



Programme Specification

Mechanical Engineering [Sep][FT][Frenchay][4yrs]

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Section 1: Key Programme Details

Part A: Programme Information

Programme title: Mechanical Engineering [Sep][FT][Frenchay][4yrs]

Highest award: MEng Mechanical Engineering

Interim award: BEng (Hons) Mechanical Engineering

Interim award: BEng Mechanical Engineering

Interim award: DipHE Mechanical Engineering

Interim award: CertHE Mechanical Engineering

Awarding institution: UWE Bristol

Affiliated institutions: Not applicable

Teaching institutions: UWE Bristol

Study abroad: No

Year abroad: No

Sandwich year: No

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: Full-time

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

For implementation from: 01 September 2020

Programme code: H30T13-SEP-FT-FR-H301

Section 2: Programme Overview, Aims and Learning Outcomes

Part A: Programme Overview, Aims and Learning Outcomes

Overview: The curriculum is designed for students seeking an engineering education closely aligned to engineering practice. Technical knowledge, engineering practice, business awareness and sustainability are integrated through projects and revisited to produce confident graduates able to apply their skills to novel situations and create engineering solutions that benefit society.

Professional 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. Projects 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 taken to an advanced level in the optional modules. Sufficient electrical and electronic content has been included in the core programme for the study of engineering problems involving electromechanical and mechatronic systems with the option of further studying

advanced artefacts.

The ability to work in multidisciplinary teams on projects that require a broader view of the role of engineering in industry and society is developed through the core programme using project weeks to bring students together in problem finding and solution spaces where students are able to interact with each other, academics and external practitioners.

The MEng year involves students working on a multidisciplinary group project that requires the demonstration of technical and business understanding of an engineering problem. This project module accounts for 50% of the level 7 credit and requires the application of innovative problem solving and project management skills. Together with the advanced level 7 options, students will graduate from the MEng programme with a significant enhancement of their ability and experience compared to the BEng programme.

The integration of knowledge, skills and practice allows the tackling of real engineering challenges and encourage students to engage with the wider role that mechanical engineers and specifically engineering habits of mind can play in tackling global challenges. This is 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.

Educational Aims: Be able to work as a graduate mechanical engineer across the engineering sector able to work as an effective member of a multidisciplinary 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 in the field in terms of business improvement and environmental sustainability.

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 strategic management and leadership skills within the context of a significant innovative engineering project requiring technical and business expertise.

Programme 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 systems incorporating digital hardware, software, communication, processing algorithms, interfacing circuits and parameter sensing and actuating devices.
- PO3. Model mechanical engineering systems and be able to specify and assess technical designs.
- PO4. Understand the manufacturing, financial and 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 either as individuals or 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.
- PO9. Demonstrated strategic management and leadership skills together with broader engineering knowledge that goes beyond those of the BEng(Hons) degree

Part B: Programme Structure

Year 1

Year 1 Compulsory Modules

| Module Code | Module Title | Credit |
|-------------|--|--------|
| UFMFPS-15-1 | Applied Electrical Technology 2020-21 | 15 |
| UFMFMS-30-1 | Dynamics Modelling and Simulation 2020-21 | 30 |
| UFMFKS-30-1 | Engineering Practice 1 2020-21 | 30 |
| UFMFLS-30-1 | Solid Mechanics, Materials and Manufacturing 2020-21 | 30 |
| UFMFNS-15-1 | Thermofluids 2020-21 | 15 |

Year 2

Year 2 Compulsory Modules

| Module Code | Module Title | Credit |
|-------------|--------------------------------|--------|
| UFMFTS-30-2 | Applied Thermofluids 2021-22 | 30 |
| UFMFL8-15-2 | Dynamics 2021-22 | 15 |
| UFMFQS-15-2 | Engineering Practice 2 2021-22 | 15 |

| | | |
|-------------|------------------------------|----|
| UFMFRS-15-2 | Engineering Research 2021-22 | 15 |
| UFMFSS-30-2 | Structural Mechanics 2021-22 | 30 |
| UFMFUS-15-2 | Systems Design 2021-22 | 15 |

Year 3

Year 3 Compulsory Modules

| Module Code | Module Title | Credit |
|-------------|--|--------|
| UFMFV8-15-3 | Group Design and Integration Project 2022-23 | 15 |
| UFMFY8-30-3 | Individual Project MEng A 2022-23 | 30 |
| UFMFNQ-15-3 | Professionalism for Engineers 2022-23 | 15 |

Year 3 Optional Modules

The student must select 60 credits from module in Optional Modules.

Students may select 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

UFMF7T-15-3 Advanced Heat Transfer OR UFMFTA-15-3 Thermofluid Systems

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

UFMFYS-15-3 Advanced Manufacturing Technology OR UFMFP9-15-3 Mechanics of Materials

UFMFSL-15-3 Integrated Electromechanical Systems OR UFMFYJ-15-3 Control Engineering

| Module Code | Module Title | Credit |
|-------------|--------------------------------|--------|
| UFMF7T-15-3 | Advanced Heat Transfer 2022-23 | 15 |

| | | |
|-------------|---|----|
| UFMFYS-15-3 | Advanced Manufacturing Technology 2022-23 | 15 |
| UFMFU6-15-3 | Composite Engineering 2022-23 | 15 |
| UFMFYJ-15-3 | Control Engineering 2022-23 | 15 |
| UFMFWS-15-3 | Emerging Automotive Technology 1 2022-23 | 15 |
| UFMFCL-15-3 | Engineering and Society 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 |
| UFMFP9-15-3 | Mechanics of Materials 2022-23 | 15 |
| UFMFTA-15-3 | Thermofluid Systems 2022-23 | 15 |
| UFMFVS-15-3 | Vehicle Dynamics 2022-23 | 15 |
| UFMFXJ-15-3 | Vibrational Dynamics 2022-23 | 15 |

Year 4

Year 4 Compulsory Module

| Module Code | Module Title | Credit |
|-------------|--|--------|
| UFMF8T-60-M | Masters Group Capstone Project 2023-24 | 60 |

Year 4 Optional Modules

Students must select 60 credits from the modules in Optional Modules.

| Module Code | Module Title | Credit |
|-------------|-----------------------------------|--------|
| UFMFTL-15-M | Advanced Mechatronics 2023-24 | 15 |
| UFMF9T-15-M | Advanced Vehicle Dynamics 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 |
| UFMFAT-15-M | Emerging Automotive Technology 2 2023-24 | 15 |
| UFMFVL-15-M | Mechanics of Composites 2023-24 | 15 |
| UFMEE8-15-M | Principles of Lean Engineering 2023-24 | 15 |
| UFMEBP-15-M | Structural Integrity in Design 2023-24 | 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 (Feb 2015)

Strategy 2030

University policies

Staff research projects

Relevant PSRB requirements: AHEP3

Industrial Advisory Board

Part E: Regulations

Approved variant to University Academic Regulations and Procedures

The 480 credit integrated Bachelor / Masters degree (or 600 credit integrated Bachelor / Masters with foundation year) is not classified, but may be awarded with merit or distinction.

The award of merit or distinction in Mechanical Engineering is determined as follows:

Distinction

An overall average of 70% has been achieved across 210 credits at level 6 or above. This average will be calculated based upon the marks for all of the level 7 modules and at level 6, must include the marks and whole credit for the project followed by the marks for the best remaining level 6 modules which are then required to make up the credit total.

Merit

An overall average of 60% has been achieved across 210 credits at level 6 or above. This average will be calculated based upon the marks for all of the level 7 modules and at level 6, must include the marks and whole credit for the project followed by the marks for the best remaining level 6 modules which are then required to make up the credit total.

Condoned Credit

Approved to variant University Academic Regulations and Procedures.

The following variant regulation for condoned credit (E4) applies to students on this award which has been accredited by a PSRB that comes under the auspices of

Engineering Council UK.

The variant applied to Level 4 September 2020 intake onwards.

The permitted maximum condoned credit is 30 credits for a Bachelors or Integrated Masters degree and a maximum of 20 credits in a Masters degree.

The awarding of condoned credit may be considered for an overall module mark in the range 30% to 39%.

As a consequence Engineering Council UK regulations about the offer of excused credit for modules critical to the awarding of accreditation, excused credit will not be available on this award.