

Mathematics 1 (ASU_S_MA1)

The module is designed to provide students with the mathematical knowledge and skills to support the study of engineering and to meet the requirements for entry into the BEng programmes at ASU. Therefore, it is a preparatory or foundation module building on knowledge obtained at school.

Mathematics 2 (ASU_S_MA2)

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 time independently to practice the mathematical concepts learned during lectures and solve additional problems.

Engineering Science 1 (ASU_S_ES1)

This module covers scientific principles of physics and chemistry at a level between secondary school 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.

Engineering Science 2 (ASU_S_ES2)

This module extends engineering students' scientific knowledge in preparation for continuing their respective engineering degrees. It covers general applied physical principles, including dynamics, statics, fluids, heat, and energy.

Intermediate English (ASU_S_IEN)

A 10 CAT module running for one semester (15 weeks) at three hours per week. It is the first credit English module required for ASU undergraduate students. The module provides intensive practice in upper-intermediate reading, oral presentations, writing, and note-taking. Academic and study skills are embedded throughout. It develops students' English language and analytical skills to pursue more advanced academic English modules and cope with the literacy demands of specialised modules taught in English.

Advanced English (ASU_S_AEN)

A 10 CAT module running for one semester (15 weeks) at three hours per week. It is the second credit English module required for ASU undergraduate students. The module provides intensive practice in advanced-level reading, oral presentations, writing, and listening. Academic and study skills are embedded throughout. It aims to enhance students' English and analytical skills as a prerequisite for academic and professional success.

Engineering Design and Modelling (ASU_S_EDM)

This module introduces engineering design, including the basics of the design process, machining and fabrication, and hand and computer-based engineering drawings. It highlights the role of engineering design within the industry and is taught in a mechanical workshop where students use model-making tools.

Scientific Principles of Engineering (ASU_S_SPE)

This module develops students' understanding of essential physics and chemistry principles for engineering study. It is accessible to students from various science backgrounds. The module introduces fundamentals of statics, dynamics, and the electrical and mechanical properties of materials.

Study Skills and Professional Practice (ASU_S_SSP)

This module introduces both study and professional skills and practices. It covers individual and team-working skills, exam preparation, revision techniques, and question-answering strategies. Students are introduced to Personal Development Planning processes and appropriate safe working practices expected in engineering and industrial environments.

Laboratory and Workshop Skills (ASU_S_LWS)

This module combines workshop exercises with practical experiments and projects. Students work in small groups of 2–5 members depending on the task. It also introduces design skills and basic engineering drawing.

Computer Programming for Engineering (ASU_S_CPE)

This module introduces programming concepts including conditionals, iterations, and block structures. Structured programming and data types are illustrated through typical and simple engineering problems.

Human Rights (ASU_S_HUR)

This module covers the basic principles of human rights, including definitions, scope, and sources, focusing on international human rights law. It includes:

- a. Charter of the United Nations
- b. Universal Declaration of Human Rights
- c. International Covenant on Civil and Political Rights
- d. International Covenant on Economic, Social and Cultural Rights
- e. Convention against Torture and Cruel, Inhuman Punishments
- f. Protection mechanisms and constitutional organisation of public rights and freedoms
- g. Freedom in the Kingdom of Bahrain

Bahrain Civilisation and History (ASU_S_BCH)

This module highlights the role of the Kingdom of Bahrain locally, regionally, and internationally through various historical eras from ancient times to the modern era. It demonstrates Bahrain's Arab and Islamic identity and its political and cultural significance.

Arabic Language (ASU_S_ALA)

A 10 CAT module running for one semester of 7 weeks (Summer Semester). The module provides intensive practice in reading, oral presentations, writing, and note-taking.

Arabic Language for Non-Arabic Speakers (ASU_S_ALN)

A 10 CAT module running for one semester of 7 weeks (Summer Semester). This module is required for non-Arabic speaking students in ASU undergraduate engineering programmes and provides intensive beginner-level practice in reading, oral presentations, writing, and note-taking.

Design and Practice (ASU_4_DAP)

This module introduces engineering practice and design, including hand and computer-aided drawings, design activities, sustainable design principles, project management, group work, and health and safety issues. The module includes a lab component where students apply theoretical concepts.

Engineering Mathematics and Modelling (ASU_4_EMM)

This module consolidates the mathematical skills underpinning BEng engineering degrees. Content includes differentiation and integration, complex numbers, linear algebra, statistics, elementary probability, and probability distributions with engineering applications. A practical component involves the use of mathematical software packages such as MATLAB and Excel.

Introduction to Mechanical Engineering (ASU_4_IME)

This module introduces core mechanical engineering concepts including engineering materials, statics, strength of materials, dynamics, and material science. A practical laboratory component equips students with relevant professional skills.

Engineering Computing (ASU_4_ENC)

This introductory module covers Object-Oriented Programming (OOP) using Python. It enables students to develop programming skills required for engineering design and simulation.

Thermofluids and Dynamics (ASU_4_TAD)

This module introduces thermofluids, including heat transfer, fluid mechanics, and thermodynamics, enabling students to analyse simple engineering systems. A practical component includes laboratory experiments.

Introduction to Electrical and Electronic Engineering (ASU_4_IEE)

This module covers fundamentals of electrical and electronic engineering, including voltage, current, power, energy, Ohm's Law, Kirchhoff's Laws, node voltage and mesh current methods, DC and AC circuit analysis, and semiconductors (diodes, BJTs, and op-amps). A practical laboratory component reinforces theoretical concepts.

Advanced Engineering Mathematics and Modelling (ASU_5_AMM)

This module covers advanced mathematical techniques for engineering problem-solving, including computational techniques, vectors, differential equations, numerical methods, matrix computation, optimisation, and advanced statistical methods.

Solid Mechanics and Finite Element Analysis (ASU_5_FEA)

This module builds on earlier solid mechanics knowledge and introduces finite element analysis (FEA) techniques for structural and stress analysis. A practical component involves the use of FEA software.

Machine Drives and Mechatronics (ASU_5_MDM)

This module covers mechanical drives, power transmission systems, microcontrollers, and electrical actuation systems. A laboratory component supports practical application.

Dynamics and Control (ASU_5_DAC)

This module extends dynamics from point masses to rigid bodies and introduces classical control methods including Bode, Nyquist, and Root Locus techniques. A practical component includes experimental work and technical reporting.

Thermofluids and Sustainable Energy (ASU_5_TSE)

This module advances knowledge in thermodynamics, heat transfer, and fluid mechanics. Topics include steam cycles, air-standard cycles, refrigeration cycles, turbulence, combustion, and heat transfer applications.

Engineering Design (ASU_5_END)

This module develops students' ability to apply structured design methodologies and computer-aided design tools. It emphasises problem-solving, 2D and 3D parametric modelling, and industry-relevant software.

Internship (ASU_5_INT)

This module provides students with industrial experience through participation in real-world projects. The University assists students in securing suitable placements.

Dynamics and System Modelling (ASU_6_DSM)

This module introduces system dynamics modelling for analysing complex, time-dependent systems. Topics include modelling processes, feedback structures, system mapping tools, and applications in energy, water, and aquaculture sectors.

Module Descriptors

Project (ASU_6_PRO)

This module enables students to undertake independent research, integrating knowledge and skills acquired throughout their studies. It develops planning, critical thinking, engineering competence, and communication skills across two semesters.

Innovation and Enterprise (ASU_6_IAE)

This practical module guides students in developing commercially viable ideas. Topics include project management, intellectual property, market research, risk assessment, finance, and business strategy development.

Thermofluids and Turbo Machinery (ASU_6_TTM)

This module provides advanced study in thermodynamics, fluid mechanics, and heat transfer, including internal combustion engines, pumps, turbines, and heat exchangers. Laboratory experiments support theoretical learning.

Manufacturing Systems and Materials Technologies (ASU_6_MMT)

This module covers advanced stress analysis, material behaviour, manufacturing systems, automation, process planning, robotics, and operations management principles.