Programme Specification

Mechanical Engineering {Foundation}

[Sep][SW][Frenchay][6yrs]

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Contents

Section 1: Key Programme Details

Part A: Programme Information

Programme title: Mechanical Engineering {Foundation} [Sep][SW][Frenchay][6yrs]

Highest award: MEng Mechanical Engineering

Interim award: BEng (Hons) Mechanical Engineering

Interim award: BEng Mechanical Engineering

Interim award: DipHE Mechanical Engineering

Interim award: CertHE Engineering

Awarding institution: UWE Bristol

Affiliated institutions: Not applicable

Teaching institutions: UWE Bristol

Study abroad: No

Year abroad: No

Sandwich year: Yes

Credit recognition: No

Department responsible for the programme: FET Dept of Engineering Design & Mathematics, Faculty of Environment & Technology

Contributing departments: Not applicable

Professional, statutory or regulatory bodies:

Institution of Mechanical Engineers (IMechE)

Apprenticeship: Not applicable

Mode of delivery: Sandwich

Entry requirements: For the current entry requirements see the UWE public website

For implementation from: 01 September 2018

Programme code: H30G-SEP-SW-FR-H301

Section 2: Programme Overview, Aims and Learning Outcomes

Part A: Programme Overview, Aims and Learning Outcomes

Overview: This programme will produce graduates with a wide range of expertise relevant to industry in general and in particular industries related to mechanical design, operations and manufacture. The programme covers a broad range of disciplines such as Mechanical Analysis, Mathematics, Electronics, Business and Manufacture. Evidence from local industries indicates a solid demand for graduates with a broad-based 'systems' approach to engineering problem solving. It is anticipated that graduates from the course will play a major role in the design, management and co-ordination of multi-disciplinary projects.

Educational Aims: The aim of the Faculty's MEng programmes is to respond to the need for effective engineering practitioners by offering programmes that are an intellectually challenging mix of taught engineering science and experiential learning. The practitioner approach is intended to produce engineers with a strong orientation towards problem solving, underpinned by theoretical knowledge.

The aim of the Mechanical Engineering programme is to produce graduates with a broad understanding of mechanical analysis and design, combined with awareness of engineering practice, information technology, project management and business issues. The MEng course is distinguished by a greater emphasis upon critical appraisal of existing ideas and practice, original thought and creative ability. This is demonstrated through the higher performance level of MEng students on the part of the course which is common with the BEng (Hons), together with accelerated development in the parts of the course which are specific to MEng students, notably the Level M work.

The aims are that graduates shall be able to:

Apply established and novel Mechanical Analysis concepts to the solution of engineering problems involving Design, Operations and Manufacture.;

Use systems incorporating digital hardware, software, communication, processing algorithms, interfacing circuits and parameter sensing and actuating devices;

Model mechanical engineering systems so as to be able to specify and assess the technical design;

Understand the manufacturing, financial and marketing implications of design proposals;

Identify the links between design, manufacturing and production management and assess the capabilities of manufacturing systems software packages which are used for the design, modification, maintenance and control of manufacturing facilities;

Operate effectively either as individuals or as members of a multi-disciplinary team;

Communicate effectively both orally and in written form;

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

Pursue independent study, undertake enquiry into novel and unfamiliar concepts and implement change in an Engineering environment.

Be equipped with strategic management and leadership skills together with broader engineering knowledge that goes beyond those of the BEng (Hons) degree.

Programme Learning Outcomes:
On successful completion of this programme graduates will achieve the following learning outcomes.

Knowledge and Understanding

A1. The principles governing the behavior of mechanical components and systems

A2. Mathematical methods appropriate to Mechanical engineering and related fields

A3. The properties, characteristics and selection of materials used in mechanical components and systems

A4. A sound understanding of core engineering science and technologies with greater depth in areas pertinent to mechanical systems

A5. The principles of information technology and data communications from a user's perspective

A6. Social, environmental, ethical, economic and commercial factors

A7. The complexity of large-scale engineering systems and projects, with particular emphasis upon mechanical systems

Intellectual Skills

B1. The ability to produce solutions to problems through the application of engineering knowledge and understanding

B2. The ability to use scientific principles in the modelling and analysis of engineering systems, processes and products. The ability to select and apply appropriate mathematical methods for modelling and analysing relevant problems

B3. The ability to use a broad spectrum of technologies/techniques to solve complex engineering problems

B4. The ability to select and apply appropriate computer based methods for modelling and analysing problems in fields relating to the design, manufacture and control of Mechanical components and systems

B5. Adoption of a creative and innovative approach to solving problems and design

B6. Comprehension of the broad picture and demonstration of of a professional attitude to the responsibilities of engineering practitioners

B7. The ability to apply theory in unfamiliar applications and to assimilate new theory

Subject/Professional Practice Skills

C1. Appropriate skills including safe working in experimental work in laboratories and workshops

C2. Demonstrate practical testing of engineering ideas through laboratory work or simulation with supporting technical analysis and critical evaluation of results

C3. Understanding and execution of the design process

C4. Use of a range of computer software for design, analysis and control

C5. Execution and management of multidisciplinary projects, both individually and as a member of a group

C6. Understanding individual roles in teams and the responsibilities of leadership

Transferable Skills and other attributes

D1. Communication skills: to communicate orally or in writing, including, for instance, the results of technical investigations, to peers and/or to "problem owners"

D2. Self-management skills: to plan and manage time, to meet deadlines and to work with others

D3. IT Skills in Context (to use software in the context of problem-solving investigations, and to interpret findings)

D4. Problem formulation and solution

D5. Progression to self learning: To gain experience of and to develop skills independently of structured class work

D6. Comprehension of professional literature: to read and to use literature sources appropriate to the discipline to support learning activities

D7. Ability to critically appraise and adjust plans to changing circumstances

D8. Ability to think independently and self-manage the work environment

Part B: Programme Structure

Year 1
The student must take 120 credits from the modules in Year 1.

Year 1 Compulsory Modules
The student must take 120 credits from the modules in Compulsory Modules.

Module Code	Module Title	Credit
UFMFEG-30-0	Engineering Experimentation 2018-19	30
UFMFHG-15-0	Foundation Group Project 2018-19	15
UFMFBG-30-0	Foundation Mathematics: Algebra and Calculus 2018-19	30
UFMFAG-30-0	Foundation Mechanics 2018-19	30
UFMFCG-15-0	Introduction to Mechatronics 2018-19	15

Year 2
The student must take 120 credits from the modules in Year 2.

Year 2 Compulsory Modules
The student must take 120 credits from the modules in Compulsory Modules.

Module Code	Module Title	Credit
UFMFN3-30-1	Design, Materials and Manufacturing 2019-20	30
UFMFF3-15-1	Energy and Thermodynamics 2019-20	15
UFMFJ9-30-1	Engineering Mathematics 2019-20	30
UFMFG3-15-1	Fluid Dynamics 2019-20	15
UFMFH3-30-1	Stress & Dynamics 2019-20	30

Year 3
The student must take 120 credits from the modules in Year 3.

Year 3 Compulsory Modules
The student must take 120 credits from the modules in Compulsory Modules.

Module Code	Module Title	Credit
UFMF88-30-2	Design and Electromechanical Systems 2020-21	30
UFMFL8-15-2	Dynamics 2020-21	15
UFMFK9-15-2	Engineering Mathematics 2 2020-21	15
UFMFW8-30-2	Heat Transfer, Power and the Environment 2020-21	30
UFMFHA-15-2	Project Management 2020-21	15
UFMFQA-15-2	Stress Analysis 2020-21	15

Year 4
The student must take 15 credits from the modules in Year 4.

Year 4 Sandwich Year
We recommend that students take this opportunity to do a year-long placement in industry or research. Students on Sandwich take the following module:

Module Code	Module Title	Credit
UFMF89-15-3	Industrial Placement 2021-22	15

Year 5
The student must take 105 credits from the modules in Year 5.

Year 5 Compulsory Modules
The MEng A module is the default but the BEng module can be accepted by agreement with the programme leader, subject to the student meeting progression criteria from Level 2.

Module Code	Module Title	Credit
UFMFU7-15-3	Computational Methods 2022-23	15

UFMFY8-30-3	Individual Project MEng A 2022-23	30

Year 5 Optional Modules
Students take 60 credits from optional modules. Students must not take more than 75 credits in one semester.

Year 5 Optional Modules A
Students must select 30-60 credits from Optional Modules A

Module Code	Module Title	Credit
UFMFYJ-15-3	Control Engineering 2022-23	15
UFMFSL-15-3	Integrated Electro-Mechanical Systems 2022-23	15
UFMF7K-15-3	Materials and Structures for Special Applications 2022-23	15
UFMFXJ-15-3	Vibrational Dynamics 2022-23	15

Year 5 Optional Modules B
Students must select 0-15 credits from Optional Modules B

Module Code	Module Title	Credit
UFMFU6-15-3	Composite Engineering 2022-23	15
UFMFP9-15-3	Mechanics of Materials 2022-23	15

Year 5 Optional Modules C
Students must select 0-15 credits from Optional Modules C

Module Code	Module Title	Credit
UFMFD7-15-3	Energy Technologies 2022-23	15
UFMFTA-15-3	Thermofluid Systems 2022-23	15

Year 6
Students take 60 credits from optional modules. Students must not take more than 75 credits in one semester.

Year 6 Compulsory Modules
The student must take 60 credits from the modules in Compulsory Modules.

Module Code	Module Title	Credit
UFMERY-30-M	Individual Project MEng B 2023-24	30
UMMC9U-15-M	Innovation in Operations Management 2023-24	15
UFMFXC-15-M	Masters Group Project 2023-24	15

Year 6 Optional Modules
\students must select 60 credits from Optional Modules.

No more than 75 credits to be taken in TOTAL in one semester.

Module Code	Module Title	Credit
UFMFUL-15-M	Advanced Control Engineering 2023-24	15
UFMFTL-15-M	Advanced Mechatronics 2023-24	15
UFMFWL-15-M	Computational Fluid Dynamics 2023-24	15
UFMEEC-15-M	Concurrent Engineering and Design for Manufacture 2023-24	15
UFMENU-15-M	Design of Fluid Systems 2023-24	15
UFMFVL-15-M	Mechanics of Composites 2023-24	15
UFMEBP-15-M	Structural Integrity in Design 2023-24	15

Part C: Higher Education Achievement Record (HEAR) Synopsis

MEng Mechanical Engineering will produce graduates with a broad understanding of mechanical analysis and design, combined with awareness of engineering practice, information technology, project management and business issues. They will have a wide range of expertise relevant to industry in general and in particular industries

related to mechanical design, operations and manufacture.

Graduates of MEng Mechanical Engineering will be able to:

apply established and novel Mechanical Analysis concepts to the solution of engineering
problems involving Design, Operations and Manufacture.

use systems incorporating digital hardware, software, communication, processing algorithms,
interfacing circuits, parameter sensing and actuating devices.

understand manufacturing, financial and marketing implications of design proposals.

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

pursue independent study, undertake enquiry into novel and unfamiliar concepts and implement change in an Engineering environment.

Part D: External Reference Points and Benchmarks

This programme has been prepared with reference to a number of external benchmarks, including the QAA Subject Benchmark Statement for Engineering, the QAA Framework for HE Qualifications, the university's learning and teaching strategy, and a number of more specialised publications relating to mechanical engineering.

The Subject Benchmark Statement for Engineering outlines a set of skills expected of a graduate in an engineering discipline (Section 4 of the Statement refers), while noting that they should be interpreted in the context of the particular engineering discipline which is being studied. These skills map closely to the skills contained in the learning outcomes for this programme, and hence we have confidence that the programme is in accordance with the precepts of the Statement.

The university's Learning and Teaching strategy has informed the faculty's policy for the delivery of its programmes, whose main features are described in section 7.

Part E: Regulations

Approved to a variant of the University Regulations and Procedures.