College of Engineering 2023-2024
BEng (Hons) Architectural Engineering – Dual Award
Module Descriptors

Module Title & Code	**Mathematics 1 ASU_S_MA1**
Description	The module is designed to provide students with the mathematical knowledge and skills to support their engineering study and the requirement for entry into the BEng programmes at ASU. Therefore, it is a preparatory or foundation module building on the knowledge obtained at school.

Module Title & Code	**Intermediate English ASU_S_IEN**
Description	A 10 CAT module, which runs for one semester of 15 weeks for three hours per week. It is the first credit English module that ASU undergraduate students are required to take. The module provides intensive practice in upper-intermediate reading, oral presentations, writing, and note taking. Academic and study skills are embedded in the module. The module develops students' English language and analytical skills to pursue a more advanced ASU academic English module and cope with the literacy demands of specialised modules taught in English.

Module Title & Code	**Principles of Engineering ASU_S_POE**
Description	The module develops the students' understanding of essential scientific principles for studying engineering to the degree level. It is designed to be accessible to students with a wide range of prior science specialisations. The module comprises two blocks of study. These blocks are common to all engineering disciplines and introduce the principles of measurement systems and units, thermal physics, mechanical and electrical principles, and engineering materials and their properties.

Module Title & Code	**Study Skills and Professional Practice ASU_S_SSP**
Description	This module introduces both study and professional skills and practice. The module introduces study skills considering both individual and team-working skills; it covers exam preparation, revision and question answering techniques. It introduces students to their own Personal Development Planning processes. It also enables students to develop and use appropriate safe working practices as expected in an engineering and industrial environment.

Module Title & Code	Engineering Science 1 ASU_S_ES1
Description	This module covers scientific principles of physics and chemistry at a level between secondary school level and Advanced Level. It serves as a preparatory module for students intending to undertake engineering undergraduate degree programmes at the University and introduces students to a range of skills required for the study of engineering.

Module Title & Code	Laboratory and Workshop Skills ASU_S_LWS
Description	This module is a mixture of workshop exercises and practical experiments and projects. Students work in small groups of 2-5 people, depending on the task. The module also provides students with an introduction to design skills and basic engineering drawing.

Module Title & Code	Engineering Science 2 ASU_S_ES2
Description	This module is aimed at extending the science knowledge of engineering students in preparation for continuing their respective engineering degrees. It covers general applied physical principles, including dynamics, statics, fluids, heat and energy.

Module Title & Code	Computer Programming for Engineering ASU_S_CPE
Description	This module introduces students to concepts of programming. This includes conditional, iterations and block structure. Structure programming and data-types will also be introduced and illustrated on typical and simple engineering problems.

Module Title & Code	Mathematics 2 ASU_S_MA2
Description	The module is designed to provide students with the mathematical knowledge and skills necessary for transition to Level 4 study of engineering subjects. Students will attend lectures and tutorials where mathematical exercises are undertaken. Where possible, the statistical content will introduce the use of statistical packages and the presentation of real-life data sets. All students will keep a logbook of the problems tackled. Besides the 36 contact hours, students are encouraged to spend some time on their own to practise the mathematical concepts they learn during the lectures and solve extra problems.

Module Title & Code	Constructing the Built Environment ASU_S_CBE
Description	This module introduces students to design principles and processes specific to constructing the built environment. It will explore traditional and modern construction methods, and students will understand how new methods and materials can sustain the built environment.

Module Title & Code	Advanced English ASU_S_AEN
Description	A 10 CAT module, which runs for one semester of 15 weeks for three hours per week. It is the second credit English module that ASU undergraduate students are required to take. The module provides intensive practice in advanced level reading, oral presentations, writing, and listening. Academic and study skills are embedded in the module. This module aims to enhance students' English and analytical skills as a prerequisite for academic and professional success.

Module Title & Code	Human Rights ASU_S_HUR
Description	This module deals with the basic principles of human rights in terms of the definition of human rights and its scope and source, focusing on the provisions of the international law of human rights, which include the following international documents: a. Charter of the United Nations b. The Universal Declaration of Human Rights c. The International Covenant on Civil and Political Rights d. The International Covenant on Economic, Social and Cultural Rights e. Convention against Torture and Cruel, Inhumane Punishments. f. Protection Mechanisms and Constitutional Organisation of Public Rights and g. Freedom in the Kingdom of Bahrain

Module Title & Code	Bahrain Civilisation and History ASU_S_BCH
Description	The aim of the module is to highlight the role of the Kingdom of Bahrain in its local, regional and international levels through various historical eras, beginning with the Old Ages through the Islamic era to the modern era. The module demonstrates the Arab and Islamic identity of the Kingdom of Bahrain and the vital role they play politically and culturally.

Module Title & Code	Arabic Language ASU_S_ALA
Description	The module runs for one semester of 7 weeks (Summer Semester). The module provides intensive practice in reading, oral presentations, writing, and note taking.

Module Title & Code	Arabic Language for Non-Arabic Speakers ASU_S_ALN
Description	The module runs for one semester of 7 weeks (Summer Semester). This Arabic module is required to be taken by non-Arabic speaking students in ASU undergraduate Engineering programmes. The module provides intensive practice for beginners in reading, oral presentations, writing, and note taking.

Module Title & Code	Engineering Practice and Design 1 ASU_4_EP1
Description	This module introduces engineering practice and design. Design activities, sustainable design principles, and transferable skills will be considered.

Module Title & Code	Engineering Mathematics 1 ASU_4_EM1
Description	This module consolidates the mathematical skills that underpin the BEng engineering degrees.

Module Title & Code	Architectural Engineering Design and Structures 1 ASU_4_AE1
Description	This module focuses on the principles and elements of Design. The module explains the fundamentals of the design process as an introduction to Architectural Design Engineering. Students are introduced to the principles and elements of design through a series of individual and group design activities through which they experience the implementation of different design elements and learn about different principles of design. This module gives the students a chance to understand and experiment with 2D and 3D compositions with specific design values and simple structures, which will be taken forward in the second part of this module, which is Architectural Engineering Design and Structures 2.

Module Title & Code	Principles of Engineering Science 1 ASU_4_PE1
Description	This module develops the students' understanding of essential scientific principles for the study of engineering to the degree level. It is designed to be accessible to students with a wide range of prior science specialisations. This module develops the students' understanding of methods for quantifying the forces between bodies. Forces that are responsible for maintaining equilibrium. This module is common to all engineering disciplines and introduces the principles of measurement systems, force and moment vector and traditional analysis, and forces in equilibrium.

Module Title & Code	CAD Graphics ASU_4_CAD
Description	Topics include intermediate CAD operations, editing drawings, constructing multi-view drawings, applying text, font, style commands, dimensioning, hatching, blocks, constructing 3D objects and modifying solid objects.

Module Title & Code	Integrated Design and Construction ASU_4_IDC
Description	The module provides insight into the design and construction processes based on integration. It is designed specifically to provide an overview of design and construction management skills, competencies and tasks.

Module Title & Code	Engineering Practice and Design 2 ASU_4_EP2
Description	The module covers practical work, project management, health and safety and risk management, and transferable skills.

Module Title & Code	Engineering Mathematics 2 ASU_4_EM2
Description	This module consolidates the mathematical skills that underpin the BEng engineering degrees.

Module Title & Code	Architectural Engineering Design and Structures 2 ASU_4_AE2
Description	The aims of this module are to understand the relationship between the building architectural form; simple structure types, and materials; present the simple environmental issues which should be considered during the design and construction of buildings; and apply these issues to an architectural design problem; resolution of structural issues, functional requirements, and form generation in one to two-story buildings.

Module Title & Code	Principles of Engineering Science 2 ASU_4_PE2
Description	This module develops the students' understanding of essential scientific principles for studying engineering to the degree level. It is designed to be accessible to students with a wide range of prior science specialisations. The module comprises two blocks of study. These blocks are common to all engineering disciplines and introduce mechanical and electrical principles and engineering materials and their properties.

Module Title & Code	Building Technology ASU_4_BDT
Description	Building services engineers are responsible for designing, installing, operating and monitoring the mechanical, electrical and public health systems required for the safe, comfortable and environmentally friendly operation of modern buildings. This module covers all of these services and their management.

Module Title & Code	Building Environment Simulation and Analysis ASU_4_BSA.
Description	This module aims to provide a general understanding and practical experience in computer modelling software systems for simulating and predicting the environmental performance of buildings. A theoretical explanation of the processes simulated in the computer models, such as heat transfer, airflow and lighting, is followed by a description of individual software packages and practical workshops using each package.

Module Title& Code	Structural Design 1 ASU_5_SD1
Description	Introduction to stress and deformation of basic structural materials subjected to axial, torsional, bending, and pressure loads. Plane stress, plane strain, and stress-strain laws. Applications of stress and deformation analysis to members subjected to centric, torsional, flexural, and combined loading. Introduction to theories of failure.

Module Title & Code	Advanced Engineering Mathematics ASU_5_AEM
Description	This module covers advanced undergraduate engineering mathematics.

Module Title & Code	Geotechnics 1 ASU_5_GT1
Description	This module introduces to the students a number of simple concepts and models, which are used to describe soil and its mechanical behaviour. Standard laboratory tests are carried out, and soil properties are derived from the results.

Module Title & Code	Design Procedures for Architecture 1 ASU_5_DA1
Description	Personal student architectural design project embracing design studio and technology studio against a defined brief.

Module Title & Code	AutoCAD-3D ASU_5_A3D
Description	The module covers key command revision, 3D viewing, viewports and coordinate systems, wire-frame modelling, surface modelling and meshing, solid modelling, studio effects, materials and lighting, and Boolean operators.

Module Title & Code	Engineering Management and Economics ASU_5_EME
Description	This module helps to prepare students for their future roles as professional engineers in a number of ways. It includes: • detailed study of project planning techniques, including network techniques, with preparation for the student's individual projects • an overview of the business functions which interact with engineering • an introduction to Systems Thinking. A formal method for studying systems will be introduced. • an introduction to recruitment, retention and equal opportunities in employment • the use of published Standards in engineering • use of the BSI website to access national and international standards • an introduction to statistics and their use in managing engineering processes • an introduction to Quality Management, with particular reference to the ISO 9000 series • an introduction to European Directives and harmonised standards • writing technical business reports, including the importance of acknowledging published sources and the use of formal methods for doing so.

Module Title & Code	Structural Design 2 ASU_5_SD2
Description	This module develops students' practice with structural engineering, introduces structural concepts, and provides an overview of specific techniques for analysing determinate structures, trusses, beams, and frames.

Module Title & Code	Building Information Modelling ASU_5_BIM
Description	This module introduces the concepts of Building Information Modelling (BIM) through the development of architectural 3D models on industry-standard parametric CAD systems. It covers the practical competence of architectural modelling and provides exposure to coordinating building information models.

Module Title & Code	Engineering Ethics ASU_5_EET
Description	This module introduces the theory and the practice of engineering ethics using a multi-disciplinary and cross-cultural approach. The theory includes ethics and the philosophy of engineering. Historical cases are taken primarily from the scholarly literature on engineering ethics, and hypothetical cases are written by students. Each student will write a story by selecting an ancestor or mythic hero as a substitute for a character in a historical case. Students will compare these cases and recommend action.

Module Title & Code	Design Procedures for Architecture 2 ASU_5_DA2
Description	Personal student architectural design project embracing design studio and technology studio against a defined brief.

Module Title & Code	Architectural Engineering Field Studies ASU_5_AFS
Description	This is substantially a project-based learning module. It seeks to bring together construction and materials needed for design, surveying for execution, and some geology. It emphasises the link between materials and site geological properties and their relationship with design and execution. There will be a block week devoted to a construction-type activity and others, including geological and site visits. Multimedia support will feature in the delivery.

Module Title & Code	Internship ASU_5_ITS
Description	This module provides the students with an opportunity to experience the industrial world and be part of a team working on real-world projects. The University assists each student in finding the most suitable industry.

Module Title & Code	Project 1 ASU_6_PR1
Description	To plan, execute, review and report upon a piece of project work related to the BEng programme being followed by the student. A Module Guide for the project is augmented by four lectures.

Module Title & Code	Structural Design and Analysis 1 ASU_6_SA1
Description	This module offers the knowledge and skills of reinforced concrete design to Eurocodes, analysis of structural form and the ability to design in both qualitative and quantitative directions.

Module Title & Code	Engineering Research Methods ASU_6_ERM
Description	The module studies the scope and significance of engineering research. It introduces students to the various aspects of engineering research; its types, tools and methods and students will learn how to apply research techniques to real-world situations. The module covers topics such as the identification of a topic by the student, proposition of hypothesis, formulation of research inquiries, development of literature review, and select research design and methodologies. Additionally, students will learn data collection techniques; primary and secondary data with application to specific problems, scaling and research instrument design and sampling design.

Module Title & Code	Energy Conservation in Building ASU_6_ECB
Description	This module will provide students with the ability to quantify the energy available from the sun, wind, sea or river, or earth for a given application at a given site. Students will develop the skills to understand and analyse the potential and limitations of the available energy conversion devices and exercise basic engineering judgment in their application.

Module Title & Code	Thermodynamics for Buildings ASU_6_TDB
Description	This module provides students with relevant the principles of heat transfer, fluid flow and thermodynamics for application to buildings and their engineering systems.

Module Title & Code	Forensic Engineering and Conservation ASU_6_FEC
Description	This module uses mainly case studies to develop the principles design by looking at the influence of failures on the evolution of the professional practice. It teaches students an understanding of holistic design applications, conservation, and the role of regulations. It teaches, develops and assesses observational, deductive, creative and communications skills.

Module Title & Code	Project 2 ASU_6_PR2
Description	To plan, execute, review and report upon a piece of project work related to the BEng programme being followed by the student. A Module Guide for the project is augmented by four lectures.

Module Title & Code	Structural Design and Analysis 2 ASU_6_SA2
Description	This module offers the knowledge and skills of steel design to Eurocodes, analysis of structural form and the ability to design in both qualitative and quantitative directions.

Module Title & Code	Geotechnics 2 ASU_6_GT2
Description	This module is intended to provide an understanding of the application of theory to the analysis and design of geotechnical structures.

Module Title & Code	Innovation, Enterprise and Management ASU_6_IEM
Description	The module is intended to be practical, with students developing some appropriate ideas of their own in such a way that they become practical, profitable propositions. Students will practice ways of finding ideas, testing those ideas and developing them, and will write their own business strategies, risk assessments and scenario testing so that they demonstrate the commercial viability of their ideas. One of the assignments will require students – to work in groups, typically to adopt a concept and develop it such that it could be commercially viable and sustainable. This might be a product or a service (such as consultancy or contract management). Students will experience topics addressing intellectual property, market research, market placement, advertising and finance. They will be expected to reflect on what they can contribute to a group.

Module Title & Code	Design Project ASU_6_DPR
Description	Main architectural design project embracing design studio and technology studio against a defined brief.