

Program Matrix Form

1. Faculty	Faculty of Computing & Information Technology
2. Program	Artificial Intelligence – AI (Bachelor)
3. Academic Year	2025-26

Level	Semester 1					Semester 2				
	Course Code	Course Name	Units/ Cr.Hr	Core/ Elective	Pre-Requisite	Course Code	Course Name	Units/ Cr.Hr	Core/ Elective	Pre-Requisite
1	MATH1010	Calculus I	2 / 4	Core	None	UNIR1002	Arabic Language Skills	1 / 2	Core	None
	COMP1116	Computer Programming	2 / 4	Core	None	ELEC1100	Principles of Electrical Circuits	2 / 4	Core	None
	COMP1118	Discrete Mathematics	2 / 3	Core	None	UNIR1100	Communication Skills I	2 / 3	Core	IC3
	COMP1117	Computer Architecture & Organization	2 / 4	Core	None	ARIN1201	Introduction to AI	2 / 4	Core	None
	UNIR1001	Oman and Islamic Culture	1 / 2	Core	None	COMP1216	Algorithms and Data Structure	2 / 4	Core	None
2	UNIR2001	Entrepreneurship	2 / 2	Core	None	UNIR2100	Communication Skills II	2 / 3	Core	UNIR1001
	ARIN2101	Artificial Intelligence: Knowledge Representation & Reasoning	2 / 4	Core	ARIN1201	ARIN2201	Introduction to Business Intelligence (BI)	2 / 4	Core	None
	COMP2108	Object Oriented Programming	2 / 4	Core	COMP1116	MATH1200	Calculus II	2 / 4	Core	MATH1000
	COMP2111	Systems Analysis and Design	2 / 4	Core	None	INTR2002	Industrial Training	0	Core	UNIR2001
	AI Elective 21		2 / 4	Elective		AI Elective 22		2 / 4	Elective	
3	MATH2200	Differential Equations and Statistics	2 / 4	Core	MATH1000	ARIN3201	Neural Network and Deep Learning	2 / 4	Core	ARIN1201
	COMP3112	Software Project Management	2 / 4	Core	None	ARIN3202	Machine learning	2 / 4	Core	ARIN1201
	ARIN3101	AI Programming	2 / 4	Core	ARIN1201	UNIR3100	Communication Skills III	2 / 3	Core	None
	AI Elective 31		2 / 4	Elective		AI Elective 32		2 / 4	Elective	
4	ARIN4101	Robotics & Automation	2 / 4	Core	ARIN3201	COMP4000B	Specialization Project	2 / 4	Core	COMP4000A
	COMP4000A	Specialization Project	2 / 4	Core	INTR2002	CYSE3221	Cyber Law and Ethics	2 / 4	Core	None
	ARIN4102	Natural Language Processing	2 / 4	Core	None	ARIN4201	Special Topics in Artificial Intelligence	2 / 4	Core	None
	AI Elective 41		2 / 4	Elective		AI Elective 42		2 / 4	Elective	

*The student must select **only one course** from the courses listed below.

AI Elective 21				
Level	Semester	Course Code	Course name	Pre request (if there)
2	1	ELEC2113	Instrumentation & Measurement	NA
2	1	NEDB2101	Database Administration	NA
2	1	COMP2100	Human-Computer Interaction	NA

*The student must select **only one course** from the courses listed below.

AI Elective 22				
Level	Semester	Course Code	Course name	Pre request (if there)
2	2	COMP2215	Operating System & Security	NA
2	2	COMP2213	Computer Network	NA
2	2	COMP2222	Computer Animation	NA

*The student must select **only one course** from the courses listed below.

AI Elective 31				
Level	Semester	Course Code	Course name	Pre request (if there)
3	1	ELEC3000	Control Systems Engineering	ELEC1100
3	1	COMP3109	Mobile Applications	NA
3	1	COMP3110	Pattern Recognition	NA

*The student must select **only one course** from the courses listed below.

AI Elective 32				
Level	Semester	Course Code	Course name	Pre request (if there)
3	2	COMP3201	Computer Graphics	NA
3	2	COMP3209	Data Mining	NA
3	2	METR3013	Programmable Logic Controllers	NA

*The student must select **only one course** from the courses listed below.

AI Elective 41				
Level	Semester	Course Code	Course name	Pre request (if there)
4	1	COMP4500	Computer Vision & Image Processing	NA
4	1	COMP4109	Internet of Things	NA
4	1	COMP4108	Big Data Analytics	NA
4	1	COWE4100	Generative AI: Models and Applications	NA

*The student must select **only one course** from the courses listed below.

AI Elective 42				
Level	Semester	Course Code	Course name	Pre request (if there)
4	2	ARIN4202	Soft Computing and Its Applications	NA
4	2	COMM4206	Data Visualization	NA
4	2	COMP4211	Game Development	NA



Courses Description		
Course Code	Course Title	Course Description
MATH1010	Calculus I	This course covers basic mathematics including functions, limits, derivatives, integration, complex numbers, vectors, and as well as applicable methods. Furthermore, theories and applications of integration, derivatives, complex numbers, and vectors will be explored.
COMP1116	Computer Programming	The course introduces the theory and practice of Computer Programming. It will be delivered through 14 weeks and the main topics include Input/Output Statements, Control Statements, Methods, Arrays, ArraLists, the Types of Errors in Java.
COMP1216	Algorithms and Data Structure	This course introduces the concept of algorithms and data structures using simple methodologies such as pseudo code and flowchart. Furthermore. It prepares them to implement algorithms for adding elements or deleting elements as well as sorting and searching techniques. This course focuses the following topics: array, linked list, sort, binary search, binary trees, stack and queue.
UNIR1100	Communication Skills I	In this course, students learn to employ reading strategies while reading faculty related texts, use paraphrasing techniques, create a presentation poster related to their specialization and write a short project proposal.
UNIR1001	Oman and Islamic Culture	يحتوي هذا المقرر على مفردات وتراكيب مرتبطة بالثقافة الإسلامية، وبيان مصادرها، وخصائصها، ثم التحديات التي تواجهها، وأثرها في الخصائص الثقافية للمجتمع العماني، ودور أهل عمان الحضاري.
UNIR1002	Arabic Language Skills	المقرر يتكون من سبع وحدات تعليمية تبدأ كل وحدة بمجموعة من القضايا النحوية المتعلقة بأقسام الكلام وأنواع العراب والقضايا المتعلقة في الجملة السمية والجملة الفعلية وما يتعلق أيضا بما يعرف بمكالمات الجمل، ثم يأتي بعد ذلك مجموعة من القضايا البالية في كل وحدة كذلك المتعلقة بالخبر والنشاء وبعض القضايا المتعلقة بعم البيان كالتشبيه والاستعارة والكناية وأيضا يتناول المقرر بعض المحسنات البديعية، ويعقب هذا القضايا نصوص تطبيقية مختارة.
ELEC1100	Principles of Electrical Circuits	This course introduces students to the basics of DC and AC electrical circuits, which will provide the necessary foundation for the student to pursue electrical engineering courses. The course will introduce the student to circuit analysis techniques using Kirchhoff's laws, Nodal and Mesh analysis techniques. It will also teach students to apply the theorems of superposition, Thevenin's and Nortok's in analyzing the electric circuit. The course will introduce the student to the calculation of AC signal quantities and the analysis of the AC circuits that include RLC elements.
COMP1117	Computer Architecture & Organization	This course provides a fundamental understanding of the concepts and knowledge associated with computer architecture and organization. The course gives a bottom-up view of how a computer works. It begins with an overview of the modern digital computer and then builds up the main architectural and system elements of a typical modern computer. Upon completing this course, the student should understand a computer's architectural components, the functions of each component, and how components interact with each other and with software.



ARIN1201	Introduction to AI	This course introduces the concepts, methods, and problem-solving and optimization techniques within the field of artificial intelligence besides presenting the fundamentals of intelligent agent's environments and types. Also, the course describes the methods of generating and representing the knowledge using List, FOL, semantic nets and forms. The artificial neural networks techniques, architecture, learning techniques and its application is covered.
COMP1118	Discrete Mathematics	This course introduces the principles and concepts of Discrete Mathematics and several main areas of discrete mathematics which provide important knowledge and skills for problem solving in discrete mathematic. Topic includes an overview of the foundations (sets, functions and arithmetic), logic and proof techniques, Induction and Recursion, Binary relations, Boolean Algebra, tree and graphs.
UNIR2001	Entrepreneurship	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. Students will apply themselves through developing their own business ideas and assessing them using knowledge and skills acquired during the course.
ARIN2101	Artificial Intelligence: Knowledge Representation & Reasoning	Knowledge representation and reasoning (KR) is a field of AI that focuses on the representation of domain specific knowledge in a form that can be utilised by computer systems. Knowledge representations within a domain are often conceived as formalisms, a description of something in formal mathematical or logical terms. This module will introduce students to methodologies for the visualisation and interpretation of domain specific knowledge and the translation of interpretations into KR formalisms. It will provide the student with an appreciation of how to evaluate the suitability of knowledge representation schemes, balance competing features/requirements and make informed decisions when designing KR formalisms. The module will also focus on the application of KR to appropriate real-world problems such as the semantic web, time-series indexing and temporal abstraction of expert knowledge.
COMP2108	Object Oriented Programming	This course introduces advanced programming skills and focuses on the core concepts of object-oriented programming and design using a high-level language, either Python or Java. Object-oriented programming represents the integration of software components into a large-scale software architecture. Software development in this way represents the next logical step after learning coding fundamentals, allowing for the creation of sprawling programs. The course focuses on the understanding and practical mastery of object-oriented concepts such as classes, objects, data abstraction, methods, method overloading, inheritance and polymorphism. Practical applications in the domain of data science and as seen in stacks, queues, lists, and trees will be examined.
COMP2111	Systems Analysis and Design	This course provides a methodical approach to developing computer systems including systems planning, design, testing, implementation and software maintenance. Emphasis is on the strategies and techniques of systems analysis and design for producing logical methodologies for dealing with complexity in the development of information systems. It will be delivered through 13 weeks and the main topics include System Analysis Fundamentals, Analysis Modelling I (business process & functional modeling), Analysis Modelling II (structural modelling & behavioral modelling), System Design and Implementation.

ELEC2113	Instrumentation & Measurement	This course introduces the fundamentals of measurement. It will introduce the students to the meters construction and application, transducer and sensors operation, data Acquisition system and signal processing of measured signal. It allows the student to design and develop instrumentation system, data acquisition system using modern equipment and tools.
NEDB2101	Database Administration	The course provides a practical introduction to management and administration of database System, and links the technical foundations underlying database methodology to the administration of the database environment. Students will gain an appreciation of the operation, management, implementation, use and maintenance of organizational databases, and thus be able to communicate effectively with other database professionals and stakeholders in the organization.
COMP2100	Human-Computer Interaction	This course introduces students to the multidisciplinary field of Human Computer Interaction (HCI). It deals with concepts and models of HCI in both theoretical and practical terms for students to understand and create user interfaces. And give them the opportunities to apply the HCI theories in practice through a series of assignments for a class project, which will include user, task and context analysis, and usability/UX evaluations of a system/product
UNIR2100	Communication Skills II	The aim of the course is to introduce students to topics of various disciplines of Business, Computer & Information Technology and Engineering offered in the faculties by using authentic 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.
ARIN2201	Introduction to Business Intelligence (BI)	This course delivers an introduction to Business Intelligence (BI) as a part of and functionality of Information Systems. It explores how business problems can be solved effectively through use of data warehouses, data mining and how to gain new insights into organizational operations and help improve enterprise decision making. It also includes discussion on the differences between types of reporting and analytics, enterprise data warehousing, data management systems, decision support systems, knowledge management systems, and big data. This course emphasizes the principles and best practices for how to use data to support factbased decision making within the enterprise
MATH1100	Calculus II	MATH1200: The course provides an exposition of appropriate results in the study of basic differential equations, basic linear algebra, and vector calculus with emphasis on methods and techniques that have proved relevant in a wide variety of applications. Students should gain knowledge of various mathematical tools and be able to apply these tools to problems from various sources.
COMP2215	Operating System & Security	This course provides students with a comprehensive understanding of the legal, ethical, and societal issues related to the use of information technology and cyberspace. It explores key topics such as intellectual property rights, data protection and privacy laws, cybercrime legislation, digital evidence, and international regulatory frameworks. Students will also engage with ethical theories and professional codes of conduct, critically analyzing real-world scenarios involving cybersecurity, social media, AI, and digital surveillance. The course aims to develop students' ability to navigate complex ethical dilemmas and understand



		the legal responsibilities of IT professionals in a global digital environment.
INTR2002	Industrial Training	This course requires students to complete a minimum of 50 hours of industrial training in an approved organization or company. The purpose is to expose students to real-world professional environments, enhance practical and communication skills, and bridge the gap between academic learning and industry expectations. Although no academic credit is awarded, successful completion is compulsory for graduation.
COMP2213	Computer Networks	This course presents a comprehensive overview of networking from fundamentals to intermediate applications and services. It is based on the top-down approach to networking. The course addresses various aspects of computer networking technologies such as: Transmission medium, Local Area Network Ethernet: Cabling, Medium Access Control, switches and routers, Internet protocol, IP Addressing (TCP/IP, ICMP,...), IP fragmentation, encapsulation, and reassembly, the future IP addressing, Network Security concepts and Internet Applications
COMP2222	Computer Animation	This course focuses to introduce the basics of 2D animation and visualization design both in theory and practice. The course is focusing on visualization and instructional design, as well as storytelling techniques practiced through scriptwriting and storyboarding.
MATH2200	Differential Equations and Statistics	This purpose of this course is to introduce four major topics to engineering students namely: types of series and test their convergence, descriptive statistics and data presentation, probability concepts, Laplace Transform and partial differential equations (PDEs).
COMP3110	Pattern Recognition	The exponential growth of data has introduced tremendous opportunities and challenges. Enabling organizations, companies and society to analyze, discover and extract knowledge to make better decisions is critical. Pattern recognition is an important technology that can be utilized by many fields such as industry 4.0 to create smart manufacturing facilities and smart products. The large deployments of sensors and internet of things combined with huge data productions require smart data analytics and pattern recognition systems to be used for knowledge extraction and decision making.
ARIN3101	AI Programming	The course deals with a broad range of artificial intelligence (AI) topics. It introduces the programming languages for artificial intelligence Python and Prolog. The course begins with an introduction to AI applications, predicate calculus, and state space search. Then it delves into some central areas of artificial intelligence such as heuristic strategies, problem solving, knowledge representation, expert systems, and machine learning. Throughout the course, the student will frequently be required to work with examples. In addition to, leaner algebra, calculus essentials and neural networks.
ELEC3000	Control Systems Engineering	This course introduces the fundamentals of control system design; system modelling principles for electrical & mechanical systems; the Laplace transform; block diagram modelling; open & closed loop control; role of feedback; transient & steady state performance; root locus; frequency response analysis; compensator design, practical issues in the implementation of control systems.
COMP3109	Mobile Applications	Mobile applications are increasingly being seen as a part of future learning. Computers are no longer confined to desks and laps but instead live in our pockets and hands. This course teaches students



		how to build mobile apps for the Android platform and how to deploy them in the Android Market. Students will learn to write native apps for Android using android studio and Java SDK which can run on different platforms.
ARIN3201	Neural Network and Deep Learning	Neural networks are a class of machine learning algorithms originally inspired by the brain, which have seen a lot of success recently in practical applications. This course gives an overview of both the foundational ideas and the recent advances in neural networks and deep learning algorithms. The course comprises some key topics of neural networks and deep learning including such as supervised learning – training the network to produce a specified behavior when one has lots of labeled examples of that behavior, unsupervised learning, and reinforcement learning.
ARIN3202	Machine learning	This course explains Machine Learning principles, concepts, and its distinctive characteristics including observing datasets, building models, and programming tools. We elucidate common coding tools and libraries including NumPy, pandas, Matplotlib, Scikit-Learn, and Keras.
UNIR3100	Communication Skills III	The purpose of the course is to enhance students' performance-based competence, reinforce essay composition skills and introduce students to the practices and finer points of writing for academic purposes. It further develops academic writing skills including: note taking, paraphrasing, summarizing, direct quotation and Harvard style citation. The course will place equal or greater emphasis on composition skills such as: essay structure, paragraph structure, coherence and general language skills.
COMP3201	Computer Graphics	This course provides an introduction to the field of computer graphics, including the fundamental concepts and techniques used to create modelling, shading, hidden surface elimination, image processing, and animations. Topics covered include 2D and 3D graphics, raster graphics, vector graphics, graphics hardware and software, matrix algebra, and animation.
COMP3209	Data Mining	Students taking this course are expected to have solid knowledge in programming, databases, algorithms and data structures. This course introduces data mining techniques, algorithms and their applications. Topics to be covered will include various aspects of data mining including data pre-processing, data visualization, association rule mining, clustering, and classification.
METR3013	Programmable Logic Controllers	This course will introduce you to the fascinating world of industrial automation and programmable logic controllers (PLCs). The course teaches the principles of Programmable Logic Controllers (PLCs), and how they are used to control industrial processes. Allen-Bradley Micro Logix PLC will be used to learn the basics of programming and creating automated industrial processes. Topics covered include PLC hardware, number systems and codes, fundamentals of logic, PLC programming, wiring and ladder diagrams, programming timers, and programming counters. Testing of PLC program will also be covered for both dry run and hot run tests. Hands-on integration of PLC to Stepper motors, Traffic lights and Fluid power control systems are examples of applications considered in the course.
ARIN4101	Robotics & Automation	This course introduces the main concepts of robotics, robot manipulator mechanics, control, and kinematics of robots and drives, aiding the understanding of automation components, and material handling, and conceptualizing the automated production lines and



		inspection.
COMP4000A	Specialization Project	This final year project requires students to integrate and implement most of the skills and knowledge gained during their study in order to be better prepared for IT employment demands. The project work spreads over two semesters (COMP4000A and COMP4000B). This why 1st, marks will be given only upon the completion of COMP4000B, 2nd the CLOs are distributed between the two related profiles but need to be seen collectively.
ARIN4101	Natural Language Processing	This course introduces the main concepts of robotics, robot manipulator mechanics, control, and kinematics of robots and drives, aiding the understanding of automation components, and material handling, and conceptualizing the automated production lines and inspection.
COMP3112	Software Project Management	This course will provide students with an understanding of the basic principles and the best practices of managing software development projects. It will covers topics such as project planning and scheduling, project scope and requirements management, risk management, project budget, resource allocation, and stakeholder management. The course will also introduce students to industry-standard project management tools and methodologies such as Agile, and Waterfall.
COMP4108	Big Data Analytics	This course explains big data principles, concepts, and its distinctive characteristics including big data storage technology, analysis techniques, and programming tools. We elucidate common coding tools including Keras and Tensor-flow and various visualization techniques on big datasets, from observations to empirical results.
COMP4109	Internet of Things	This course teaches a deep understanding of IoT technologies from the ground up. Students will learn IoT device programming (Arduino and Raspberry Pi), sensing and actuating technologies, IoT protocol stacks (Zigbee, 5G, NFC, MQTT, etc), networking backhaul design and security enforcement, data science for IoT, and cloud-based IoT platforms such as AWS IoT. Students will be guided through laboratory assignments designed to give them practical real-world experience, where they will deploy a distributed wi-fi monitoring service, a cloud-based IoT service platform serving tens of thousands of heartbeat sensors, and more. Students will emerge from the class with a cutting-edge education on this rapidly emerging technology segment, and with the confidence to carry out tasks they will commonly encounter in industrial settings.
COWE4100	Generative AI: Models and Applications	This course explores how generative artificial intelligence (GenAI) technologies are reshaping the landscape of web development. It focuses on integrating AI models into web applications to automate design, enhance user interaction, and generate content dynamically. Students will gain hands-on experience in using APIs and SDKs from platforms like OpenAI, Google, Hugging Face, and Stability AI to build smart, adaptive, and AI-powered websites and services. Topics include prompt engineering, AI-assisted coding, content generation, AI UX, and ethical use of GenAI in web systems.



COMP4500	Computer Vision & Image Processing	); 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 understand the breadth and depth of the lecturing materials.
COMP4000B	Specialization Project	This final year project requires students to integrate and implement most of the skills and knowledge gained during their study in order to be better prepared for IT employment demands. The project work spreads over two semesters (COMP4000A and COMP4000B). This why 1st, marks will be given only upon the completion of COMP4000B, 2nd the CLOs are distributed between the two related profiles but need to be seen collectively. (Objectives, anyway, are stated collectively in both profiles).
CYSE3221	Cyber Law and Ethics	This course offers an introduction to the concepts, principles, and various technical and administrative aspects of cybersecurity as it relates to law, computing, and ethics. It will define ethics, morality, and moral systems and recognize the distinction between ethical theory and professional ethics.
ARIN4201	Special Topics in Artificial Intelligence	This course is a graduate-level, seminar-oriented research course covering topics at the intersection of language, vision, graphics, and robotics. The class focuses on the grounding of language to various representations and modalities. Students are expected to have prior experience with deep learning concepts and framework (Pytorch, Tensor-flow, etc.), and should also have familiarity with at one of the following areas: natural language processing, vision, graphics or robotic
ARIN4202	Soft Computing and Its Applications	This course introduces the theory and practice of soft computing, including the applications of modern techniques, such as Neural Networks, Fuzzy Sets, and Genetic Algorithms for real-life problems. It covers implementing Hybrid systems using Fuzzy -neural and Neuro-evolutionary approaches. Also, the applications of soft computing in Knowledge discovery in databases, Data mining, pattern recognition, control systems, and image processing are included. Besides, deploy soft computing techniques in designing and implementing intelligent solutions for different real-life problems.
COMM4206	Data Visualization	This course introduces the basic concepts of the modeling and data visualization. It familiarizes students with different methods and techniques. Besides, basic modeling and graphics methods, visualization techniques, system modeling, data modelling, and agent-based modeling are included.
COMP4210	Mobile & Wireless Networks	This course covers mobile and wireless networks and their applications. It introduces a wide range of current and next-generation wireless networking protocols and technologies. The course focuses on the most widely used mobile and wireless network standards including cellular, Wi-Fi, Bluetooth, etc. During the course, students will learn the specific mechanisms of different wireless network architectures and technologies.

COMP4211	Game Development	This course aims to provide the students with an understanding of the design and development of 2D/3D games, and provide them with practical experience using Unity development platform.
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