Programme Specification

Mechanical Engineering {Foundation} [Frenchay]

Version: 2025-26, v2.0, Validated

Contents

Section 1: Key Programme Details

Part A: Programme Information

Programme title: Mechanical Engineering {Foundation} [Frenchay]

Highest award: BEng (Hons) Mechanical Engineering

Interim award: BEng Mechanical Engineering

Interim award: DipHE Mechanical Engineering

Interim award: CertHE Mechanical Engineering

Awarding institution: UWE Bristol

Teaching institutions: UWE Bristol

Study abroad: No

Year abroad: No

Sandwich year: Yes

Credit recognition: No

School responsible for the programme: CATE School of Engineering, College of Arts, Technology and Environment

Professional, statutory or regulatory bodies:

Institution of Mechanical Engineers (IMechE)

Modes of delivery: Full-time, Sandwich

Entry requirements: The University's Standard Entry Requirements

For implementation from: 01 September 2026

Programme code: H30V00

Section 2: Programme Overview, Aims and Learning Outcomes

Part A: Programme Overview, Aims and Learning Outcomes

Overview: The curriculum is designed for students seeking a mechanical engineering education closely aligned to engineering practice. Technical knowledge, engineering practice, business awareness and sustainability are integrated throughout the programme, graduates gain confidence to able to apply their skills to novel situations and create engineering solutions that benefit society.

Professional and practical development is placed at the heart of the curriculum. From day one, students are taken on a journey from student engineer to graduate engineer, preparing them for life as an engineering professional. Students will identify, develop and demonstrate competencies expected of a professional engineer in the workplace. Assessments and activities, embedded throughout the curriculum, are designed to develop the engineering habits of mind such as: Problem-finding, Problem-solving, Visualising, Systems Thinking, Improving, and Adapting. Foundation principles of engineering science, skills and practice are integrated throughout all years of study.

Mechanical engineers are employed throughout the engineering sector in the creation, maintenance and improvement of engineering operations. Consequently, mechanical engineering graduates need to be able to integrate engineering knowledge skills from across engineering and be able to be an effective member of a multidisciplinary team. Mechanical engineering topics of engineering analysis, design, structures, stress analysis, dynamics, materials, thermofluids, systems and manufacturing are developed throughout the core and student engineers are allowed to pursue limited specialisation at in their final years. A theme of stress analysis, materials engineering, dynamics, thermofluids, integrated electromechanical studies run through the core of the programme.

The ability to work in teams and as individuals is required with a view of giving our graduates ready progress to engineering roles in industry and society is developed throughout the core programme.

The programme has an accessible and modern engineering curriculum designed to attract students from diverse backgrounds able to see the future role of engineering in industry and society.

The design of the programme, and in particular the focus on the development of engineering habits and behaviours required by engineering origanisations of graduate engineers is intended to ensure that the Educational Aims and Learning Outcomes are relevant to full-time learners with limited or no prior experience of the engineering profession and to those learners who are based in industry either as degree apprentices or as experienced engineers working towards higher part-time academic and professional qualifications.

The Foundation Year entry route provides the opportunity for students to enter the programme from an academic background that is different to that normally required for the study of engineering undergraduate programmes.

Features of the programme: Challenging group and individual assessments create a student engineer community within curriculum utilizing the state-of-the art engineering building.
The programme has a strong core of essential engineering learning to foster a strong cohort community.
The programme has an industry informed curriculum.
Themed modules scaffold the journey from student engineer to graduate engineer.
Professional and personal development embedded throughout all levels of the programme.
Real engineering problems in core curriculum where students can explore industrial, environmental and societal impact of discipline.
Mathematics skills aligned taught in engineering context.

Educational Aims: Be able to work as a graduate mechanical engineer across the engineering sector able to work as an effective member of a team.

Have acquired the knowledge and understanding of scientific principles and methods necessary to underpin an education in engineering. The programme will provide insight into, and practical skills in, the creation and maintenance of complex engineering products and will explore the environmental impact of engineering.

Have demonstrated an ability to integrate their knowledge and understanding of core subject material in order to solve a substantial range of engineering problems, including ones of a complex nature either individually or as part of a team.

Have developed and demonstrated understanding of the competencies and social responsibilities required by a professional engineer in the workplace and society. Activities to scaffold this development are embedded throughout the core curriculum to develop the engineering habits of mind. As a consequence, students will be able to critically appraise the value and effectiveness of future engineering innovations.

Have the requisite academic knowledge, skills and preparation for progression to study for higher degrees in appropriate engineering disciplines.

Be equipped to make an early contribution to the success of an engineering organization having demonstrated technical, strategic management and leadership skills within the context of a significant innovative engineering project.

Programme Learning Outcomes:

On successful completion of this programme graduates will achieve the following learning outcomes.

Programme Learning Outcomes

PO1. Apply established and novel mechanical analysis concepts to solve engineering problems involving design, operations and manufacture that arise across mechanical engineering applications.

PO2. Use mechanical engineering systems incorporating hardware, software and processing algorithms.

PO3. Model mechanical engineering systems and be able to specify and assess technical designs.

PO4. Understand the manufacturing, financial or marketing implications of design proposals.

PO5. Identify the links between design, manufacturing and production management and assess the capabilities of manufacturing systems software used in the design, maintenance and improvement of manufacturing facilities.

PO6. Communicate and operate effectively, professionally and ethically as individuals and as members of a team.

PO7. Pursue independent study, research and investigations to undertake enquiry into novel and unfamiliar concepts and implement change in an engineering environment.

PO8. Make considered judgements and decisions on complex engineering issues in which not all facts and consequences are accurately known.

Assessment strategy: The assessment strategy for the curriculum is designed to connect topics and levels within the curriculum and to enable students to reflect upon their development. The assessment methods on the programme are aligned to the requirements of the Institution of Mechanical Engineers who place high importance on the demonstration of authentic and verifiable learning outcomes for each individual student. This consideration can lead to a reliance on written examinations and limit the scope for project or group work activities. We have therefore widened the range of activities within our examinations to include more open book examinations, questions based on pre-seen scenarios, questions that build on practical laboratory-based activities and computer-based examinations where students demonstrate the use of software to solve engineering problems. The assessment strategy is designed to work for large module cohorts, typically associated with this programme (100-450).

The above Factors influence and inform the design of this programme's assessment strategy.

In year 1 the Professionalism Skills for Engineers module develops professional attributes and engineering habits of mind through activities and assessments that encourage reflections through a structured portfolio. As part of the portfolio we have the concept of a "passport" where students demonstrate key professional skills such as workshop skills, library skills and health and safety awareness. This "replicates" part of the experience of an engineering apprentice but for one who is working in an academic environment.

The assessment strategies of the other core level 4 modules each designed to make sure that the content covered is connected. Solid Mechanics, Materials and Manufacturing and Dynamics Modelling and Simulation are strong examples where students are assessed on key technical engineering material at the end of the first and second semesters.

The assessment strategy takes a programmatic view in order to connect the immersive activities across modules at a specific level or across levels for an engineering theme.

For example, the level 4 module Thermofluids has an examination where examination questions are based around previously completed laboratory sessions, an activity that should mean that they are fully engaged and aware of how to prepare for that assessment. The assessment at level 4 is then built on for the level 5 module Applied Thermofluids where technical aspects of this engineering theme are developed from the previous level this change of emphasis should create the culture required for students to embrace active learning styles.

Generally speaking at level 5 Structural Mechanics, Dynamics, Applied Mechatronics as well as Applied Thermofluids all provide examples of how content and assessment is developed from level 4 to level 5.

The level 5 module Project Management for Engineers takes over from the level 4 module Professional Skills for Engineers, where the previous module relies on the importance and creation of the team with key roles allocated and the dynamics of the team monitored through a regular peer assessment process. The level 5 module helps students understand the importance of project management in an engineering problem context and forms the vehicle for the assessment that is designed to be motivational and accessible and is assessed through a portfolio of work.

The level 5 module Applied Mechatronics is designed to be a link to level 6 module

Integrated Electromechanical Systems and is a significant development from the previous accredited curriculum where there was a missing link from the level 4 module Applied Electrical Technology. Students work in small groups to tackle applied mechatronics problems. Their work is assessed through coursework and presentation packaged in a portfolio of work. Students should be able to start their level 6 module Integrate Electromechanical Systems in good order in the next academic year.

In the final year of the programme students are able to work on their individual engineering project as well as group activities to showcase their understanding and skill as engineering practitioners. Optional modules covering three essential themes of Mechanical Engineering provide the opportunity to pursue specialist areas and a limited variety of assessment approaches that are used for these modules.

The level 6 module Advanced FEA for Design provides an exciting new development that brings FEA, a fundamental engineering tool, to the students in the context of engineering design which will certainly help support most students who will be using FEA as part of their individual project. The assessment for this module replicates a postgraduate viva experience challenging the students to present technical work in a professional environment.

Student support: Espresso Maths drop-in support stations at the School of Engineering
Personality and professional strengths finding activity at start of programme.
Mathematics diagnostic testing and follow-up interventions early in year 1.
Development of group work skills and attributes.
Academic Personal Tutors to liaise with Disability Advisors to support to all SpLD students
Academic Personal Tutors to support all students with issues of academic studies and continuation
Success Coaches to support all students with issues of motivation, confidence and well-being

Video capture of course content delivery

E-assessments for rapid feedback

Part B: Programme Structure

Year 1

Full time and sandwich students must take 120 credits from the modules in Year 1.

Year 1 Compulsory Modules (Full Time and Sandwich)

Full time and sandwich students must take 120 credits from the modules in Compulsory Modules (Full Time and Sandwich).

Module Code	Module Title	Credit
UFMFEG-30-0	Engineering Experimentation 2025-26	30
UFMFHG-15-0	Foundation Group Project 2025-26	15
UFMFBG-30-0	Foundation Mathematics: Algebra and Calculus 2025-26	30
UFMFAG-30-0	Foundation Mechanics 2025-26	30
UFMFCG-15-0	Introduction to Mechatronics 2025-26	15

Year 2

Full time and sandwich students must take 120 credits from the modules in Year 2.

Year 2 Compulsory Modules (Full Time and Sandwich)

Full time and sandwich students must take 120 credits from the modules in Compulsory Modules (Full Time and Sandwich).

Module Code	Module Title	Credit
UFMEB9-15-1	Design Fundamentals And Manufacturing Workshop 2026-27	15
UFMEAS-15-1	Professional Skills for Engineers 2026-27	15
UFMFPS-15-1	Applied Electrical Technology 2026-27	15

UFMFMS-30-1	Dynamics Modelling and Simulation 2026-27	30
UFMFLS-30-1	Solid Mechanics, Materials and Manufacturing 2026-27	30
UFMFNS-15-1	Thermofluids 2026-27	15

Year 3
Full time and sandwich students must take 120 credits from the modules in Year 3.

Year 3 Compulsory Modules (Full Time and Sandwich)
Full time and sandwich students must take 120 credits from the modules in Compulsory Modules (Full Time and Sandwich).

Module Code	Module Title	Credit
UFMEBB-15-2	Applied Mechatronics 2027-28	15
UFMEB5-15-2	Project Management for Engineers 2027-28	15
UFMFTS-30-2	Applied Thermofluids 2027-28	30
UFMFL8-15-2	Dynamics 2027-28	15
UFMFSS-30-2	Structural Mechanics 2027-28	30
UFMFUS-15-2	Systems Design 2027-28	15

Year 4
Full time students must take 120 credits from the modules in Year 4.
Sandwich students must take 15 credits from the modules in Year 4.

Sandwich students take a placement year and study UFMF89-15-3 Industrial Placement.

Year 4 Compulsory Modules (Full Time)
Full time students must take 90 credits from the modules in Compulsory Modules (Full Time).

Module Code	Module Title	Credit

UFMEBA-15-3	Advanced FEA for Design 2028-29	15
UFMFSL-15-3	Integrated Electro-Mechanical Systems 2028-29	15
UFMFYS-15-3	Advanced Manufacturing Technology 2028-29	15
UFMEB6-15-3	Engineering in Society 2028-29	15
UFMFX8-30-3	Engineering Project 2028-29	30

Year 4 Compulsory Modules (Sandwich)
Sandwich students must take 15 credits from the modules in Compulsory Modules (Sandwich).

Module Code	Module Title	Credit
UFMF89-15-3	Industrial Placement 2028-29	15

Year 4 Optional Modules (Full Time)
Full time students must select 30 credits from module in Optional Modules (Full Time) with a maximum of 15 credits from each of the following combinations:

UFMFU6-15-3 Composite Engineering OR UFMF7K-15-3 Materials and Structures for Special Applications

UFMFXJ-15-3 Vibrational Dynamics OR UFMFVS-15-3 Vehicle Dynamics

UFMFTA-15-3 Thermofluid Systems

Module Code	Module Title	Credit
UFMFU6-15-3	Composite Engineering 2028-29	15
UFMF7K-15-3	Materials and Structures for Special Applications 2028-29	15
UFMFTA-15-3	Thermofluid Systems 2028-29	15
UFMFVS-15-3	Vehicle Dynamics 2028-29	15

UFMFXJ-15-3	Vibrational Dynamics 2028-29	15

Year 5

Sandwich students must take 105 credits from the modules in Year 5.

Year 5 Compulsory Modules (Sandwich)

Sandwich students must take 75 credits from the modules in Compulsory Modules (Sandwich). ADD ENG DESIGN PROJ WHEN ROLLED OVER

Module Code	Module Title	Credit
UFMEBA-15-3	Advanced FEA for Design 2029-30	15
UFMFSL-15-3	Integrated Electro-Mechanical Systems 2029-30	15
UFMFYS-15-3	Advanced Manufacturing Technology 2029-30	15
UFMFX8-30-3	Engineering Project 2029-30	30

Year 5 Optional Modules (Sandwich)

Sandwich students must select 30 credits from module in Optional Modul with a maximum of 15 credits from each of the following combinations:

UFMFU6-15-3 Composite Engineering OR UFMF7K-15-3 Materials and Structures for Special Applications

UFMFXJ-15-3 Vibrational Dynamics OR UFMFVS-15-3 Vehicle Dynamics

UFMFTA-15-3 Thermofluid Systems

Module Code	Module Title	Credit
UFMFU6-15-3	Composite Engineering 2029-30	15
UFMF7K-15-3	Materials and Structures for Special Applications 2029-30	15
UFMFTA-15-3	Thermofluid Systems 2029-30	15
UFMFVS-15-3	Vehicle Dynamics 2029-30	15

UFMFXJ-15-3	Vibrational Dynamics 2029-30	15

Part C: Higher Education Achievement Record (HEAR) Synopsis

Graduates of this programme will be equipped with a broad understanding of mechanical analysis and design, combined with knowledge of engineering practice, information technology and project management.

The programme produces graduates with a broad-based 'systems' approach to engineering problem solving. Graduates from this programme will be equipped to work in multi-disciplinary teams, able to critically appraise existing ideas and practice and produce creative solutions to engineering problems.

Part D: External Reference Points and Benchmarks

QAA UK Quality Code for HE
Framework for higher education qualifications (FHEQ)
Subject benchmark statement for Higher Education qualifications in engineering (March 2023)
Strategy 2030
University policies
Staff research projects
Relevant PSRB requirements: AHEP4
Industrial Advisory Board

Part E: Regulations

Approved to University Academic Regulations and Procedures.

The PSRB requirements below are permitted within the regulations.

The following requirements apply to awards which have been accredited by a PSRB that comes under the auspices of the Engineering Council UK:
- The permitted maximum compensated credit is 30 credits for a Bachelors or Integrated Masters degree, and a maximum of 20 credits in a Masters degree.

- The awarding of compensated credit may be considered for an overall module mark in the range of 30% to 39% for Levels 4-6 and 40%-49% for Level 7.
- Major individual and group-based project modules must not be compensated.