMENT AND INSTRUMENTS

The Radio Astronomy Laboratory consists of two main systems:

- Decametric Radio Array, which receives signals from the Sun, Jupiter and the Galactic Background Radiation at 20.1 MHz; and
- A 40-m radio interferometer made of three dishes, 5 meters each, which receives signals at 1.4 GHz.

Decametric Radio Array:

This telescope array consists of four dual-dipole antenna units using NASA's Radio JOVE Telescope kit as a building block. The receiver of the telescope is designed to operate at 20.1 megahertz (MHz) in order to conduct radio observations of Jupiter-Io interactions, solar bursts, and background radio emissions from the Milky Way Galaxy.

40-m Radio Interferometer:

Three SPIDER 500A telescopes are used to simulate a radio interferometer with a size equivalent to a 40-m dish. The system is in the shape of a rectangular scalene triangle with distances (sides of scalene triangle) of 30, 40 and 50 meters. This array is able to simulate the resolution of a 40-m diameter single dish antenna with a collection area equal to an antenna of 8.7 meters in diameter. The synthesized beam in this configuration measures 0.36° (21 arc minutes).

TESTS AND SERVICES

Conduct radio observations of the Universe at 20.1 MHz and 1.4 GHz

SAASST HIGH ENERGY ASTROPHYSICS LABORATORY



Location	Lab Staff in Charge	Contacts
SAASST	Dr. Antonios Manousakis	065166187

INTRODUCTION

Main Objectives:

- Conduct computer modeling to study the environments of stars in interacting binary systems.
- Determine the fundamental physics of stellar winds in stars and their accretion processes.
- Utilize data from current X-ray facilities such as XMM-Newton, INTEGRAL, Chandra, and NuSTAR.

EQUIPMENT AND INSTRUMENTS

Astronomical Observatories

- Sharjah Optical Observatory
- Sharjah Lunar Impact Observatory
- Wadi El-Helo Astronomical Observatory
- Decametric Radio Telescope
- 40-m Sharjah Radio Telescope

TESTS AND SERVICES

Conduct optical, radio, and X-ray observations of the Universe

SAASST SPACE ARTIFICIAL INTELLIGENCE LABORATORY



INTRODUCTION

The main objectives of the laboratory are to:

- Develop Artificial Intelligence and Machine Learning algorithms that could be integrated for other SAASST labs.
- Promote multidisciplinary projects that involve the field of computer science with space sciences and astronomy.
- Integrate AI with the UAEMMN project
- Integrate AI with the decametric radio telescope
- Use AI to predict Ionospheric Scintillations
- Build a model that includes AI algorithms and a UAV to detect meteorites.

EQUIPMENT AND INSTRUMENTS

The Space Artificial Intelligence Laboratory requires access to a cluster for model training. At the moment, we are using the SAQR cluster at the High-Performance Computing Facility at the University of Sharjah. We are also utilizing computers at SAASST. Moreover, we have a Raspberry Pi3 processor, NVIDIA Jetson Nano processor, an RPi3 Camera, a processor fan, and a Matrice DJI 600 Drone.

TESTS AND SERVICES

- Train students on ML techniques
- Detect meteors in files produced by the UAEMMN Cameras
- Detect possible meteorites
- Predict Ionospheric Scintillations