



Program Matrix

Faculty		Engineering									
Program		Electrical and Computer Engineering									
Award		Bachelor of Engineering in Electrical and Computer Engineering									
Credit Hours		133 Credit Hours									
Academic Year		Cohort 2026/2027 Onwards									
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 Circuit Analysis	ELEC1100	Core	4	ELEC2300	Electrical Energy Conversion & Utilization	ELEC1100	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	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.											

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 وقيمته، وفهم دور المتغيرات التراثية والتاريخية والديمغرافية 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

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.