

CURRICULUM VITAE

Ahmed Al Makky PhD in Mechanical Engineering – CFD



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[Ahmed Al Makky - Google Scholar](#)

Personal Statement

I am a highly motivated researcher with a solid theoretical and technical background in mechanical engineering and computational fluid mechanics (CFD). My research background has been mainly focused on designing 3D models that address various types of renewable energy problems, namely electro chemical flow modelling in fuel cells, flow modelling within porous media to predict carbon dioxide exchange between the atmosphere and the surface of the earth, combustion modelling through reactive flow modelling, and tidal turbine development through flow modelling. During those projects, I acquired the skills needed for working with interdisciplinary teams and projects, and I also learned how to use advanced software such as ANSYS, MATLAB and STARCCM. I am looking forward to making significant contributions in research and academia that will benefit humanity through introducing new technologies that will improve people's quality of life and will save the planet.

Research Areas

- Design of Alkaline Electrolysers, including electro chemical flow simulations modelling using CFD for practical implementation on fuel cells and electrolysers.
- Hydrogen Engine Combustion Design.
- The Design of a 2.3 [MW] Wind Turbine.
- The Design of a magnetic ball bearing flywheel.
- Biofuel and hydrogen combustion flow modelling using CFD.
- Aerodynamic flow analysis and optimization around transport objects.
- Using CFD to develop new technologies for wind and tidal turbines.

Professional Experience

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| Aug 2021 - Present | Assistant Professor of Mechanical Engineering in the SREE Department at the University of Sharjah (UOS) Research, lecturing and moderating courses. |
| Aug 2018 – Aug 2021 | Assistant Professor of Mechanical Engineering at the American University of the Middle East (AUM) lecturing and moderating courses. |
| Jan 2017 – July 2018 | KTP (Knowledge Transfer Partnerships) Research Associate at the University of the West of Scotland (UWS). This partnership involved a team of researchers from the University (in which I was assigned the task of the project leader) and a local group that delivers engineering solutions to the oilfield industry in an R&D project to further develop a tidal turbine which is a patent owned by the local group. The project included experiments on mini models of the turbine, dimensionless analysis, and CFD simulations to enhance the marketability of the turbine |
| Mar 2016 – Dec 2016 | Post-Doc researcher at the University of the West of Scotland. During the post-Doc period I Worked on five main projects: <ol style="list-style-type: none">1. The Magnetorheological Fluid Project:
The project focused on using magnetorheological fluid to control the manufacturing process of a composite material used in the aerospace sector. The project involved utilizing FEMM 4.2 software to quantify the magnetic field acting on the magnetorheological fluid while the manufacturing process was conducted.2. Latest Heat Capture Methods Survey:
The purpose of the project was to survey the latest energy capture methods relating to data centres, domestic sector, industrial sector, and the power generation sector in relation to both the fossil fuel and renewables sector.3. PEM Fuel Cell Development and Research:
The work in the fuel cell lab included: a survey of the required apparatus for purchasing and putting together an order list, commissioning the fuel cell lab, training researchers on how to use the equipment, teaching five PhD students the foundations of hydrogen air breathing fuel cell and covering the materials side for the different layers used within the fuel cell. This included teaching electrochemistry, mass transport and heat transfer in the application of |

fuel cells. The impedance technique was used through the application of the Bode plot and Nyquist diagrams for identifying the fuel cells operation performance. The project was concluded by producing CAD diagrams for both the hydrogen air breathing fuel cells and the hydrogen generator.

4. Cooker Heat Exchanger Design:

The Chinese cooker project work included: conducting temperature distribution data gathering along the cooker burner, modelling the cooker and the new incorporated heat exchanger, making design diagrams for the heat exchanger experimental rig, and making detailed diagrams for individual parts. A MATLAB code was written to help in the design calculations of the heat exchanger. CFD modelling was run. This was performed through capturing the velocity and temperature fields. Finally, this was followed by combustion simulations.

5. Biogas Production Apparatus:

The biogas apparatus is designed to bio-digest forest wood, this was required by the customer. The rig was made of a mixing unit, the second unit was used to apply the required minerals for the bacteria and the gas separation unit, both units use heaters. The final unit has the methane gas collector submerged in water, as the gas accumulates inside the cylinder it rises and pushes water out of it allowing unwanted gas species to be diluted in the water.

6. The Hollander Beater Design Project:

This project resulted in modelling a 3D model of the Hollander beater in addition to also conducting CFD simulations, relating to the rotating beating part.

Apr 2012 – Present	CFD Consultant (http://cfd2012.com/index.html)
Mar 2006 – Sep 2006	Assistant Manager at Nikko Electronics (UK).
Sep 2005 – Feb 2006	Private Tutor, teaching courses in mechanical engineering.
Jan 2005 – Feb 2006	Autodesk 3ds Max modeller.
Aug 2004 – Feb 2006	Machine Design Modeller using AutoCAD.

Teaching Experience

Aug 2021 - Present Assistant Professor at the SREE Department at the University of Sharjah (UOS) moderating and lecturing modules. The modules I taught are the following courses:

- 1- Engineering Management: (0406361)
- 2- Fuel Cells: (0406463)
- 3- Wind Energy Systems: (0406330)
- 4- Statics & Dynamics: (0406101)
- 5- Energy Storage Lab: (0406452)
- 6- Wind Energy Systems Lab: (0406331)
- 7- Hydraulics Engineering and Design: (0401445)
- 8- Fluid Mechanics Lab: (0401344)
- 9- Fluid Mechanics: (0401343)

I gave a 60-hour summer term training teaching Internal Combustion Engines design, furthermore I also taught Magnetic Ball Bearings for the SDP project.

Aug 2018 - Aug 2021 Assistant Professor of Mechanical Engineering at the American University of the Middle East (AUM) moderating and lecturing modules. As a course moderator, I am in charge of preparing the course syllabus, the course design document, the lecture notes, the PowerPoint slides and handouts. My responsibilities also involve preparing exam questions, in-class assessments, project reports, and presentations. My responsibilities as a course moderator also is to follow up my team of teaching fellows to ensure that all the taught sections of the same course are consistent. The maximum teaching hours that I moderated is about 15 hours, which included four sections with a maximum number of 30 students in each. When I am assigned the role of a lecturer, I also supervise capstone projects. During the COVID-19 online teaching period, the number of students in my sections doubled reaching 60 students per class with a total number of 3 to 4 sections. The modules I taught are the following courses:

- 1- Statics (ME270): Topics covered included introduction to statics, force systems, equilibrium, structures, distributed forces, friction, centroids, and centres of mass.
- 2- Dynamics (ME274): Topics covered included introduction to dynamics, kinematics of particles, kinetics of particles, kinetics of systems of particles, plane kinematics of rigid bodies, plane kinetics of rigid bodies and introduction to three-dimensional dynamics of rigid bodies.
- 3- System Modelling (ME375): Topics covered included an introduction to system dynamics, the Laplace transform,

mechanical systems, transfer-function approach to modelling dynamic systems, state-space approach to modelling dynamic systems, and time-domain analysis of dynamic systems and frequency-domain analysis of dynamic systems.

- 4- Thermodynamics I (ME200): Topics covered included introduction and basic concepts, energy, energy transfer, energy analysis, properties of pure substances, energy analysis of closed systems, mass energy analysis of control volumes, the second law of thermodynamics, entropy, vapour power cycles and refrigeration cycles.
- 5- Automotive Prime Movers (ME440): Topics covered included Fuel cells design, combustion and fuel atomization.
- 6- Capstone Project (ME463): Topics covered included encouraging students to think critically, solve challenging problems, and develop skills such as oral communication, public speaking, research skills, media literacy, teamwork, planning, self-sufficiency and goal setting.

Mar 2016 – July 2018 (University of the West of Scotland), delivering the following courses:

1. Renewable Energy (ENGG10009):
Topics covered include wind energy, solar power, Energy Storage Systems, Hydro Power, Tidal Power, Batteries, Fuel Cells and Electroliers
2. Engineering Project Management using MS-Project (ENGG09004):
The module involved both theoretical and practical practice in computer labs. My role was focused on teaching students (in the computer lab) the application of the MS-Project software for producing project Gantt charts and guiding them in using the 'divide and conquer method'. This method is based on the principle of breaking up a certain project into individual tasks. My civil engineering students applied the skills they acquired in building a construction project, while the mechanical engineering students applied their skills on product manufacturing or on project development. This helped students apply the skills learned in other taught modules such as warehouse store management, supplies chain management, human resource management, etc... After that, students had to estimate the required days for completing each task and allocate the required number of people and funds. The next step was to organize the individual tasks in a logical and feasible order to fit in with the working hours and holidays and take into consideration the project funding so that the project would not exceed the allocated budget. Each project was assessed based on how the student solved all the project problems and how feasible was his/her proposed Gantt chart in real-life.
3. Polymer Electrolyte Membrane (PEM) Fuel Cell Theory and Practice:

This was a 30-hour course which was specifically prepared and tailored to meet the needs of five PhD students who were about to start research in this field.

Sep 2008 - Jun 2012 (Warwick University): Demonstrating and teaching the following courses:

- 1 Design for Function (ES174):
which includes introduction to CAD laboratory, reverse engineering, civil structure computer laboratory, stage 2 fluid flow PC (Car Aerodynamics) Laboratory, stage 2 load bearing Framework PC laboratory, stage 3 project-model dragster laboratory, and stage project-model dragster testing
- 2 Mechanical Design (ES3C2) – Laboratory:
The mini-racing car project. The module aimed at guiding students on how to work in groups and break down tasks to make a small racing car model to compete later in a race with other groups at the end of the term. The module helps students learn how to model individual parts of the car then create a full working assembly. This was accomplished first through guiding students to use the basic steps of drawing rectangular shapes, circles, lines, construction lines. In addition to that, they were guided on how to create reference geometry with planes, points, and axis lines. Then they were shown how to create solids with extrude, revolve, sweep and loft command. Boolean operations that included union, subtract and common were also included. The course concluded by guiding students to the steps on making CAD drawings with all the necessary dimensioning procedures according to fixed standards. Creating functioning assemblies was also carried out through using the parts mating approach which concentrates on the operational role of the two parts. At the end of the project, the modelled parts prepared by the students were 3D printed then assembled and put to the test. An independent part of the module was using the CFD package included within the SolidWorks software. This was used to conduct a racing car CFD analysis project which was intended to teach the students how to create the fluid domain, assign the boundary conditions, select turbulence model, fluid physical properties and validate the simulation output data. Then the students were asked to analyse the data, modify the design, and backup their statements through scientific methods and data comparison.
- 3 Computational Fluid Dynamics (E440/ES911) – Laboratory: The CFD module was composed of the following six sub-tasks:
Task 1: Teaching programming for CFD using FORTRAN90 Lab: This was achieved first by guiding students to install the FOTRAN90 compiler. Then by teaching FORTRAN90 basics; starting with the general algebraic operations to creating matrices to defining real and integer variables. Later-on conditional statements like while, if and else statements were covered. Furthermore, students were taught how to use

functions and procedures. Likewise assigning file names and specifying their type of format for input and output files. This was followed by data analysis and by reading the data into Excel. Students were then trained on how to compile and debug a code. Once the basics of programming were covered, it was followed by applying the learned skills to solving differential equations.

Task 2: A one none-dimensional Navier Stokes equation was assigned to be solved by the students for a circular tube case. This was done first by applying finite difference methods to the derivative terms for individual nodes. Likewise, the boundary conditions were applied. Hence the equation was then converted to an algebraic form for individual nodes. The individual nodes created a set of equations to be solved. This resulted in teaching the students how to programme the Tri-Diagonal Matrix Algorithm to solve a set of algebraic equations. Once the space part of the equation was covered the students were asked to apply a time stepping method which means either using the implicit Euler time stepping method or a third order Runge-Kutta method. The time solution required applying initial conditions for the simulation. Data analysis then was conducted from the data obtained from the output generated file. The plots showed the velocity profiles of the solution as a function of time. The generated data was then validated against its exact solution.

Task 3: Solving a one-dimensional wave equation using the Lax-Wendroff method. Similar steps were followed as in task 2 mentioned above. Data analysis was then conducted using the obtained data from the output generated file. The plots showed the velocity profiles of the solution as a function of time.

Task 4: The task required students to carry out a numerical solution of an autonomous linear ordinary differential equation called the Predator-Prey model. This was done first by solving the problem by hand based on the theory covered in the theoretical lectures, then by writing the FORTRAN90 programming code for it. The code was then run and debugged. Once the data was generated, graphing the plane phase diagram of the data analysis phase was done to find the equilibrium point of the solution.

Task 5: The project covered the use of STAR-CCM+ CFD software. This was done through assisting students in practising the ready tutorials made by the STAR-CCM+ company. The tutorial steps were reading first in the simulation geometry files. Then came selecting the appropriate meshing model, such as tetrahedral, hexahedral or other types of mesh. This was followed by assigning the different domain geometry surfaces' names. Likewise selecting the turbulence model required for the simulation was followed. The next was to set up the CFD simulation through assigning the fluid domain and its physical properties and applying the wall and inlet and outlet boundary conditions. This was then

followed the process of solution monitoring with the aim of achieving numerical stability of the conducted simulation to finally come to the data analysis stage and validation.

Task 6: Based on the skills acquired by the students, the final project was assigning the students a practical real-life problem that requires computational fluid dynamics software like ANSYS or STAR-CCM+.

4 Civil Engineering Materials and Structural Analysis (ES3D3).

Laboratory:

Bending Moments Diagrams

5 Technological Science 1 (ES180):

Pin-jointed Frame Laboratory, Dimensional analysis, and Support Session for Students without A Level Physics.

6 Technological Science 2 (ES2A7) – Laboratory

4 Pipe Flow.

7 Solid Mechanics (ES3D3):

Taught civil engineering structures module, which covered both experimental and practical lab. The covered theory of the module was a review of centroids and moments of inertia, tension, compression, and shear followed by axially loaded members, torsion, shear forces, bending moments, stresses in beams, deflections in beams, and columns. The structures' solution examples class covered 20 hands-on calculations where the students were first trained on reading the problem basic information then determining the reaction forces, the methods of drawing shear and bending moment and deflection diagrams.

The structure's lab covered two types of structures one with a truss with tension and the other with a loaded beam. Using load cell sensors connected to individual beams instantaneous readings were made by the students. The second stage of the lab, after the experimental data was gathered, hands-on calculation were done and the comparison between the obtained data with the measured experimental data was carried out.

Development of Teaching Materials

I developed seven CFD teaching materials in the form of tutorial manuals to support university students' learning of CFD and facilitate their understanding of its complexities:

- 1 Coding Tutorial for Computational Fluid Dynamics.
- 2 ANSYS-CFX Introductory Tutorials.
- 3 Methane Combustion Modelling Tutorial using ANSYS CFX
- 4 Flow Modelling in Heat Exchangers using ANSYS CFX.
- 5 Spray Modelling Using ANSYS CFX.
- 6 Flow Modelling in a Porous-Fluid Domain using ANSYS CFX.
- 7 ANSYS CFX Flow Modelling Around a Wind Turbine.

Teaching Interests

In for the duration of 3 years, I worked at the American University of the Middle East as an assistant professor lecturing and moderating the following courses: Statics, Dynamics, System Modelling, Thermodynamics, and Capstone Projects. Before that, I worked at the University of the West of Scotland where I prepared and taught the materials for the Renewable Energy module. I also worked there as an instructor for CFD, CAD and Programming modules. Likewise, I took part in teaching Design and Analysis of Structures at Warwick University. In all places where I worked as an instructor, I always received positive input from students. Based on my teaching experience, which spans for more than twelve years and include three universities, my teaching interests cover a wide range of mechanical engineering courses, and I have a special interest in topics that are related to solid and fluid mechanics, which involve the use of programmed numerical methods. My teaching is relevant to my research work, which is mainly in computational fluid Dynamics.

Industrial Experience

Jan 2017 – July 2018 As a KTP Research Associate working with a local group that provides engineering solutions to the oilfield industry I got acquainted with a comprehensive range of CNC machine tools (boring, turning, and milling machines) in the Precision Engineering Division of the company. In addition to that, I was in direct contact with the local group management section of the division, and I had the chance to learn more about management behaviour and roles in manufacturing, quality, marketing, sales, finance, and purchasing and procurement.

Education and Degrees

Doctorate

Apr 2008 – Jul 2016 Doctor of Philosophy, July 2016. The duration of study spanned from April 2008 to March 2016. Initially started the PhD program at Warwick University (April 2008-August 2014) covering the theoretical aspect of the project and finished the project after covering the experimental aspect of the project at the University of the West of Scotland (September 2014-March 2016), Glasgow, United Kingdom. School of Engineering and Computing.

Thesis Title: 'Prediction of the Gas Emission and Movement from Soil Media with Concern of Energy and Environment'

Main Activities and Duties at the University of the West of Scotland.

- Took part in the organizing committee for the SEP2015. 11-15 August conference at the University of UWS.
- Conducted MATLAB Coding to develop a: Respiration Chamber Software.
- Took measurements of carbon dioxide at sites of chamber deployment.
- Ran CFD simulations using ANSYS CFX.
- Used SolidWorks CAD software to model the required respiration chamber for experiments.

Main Activities and Duties at the University of Warwick.

- Teaching and Lab demonstrating.
- Mathematical modelling using MATLAB and FORTRAN 90.
- Running flow modelling simulations using ANSYS-CFX and STAR-CCM+ software.
- CAD Geometry modelling using SolidWorks.
- Combustion Modelling using a DNS FORTRAN90 Code.
- Vortex Dynamics using a Spectral DNS FORTRAN90 Code.
- Flow Modelling in Porous Media using ANSYS.

Masters

Sep 2006 – Mar 2008 Master's degree in Sustainable Energy and Environment: Cardiff University, Cardiff, United Kingdom. School of Engineering.
Thesis Title: 'Burning Rate Characteristics of Turbulent Rich Premixed Flames'.

The Subjects studied in the master's program were: Thermal Analysis, Sustainable Energy Studies, Risk and Hazards Management in the Energy Sector, Hydro-Environmental Modelling, Sustainable Energy and Environment Case Study, Alternative Energy Systems, Fuels and Energy

Systems, Thermodynamics and Heat Transfer, Energy Management, and Sustainable Development

Bachelor

Sep 1997 - Oct 2005 Bachelor's degree in Mechanical Power Engineering: Damascus University, Damascus, Syria. Faculty of Mechanical and Electrical Engineering.
Thesis Title: 'A Technological Study of an Apple Nectar Production and Refrigeration Plant'
The main subjects studied in the BSC program were: Engineering Mechanics, Electrical Engineering, Mathematics, Strength of Materials, Materials Science & Properties, Production Engineering, Machines Elements, Fluid Mechanics, Thermodynamics, Metallurgy, Mechanisms Theory & Machines, Measurements & Measuring Devices, Internal Combustion Engines, Heat Transfer, Electronic Engineering, Gas Dynamics, Mechanical Vibrations, Turbo Thermal Machines, Steam Generators, Electrical Control, Programming & Computers, Combustion Engines Design, Hydraulic Machines, Power Generating Stations, Heating & Air Conditioning, Refrigerating Machines, Power Transfer, Measurements & Automatic Control, Electrical Equipment Investment, Industrial Organizations & Circuits.

Journal Publications

- 1- A Alkhalidi, T Salameh, A Al Makky, Experimental investigation thermal and exergy efficiency of photovoltaic/thermal system, Energy 222, 119897
- 2- Tareq Salameh, Malek Alkasrawi, Abdul Ghani Olabi¹, Ahmed Al Makky, Mohammad Ali Abdelkareem, Experimental and Numerical Analysis of Heat Transfer Enhancement inside Concentric Counter Flow Tube Heat Exchanger Using Different Nanofluids, International Journal of Thermofluids, Elsevier 2023.
- 3- M. Mahmoud, T. Wilberforce, T. Salameh, A. Al Makky, A.G. Olabi, Case studies and analysis of hydro energy systems, Renewable Energy-Volume 1: Solar, Wind, and Hydropower, Elsevier 2023, pp. 499-517.
- 4- Ahmed G. Abokhalil & Mohammad Alobaid & Ahmed Al Makky, 2023. "Innovative Approaches to Enhance the Performance and Durability of Proton Exchange Membrane Fuel Cells," Energies, MDPI, vol. 16(14), pages 1-13, July.
- 5- A. Qaisar; E. T. Sayed, PhD; N. Shehata, PhD; J. B. M. Parambath; A. A. Makky, PhD; M. A. Abdelkareem, Review of Recent Advances on Metal-Organic Frameworks (MOFs) and their Electrochemical Applications, Renewable and Sustainable Energy Reviews.
- 6- A.G. Olabi, Q. Abbas, A. Al Makky, M.A. Abdelkareem, Supercapacitors as next generation energy storage devices: Properties and applications, Energy, 248 (2022) 123617.

- 7- Wessam Nimir , Amani Al-Othman , Muhammad Tawalbeh , Ahmed Al Makky , Azza Ali , Hassan Karimi-Maleh ,Fatemeh Karimi , Ceren Karaman :2021. Approaches towards the development of heteropolyacid-based high temperature membranes for PEM fuel cells. International Journal of Hydrogen Energy: <https://doi.org/10.1016/j.ijhydene.2021.11.174>.
- 8- Qaisar Abbas, Mojtaba Mirzaeian, Mohammad Ali Abdelkareem, Ahmed Al Makky, Arti Yadav, Abdul Ghani Olabi:2021. Structural tuneability and electrochemical energy storage applications of resorcinol-formaldehyde-based carbon aerogels: International Journal of Energy Reviews: DOI: 10.1002/er.7556.
- 9- S. Bhattarai, P. Vichare, K. P. Dahal, A. Al Makky: 2019. Novel trends in modelling techniques of Pelton turbine bucket for increased renewable energy production. Renewable and Sustainable Energy Reviews 112(2019): 87-101.
- 10- A. Al Makky, A. Alaswad, D. Gibson, S. Song A. G. Olabi: 2018. A numerical and experimental study of a new design of closed dynamic respiration chamber. Computers and Electronics in Agriculture 145, 326 – 340.
- 11- T. Wilberforce, Z. El-Hassan, F. N. Khatib, A. Al Makky, A. Baroutaji, J. G. Carton: 2017. Development of Bi-polar plate design of PEM fuel cell using CFD techniques. International Journal of Hydrogen Energy 42 (40), 25639-25662.
- 12- T. Wilberforce, Z. El-Hassan, F. N. Khatib, A. Al Makky, A. Baroutaji, J. G. Carton: 2017. Developments of electric cars and fuel cell hydrogen electric cars. International Journal of Hydrogen Energy 42 (40), 25695-25734.
- 13- T. Wilberforce, Z. El-Hassan, F. N. Khatib, A. Al Makky, A. Baroutaji, J. G. Carton: 2017. Modelling and simulation of Proton Exchange Membrane fuel cell with serpentine bipolar plate using MATLAB. International Journal of Hydrogen Energy 42 (40), 25639-25662.
- 14- A. Alaswad, A. Baroutaji, H. Achour, J. Carton, A. Al Makky, A. G. Olabi: 2016. Developments in fuel cell technologies in the transport sector. International journal of hydrogen energy 41 (37), 16499-16508.
- 15- A. Al Makky, A. Alaswad, D. Gibson, A. G. Olabi: 2016. Prediction of the gas emission from porous media with the concern of energy and environment. Renewable and Sustainable Energy Reviews 68, 1144-1156.
- 16- A. Al Makky, A. Alaswad, D. Gibson, A. G. Olabi: 2016. Renewable Energy Scenario and Environmental Aspects of Soil Emission Measurements. Renewable and Sustainable Energy Reviews 68, 1157-1173.
- 17- S. Ahmadi, A. Al-Makky: 2012. Simulation of Two-Phase Flow in Elbow with Problem Solving. International Journal of Modern Physics C 25 (12), 1441007.

Conference Papers

- 1- Mohammad Jamjoum; Raneem Negry; Emad Abdelsalam; Fares Almomani; Tareq Salameh; Ahmed Al Makky: 2023. Customers Dependent Demand Response in Energy Hubs with IoT Perforation. 2023 Advances in Science and Engineering Technology International Conferences (ASET).

- 2- Dareen Habash; Emad Abdelsalam; Hamza Alnawafah; Fares Almomani; Tareq Salameh; Ahmed Al Makky: 2023. A Novel Hybrid Solar Chimney Power Plant Integrated with Electrolysis Station. 2023 Advances in Science and Engineering Technology International Conferences (ASET).
- 3- A. Al Makky, Z. El Hassan, T. Lesile, D. Jamard, A. G. Olabi: 2017. An Experimental Study of the Linell impulse Turbine. 12th sdewes Conference Dubrovnik on sustainable development of energy, water and environment systems.
- 4- T. Wilberforce, A. Al Makky, A. Baroutaji, R. Sambhi, A. G. Olabi: 2017. Computational Fluid Dynamic simulation and modelling (CFX) of flow plate in PEM fuel cell using aluminium open cellular foam material. Conference: Power and Energy Conference (TPEC), IEEE Texas, 1-6.
- 5- T. Wilberforce, A. Al Makky, A. Baroutaji, R. Sambhi, A. G. Olabi: 2017. Optimisation of bipolar plate through computational fluid dynamic simulation and modelling using Nickle open pore cellular foam material. International Conference on Renewable Energies and Power Quality (ICREPQ'17).
- 6- Tabbi Wilberforce, Fawwad Nisar Khatib, Ahmed Al Makky, Ahmad Baroutaji, Abdul Ghani Olabi: 2017. Characterisation of Proton Exchange Membrane (PEMFC) Fuel Cell Through Design of Experiment (DOE). SEEP2017 Conference- 10th International Conference on Sustainable Energy and Environmental Protection.
- 7- Tabbi Wilberforce, Fawwad Nisar Khatib, Ogungbemi Emmanuel, Oluwatosin Ijeadola, A. Abdulrahman, Ahmed Al Makky Ahmad Baroutaji & Abdul Ghani Olabi: 2017. Experimental Study of Operational Parameters on the Performance of PEMFCS in Dead end Mode. SEEP2017 Conference- 10th International Conference on Sustainable Energy and Environmental Protection.
- 8- E. Ogungbemi, O. Ijaodola, A. Wilberforce, A. Al Makky, A. G. Olabi: 2017. Characterization of Proton Exchange Membrane (PEMFC) Fuel Cell Through Design of Experiment (DOE). SEEP2017 Conference- 10th International Conference on Sustainable Energy and Environmental Protection.
- 9- E. Ogungbemi, O. Ijaodola, A. Wilberforce, A. Al Makky, A. G. Olabi: 2017. Review of PEM Fuel Cell Materials. SEEP2017 Conference- 10th International Conference on Sustainable Energy and Environmental Protection.
- 10- A. Al Makky, A. G. Olabi, A. Alaswad, D. Gibbson and S. Song: 2015 A numerical and experimental study of a new design of closed dynamic respiration chambers. SEEP2015 Conference: 8th International Conference on Sustainable Energy and Environmental Protection.

Patent

Inventors: Abdul Ghani Olabi, Mohammad Ali Abdelkareem, Qaisar Abbas, Ahmed Al Makky, Integrated Thermal management system with a symmetrical supercapacitor cell, ppublication date: 5/7/5/2024, Patent Office, US, Patent Number, 11978590, Application Number 18127383.

Training Courses

I Attended a course in Management at Ashorne Hill Management College. The two-week residential course meets the study requirements for CMI Level 5 in management and Leadership. The course consisted of two-week residential modules covering the following units:

5-9 Mar 2017

Week 1

- Working in teams
- Project management
- Conflict management
- Influencing skills
- Communication skills
- Managing resources
- Leadership and management
- Motivating others
- Health and safety
- Time management

2-6 Jul 2017

Week 2

- The business environment
- Business strategy
- Marketing
- Financial concepts
- Capital and budgeting
- Analysis of accounts
- Business simulation

Personal Skills and Abilities

Languages

- 1 English (professional).
- 2 Arabic (Professional).

Computer Skills

- Knowledge of Flow/Stress Modelling Software
 - 1 ANSYS 24 R1 – CFX (Advanced).
 - 2 ANSYS-3 FLUENT (Advanced).
 - 3 ICEM CFD (Advanced).
 - 4 ANSYS-Static Structural (Advanced).
 - 5 ANSYS-Rigid Dynamics (Advanced).

- 6 BladeGen (Advanced).
- 7 STAR-CCM+ (Elementary)
- Advanced Knowledge of Modelling Software
 - 1 AutoCAD 2024 (Advanced).
 - 2 Autodesk 3ds Max 2024 (Advanced).
 - 3 SOLIDWORKS 2024 (Advanced).
- Knowledge of Mathematical Modelling
 - 1 MATLAB R24a (Good).
 - 2 Fortran 90 (Good).
 - 3 Turbo Pascal (Good).
 - 4 C++ (Elementary)>
- Advanced Knowledge of MS-Office 365 Software

Interests and Hobbies

Reading, Swimming, Drawing, Flight and Aerospace.