

جامعة صحر
Sohar University



Faculty of Engineering Programs Booklet

Academic Year
2026-2027

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Message from the Dean



Assalamualaikum Warahmatullahi Wabarakatuh
and Greetings

Welcome to the Faculty of Engineering at Sohar University.

Engineering is more than a profession. It is the ability to create solutions, transform ideas into reality, and use knowledge to improve the world. As you begin your journey with us, I encourage you to be ambitious, curious, and confident in your capacity to make a real difference.

At the Faculty of Engineering, our vision is to prepare graduates who excel academically and thrive in the world of work. We focus on developing well-rounded engineers: individuals who combine strong technical foundations with practical skills, problem-solving, innovation, digital competence, communication, teamwork, and professional responsibility. This balanced approach ensures that our graduates are job-ready, adaptable, confident, and prepared to contribute from the very start of their careers.

Your commitment to learning is essential. Your class attendance is not simply a requirement; it is vital to your academic success, your professional development, and your future as an engineer. Being present, engaged, and consistent builds discipline, strengthens understanding, and prepares you for industry expectations. Excellence begins with showing up.

Our mission is closely aligned with Oman Vision 2040. Oman is entering a period of rapid economic and technological transformation, creating new opportunities for engineers who can support sustainable development, industrial growth, and the advancement of a knowledge-based economy. We are committed to preparing the talented engineers our nation needs for this future.

The international accreditation of our programmes by Engineers Australia reflects the strength of our curriculum. It provides our students with a globally recognised qualification, enhancing career prospects both within Oman and internationally.

Education is a lifelong journey. Our undergraduate and postgraduate programmes offer pathways to build strong foundations, deepen specialist knowledge, and progress toward advanced professional and leadership roles.

Most importantly, you are a valued member of our community. Our staff is here to support you, challenge you, and help you realise your potential.

Welcome to the Faculty of Engineering. Welcome to Sohar University. Welcome to your future.

Professor Dr. Ahmed Ibrahim Ahmed Al-Shamma'A
Dean
Faculty of Engineering

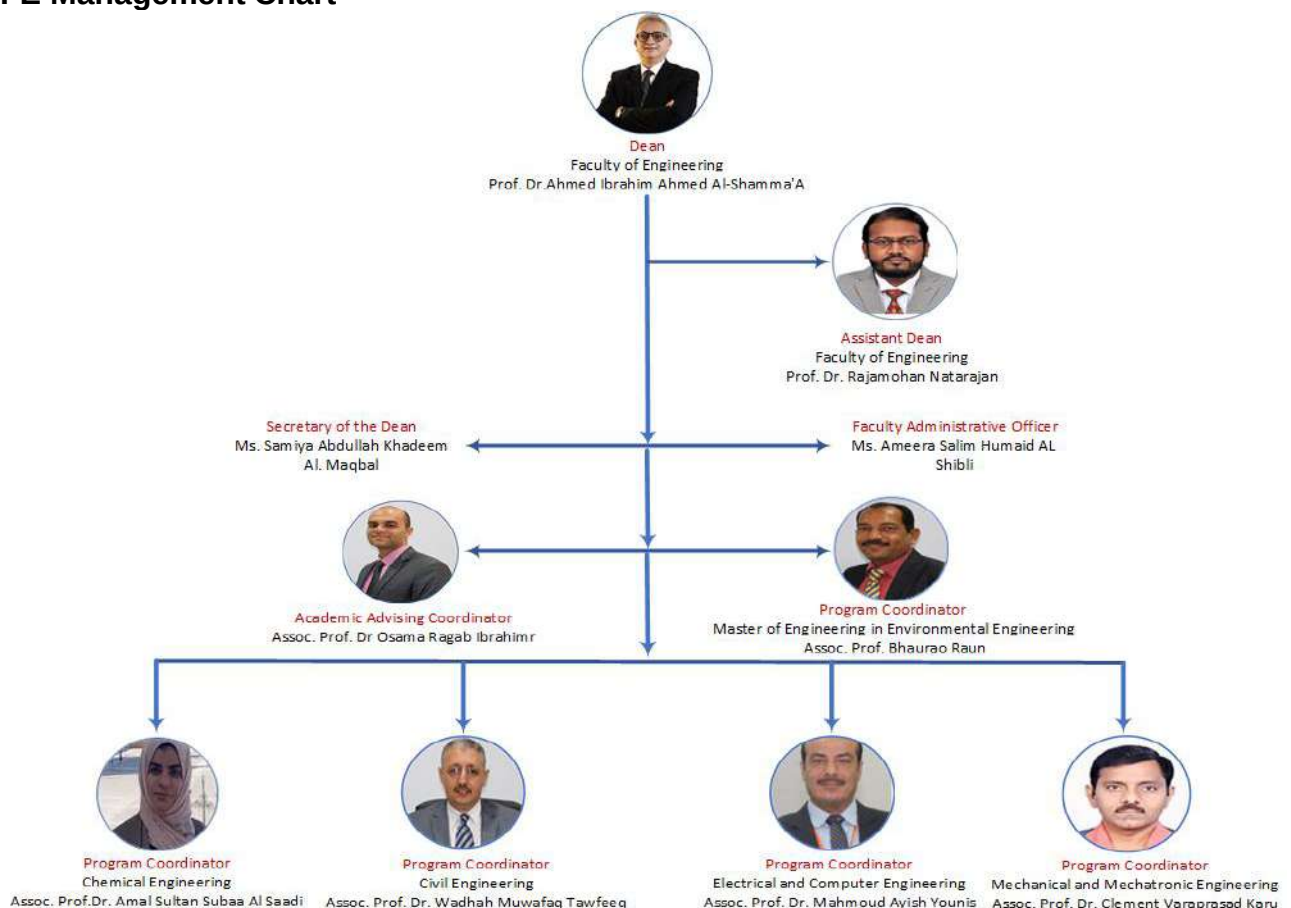
About the Faculty

The Faculty of Engineering at Sohar University is one of the most prominent and research-active faculties at the institution, renowned for its strong legacy of delivering academically rigorous, industry-relevant programs. Currently, the faculty offers a diverse range of programs, including four Bachelor's degrees in key engineering disciplines, a Master's program in Environmental Engineering, and a PhD in Engineering. All undergraduate programs are fully accredited by Engineers Australia, reflecting the faculty's commitment to international standards of excellence. Students benefit from learning under the guidance of experienced academics and accomplished researchers, gaining hands-on exposure through practical training, cutting-edge laboratories, and research-driven projects. Graduates from the Faculty of Engineering have gone on to establish successful careers in leading national and international companies. In a dynamic, supportive learning environment, the faculty is dedicated to equipping students with the skills and knowledge needed for a successful career in engineering. Join us for a prosperous future.

Programs offered by the Faculty of Engineering:

- PhD in Engineering
- Master of Engineering in Environmental Engineering
- Bachelor of Engineering: Chemical Engineering (CHE)
- Bachelor of Engineering: Civil Engineering (CVE)
- Bachelor of Engineering: Electrical and Computer Engineering (ECE)
- Bachelor of Engineering: Mechanical and Mechatronic Engineering (MME)

FE Management Chart



Faculty Management Team Directory

Position	Name
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CHEMICAL ENGINEERING (CHE)

Program Name	Chemical Engineering
Award	Bachelor of Engineering Chemical Engineering
Exit point	Diploma
Language of Instruction	English
Mode of Study	Conventional
Study Scheme	Full Time
Study Duration	4 Years
Credit Units / Hours	69 Credit Units / 133 Credit Hours
Professional Body Accreditation	Full Accreditation by Engineers Australia
Entry Requirement	- Completed the General Education Diploma in Oman, or equivalent (formerly Secondary School Completion Certificate), and - Obtained at least a pass mark of 50% or equivalent in Advanced Mathematics, Physics, and/or Chemistry.

Program Aim

The Chemical Engineering program aims to graduate engineers who are capable of working in the fields of Chemical Engineering with high technical, communication, teamwork, and leadership skills.

Program Objectives (POs)

- PO1:** Graduates who can successfully work in Chemical Engineering or related disciplines.
- PO2:** Graduates who act ethically and professionally in modern diverse work environments and communities through effective communication, leadership, and responsible teamwork.
- PO3:** Graduates who pursue post-graduate studies and/or professional development in Chemical Engineering or related disciplines to sustain and advance their careers.

Program Learning Outcomes (PLOs) for Bachelor Exit Award

PLO1: Apply advanced knowledge of engineering, science, and mathematics for solving Chemical Engineering problems.
PLO2: Prepare solutions for well-defined tasks related to Chemical Engineering.
PLO3: Communicate effectively on complex engineering activities, with adaptation for appropriate audiences.
PLO4: Use a broad range of numerical skills for solving Chemical Engineering problems.
PLO5: Use relevant information and communication technologies, including engineering software and simulation tools, for supporting Chemical Engineering practice.
PLO6: Practice highly advanced levels of ethical principles and values in the fields of Chemical Engineering.
PLO7: Develop advanced leadership and teamwork skills with full accountability for achieving goals and objectives.
PLO8: Apply highly specialized entrepreneurial and employability skills suitable for work environment.
PLO9: Implement lifelong learning independently for integration of new knowledge using appropriate learning strategies.

Program Learning Outcomes (PLOs) for Diploma Exit Award

PLO1: Apply significant knowledge of engineering, science, and mathematics for solving Chemical Engineering problems.
PLO2: Prepare solutions for well-defined tasks related to Chemical Engineering.
PLO3: Communicate appropriately on well-defined engineering activities, with diverse audiences.

PLO4: Apply a broad range of numerical skills for solving Chemical Engineering problems.
PLO5: Utilize a range of information and communication technology tools and techniques in the discipline of Chemical Engineering.
PLO6: Practice significant levels of ethical principles and values in the fields of Chemical Engineering.
PLO7: Develop leadership and teamwork skills with full accountability for achieving goals and objectives.
PLO8: Employ substantial entrepreneurial and employability skills in a work environment.
PLO9: Identify the need for lifelong learning in the context of technological change related to Chemical Engineering.

Study Plan

Program Matrix											
Year	Semester 1					Semester 2					Seme ster 3
	Course Code	Course Name	Pre- requisi te	Core/ Elect ive	Cre dit Hou rs	Course Code	Course Name	Pre- requisit e	Core/ Elect ive	Cre dit Hou rs	
1	CHEM1020	General Chemistry	None	Core	4	ELEC1100	Principles of Electrical Circuits	MATH1010	Core	4	The student is allowed to register 2 courses (not exceeding 9 credit hours)
	COMP1500	Introduction to Programming	IC3M2	Core	4	ENGG1010	Applied Mechanics	MATH1010	Core	4	
	ENGG1013	Engineering Drawing and Computer Drafting	None	Core	2	ENGG1023	Engineering Materials	None	Core	4	
	MATH1010	Calculus I	SET3	Core	4	MATH1200	Calculus II	MATH1010	Core	4	
	UNIR1100	Communication Skills (1)	None	Core	3	UNIR1003	Oman the State and People	IC3M1A	Core	2	
2	CHEM2000	Chemistry for Engineers	None	Core	4	CHEM2002	Process System Analysis	None	Core	4	The student is allowed to register 2 courses (not exceeding 9 credit hours)
	ELEC2113	Instrumentation & Measurement	ELEC1100	Core	4	CHEM2004	Fundamental of Fluid Mechanics	None	Core	4	
	CHEM2001	Introduction of Chemical Engineering	None	Core	4	CHEM2056	Physical & Surface Chemistry	CHEM1020	Core	4	
	MATH2200	Differential Equations and Statistics	MATH1200	Core	4	UNIR2001	Entrepreneurship	None	Core	2	
	UNIR1002	Arabic Language Skills	SET 1A	Core	2	UNIR2100	Communication Skills (2)	UNIR1100	Core	3	
	Diploma Internship										
3	CHEM3000	Heat Transfer	None	Core	4	CHEM3010	Process Modelling and Dynamics	None	Core	4	The student is allowed



	CHEM3008	Chemical Process Industries	None	Core	4	CHEM3012	Separation Processes (2)	None	Core	4	to register 2 courses (not exceeding 9 credit hours)
	CHEM3011	Separation Processes (I)	None	Core	4	CHEM3003	Process Engineering Thermodynamics	None	Core	4	
	ENGG3700	Numerical Analysis and Optimization	MATH2200	Core	4	UNIR3100	Communication Skills (3)	UNIR2100	Core	3	
4	CHEM4004	Process and Control System Design	CHEM3010	Core	4	CHEM4007B	Process Design Practice	None	Core	4	The student is allowed to register 2 courses (not exceeding 9 credit hours)
	CHEM4005	Reaction Engineering	CHEM3003	Core	4	CHEM4015	Waste Treatment Processes	None	Core	4	
	CHEM4007A	Process Design Practice	None	Core	4	ENGG4000	Renewable & Sustainable Energy	None	Core	4	
	ENGG4801A	Final Year Project (A)	75% of Level 3 courses	Core	4	ENGG4801B	Final Year Project (B)	ENGG4801A	Core	4	
	Bachelor Internship										

Bachelor Award:

Internship course (or an equivalent) is a mandatory requirement for students exiting at Bachelor level (and haven't completed it at Diploma level). The internship course is non-credit-bearing and must be successfully completed to fulfill program requirements.

Course Description

Level 1

CHEM1020

This introductory course in general chemistry covers the fundamental principles of chemistry, including the conversion of units, naming compounds, and writing chemical formulas. Students will learn how to balance chemical equations and apply stoichiometry to solve problems related to chemical reactions. The course also introduces the concepts of molarity and molality for solution concentration calculations. Throughout, emphasis is placed on developing a strong foundation in the mathematical and theoretical aspects of chemistry, providing students with the skills necessary for further study in chemistry and related fields.

COMP1500

This course introduces students to C++ programming for solving a well-defined engineering problem through algorithmic and structured coding. Students will gain practical experience in developing programs using variables, selection, loops, arrays, functions, and mathematical expressions. Emphasis is placed on hands-on computer lab activities that enhance problem-solving skills, and program design. The course provides a strong foundation for applying C++ in engineering and computational applications.

ENGG1013

The course covers a broad range of engineering drawings utilizing free-hand sketching, engineering drawing, and computer-aided drafting and solid modelling. The fundamental principles of orthographic projection as well as the topics of dimensioning, sectional views, isometric and perspective pictorial views. In addition, Computer Aided Drafting is also covered and practiced using AutoCAD.

MATH1010

This course covers basic mathematics, including functions, limits, derivatives, integration, complex numbers, vectors, and applicable methods. Furthermore, this course also includes theories and applications of integration, derivatives, complex numbers, and vectors.

UNIR1100

In this course, students learn to employ reading strategies while reading faculty related texts, use paraphrasing techniques, produce a short project proposal and make a poster presentation related to their specialization.

ELEC1100

This course introduces students to a wide range of DC electrical circuit analysis techniques, which will provide the necessary foundation for electrical engineering courses. In this course, students apply Kirchhoff's laws, and nodal and mesh analysis techniques to solve electrical circuit parameters. Students will also be taught how to use important theorems such as superposition, Thevenin, and Norton in circuit analysis. In addition, it teaches the student to calculate the quantities of alternating current AC signals. It introduces the course to the analysis of alternating current circuits which include resistors, inductors, and capacitors.

ENGG1010

This course is designed primarily for all engineering students. It provides comprehensive knowledge and insight into the study of Mechanics. Topics to be covered include Vectors, operations with forces, resultants of coplanar force systems. Equilibrium and coplanar force systems. Newton's laws of motion and their applications, Friction and its applications. Kinetic energy. Kinematics of a particle, composition and resolution of velocities and accelerations, relative velocity and acceleration, representation by vectors. Plane Kinematics of rigid body, angular velocity diagrams applied to simple mechanisms.

ENGG1023

This course covers a broad range of fundamental principles of material sciences and its key role in the selection and utilization of materials for various engineering applications. Course topics include crystal structure and defects, mechanical and electrical properties, phase diagram, corrosion and materials processing. Overall, engineering materials is an important course that lays the foundation for several other courses in engineering and provides students with essential knowledge for their higher levels.

MATH1200

This course offers a foundational study of basic linear algebra and vector calculus, with emphasis on mathematical methods and techniques that are broadly applicable across various scientific and engineering fields. Students will develop a strong understanding of core mathematical concepts and gain the ability to apply these tools to solve problems from a wide range of real-world applications. The course also includes an introduction to series topics, enhancing analytical skills, and mathematical reasoning.

UNIR1003

يشتمل هذا المقرر على نطاق عريض من المعارف والمهارات والقيم التي تعزز وعي الطلبة بهوية المجتمع العماني وقيمه، وفهم دور المتغيرات التراثية والتاريخية والديمقراطية والثقافية والمؤسسية في تشكيل الهوية العمانية وتحديد سماتها. ويركز المقرر على التنظيم الإداري للدولة، ومنطلقات النهضة العمانية المعاصرة ومؤثراتها من خلال تسليط الضوء على فكر حضرة صاحب الجلالة السلطان هيثم بن طارق المعظم، ويركز المقرر أيضا على تعزيز قيم الانتماء والولاء والمواطنة وعلاقتها بحقوق الإنسان، والتعريف بعلاقة السلطنة بمحيطها الخليجي والعربي والإقليمي والدولي بما في ذلك المواثيق الدولية، بالإضافة إلى تسليط الضوء على الأمن الفكري والتحديات المعاصرة، ودور مؤسسات الدولة المدنية والعسكرية في خدمة الوطن..

Level 2

CHEM2000

This course defines the foundation for the phenomena/concepts of physical and organic chemistry by introducing intermolecular forces, the properties of liquids covering significant hydrocarbons, and the synthesis and reaction mechanisms of various functional groups.

ELEC2113

This course includes a significant knowledge of measurement and instrumentation systems. In this course, the students will understand the scope of the transducer and sensors operation, the data Acquisition system, and signal processing. In addition, it will improve the students' understanding of the construction and application of the indicating meters. It allows the student to develop a skill to solve problems related to instrumentation systems and data acquisition systems.

CHEM2001

This course introduces the significant knowledge of analysis tools of process engineers-mass and energy balance. It also exposes students to the way process engineers work, think and communicate their ideas. It is the corner stone course for all process engineering disciplines and introduces students to teaching and learning approaches in the division of Chemical Engineering

MATH2200 This course aims to introduce four major topics to engineering students namely: 1st order and 2nd order basic differential equations, Laplace Transform and partial differential equations (PDEs), descriptive statistics and data presentation, and probability concepts.
UNIR1002 يتناول هذا المقرر عددا من القضايا النحوية والصرفية والإملائية والبلاغية التي تسهم في إكساب المهارات اللغوية. هذه القضايا تتعلق بأقسام الكلام، وأنواع الإعراب، والجملة الاسمية، والجملة الفعلية، ومكملات الجملة، والخبر والإنشاء. ويعقب هذا القضايا نصوص تطبيقية مختارة، مع التركيز على تنمية المهارات اللغوية الأساسية (الاستماع، والقراءة، والكتابة، والتحدث).
CHEM2002 The course introduces a systems approach to understanding and analyzing the structure and morphology of industrial chemical processes. The context and needs that give rise to process systems are examined along with the concepts of unit operations. Understanding the nature of individual units and complex flowsheets is done through analysis of degrees of freedom solvability issues. Techniques for the decomposition of large, complex systems to smaller problems are developed. Application of computer-aided flow sheeting tools facilitate process analysis, process calculations which include economic environmental impacts.
CHEM2004 This is an introductory course on the fundamentals of fluid mechanics and their applications to engineering problems. The lessons that covered in this course include dimensional analysis, viscosity, shear stress and shear strain, pressure, conservation of mass, ideal and viscous fluid in a pipe, pumps and net positive suction head.
CHEM2056 Physical & Surface chemistry course explains how to understand matter by observing how it behaves under different conditions and how it interacts with its environment. It underpins a number of other areas of science, including materials science, nanotechnology and biotechnology. This subject covers a number of key areas of physical chemistry, focusing on thermochemistry, rates of chemical reactions, acid-base and ionic equilibria, the properties of surfaces and phase changes.
UNIR2001 This course is an introductory course in entrepreneurship and innovation. The course aims to expose undergraduate students of various academic backgrounds to business venturing and entrepreneurial activity. The course focuses on boosting the concept of entrepreneurship which leads the small businesses. Students will apply themselves through developing their own business ideas and assessing them using knowledge and skills acquired during the course.
UNIR2100 The aim of this English for Academic Purposes (EAP) course is to introduce students to topics from various disciplines of Engineering, Computer & Information Technology and Business, as offered in the faculties, using authentic reading texts and videos. The course also aims to enhance students' Academic English skills with a particular focus on academic reading and writing. In addition, the course focuses on developing academic and technical vocabulary, core grammatical structures, and summarizing skills.
Level 3
CHEM3000 The course aims to provide the students with the background necessary to understand the fundamentals of heat transfer and its applications so that they are able to solve heat transfer calculations and design equipment for industrial applications.
CHEM3008 This course introduces and explores chemical engineering principles and concepts as they are applied to the chemical and petrochemical process industries, with a focus on the industries within the Sultanate of Oman.
CHEM3011 Diffusion, convective and interfacial mass transfer, and its application to continuous contact operations. Design of equilibrium-stage separation processes including distillation, gas-liquid absorption and stripping, liquid-liquid extraction, leaching and humidification.
ENGG3700 This course introduces the student to the use of numerical methods for solving engineering problems with the aid of a digital computer. The course contains numerical methods for solving non-linear equations, optimization, curve fitting and interpolation, integration of data and functions,

and solving ordinary and partial differential equations. MATLAB will be used as the programming language.

CHEM3010

This course builds on the knowledge learned in Mathematical process modeling for design and control. Conservation principles, development of constitutive equations in models & analysis of resultant models for use in control & diagnosis of process faults. Model verification, calibration & validation based on process data.

CHEM3012

One of the basic steps in Chemical Engineering and Industry is the Separation process. This course covers theories, concepts and application of separation techniques in the industry. The course will introduce the most common unit operations in the chemical industry including evaporation, drying, fluid mixing, and adsorption.

CHEM3003

This course provides an insight into the principles, concepts, and laws/postulates of process engineering thermodynamics to applications that require quantitative knowledge of thermodynamic properties from a macroscopic to a molecular level. It covers topics including Mass and Energy balances, Equations of state, Thermodynamic properties of pure components and mixtures, Phase and Chemical reaction equilibria.

UNIR3100

The purpose of the course is to enhance students' performance-based competence, and equip them with the necessary academic research writing skills required to undertake an independent research project. It further develops academic writing skills including paraphrasing, summarizing, synthesizing, direct quotation and APA style citation.

Level 4

CHEM4004

The dynamic behavior and automatic control of processes are studied. Mathematical tools for analyzing the transient behavior of open and closed-loop systems are presented. The steps of controller development are treated: process characterization (using mathematical models), controller design, and implementation. Methods for assessing system stability and performance are investigated and are used in the design of controllers. Frequency response methods are introduced, as is the development and implementation of controller enhancements including feedforward and cascade control.

CHEM4005

Reaction engineering deals with the performance analysis and design of equipment for carrying out chemical reactions. The analysis involves principles of chemical kinetics, thermodynamics, heat and mass transfer as well as fluid mechanics. The present course covers basic principles of chemical kinetics and reaction equilibrium, various ideal reactors in which the complexities arising from resistances associated with fluid flow as well as heat and mass transfer. Design procedures for reactors including batch, semi batch and continuous reactors are covered.

CHEM4007A

This capstone course will consolidate the necessary skills and knowledge for a working chemical engineer by carrying out an industrial process design and developing an Engineering Design Document. The students will develop competency in the following: Process selection and synthesis, the use and recognition of the limitations of process simulation software, development of Piping and Instrumentation diagrams, analysis of Process Safety, equipment sizing, materials selection, and Capital, Operating Cost and economic analysis along with optimization.

ENGG4801A

Students from the four engineering disciplines, Chemical, Civil, Mechanical and Mechatronic, and Electrical and Computer Engineering, undertake a two-part Final Year Project consisting of ENGG4801A (the initial phase) and ENGG4801B (the final phase). These supervised projects allow students to investigate practical engineering problems and apply the knowledge and skills gained throughout their studies. ENGG4801A provides the foundation for the research sequence. In this phase, students identify a problem, review relevant literature, define research objectives, and outline suitable research methods. They also conduct preliminary analyses and planning as required for their project. Alongside technical tasks, students develop skills in teamwork, communication, ethics, creativity, and independent learning. The phase concludes with the submission of the ENGG4801A report and an oral presentation that meets academic requirements.

CHEM4007B

This capstone course will consolidate the necessary skills and knowledge for a working chemical engineer by carrying out an industrial process design and developing an Engineering Design Document. The students will develop competency in the following: engineering and economic analysis of integrated chemical processes, equipment, and systems. Comprehensive integrated plant design is delivered. Optimal design, Profitability. Methods of analyzing risk are provided, and the basic types of health, safety, and environmental regulations are explained, with references to government databases. The assessment of plant safety is introduced through their relationships to hazard and operability (HAZOP) studies, the Dow Fire and Explosion Index, the Dow Chemical Hazards Index and to life-cycle analysis. Ethics and professionalism. The aim of the course is to prepare students for technical positions in industry by solving a series of open-ended engineering design challenges, emphasizing on process synthesis, design of equipment and processes to meet specified needs with appropriate attention to health and safety analyses, sustainability and environmental stewardship, regulatory constraints, and assessments of process operability and economics.

CHEM4015

The course introduces students to the fundamental theories that govern water and wastewater. It covers the application of a selected set of design and analysis methods to the calculation of drinking water and wastewater systems, as well as the treatment of wastewater.

ENGG4000

The course establishes the fundamentals of energy and sustainable development, renewable and nonrenewable energy, energy systems, climate change and energy, life cycle analysis, energy conservation and optimization, sustainability and business, energy storage and management.

ENGG4801B

ENGG4801B builds on the groundwork established in ENGG4801A by focusing on the complete execution of the research plan. Students conduct experiments, collect and analyze data, and interpret their findings through structured results, discussions, and evidence-based conclusions. Beyond the technical outputs, ENGG4801B fosters creativity, ethical practice, teamwork, and entrepreneurial awareness by encouraging students to link their research outcomes to real-world engineering applications. By the end of the sequence, students gain deep research capabilities and the confidence to tackle complex engineering challenges, contribute to innovation, and continue growing professionally. They produce the ENGG4801B report and deliver oral presentations aligned with academic expectations.

Internship Course:

This course provides students with the opportunity to apply the knowledge and skills acquired during their studies in a workplace environment, enhance their career readiness, and develop their professional and practical competencies in alignment with the program learning outcomes and labour market requirements. The course is a compulsory component of the academic program, where applicable, depending on the nature of the program. It is governed by the University's approved policies and procedures and is supervised by academic staff in collaboration with the host training organisations. The specific requirements, duration, and assessment methods vary according to the academic program.

CIVIL ENGINEERING (CVE)

Program Name	Civil Engineering
Award	Bachelor of Engineering Civil Engineering
Exit point	Diploma
Language of Instruction	English
Mode of Study	Conventional
Study Scheme	Full Time
Study Duration	4 Years
Credit Units / Hours	69 Credit Units / 133 Credit Hours
Professional Body Accreditation	Full Accreditation by Engineers Australia
Entry Requirement	- Completed the General Education Diploma in Oman, or equivalent (formerly Secondary School Completion Certificate), and - Obtained at least a pass mark of 50% or equivalent in Advanced Mathematics, Physics, and/or Chemistry.

Program Aim

The Civil Engineering program aims to graduate engineers who are capable of working in the fields of Civil Engineering with high technical, communication, teamwork and leadership skills.

Program Objectives (POs)

PO1: Graduates who can successfully work in Civil Engineering or related disciplines.

PO2: Graduates who act ethically and professionally in modern diverse work environments and communities through effective communication, leadership, and responsible teamwork.

PO3: Graduates who pursue post-graduate studies and/or professional development in Civil Engineering or related disciplines to sustain and advance their careers.

Program Learning Outcomes (PLOs) for Bachelor Exit Award

PLO1: Apply advanced knowledge of engineering, science, and mathematics for solving Civil Engineering problems.

PLO2: Design Civil Engineering systems for addressing complex engineering problems, and safety requirements.

PLO3: Communicate effectively on complex engineering activities, with adaptation for appropriate audiences.

PLO4: Apply appropriate numerical and analytical techniques for solving Civil Engineering problems.

PLO5: Use relevant information and communication technologies, including engineering software and simulation tools, to support Civil Engineering practice.

PLO6: Practice highly advanced levels of ethical principles and values in the fields of Civil Engineering.

PLO7: Develop advanced leadership and teamwork skills with full accountability for achieving goals and objectives.

PLO8: Apply highly specialized entrepreneurial and employability skills suitable for work environment.

PLO9: Implement lifelong learning independently for integration of new knowledge using appropriate learning strategies.

Program Learning Outcomes (PLOs) for Diploma Exit Award

PLO1: Apply significant knowledge of engineering, science, and mathematics for solving Civil Engineering problems

PLO2: Prepare solutions for well-defined tasks related to Civil Engineering.

PLO3: Communicate appropriately on engineering activities, with diverse audiences
PLO4: Utilize a broad range of numerical skills for solving Civil Engineering problems.
PLO5: Use a range of information and communication technology tools and techniques in the discipline of Civil Engineering.
PLO6: Practice significant levels of ethical principles and values in the fields of Civil Engineering.
PLO7: Develop leadership and teamwork skills with full accountability for achieving goals and objectives.
PLO8: Employ substantial entrepreneurial and employability skills in a work environment.
PLO9: Identify the need for lifelong learning in the context of technological change related to Civil Engineering.

Study Plan

Program Matrix											
Year	Semester 1					Semester 2					Semester 3
	Course Code	Course Name	Pre-requisite	Core/Elective	Credit Hours	Course Code	Course Name	Pre-requisite	Core/Elective	Credit Hours	
1	CHEM1020	General Chemistry	None	Core	4	ELEC1100	Principles of Electrical Circuits	MATH1010	Core	4	The student is allowed to register 2 courses (not exceeding 9 credit hours)
	COMP1500	Introduction to Programming	IC3M2	Core	4	ENGG1010	Applied Mechanics	MATH1010	Core	4	
	ENGG1013	Engineering Drawing and Computer Drafting	None	Core	2	ENGG1023	Engineering Materials	None	Core	4	
	MATH1010	Calculus I	SET3	Core	4	MATH1200	Calculus II	MATH1010	Core	4	
	UNIR1100	Communication Skills (1)	None	Core	3	UNIR1003	Oman the State and People	IC3M1A	Core	2	
2	CIVE2610	Introduction to Civil Engineering and Environmental Issues	None	Core	4	CIVE2320	Introduction to Structural Analysis and Design	ENGG1010	Core	4	The student is allowed to register 2 courses (not exceeding 9 credit hours)
	CIVE2710	Surveying	None	Core	4	CIVE2210	Fundamentals of Engineering Geology and Soil Mechanics	None	Core	4	
	CIVE2310	Strength of Materials	ENGG1010	Core	4	CIVE2120	Fundamentals of Fluid Mechanics	None	Core	4	
	MATH2200	Differential Equations and Statistics	MATH1200	Core	4	UNIR2001	Entrepreneurship	None	Core	2	
	UNIR1002	Arabic Language Skills	SET 1A	Core	2	UNIR2100	Communication Skills (2)	UNIR1100	Core	3	
	Diploma Internship										The student
3	CIVE3340	Structural Analysis	CIVE2320	Core	4	CIVE3350	Design of Reinforced	CIVE2320	Core	4	

	CIVE3360	Structural Steel Design	CIVE2320	Core	4	CIVE3220	Concrete Structures Geotechnical Engineering	CIVE2210	Core	4	is allowed to register 2 courses (not exceeding 9 credit hours)
	CIVE3110	Hydrology	None	Core	4	CIVE3410	Traffic and Transportation Engineering	None	Core	4	
	ENGG3700	Numerical Analysis and Optimization	MATH2200	Core	4	UNIR3100	Communication Skills (3)	UNIR2100	Core	3	
Bachelor Internship											
4	CIVE4510A	Civil Engineering Design	CIVE3350	Core	4	CIVE4420	Highway Engineering and Road Safety	None	Core	4	The student is allowed to register 2 courses (not exceeding 9 credit hours)
	CIVE4130	Water Resources Engineering	None	Core	4	CIVE4140	Waste Treatment Processes	None	Core	4	
	CIVE4810	Project Management	None	Core	4	CIVE4510B	Civil Engineering Design	CIVE3350	Core	4	
	ENGG4801A	Final Year Project (A)	75% of Level 3 courses	Core	4	ENGG4801B	Final Year Project (B)	ENGG4801A	Core	4	
Bachelor Award: Internship course (or an equivalent) is a mandatory requirement for students exiting at Bachelor level (and haven't completed it at Diploma level). The internship course is non-credit-bearing and must be successfully completed to fulfill program requirements.											

Course Description

Level 1

CHEM1020:

This introductory course in general chemistry covers the fundamental principles of chemistry, including the conversion of units, naming compounds, and writing chemical formulas. Students will learn how to balance chemical equations and apply stoichiometry to solve problems related to chemical reactions. The course also introduces the concepts of molarity and molality for solution concentration calculations. Throughout, emphasis is placed on developing a strong foundation in the mathematical and theoretical aspects of chemistry, providing students with the skills necessary for further study in chemistry and related fields.

COMP1500:

This course introduces students to C++ programming for solving a well-defined engineering problem through algorithmic and structured coding. Students will gain practical experience in developing programs using variables, selection, loops, arrays, functions, and mathematical expressions. Emphasis is placed on hands-on computer lab activities that enhance problem-solving skills, and program design. The course provides a strong foundation for applying C++ in engineering and computational applications.

ENGG1013:

The course covers a broad range of engineering drawings utilizing free-hand sketching, engineering drawing, and computer-aided drafting and solid modelling. The fundamental principles of orthographic projection as well as the topics of dimensioning, sectional views, isometric and perspective pictorial views. In addition, Computer Aided Drafting is also covered and practiced using AutoCAD.

MATH1010:

This course covers basic mathematics, including functions, limits, derivatives, integration, complex numbers, vectors, and applicable methods. Furthermore, this course also includes theories and applications of integration, derivatives, complex numbers, and vectors.

UNIR1100:

In this course, students learn to employ reading strategies while reading faculty related texts, use paraphrasing techniques, produce a short project proposal and make a poster presentation related to their specialization.

ELEC1100:

This course introduces students to a wide range of DC electrical circuit analysis techniques, which will provide the necessary foundation for electrical engineering courses. In this course, students apply Kirchhoff's laws, and nodal and mesh analysis techniques to solve electrical circuit parameters. Students will also be taught how to use important theorems such as superposition, Thevenin, and Norton in circuit analysis. In addition, it teaches the student to calculate the quantities of alternating current AC signals. It introduces the course to the analysis of alternating current circuits which include resistors, inductors, and capacitors.

MATH1200:

This course offers a foundational study of basic linear algebra and vector calculus, with emphasis on mathematical methods and techniques that are broadly applicable across various scientific and engineering fields. Students will develop a strong understanding of core mathematical concepts and gain the ability to apply these tools to solve problems from a wide range of real-world applications. The course also includes an introduction to series topics, enhancing analytical skills, and mathematical reasoning.

ENGG1010:

This course is designed primarily for all engineering students. It provides comprehensive knowledge and insight into the study of Mechanics. Topics to be covered include Vectors, operations with forces, resultants of coplanar force systems. Equilibrium and coplanar force systems. Newton's laws of motion and their applications, Friction and its applications. Kinetic energy. Kinematics of a particle, composition and resolution of velocities and accelerations, relative velocity and acceleration, representation by vectors. Plane Kinematics of rigid body, angular velocity diagrams applied to simple mechanisms.

ENGG1023:

This course covers a broad range of fundamental principles of material sciences and its key role in the selection and utilization of materials for various engineering applications. Course topics include crystal structure and defects, mechanical and electrical properties, phase diagram, corrosion and materials processing. Overall, engineering materials is an important course that lays the foundation for several other courses in engineering and provides students with essential knowledge for their higher levels.

UNIR1003:

يشتمل هذا المقرر على نطاق عريض من المعارف والمهارات والقيم التي تعزز وعي الطلبة بهوية المجتمع العماني وقيمه، وفهم دور المتغيرات التراثية والتاريخية والديمقراطية والثقافية والمؤسسية في تشكيل الهوية العمانية وتحديد سماتها. ويركز المقرر على التنظيم الإداري للدولة، ومنطلقات النهضة العمانية المعاصرة ومؤشراتها من خلال تسليط الضوء على فكر حضرة صاحب الجلالة السلطان هيثم بن طارق المعظم، ويركز المقرر أيضا على تعزيز قيم الانتماء والولاء والمواطنة وعلاقتها بحقوق الإنسان، والتعريف بعلاقة السلطنة بمحيطها الخليجي والعربي والإقليمي والدولي بما في ذلك المواثيق الدولية، بالإضافة إلى تسليط الضوء على الأمن الفكري والتحديات المعاصرة، ودور مؤسسات الدولة المدنية والعسكرية في خدمة الوطن.

Level 2

CIVE2610:

This course introduces the students to the practice of civil engineering and its branches, types and selection of construction materials for civil engineering purposes, construction techniques, civil engineering drawing, quantity surveys and team working skills. Also introduces the students to environmental issues & their management, the environmental population, and the adverse effects of the environment on civil engineering projects and vice versa.

CIVE2710:

This is an introductory course in understanding the scope and nature of surveying equipment use and surveying computations. Identification and applying the main methodologies and appropriate tools of Practical components include significant knowledge of taking survey field notes, levelling, using an automatic level, and traversing using total station instrument.

CIVE2310:

This course describes the relationship between stress and strain in deformable solids. Analysis is applied to axially loaded members, circular shafts, beams and columns. Statically indeterminate systems, properties of structural materials, Stress analysis, principal stresses, Mohr's Circle and combined loading are included. Thin wall cylinder analysis, torsion, beam bending and transfer shear in beam are also covered.

MATH2200: This course aims to introduce four major topics to engineering students namely: 1st order and 2nd order basic differential equations, Laplace Transform and partial differential equations (PDEs), descriptive statistics and data presentation, and probability concepts.
UNIR1002: يتناول هذا المقرر عددا من القضايا النحوية والصرفية والإملائية والبلاغية التي تسهم في إكساب المهارات اللغوية. هذه القضايا تتعلق بأقسام الكلام، وأنواع الإعراب، والجملة الاسمية، والجملة الفعلية، ومكملات الجملة، والخبر والإنشاء. ويعقب هذا القضايا نصوص تطبيقية مختارة، مع التركيز على تنمية المهارات اللغوية الأساسية (الاستماع، والقراءة، والكتابة، والتحدث).
CIVE2320: The students taking this course will demonstrate basic knowledge of the essential structural analysis techniques, understanding of the scope of statistically determinate beams, trusses, frames, structural loading, structural instability deflections by integration method, moment area method and conjugate beam method. The students will also apply the main methodologies of structural design.
CIVE2210: The course Introduces students to the basics of engineering geology, such as geological structures, rocks/soil formation, types and their physical characteristics. The study of the soil will be the second part of this course, in which the students will be able to classify the soil and identify their engineering properties. The effects of compaction, permeability, seepage, and soil stresses are also within the scope of this course. This course also includes experimental work related to soil properties.
CIVE2120: This is an introductory course on the fundamentals of fluid mechanics and their applications to engineering problems. The lessons that covered in this course include dimensional analysis, viscosity, shear stress and shear strain, pressure, conservation of mass, ideal and viscous fluid in a pipe, pumps and net positive suction head.
UNIR2001: This course is an introductory course in entrepreneurship and innovation. The course aims to expose undergraduate students of various academic backgrounds to business venturing and entrepreneurial activity. The course focuses on boosting the concept of entrepreneurship which leads the small businesses. Students will apply themselves through developing their own business ideas and assessing them using knowledge and skills acquired during the course.
UNIR2100: The aim of this English for Academic Purposes (EAP) course is to introduce students to topics from various disciplines of Engineering, Computer & Information Technology and Business, as offered in the faculties, using authentic reading texts and videos. The course also aims to enhance students' Academic English skills with a particular focus on academic reading and writing. In addition, the course focuses on developing academic and technical vocabulary, core grammatical structures, and summarizing skills.
Level 3
CIVE3340: This course will emphasize developing students' ability to analyze a structure and to provide realistic applications encountered in professional practice. The students taking this course will be introduced to elementary structural analysis techniques, influence lines diagrams, deflections by virtual work method, analysis of indeterminate structures using method of consistent deformations, slope deflection method and moment distribution method, introduction to matrix method and structural analysis software.
CIVE3360: This course focuses on steel structures, layout of steel structures, calculation of loads and forces in steel members, steel material properties, steel cross-section properties, design of steel tension members, design of steel compression members, design of laterally unrestrained and restrained steel beams, design of steel base plates, design of steel members subjected to combined axial and flexural loads and design of steel connections. Students use British Standards BS5950 for structural steel design.
CIVE3110: Demonstrate a command of the concepts governing the occurrence, distribution, and movement of water and contaminant substances in watershed systems. Understanding new knowledge in meteorological considerations, precipitation, evaporation, transpiration, infiltration, stream flow,

hydrograph analysis, flood routing, groundwater flow, and frequency analysis is developed. Understanding the relationship between Principle and mathematical models describing the propagation of contaminants in rivers, lakes, soils, and groundwater.

ENGG3700:

This course introduces the student to the use of numerical methods for solving engineering problems with the aid of a digital computer. The course contains numerical methods for solving non-linear equations, optimization, curve fitting and interpolation, integration of data and functions, and solving ordinary and partial differential equations. MATLAB will be used as the programming language.

CIVE3350:

Introduce the students to structures and loading systems, reinforced concrete theory for flexure, shear, and compression; strength. Ultimate & serviceability limit states. Code provisions and detailing. Design of beams, solid slabs, Flat slabs, stair slabs, columns and footings. Use STAAD Pro. to design a continuous beam.

CIVE3220:

This course develops fundamental soil mechanics theory and its application to geotechnical analysis and design. Topics covered include stress distribution in soils, compressibility and consolidation of soils, 1D-consolidation theory and characteristics, slope stability, modes of slope failure, and analysis of infinite slope. Students are also introduced to site investigations, bearing capacity and geotechnical design of shallow and deep foundations, a brief introduction about the lateral earth pressure and the calculation of safety factors for retaining walls. This course also includes laboratory investigations to determine the physical and mechanical properties of soil.

CIVE3410:

This course introduces students to the specialized knowledge of transportation and traffic engineering. It demonstrates a command of the concepts for good planning, design, and operation of transport facilities in order to improve their understanding of the relation between safety, efficiency, cost effectiveness and minimize their adverse impacts. This course deals primarily with analytical and extensive understanding of the principles of road transport systems and the traffic analysis process. Topics include specialized problems related to the basic traffic flow theories, traffic management and operations and the travel demand forecasting.

UNIR3100:

The purpose of the course is to enhance students' performance-based competence, and equip them with the necessary academic research writing skills required to undertake an independent research project. It further develops academic writing skills including paraphrasing, summarizing, synthesizing, direct quotation and APA style citation.

Level 4

CIVE4510A:

In this course, students are required to work in groups to undertake complete design work on a given civil engineering project and to submit some reports to show the project design progress. Briefing seminars regarding good professional practice will be conducted to enhance the students' capabilities and performance.

CIVE4130:

This course is oriented to review advanced specialized practices of water resources engineering within civil engineering program including analyses and design elements. There is an extensive understanding of four major topics covered in this course including water resources planning and water demand/supply analysis and design, urban sewage drainage systems design, flood damage mitigation and hydraulic structures design such as dams, culverts and irrigation systems design.

CIVE4810:

The course includes the study of project components, construction contract and tendering, project closeout, planning and scheduling of project by critical path method, least cost scheduling, cost estimation and the role of engineering economics in civil construction.

ENGG4801A:

Students from the four engineering disciplines, Chemical, Civil, Mechanical and Mechatronic, and Electrical and Computer Engineering, undertake a two-part Final Year Project consisting of ENGG4801A (the initial phase) and ENGG4801B (the final phase). These supervised projects allow students to investigate practical engineering problems and apply the knowledge and skills gained throughout their studies. ENGG4801A provides the foundation for the research sequence. In this phase, students identify a problem, review relevant literature, define research objectives,

and outline suitable research methods. They also conduct preliminary analyses and planning as required for their project. Alongside technical tasks, students develop skills in teamwork, communication, ethics, creativity, and independent learning. The phase concludes with the submission of the ENGG4801A report and an oral presentation that meets academic requirements.

CIVE4420:

A study of the advanced specialized concepts required to demonstrate a general understanding for design construction and management of roads with extensive understanding of the principles of highway engineering. In addition, general knowledge of the essential fundamentals of road safety will be addressed. Also, applying established concepts with advanced technologies on the highway planning and management also will be discussed.

CIVE4140:

The course introduces students to the fundamental theories that govern water and wastewater. It covers the application of a selected set of design and analysis methods to the calculation of drinking water and wastewater systems, as well as the treatment of wastewater.

CIVE4510B:

In this course, students are required to work in groups to undertake complete design work on a given civil engineering project and to submit some reports to show the project design progress. Briefing seminars regarding good professional practice will be conducted to enhance the students' capabilities and performance.

ENGG4801B:

ENGG4801B builds on the groundwork established in ENGG4801A by focusing on the complete execution of the research plan. Students conduct experiments, collect and analyze data, and interpret their findings through structured results, discussions, and evidence-based conclusions. Beyond the technical outputs, ENGG4801B fosters creativity, ethical practice, teamwork, and entrepreneurial awareness by encouraging students to link their research outcomes to real-world engineering applications. By the end of the sequence, students gain deep research capabilities and the confidence to tackle complex engineering challenges, contribute to innovation, and continue growing professionally. They produce the ENGG4801B report and deliver oral presentations aligned with academic expectations.

Internship Course:

This course provides students with the opportunity to apply the knowledge and skills acquired during their studies in a workplace environment, enhance their career readiness, and develop their professional and practical competencies in alignment with the program learning outcomes and labour market requirements. The course is a compulsory component of the academic program, where applicable, depending on the nature of the program. It is governed by the University's approved policies and procedures and is supervised by academic staff in collaboration with the host training organisations. The specific requirements, duration, and assessment methods vary according to the academic program.

ELECTRICAL AND COMPUTER ENGINEERING (ECE)

General Information about the Program:

Program Name	Electrical and Computer Engineering
Award	Bachelor of Engineering Electrical and Computer Engineering
Exit point	Diploma
Language of Instruction	English
Mode of Study	Conventional
Study Scheme	Full Time
Study Duration	4 Years
Credit Units / Hours	69 Credit Units / 133 Credit Hours
Professional Body Accreditation	Full Accreditation by Engineers Australia
Entry Requirement	- Completed the General Education Diploma in Oman, or equivalent (formerly Secondary School Completion Certificate), and - Obtained at least a pass mark of 50% or equivalent in Advanced Mathematics, Physics, and/or Chemistry.

Program Aim

The Electrical and Computer Engineering program aims to graduate engineers who are capable of working in the field of Electrical and Computer Engineering with high technical, communication, teamwork, and leadership skills.

Program Objectives (POs)

- PO1:** Graduates who can successfully work in Electrical and Computer Engineering or related disciplines.
- PO2:** Graduates who act ethically and professionally in modern diverse work environments and communities through effective communication, leadership, and responsible teamwork.
- PO3:** Graduates who pursue post-graduate studies and/or professional development in Electrical and Computer Engineering or related disciplines to sustain and advance their careers.

Program Learning Outcomes (PLOs) for Bachelor Exit Award

PLO1: Apply advanced knowledge of engineering, science, and mathematics for solving Electrical and Computer Engineering problems.
PLO2: Design Electrical and Computer Engineering systems for addressing complex engineering problems, and safety requirements.
PLO3: Communicate effectively on complex engineering activities, with adaptation for appropriate audiences.
PLO4: Apply appropriate numerical and analytical techniques for solving Electrical and Computer Engineering problems.
PLO5: Use relevant information and communication technologies, including engineering software and simulation tools, to support Electrical and Computer Engineering practice.
PLO6: Practice highly advanced levels of ethical principles and values in the fields of Electrical and Computer Engineering.
PLO7: Develop advanced leadership and teamwork skills with full accountability for achieving goals and objectives.
PLO8: Apply highly specialized entrepreneurial and employability skills suitable for the work environment.

PLO9: Implement lifelong learning independently for integration of new knowledge using appropriate learning strategies.

Program Learning Outcomes (PLOs) for Diploma Exit Award

- PLO1:** Apply significant knowledge of engineering, science, and mathematics to solve Electrical and Computer engineering problems.
- PLO2:** Prepare solutions for well-defined tasks related to Electrical and Computer Engineering.
- PLO3:** Communicate appropriately on engineering activities with diverse audiences.
- PLO4:** Utilize a broad range of numerical skills for solving Electrical and Computer Engineering problems.
- PLO5:** Use a range of information and communication technology tools and techniques in the discipline of Electrical and Computer Engineering
- PLO6:** Practice significant levels of ethical principles and values in the fields of Electrical and Computer Engineering.
- PLO7:** Develop leadership and teamwork skills with full accountability for achieving goals and objectives.
- PLO8:** Employ substantial entrepreneurial and employability skills in a work environment.
- PLO9:** Identify the need for lifelong learning in the context of technological change related to Electrical and Computer Engineering.

Study Plan

Program Matrix											
Year	Semester 1					Semester 2					Semester 3
	Course Code	Course Name	Pre-requisite	Core/Elective	Credit Hours	Course Code	Course Name	Pre-requisite	Core/Elective	Credit Hours	
1	CHEM1020	General Chemistry	None	Core	4	ELEC1100	Principles of Electrical Circuits	MATH1010	Core	4	The student is allowed to register 2 courses (not exceeding 9 credit hours)
	COMP1500	Introduction to Programming	IC3M2	Core	4	ENGG1010	Applied Mechanics	MATH1010	Core	4	
	ENGG1013	Engineering Drawing and Computer Drafting	None	Core	2	ENGG1023	Engineering Materials	None	Core	4	
	MATH1010	Calculus I	SET3	Core	4	MATH1200	Calculus II	MATH1010	Core	4	
	UNIR1100	Communication Skills (1)	None	Core	3	UNIR1003	Oman the State and People	IC3M1A	Core	2	
2	COMP2130	Digital and Computer Systems	MATH1010 and COMP1500	Core	4	COMP2230	Data Structures and Algorithms	COMP1500	Core	4	The student is allowed to register 2 courses (not exceeding 9 credit hours)
	ELEC2113	Instrumentation & Measurement	ELEC1100	Core	4	ELEC2013	Signals & Systems	MATH2200	Core	4	
	ELEC2200	Electrical and Electronic	ELEC1100	Core	4	ELEC2300	Electrical Energy Conversion	ELEC1100	Core	4	

		Circuit Analysis					& Utilization				
	MATH2200	Differential Equations and Statistics	MATH1200	Core	4	UNIR2001	Entrepreneurship	None	Core	2	
	UNIR1002	Arabic Language Skills	SET 1A	Core	2	UNIR2100	Communication Skills (2)	UNIR1100	Core	3	
	Diploma Internship										
3	COMP3130	Computer Networks and Security	COMP2130	Core	4	COMP3240	Introduction to Artificial Intelligence	COMP1500	Core	4	The student is allowed to register 2 courses (not exceeding 9 credit hours)
	ELEC3000	Control Systems Engineering	ELEC2013	Core	4	ELEC3600	Electromagnetic Fields and Transmission Lines	MATH1200	Core	4	
	ELEC3400	Electronic Circuits	ELEC2200	Core	4	ELEC3500	Power Electronics	ELEC2200	Core	4	
	ENGG3700	Numerical Analysis and Optimization	MATH2200	Core	4	UNIR3100	Communication Skills (3)	UNIR2100	Core	3	
4	COMP4130	Computer Organization and Architecture	COMP2130	Core	4	COMP4230	Embedded System Design and Interfacing	COMP2130	Core	4	The student is allowed to register 2 courses (not exceeding 9 credit hours)
	COMP4500	Computer Vision & Image Processing	ELEC2013 and COMP3240	Core	4	COMS4200	Communication Systems	ELEC2013	Core	4	
	ELEC4300	Power Systems Analysis	ELEC2300	Core	4	ELEC4020	Renewable & Sustainable Energy	ELEC2300	Core	4	
	ENGG4801A	Final Year Project (A)	75% of Level 3 courses	Core	4	ENGG4801B	Final Year Project (B)	ENGG4801A	Core	4	
	Bachelor Internship										
Bachelor Award: Internship course (or an equivalent) is a mandatory requirement for students exiting at Bachelor level (and haven't completed it at Diploma level). The internship course is non-credit-bearing and must be successfully completed to fulfill program requirements.											

Course Description

Level 1

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The course covers a broad range of engineering drawings utilizing free-hand sketching, engineering drawing, and computer-aided drafting and solid modelling. The fundamental principles of orthographic projection as well as the topics of dimensioning, sectional views, isometric and perspective pictorial views. In addition, Computer Aided Drafting is also covered and practiced using AutoCAD.

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ENGG1010

This course is designed primarily for all engineering students. It provides comprehensive knowledge and insight into the study of Mechanics. Topics to be covered include Vectors, operations with forces, resultants of coplanar force systems. Equilibrium and coplanar force systems. Newton's laws of motion and their applications, Friction and its applications. Kinetic energy. Kinematics of a particle, composition and resolution of velocities and accelerations, relative velocity and acceleration, representation by vectors. Plane Kinematics of rigid body, angular velocity diagrams applied to simple mechanisms.

ENGG1023

This course covers a broad range of fundamental principles of material sciences and its key role in the selection and utilization of materials for various engineering applications. Course topics include crystal structure and defects, mechanical and electrical properties, phase diagram, corrosion and materials processing. Overall, engineering materials is an important course that lays the foundation for several other courses in engineering and provides students with essential knowledge for their higher levels.

MATH1200

This course offers a foundational study of basic linear algebra and vector calculus, with emphasis on mathematical methods and techniques that are broadly applicable across various scientific and engineering fields. Students will develop a strong understanding of core mathematical concepts and gain the ability to apply these tools to solve problems from a wide range of real-world applications. The course also includes an introduction to series topics, enhancing analytical skills, and mathematical reasoning.

UNIR1003

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COMP2130

This course introduces the fundamental principles of digital systems and the basics of computer hardware. Students will learn the operation, electrical characteristics, and timing properties of essential digital building blocks, as well as gain proficiency in a hardware description language for specifying and simulating digital circuits. The course emphasizes both analysis and design of simple digital systems. Through hands-on laboratory sessions, students will implement small-scale systems using standard digital hardware platforms.

ELEC2113

This course includes a significant knowledge of measurement and instrumentation systems. In this course, the students will understand the scope of the transducer and sensors operation, the data Acquisition system, and signal processing. In addition, it will improve the students' understanding of the construction and application of the indicating meters. It allows the student to develop a skill to solve problems related to instrumentation systems and data acquisition systems.

ELEC2200

This course introduces the principles of AC circuit analysis and the fundamentals of electronic devices. Topics include single- and three-phase AC circuits, circuit theorems, and power calculations. Students also study semiconductor basics, diodes, BJTs, FETs, and MOSFETs with emphasis on biasing, small-signal analysis, and practical applications in circuit design.

MATH2200

This course aims to introduce four major topics to engineering students namely: 1st order and 2nd order basic differential equations, Laplace Transform and partial differential equations (PDEs), descriptive statistics and data presentation, and probability concepts.

UNIR1002

يتناول هذا المقرر عددا من القضايا النحوية والصرفية والإملائية والبلاغية التي تسهم في إكساب المهارات اللغوية. هذه القضايا تتعلق بأقسام الكلام، وأنواع الإعراب، والجملة الاسمية، والجملة الفعلية، ومكملات الجملة، والخبر والإنشاء. ويعقب هذا القضايا نصوص تطبيقية مختارة، مع التركيز على تنمية المهارات اللغوية الأساسية (الاستماع، والقراءة، والكتابة، والتحدث).

COMP2230

This course introduces the concept of algorithms and data structures using significant knowledge of different related methodologies. The course will also highlight writing steps for solving well-defined engineering problems using pseudo code and drawing flowchart. Furthermore, this course implements algorithms for element manipulation and sorting and searching techniques. The course will also emphasize on: arrays, Linked lists, sorting, binary search, binary trees, stack, queue, and dequeuer.

ELEC2013

This course introduces the theory of signals, systems and practice of processing analogue signals to many branches of engineering and mathematics that stem from it. It focuses on one-dimensional signals and single-input, single-output, linear time-invariant systems, time and frequency-domain representation and analysis of continuous and discrete time signals and systems, Fourier Series and Fourier transform, Laplace transform, Z-Transform and their applications in filter design, signal telecommunications and control. MATLAB software will be used to implement signals of modern communication and control systems.

ELEC2300

This course covers the principles of electrical energy conversion and its practical applications. Topics include magnetic circuits, transformer operation and performance, DC and induction machines, and various energy conversion systems such as non-renewable, wind, and solar. The course also introduces demand-side management, energy consumption, and professional practices in electrical engineering.

UNIR2001

This course is an introductory course in entrepreneurship and innovation. The course aims to expose undergraduate students of various academic backgrounds to business venturing and entrepreneurial activity. The course focuses on boosting the concept of entrepreneurship which leads the small businesses. Students will apply themselves through developing their own business ideas and assessing them using knowledge and skills acquired during the course.

UNIR2100

The aim of this English for Academic Purposes (EAP) course is to introduce students to topics from various disciplines of Engineering, Computer & Information Technology and Business, as offered in the faculties, using authentic reading texts and videos. The course also aims to enhance students' Academic English skills with a particular focus on academic reading and

writing. In addition, the course focuses on developing academic and technical vocabulary, core grammatical structures, and summarizing skills.

Level 3

COMP3130

This course provides an in-depth understanding of computer networks and the essential principles of network security. Students will explore the architecture, protocols, and operations of various types of networks, as well as the measures required to secure these networks against potential threats. The course combines theoretical foundations with practical applications to prepare students for real-world challenges in networking and cybersecurity.

ELEC3000

This course provides the students with specialized knowledge of control systems, modeling of electrical and mechanical systems, and generating the control system transfer function by using block diagram reduction. Also, the course will demonstrate a command of the open and closed-loop control, transient analysis, steady-state analysis, and root locus concepts. In addition, the course will develop a broad range of cognitive and technical skills to solve problems related to control system engineering.

ELEC3400

This course establishes the fundamentals of small signal analysis of BJT and FET amplifiers circuit, frequency response of the amplifiers, constant current sources, differential amplifiers, multistage amplifiers, power amplifiers, operational amplifier and its applications, active filters, and oscillator circuits.

ENGG3700

This course introduces the student to the use of numerical methods for solving engineering problems with the aid of a digital computer. The course contains numerical methods for solving non-linear equations, optimization, curve fitting and interpolation, integration of data and functions, and solving ordinary and partial differential equations. MATLAB will be used as the programming language.

COMP3240

The course provides students with a foundational understanding of AI concepts, techniques, and applications. It explores the principles of intelligent systems and how they can be designed to solve complex problems. The course begins with an overview of intelligent agents, their structure, and their decision-making processes. A significant portion is dedicated to search algorithms, including uninformed search methods and informed (heuristic) search techniques that enable efficient problem-solving. Students will also be introduced to various AI techniques in real-world applications, including Artificial Neural Networks (ANNs), Genetic Algorithms, Fuzzy Logic, and Neuro-Fuzzy Systems, which combine neural networks and fuzzy logic.

ELEC3600

This course establishes the fundamentals of distributed transmission media, wave propagation on a transmission line and impedance matching. The course also presents the wave propagation in optical fiber, fiber optics characteristics parameters and basic electromagnetic theory as required by students in electrical, telecommunications, computing and other engineering-based technologies.

ELEC3500

This course provides a comprehensive introduction to power electronics and its applications in modern electrical systems. Topics include semiconductor switching devices, rectifiers, DC-DC converters, inverters, and AC voltage controllers. Students study power conversion principles, converter performance, pulse-width modulation, and drive applications for AC and DC motors.

UNIR3100

The purpose of the course is to enhance students' performance-based competence, and equip them with the necessary academic research writing skills required to undertake an independent research project. It further develops academic writing skills including paraphrasing, summarizing, synthesizing, direct quotation and APA style citation.

Level 4

COMP4130

This course discusses the component, structure and function of a computer. It exposes students with the architecture and organization of a computer. This subject covers the numbering system and the representation of data, the internal and external computer communication through system buses and Input and Output, computer storage, internal architecture of Central

Processing Unit, Logic Gates and Boolean Algebra. Assembly languages are exposed to students for better understanding of the computer structure and component as a whole.

COMP4500

This course will introduce students to vision sensors, computer vision systems and digital image processing. It also introduces the areas of artificial intelligence that relate to fundamental issues and techniques of computer vision and image processing. Emphasis will be on physical, mathematical, image-processing, pattern recognition, and feature extraction aspects of vision. The course will have a proper Lab activity to enable students to understand the breadth and depth of the lecturing materials.

ELEC4300

This course provides an in-depth study of electric power system analysis and modeling. It covers the representation of major power system components, including transmission lines and synchronous machines. Topics include Y-bus and Z-bus matrix formulation, power flow analysis for two-bus and multi-bus systems, and fault calculations using symmetrical components. The course also addresses unbalanced fault analysis, voltage stability, and transient stability to enhance understanding of system performance under various operating conditions. Additionally, the course applies established concepts and theories to solve a wide range of power system problems using PowerWorld software.

ENGG4801A

Students from the four engineering disciplines, Chemical, Civil, Mechanical and Mechatronic, and Electrical and Computer Engineering, undertake a two-part Final Year Project consisting of ENGG4801A (the initial phase) and ENGG4801B (the final phase). These supervised projects allow students to investigate practical engineering problems and apply the knowledge and skills gained throughout their studies. ENGG4801A provides the foundation for the research sequence. In this phase, students identify a problem, review relevant literature, define research objectives, and outline suitable research methods. They also conduct preliminary analyses and planning as required for their project. Alongside technical tasks, students develop skills in teamwork, communication, ethics, creativity, and independent learning. The phase concludes with the submission of the ENGG4801A report and an oral presentation that meets academic requirements.

COMP4230

This course introduces students to the principles and practices of developing and designing small-scale embedded systems. It emphasizes both theoretical understanding and practical application through detailed engineering design and prototype development. Working in teams, students will undertake real-world design projects that address global challenges, applying cross-disciplinary approaches to solve diverse engineering problems.

COMS4200

This course introduces the fundamental theories and principles of analog and digital communication systems. It covers key communication techniques with emphasis on the analysis, design, and performance evaluation of communication systems. The course integrates theoretical foundations with practical applications, equipping students with essential knowledge and skills relevant to careers in telecommunications, networking, and signal processing.

ELEC4020

The course establishes the fundamentals of energy and sustainable development, renewable and non-renewable energy, energy systems, climate change and energy, life cycle analysis, energy conservation and optimization, sustainability and business, energy storage and management.

ENGG4801B

ENGG4801B builds on the groundwork established in ENGG4801A by focusing on the complete execution of the research plan. Students conduct experiments, collect and analyze data, and interpret their findings through structured results, discussions, and evidence-based conclusions. Beyond the technical outputs, ENGG4801B fosters creativity, ethical practice, teamwork, and entrepreneurial awareness by encouraging students to link their research outcomes to real-world engineering applications. By the end of the sequence, students gain deep research capabilities and the confidence to tackle complex engineering challenges, contribute to innovation, and continue growing professionally. They produce the ENGG4801B report and deliver oral presentations aligned with academic expectations.

Internship Course:

This course provides students with the opportunity to apply the knowledge and skills acquired during their studies in a workplace environment, enhance their career readiness, and develop their professional and practical competencies in alignment with the program learning outcomes and labour market requirements. The course is a compulsory component of the academic program, where applicable, depending on the nature of the program. It is governed by the University's approved policies and procedures and is supervised by academic staff in collaboration with the host training organisations. The specific requirements, duration, and assessment methods vary according to the academic program.

MECHANICAL AND MECHATRONIC ENGINEERING (MME)

General Information about the Program:

Program Name	Mechanical and Mechatronic Engineering
Award	Bachelor of Engineering Mechanical and Mechatronic
Exit point	Diploma
Language of Instruction	English
Mode of Study	Conventional
Study Scheme	Full Time
Study Duration	4 Years
Credit Units / Hours	69 Credit Units / 133 Credit Hours
Professional Body Accreditation	Full Accreditation by Engineers Australia
Entry Requirement	- Completed the General Education Diploma in Oman, or equivalent (formerly Secondary School Completion Certificate), and - Obtained at least a pass mark 50% or equivalent) in Advanced Mathematics, Physics, and/or Chemistry.

Program Aim

The Mechanical and Mechatronic Engineering program aims to graduate engineers capable of working in Mechanical and Mechatronic engineering with high technical, communication, teamwork, and leadership skills.

Program Objectives (POs)

- PO1:** Graduates who can successfully work in Mechanical and Mechatronic Engineering or related disciplines.
- PO2:** Graduates who act ethically and professionally in modern diverse work environments and communities through effective communication, leadership, and responsible teamwork.
- PO3:** Graduates who pursue post-graduate studies and/or professional development in Mechanical and Mechatronic Engineering or related disciplines to sustain and advance their careers.

Program Learning Outcomes for (PLOs) Bachelor Exit Award

PLO1: Apply advanced knowledge of engineering, science, and mathematics for solving Mechanical and Mechatronic Engineering problems.
PLO2: Design Mechanical and Mechatronic Engineering systems for addressing complex engineering problems, and safety requirements.
PLO3: Communicate effectively on complex engineering activities, with adaptation for appropriate audiences.
PLO4: Apply appropriate numerical and analytical techniques for solving Mechanical and Mechatronic Engineering problems.
PLO5: Use relevant information and communication technologies, including engineering software and simulation tools, to support Mechanical and Mechatronic Engineering practice.
PLO6: Practice highly advanced levels of ethical principles and values in the fields of Mechanical and Mechatronic Engineering.
PLO7: Develop advanced leadership and teamwork skills with full accountability for achieving goals and objectives.
PLO8: Apply highly specialized entrepreneurial and employability skills suitable for work environment.
PLO9: Implement lifelong learning independently for integration of new knowledge using appropriate learning strategies.

Program Learning Outcomes (PLOs) for Diploma Exit Award

PLO1: Apply significant knowledge of engineering, science, and mathematics for solving Mechanical and Mechatronic Engineering problems.
PLO2: Prepare solutions for well-defined tasks related to Mechanical and Mechatronic Engineering.
PLO3: Communicate appropriately on engineering activities, with diverse audiences.
PLO4: Utilize a broad range of numerical skills for solving Mechanical and Mechatronic Engineering problems.
PLO5: Use a range of information and communication technology tools and techniques in the discipline of Mechanical and Mechatronic Engineering.
PLO6: Practice significant levels of ethical principles and values in the fields of Mechanical and Mechatronic Engineering.
PLO7: Develop leadership and teamwork skills with full accountability for achieving goals and objectives.
PLO8: Employ substantial entrepreneurial and employability skills in a work environment.
PLO9: Identify the need for lifelong learning in the context of technological change related to Mechanical and Mechatronic Engineering.

Study Plan

Program Matrix											
Year	Semester 1					Semester 2					Semester 3
	Course Code	Course Name	Pre-requisite	Core/Elective	Credit Hours	Course Code	Course Name	Pre-requisite	Core/Elective	Credit Hours	
1	CHEM1020	General Chemistry	None	Core	4	ELEC1100	Principles of Electrical Circuits	MATH1010	Core	4	The student is allowed to register 2 courses (not exceeding 9 credit hours)
	COMP1500	Introduction to Programming	IC3M2	Core	4	ENGG1010	Applied Mechanics	MATH1010	Core	4	
	ENGG1013	Engineering Drawing and Computer Drafting	None	Core	2	ENGG1023	Engineering Materials	None	Core	4	
	MATH1010	Calculus I	SET3	Core	4	MATH1200	Calculus II	MATH1010	Core	4	
	UNIR1100	Communication Skills (1)	None	Core	3	UNIR1003	Oman the State and People	IC3M1A	Core	2	
2	MECH2118	Manufacturing Processes	ENGG1023	Core	4	METR2000	Fundamentals of Mechatronics	None	Core	4	The student is allowed to register 2 courses (not exceeding 9 credit hours)
	ELEC2113	Instrumentation & Measurement	ELEC1100	Core	4	MECH2108	Mechanical Drawing & Design Fundamentals	ENGG1013	Core	4	
	MECH2308	Strength of Materials	ENGG1010	Core	4	MECH2413	Fundamentals of Fluid Mechanics	None	Core	4	
	MATH2200	Differential Equations and Statistics	MATH1200	Core	4	UNIR2001	Entrepreneurship	None	Core	2	

	UNIR1002	Arabic Language Skills	SET 1A	Core	2	UNIR2100	Communication Skills (2)	UNIR1100	Core	3	
	Diploma Internship										
3	METR3200	Control Systems Engineering	None	Core	4	METR3013	Programmable Logic Controllers and Automation	None	Core	4	The student is allowed to register 2 courses (not exceeding 9 credit hours)
	MECH3800	Non-destructive testing & Metrology	None	Core	4	MECH3313	Advanced Machine Design & Finite Elements	None	Core	4	
	MECH3408	Heat Transfer	None	Core	4	MECH3508	Thermodynamics	None	Core	4	
	ENGG3700	Numerical Analysis and Optimization	MATH2200	Core	4	UNIR3100	Communication Skills (3)	UNIR2100	Core	3	
	Bachelor Internship										
4	MECH4213	Robot Dynamics and Mechanical Vibrations	None	Core	4	MECH4513	Refrigeration & Heat Engines	MECH3508	Core	4	The student is allowed to register 2 courses (not exceeding 9 credit hours)
	MECH4913	Design Project A	None	Core	4	MECH4914	Design Project B	None	Core	4	
	METR4913	Computer Vision and Image Processing	None	Core	4	MECH4012	Advanced Manufacturing Technology	MECH2118	Core	4	
	ENGG4801A	Final Year Project (A)	75% of Level 3 courses	Core	4	ENGG4801B	Final Year Project (B)	ENGG4801A	Core	4	
Bachelor Award: Internship course (or an equivalent) is a mandatory requirement for students exiting at Bachelor level (and haven't completed it at Diploma level). The internship course is non-credit-bearing and must be successfully completed to fulfill program requirements.											

Course Description

Level 1

CHEM1020:

This introductory course in general chemistry covers the fundamental principles of chemistry, including the conversion of units, naming compounds, and writing chemical formulas. Students will learn how to balance chemical equations and apply stoichiometry to solve problems related to chemical reactions. The course also introduces the concepts of molarity and molality for solution concentration calculations. Throughout, emphasis is placed on developing a strong foundation in the mathematical and theoretical aspects of chemistry, providing students with the skills necessary for further study in chemistry and related fields.

COMP1500:

This course introduces students to C++ programming for solving a well-defined engineering problem through algorithmic and structured coding. Students will gain practical experience in developing programs using variables, selection, loops, arrays, functions, and mathematical expressions. Emphasis is placed on hands-on computer lab activities that enhance problem-solving skills, and program design. The course provides a strong foundation for applying C++ in engineering and computational applications.

ENGG1013:

The course covers a broad range of engineering drawings utilizing free-hand sketching, engineering drawing, and computer-aided drafting and solid modelling. The fundamental principles of orthographic projection as well as the topics of dimensioning, sectional views, isometric and perspective pictorial views. In addition, Computer Aided Drafting is also covered and practiced using AutoCAD.

MATH1010:

This course covers basic mathematics, including functions, limits, derivatives, integration, complex numbers, vectors, and applicable methods. Furthermore, this course also includes theories and applications of integration, derivatives, complex numbers, and vectors.

UNIR1100:

In this course, students learn to employ reading strategies while reading faculty related texts, use paraphrasing techniques, produce a short project proposal and make a poster presentation related to their specialization.

ELEC1100:

This course introduces students to a wide range of DC electrical circuit analysis techniques, which will provide the necessary foundation for electrical engineering courses. In this course, students apply Kirchhoff's laws, and nodal and mesh analysis techniques to solve electrical circuit parameters. Students will also be taught how to use important theorems such as superposition, Thevenin, and Norton in circuit analysis. In addition, it teaches the student to calculate the quantities of alternating current AC signals. It introduces the course to the analysis of alternating current circuits which include resistors, inductors, and capacitors.

ENGG1010:

This course is designed primarily for all engineering students. It provides comprehensive knowledge and insight into the study of Mechanics. Topics to be covered include Vectors, operations with forces, resultants of coplanar force systems. Equilibrium and coplanar force systems. Newton's laws of motion and their applications, Friction and its applications. Kinetic energy. Kinematics of a particle, composition and resolution of velocities and accelerations, relative velocity and acceleration, representation by vectors. Plane Kinematics of rigid body, angular velocity diagrams applied to simple mechanisms.

ENGG1023:

This course covers a broad range of fundamental principles of material sciences and its key role in the selection and utilization of materials for various engineering applications. Course topics include crystal structure and defects, mechanical and electrical properties, phase diagram, corrosion and materials processing. Overall, engineering materials is an important course that lays the foundation for several other courses in engineering and provides students with essential knowledge for their higher levels.

MATH1200:

This course offers a foundational study of basic linear algebra and vector calculus, with emphasis on mathematical methods and techniques that are broadly applicable across various scientific and engineering fields. Students will develop a strong understanding of core mathematical concepts and gain the ability to apply these tools to solve problems from a wide range of real-world applications. The course also includes an introduction to series topics, enhancing analytical skills, and mathematical reasoning.

UNIR1003:

يشتمل هذا المقرر على نطاق عريض من المعارف والمهارات والقيم التي تعزز وعي الطلبة بهوية المجتمع العماني وقيمه، وفهم دور المتغيرات التراثية والتاريخية والديمقراطية والثقافية والمؤسسية في تشكيل الهوية العمانية وتحديد سماتها. ويركز المقرر على التنظيم الإداري للدولة، ومنطلقات النهضة العمانية المعاصرة ومؤشراتها من خلال تسليط الضوء على فكر حضرة صاحب الجلالة السلطان هيثم بن طارق المعظم، ويركز المقرر أيضا على تعزيز قيم الانتماء والولاء والمواطنة وعلاقتها بحقوق الإنسان، والتعريف بعلاقة السلطنة بمحيطها الخليجي والعربي والإقليمي والدولي بما في ذلك المواثيق الدولية، بالإضافة إلى تسليط الضوء على الأمن الفكري والتحديات المعاصرة، ودور مؤسسات الدولة المدنية والعسكرية في خدمة الوطن.

Level 2

MECH2118:

This course offers an in-depth understanding of manufacturing processes and material properties. It covers fundamental concepts in metal casting (including sand, die, and precision casting), metal forming (such as forging, rolling, drawing, and extrusion), sheet metal work, heat treatment, welding, brazing, and soldering. Students will develop technical skills in metal cutting operations, including turning, shaping, planning, drilling, milling, and grinding. Additionally, the course

emphasizes the importance of Professional Practices and Ethics essential for building a successful career in the field.

ELEC2113:

This course includes a significant knowledge of measurement and instrumentation systems. In this course, the students will understand the scope of the transducer and sensors operation, the data Acquisition system, and signal processing. In addition, it will improve the students' understanding of the construction and application of the indicating meters. It allows the student to develop a skill to solve problems related to instrumentation systems and data acquisition systems.

MECH2308:

This course describes the relationship between stress and strain in deformable solids. Analysis is applied to axially loaded members, circular shafts, beams and columns. Statically indeterminate systems, properties of structural materials, Stress analysis, principal stresses, Mohr's Circle and combined loading are included. Thin wall cylinder analysis, torsion, beam bending and transfer shear in beam are also covered.

MATH2200:

This course aims to introduce four major topics to engineering students namely: 1st order and 2nd order basic differential equations, Laplace Transform and partial differential equations (PDEs), descriptive statistics and data presentation, and probability concepts.

UNIR1002:

يتناول هذا المقرر عددا من القضايا النحوية والصرفية والإملائية والبلاغية التي تسهم في إكساب المهارات اللغوية. هذه القضايا تتعلق بأقسام الكلام، وأنواع الإعراب، والجملة الاسمية، والجملة الفعلية، ومكملات الجملة، والخبر والإنشاء. ويعقب هذا القضايا نصوص تطبيقية مختارة، مع التركيز على تنمية المهارات اللغوية الأساسية (الاستماع، والقراءة، والكتابة، والتحدث).

METR2000:

The "Fundamentals of Mechatronics" course introduces the principles and applications of mechatronic systems, integrating mechanical, electronic, and computational elements. Topics include hydraulic and pneumatic systems, sensors, actuators, and motors such as stepper, DC, and servo motors. The course explores CNC machines, basic programming for turning and milling operations, and microcontrollers for system interfacing. It covers control and communication systems, signal conversion (ADC/DAC), and the role of artificial intelligence and robotics in automation. Through theoretical knowledge and practical activities, students will develop essential skills for analyzing, designing, and implementing mechatronic systems in real-world applications.

MECH2108:

This course provides principles of technical and assembly drawings of various mechanical components and elementary design concepts. The first part covers mechanical drawing and the second deals with the basic design aspects of mechanical components and assemblies. Topics included are part and assembly drawings of various mechanical components and basic design concepts of various mechanical components such as thread fasteners, power screws, flexible drives, springs, couplings, gears and bearings.

MECH2413:

This is an introductory course on the fundamentals of fluid mechanics and their applications to engineering problems. The lessons that covered in this course include dimensional analysis, viscosity, shear stress and shear strain, pressure, conservation of mass, ideal and viscous fluid in a pipe, pumps and net positive suction head.

UNIR2001:

This course is an introductory course in entrepreneurship and innovation. The course aims to expose undergraduate students of various academic backgrounds to business venturing and entrepreneurial activity. The course focuses on boosting the concept of entrepreneurship which leads the small businesses. Students will apply themselves through developing their own business ideas and assessing them using knowledge and skills acquired during the course.

UNIR2100:

The aim of this English for Academic Purposes (EAP) course is to introduce students to topics from various disciplines of Engineering, Computer & Information Technology and Business, as offered in the faculties, using authentic reading texts and videos. The course also aims to enhance students' Academic English skills with a particular focus on academic reading and writing. In addition, the course focuses on developing academic and technical vocabulary, core grammatical structures, and summarizing skills.

Level 3

METR3200:

This course provides the students with specialized knowledge of control systems, modeling of electrical and mechanical systems, and generating the control system transfer function by using block diagram reduction. Also, the course will demonstrate a command of the open and closed-loop control, transient analysis, steady-state analysis, and root locus concepts. In addition, the course will develop a broad range of cognitive and technical skills to solve problems related to control system engineering.

MECH3800:

The course provides knowledge of specialized inspection techniques in non-destructive testing (NDT) such as Eddy current (ECT), Magnetic particle (MPT), Penetrant (PT), X-ray radiography (RT), Ultrasonic (UT) flaw detection etc. The course also focusses on statistical quality control methods applied to industries, linear, angular and mechanical measurement (Metrology) techniques. The students' professional advancement in the industries would be aided by this course.

MECH3408:

The course aims to provide the student with the background necessary to understand fundamentals of heat transfer and its applications so that they are able to solve heat transfer calculations and design equipment for industrial applications.

ENGG3700:

This course introduces the student to the use of numerical methods for solving engineering problems with the aid of a digital computer. The course contains numerical methods for solving non-linear equations, optimization, curve fitting and interpolation, integration of data and functions, and solving ordinary and partial differential equations. MATLAB will be used as the programming language.

METR3013:

This course equips students with a comprehensive understanding of Programmable Logic Controllers (PLCs) and their role in industrial automation systems. It emphasizes experiential learning through a balance of theoretical concepts and hands-on practical sessions. Students will develop skills in ladder logic programming, interfacing techniques, and troubleshooting PLC systems. The course also integrates the latest advancements in automation, including Industry 4.0, IoT, and SCADA systems, fostering a forward-looking perspective on the challenges and innovations in automation. The outcome-based approach ensures learners gain technical competence, problem-solving skills, and the ability to implement automation solutions in real-world applications.

MECH3313:

The course deals with specialized knowledge of design of mechanical elements, prediction of mechanical response and failure mechanism of machine components and structures. Computer modelling of stresses using the Finite Element Analysis (FEA) and assessment of criteria to analyze stresses and predict failure. The lectures on the FEM will introduce the mathematical theory and focus on issues in modelling and on the interpretation of results and findings. The lectures on mechanical design will consider the design of mechanical elements and issues such as concepts of stress concentration, and application of fracture mechanics to evaluate components failures resulting from static and variable- fatigue loading.

MECH3508:

This course introduces scientific concepts pertaining to the conversion of energy between various forms such as heat, work, and internal energy. Based on the four basic thermodynamic laws (zeroth, first, second, and third), the physical science of heat and temperature, as well as their relationships to energy, entropy and work, are analyzed. These thermodynamic principles are applied to various real-world systems such as gas and vapor power thermal systems.

MECH3900:

A compulsory, non-credit-bearing, Pass/Fail workplace placement of a minimum of 8 weeks (200 hours), normally undertaken at Level 3 or Level 4, in accordance with the University's Mandatory Internship Framework. Students are placed with an approved host organisation under the guidance of an Industry Mentor/Supervisor and a Faculty Internship Coordinator. They are required to complete an Internship Readiness Programme before placement. Assessment combines employer evaluation, a written internship report, a reflective portfolio/logbook, and a presentation/viva. It demonstrates achievement of the Oman Qualifications Framework (OQF) competencies and Sohar University Graduate Attributes, including communication, IT, numeracy, creativity and problem-solving, teamwork, ethical responsibility, and critical judgment and

decision-making skills. Students who have completed the 100-hour Diploma-level Internship are only required to complete the remaining 100 hours at Bachelor level.

UNIR3100:

The purpose of the course is to enhance students' performance-based competence, and equip them with the necessary academic research writing skills required to undertake an independent research project. It further develops academic writing skills including paraphrasing, summarizing, synthesizing, direct quotation and APA style citation.

MECH4213:

This course provides the students with specialized knowledge of control systems, modeling of electrical and mechanical systems, and generating the control system transfer function by using block diagram reduction. Also, the course will demonstrate a command of the open and closed-loop control, transient analysis, steady-state analysis, and root locus concepts. In addition, the course will develop a broad range of cognitive and technical skills to solve problems related to control system engineering.

Level 4

MECH4913:

This course is divided into two key sections. The first part offers comprehensive coverage of specialized robotics topics, including industrial automation, introduction to robotics, robot sensors, vision systems, end effectors, drives, actuators, robot kinematics and dynamics, and coordinate transformation. The second part focuses on advanced mechanical vibrations, covering free and forced vibrations, damped and undamped systems, vibration isolation, and multi-degree-of-freedom vibration systems.

METR4913:

This course aims to prepare students to design mechanical and/or mechatronic systems. The mechanical or mechatronic system comprises individual elements that must work together synergistically. It must reliably and economically do specified functions. Engineers at this level of the program must use their acquired technical knowledge, learning ability, and conceptual skills to assess the requirements, select or invent components, and combine and size them to satisfy the intended function. The management would receive the final product from the designer and deliver it to the market or the customer accurately and convincingly.

METR4913:

This course will introduce students to vision sensors, computer vision systems and digital image processing. It also introduces the areas of artificial intelligence that relate to fundamental issues and techniques of computer vision and image processing. Emphasis will be on physical, mathematical, image-processing, pattern recognition, and feature extraction aspects of vision. The course will have a proper Lab activity to enable students to understand the breadth and depth of the lecture materials.

ENGG4801A:

Students from the four engineering disciplines, Chemical, Civil, Mechanical and Mechatronic, and Electrical and Computer Engineering, undertake a two-part Final Year Project consisting of ENGG4801A (the initial phase) and ENGG4801B (the final phase). These supervised projects allow students to investigate practical engineering problems and apply the knowledge and skills gained throughout their studies. ENGG4801A provides the foundation for the research sequence. In this phase, students identify a problem, review relevant literature, define research objectives, and outline suitable research methods. They also conduct preliminary analyses and planning as required for their project. Alongside technical tasks, students develop skills in teamwork, communication, ethics, creativity, and independent learning. The phase concludes with the submission of the ENGG4801A report and an oral presentation that meets academic requirements.

MECH4513:

This course develops an advanced knowledge of heat engines, refrigeration systems and air conditioning applications. The course mainly focuses on thermodynamic cycles, performance analysis of Internal and external combustion engines, refrigeration and air-conditioning applications including aircraft refrigeration systems, vapor compression and absorption refrigeration systems, cascade refrigeration systems etc. The course also gives special thrust to psychometrics, various air-conditioning processes, cooling and heating load calculations for designing an air conditioning system.

MECH4914:

Design Project B is a capstone design course that focuses on various project management tools and detailed design of a mechanical/ Mechatronic/thermal system. The students will apply their knowledge and skills to design a mechanical or mechatronic system and to determine the economic, environmental, and ethical aspects of the proposed design. They will work in teams, prepare written and technical reports.

MECH4012:

This course provides an in-depth exploration of modern manufacturing technologies, blending traditional principles with cutting-edge advancements to prepare students for the evolving landscape of industrial engineering. Emphasizing the integration of automation, digital technologies, and precision machining, the course covers topics such as Computer-Integrated Manufacturing (CIM), Industry 4.0, and smart manufacturing systems. Students will gain comprehensive knowledge of cutting tool technologies, mechanics of single-point and multi-point cutting tools, and advanced CNC machining techniques, including shop turn and shop mill programming. The course also delves into rapid prototyping technologies, fundamentals of additive manufacturing, and assembly line optimization. In addition, students will explore non-traditional machining methods, including thermal, electrochemical, and mechanical energy-based processes, equipping them with skills to address complex manufacturing challenges. With a focus on research, problem-solving, and practical applications, this course bridges the gap between theory and industry practice, preparing students to innovate and excel in the field of advanced manufacturing.

ENGG4801B:

ENGG4801B builds on the groundwork established in ENGG4801A by focusing on the complete execution of the research plan. Students conduct experiments, collect and analyze data, and interpret their findings through structured results, discussions, and evidence-based conclusions. Beyond the technical outputs, ENGG4801B fosters creativity, ethical practice, teamwork, and entrepreneurial awareness by encouraging students to link their research outcomes to real-world engineering applications. By the end of the sequence, students gain deep research capabilities and the confidence to tackle complex engineering challenges, contribute to innovation, and continue growing professionally. They produce the ENGG4801B report and deliver oral presentations aligned with academic expectations.

Internship Course:

This course provides students with the opportunity to apply the knowledge and skills acquired during their studies in a workplace environment, enhance their career readiness, and develop their professional and practical competencies in alignment with the program learning outcomes and labour market requirements. The course is a compulsory component of the academic program, where applicable, depending on the nature of the program. It is governed by the University's approved policies and procedures and is supervised by academic staff in collaboration with the host training organisations. The specific requirements, duration, and assessment methods vary according to the academic program.

MASTER OF ENGINEERING IN ENVIRONMENTAL ENGINEERING

General Information about the Program

Program Name	Environmental Engineering
Award	Master of Engineering in Environmental Engineering
Language of Instruction	English
Mode of Study	Conventional
Study Scheme	Full Time
Study Duration	2 Years
Credit Units/Hours	24 Credits Units / 36 Credit Hours
Entry Requirement	• Hold a Bachelor degree (or equivalent) in an Engineering field (Civil Engineering, Process Metallurgy and Materials Engineering, Chemical Engineering, or other close Engineering specialty from Sohar University or another reputable university with: • CGPA of at least 2.4 out of 4.00 for new graduates or 2.25 out of 4.00 for candidates with 2 or more years of relevant professional experience. • Satisfy the English proficiency requirements: an IELTS score of 6+, or TOFEL score of 500 or above in paper-based exam or score of 173 or above in the computer-based exam or 61 in internet-based exam (not more than 2 years old). • Candidates who did not satisfy English language requirements must enroll in a Specialized Professional English Course, for which a fee will be charged, run by the University. Passing is essential for degree award. • Candidates who graduated from a programme delivered in English language will be exempted from the language requirements provided that they pass an interview with the Admission Committee at FE. • Pass marks in an interview with the Admission Committee at FE. • Admission to M Eng. program is subject to the ratifications of the MoHERI, Sultanate of Oman.

Program Aim

The Master of Engineering in Environmental Engineering program aims to equip graduates with the skills necessary to design and implement technology and management practices that effectively utilize resources and assets sustainably and cost-effectively. It focuses on using scientific and engineering processes and tools to solve problems related to air, water, and soil quality.

Program Objectives (POs)

- PO1:** Graduates will have a mastery of the basics and relevant advanced knowledge and tools in core fields of Environmental Engineering and the ability to solve complex problems in and across sub-disciplines of Environmental Engineering.
- PO2:** Graduates will play a crucial role in societal development, utilizing their ability to develop sustainably and applying environmental engineering principles in their professional careers.

- PO3:** Graduates will exemplify a commitment to lifelong learning, actively pursuing professional development and growth in the environmental engineering discipline.
- PO4:** Graduates will contribute to the environmental, social, economic, and technological pillars of the knowledge-based economy through the production of innovative solutions that are supportive of sustainable development and evidence-based decision-making.

Program Learning Outcomes (PLOs)

PLO1:	Apply knowledge of physical, chemical, and biological sciences and mathematics appropriate to the field of environmental engineering to tackle more complex, open-ended problems.
PLO2:	Apply understanding of material and energy balances to examine the movement of chemicals in air, water and soils related to environmental problems of societal importance.
PLO3:	Use complex lab results, work with experimental data and communicate experimental information through appropriate methods for use in design and practice.
PLO4:	Use engineering concepts and numerical methods towards the design of environmentally friendly systems, components, or processes that consider risk, uncertainty, life cycle principles, and environmental impact.
PLO5:	Incorporate advanced knowledge and environmental related practices of information and communication technologies in appropriate ways for professional work purposes.
PLO6:	Assume responsibility for the translation of tools and practices of the profession, project management and institutional roles to the conduct of environmental policy and regulations.
PLO7:	Apply knowledge related to the global, societal, and environmental implications of environmental engineering solutions based on knowledge of current issues.
PLO8:	Use effective and professional communication methods to collaborate within multi-disciplinary teams.



Study Plan

Program Matrix										
Year	Semester 1					Semester 2				
	Course Code	Course Name	Pre-requisite	Core / Elective	Credit Hours	Course Code	Course Name	Pre-requisite	Core / Elective	Credit Hours
1	ENVE6001	Geo-environmental Engineering	None	Core	3	ENVE6003	Solid Waste Technology and Management	None	Core	3
	ENVE6002	Air Pollution Control Design	None	Core	3	ENVE6004	Advanced Water and Wastewater Treatment	None	Core	3
	ENVE6007	Environmental Monitoring and Assessment	None	Elective	3	ENVE6011	Water Resources and Environmental Systems Analysis	None	Elective	3
	UNIR6000	Advanced communication for Engineers	None	Core	0					
2	ENVE6000	Master's Thesis	None	Core	9	ENVE6000	Master's Thesis	None	Core	9

Course Description

Level 1
ENVE6001 Geo-environmental Engineering Geoenvironmental engineering deals with the behavior of soils, rocks and groundwater when they interact with contaminants and addresses problems of hazardous and non-hazardous waste management, contaminated sites, and sustainable development. The topics include various geoenvironmental problems and the need for environmental engineering, the fundamental background needed to understand and address environmental problems, management of wastes through engineered landfills and impoundments, characterizing, assessing and remediating contaminated sites, beneficial use of waste and recycled materials, and incorporating sustainability in waste management and pollution control.
ENVE6002 Air Pollution Control Design This course focuses on core principles and advanced specialized knowledge of air pollution, physical and chemical principles regarding formation and control of air pollutants in industrial and technological processes, air pollution modeling principles of particulate and gaseous control; design devices and systems for air pollution control and application to industrial air pollution control.
ENVE6003 Solid Waste Technology and Management The course aims to provide a comprehensive understanding of the problems associated with solid waste and the various technologies and management strategies used to address them. It focuses on developing specific skills related to waste management planning, source separation, incineration, and landfilling. Additionally, the course emphasizes the principles and tools necessary for conducting assessment of solid waste management systems.
ENVE6004 Advanced Water and Wastewater Treatment This course covers water quality, standards and regulations, specialized and advanced unit processes of softening, ion exchange, adsorption, solid-liquid filtration and membrane systems. The principle of operation of aerobic treatment processes is discussed in detail and methods of advanced effluent treatment for higher discharge standards and effluent re-use are described. Design of waste water treatment systems is discussed in detail.
ENVE6005 Environmental Risk Assessment

This course examines the fundamental principles governing toxic contaminant exposure and risk to humans and ecosystems. The course also covers necessary aspects of probability and statistics; physical and chemical behavior of key priority pollutants; mass transfer and exposure pathways of the contaminants; human and environmental toxicology and methodologies for risk assessment. The course will also involve several case studies of remediation technology applications with a focus on understanding how human and environment risk is managed in real life situation.

ENVE6006

Environmental Data Analysis

This course focuses on application of statistical principles to design of measurement systems and sampling programs. The course also focuses on experimental design; data analysis; description of uncertainty; hypothesis tests; model parameter estimation methods; linear and nonlinear regression methods; trend analysis; statistical analysis of censored data and statistics of extremes.

ENVE6007

Environmental Monitoring and Assessment

This course covers general procedures, methods, theories and techniques related to monitoring programs for different environments the course provides basic environment assessment procedures. The course is divided into two parts. The first part deals with basic environment monitoring methodology and techniques, which are how to obtain and analyze information on the existence and concentration of substances in the environment, either naturally occurring or from anthropogenic sources. The course also examines natural hazard monitoring. The second part of the course introduces the concept and nature of environmental assessment (EA or EIA), an exploration of best practice in EA and a description of EA procedures.

ENVE6008

Environmental Remediation of Contaminated Sites

This course develops students' understanding of integrated approaches to remediating contaminated sites; ability to select and design appropriate technologies for remediation by applying fundamental knowledge of biological, chemical and physical processes. The course also improves students' skills in communication, teamwork and analysis.

ENVE6009

Environmental Effects on Concrete

The course focuses on macro and micro environmental factors affecting concrete strength and durability; local durability problems; performance of concrete under wet-dry and thermal cycles; cracking phenomena; mechanics of deterioration due to salt-weathering, sulphate attack, carbonation and reinforcement corrosion and modelling of transport phenomena.

ENVE6010

Environmental Impacts of Transportation Facilities

The course focuses on the effects of environmental impacts on transportation planning and design decisions; legislation; measurement and prediction of air, noise and water pollution; vibrations; visual intrusion; assessment of environment costs and benefits; assessment of social and economic impacts; environmental impact statements.

ENVE6011

Water Resources and Environmental Systems Analysis

The course covers applications of system engineering techniques to water and environmental problems; optimization techniques; linear programming; integer programming; goal programming; nonlinear programming; dynamic programming; multi-objective decision analysis and simulation methods.

ENVE6012

Environment Management Systems

This course introduces in details the related aspects to Environmental Management Systems (EMS). The course discusses the ISO 14000 standard and its implementation. Students will learn how to use ISO 14000 standard as the framework for environmental improvement, sustainability programs, carbon-reduction strategies, environmental compliance and operational efficiencies in order to provide private- and public-sector organizations with a systematic approach to environmental improvement. The course will cover the following areas: the history of EMS, the elements of an EMS; systems audit and review and gap analysis; legal requirements, due diligence document control, liability; regulation and accreditation; community consultation; emerging issues in environmental management.

ENVE6013

Microbiology in Environmental Engineering

This course covers important aspects of environmental microbiology and its applications to environmental systems. The main topics comprised the role of microorganisms in wastewater treatment, aerobic and anaerobic digestion of municipal sludges, and degradation of water quality in drinking water systems; disinfection of wastewater and drinking water for removal of viruses, bacteria and protozoa that cause waterborne diseases. The course also covers microbiological safety of biosolids, national and international regulations regarding use of biosolids and options for recycling to agricultural and other uses.

UNIR6000

Advanced communication

This course focuses on training the students on writing and giving oral presentation to different type of audiences they will communicate in their profession.

ENVE6000

Master's Thesis

This Master's thesis focuses on addressing an environmental engineering challenge to address the specific problem or research gap. The study employs a systematic methodology or approach to evaluate key variables or focus areas and proposes potential solutions, models, or insights. The findings of this research are expected to contribute to [impact, such as sustainable development, pollution mitigation, resource optimization, or policy improvement and provide a foundation for future advancements.

DOCTOR OF PHILOSPHY IN ENGINEERING

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General Information about the Program

Program Name	PhD in Engineering
Award	Doctor of Philosophy (PhD) in Engineering
Language of Instruction	English
Mode of Study	Conventional
Study Scheme	Full Time
Study Duration	3 Academic Years Minimum
Credit Units/Hours	48 Credits Units / 90 Credit Hours
Entry Requirement	• Hold a Master degree in an Engineering field (Mechanical, Electrical, Chemical, Civil, etc.). • Satisfy the English proficiency requirements: an IELTS score of 6+, or TOFEL score of 500 or above in paper-based exam or score of 173 or above in the computer-based exam or 61 in internet-based exam (not more than 2 years old). • Successfully passed the Ph.D qualifying examination scheduled within the first semester of enrolment. • Admission will be dependent on an assessment of the research topic proposed by the student, to ensure that Sohar University is able to provide appropriate supervision and facilities to support that research. Assessment will be the responsibility of the Ph.D. Program Coordinator and it will be carried out in discussion with the student, Research Degree Committee and the faculty management team to support that research prior to approval of the topic. • Admission to the PhD program is subject to the ratifications of the Ministry of Higher Education, Research, and Innovation (MoHERI), Sultanate of Oman. • Passed an interview with the admission committee (if required).

Program Aim

The PhD program in the Faculty of Engineering at Sohar University aims to prepare researchers who can explore complex engineering problems and contribute meaningful solutions through original research. The program encourages independent thinking, strong analytical skills, and in-depth knowledge in the chosen field. It supports students in developing the ability to carry out high-quality research that can benefit industry, society, and the wider academic community. Graduates will be well-equipped to take on advanced roles in universities, research centers, and professional engineering environments.

Program Objectives (POs)

- PO1:** Researchers who are highly qualified and able to synthesize scientific and technical engineering knowledge to address complex research challenges and generate impactful contributions within the field of Engineering.
- PO2:** Highly skilled graduates who are abreast of the latest advances in their relevant engineering fields that contribute to the advancement of knowledge for the benefit of society.
- PO3:** Scholars who communicate effectively, uphold ethical and responsible practices, and demonstrate leadership and teamwork skills in diverse organizations.

Program Learning Outcomes (PLOs)

PLO1:	Apply deep and comprehensive knowledge of engineering, science, and mathematics for solving various dimensions of problems in their relevant fields or professional areas.
PLO2:	Apply advanced research techniques to emerging development for solving problems by integrating disciplinary knowledge in innovative ways.
PLO3:	Communicate the results of the original research significantly using a range of media, to the peers and community.
PLO4:	Analyze complex problems using advanced numerical and computational techniques, leading to the generation of new knowledge and significant developments in their field of specialization.
PLO5:	Perform lifelong learning and personal development in shaping future directions within the related field.
PLO6:	Comply with ethics and professionalism, for research advancement in the field and their impact to society.



Study Plan

Program Matrix										
Year	Semester 1					Semester 2				
	Course Code	Course Name	Pre-requisite	Core/Elective	CHrs	Course Code	Course Name	Pre-requisite	Core/Elective	CHrs
1	PHDE7001	Research Methodology	None	Core	0	PHDE7000	PhD Thesis	None	Core	15
	PHDE7000	PhD Thesis	None	Core	15					
2	PHDE7000	PhD Thesis	None	Core	15	PHDE7000	PhD Thesis	None	Core	15
3	PHDE7000	PhD Thesis	None	Core	15	PHDE7000	PhD Thesis	None	Core	15

Course Description

Level 1
PHDE7000 The PhD Thesis is a major course of the PhD program, carried out over three years with continuous supervision. Students engage in original research, progressing through stages like literature review, methodology development, data collection, analysis, and thesis writing. Each semester, they are expected to show measurable progress. The course concludes with the submission and defense of a comprehensive thesis that contributes new knowledge to their field. Course 1 code: the description of the course will come here.
PHDE7001 This course introduces students to the fundamentals of academic research, covering topic selection, literature review, research design, data collection, and analysis. It explores both quantitative and qualitative methods, emphasizes ethical research practices, and helps students develop writing and referencing skills. Students will also engage in discussions and activities that strengthen critical thinking. By the end, they will be prepared to draft a research proposal with clarity and confidence