



Programme Specification

Automotive Engineering [Sep][SW][Frenchay][5yrs]

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Section 1: Key Programme Details

Part A: Programme Information

Programme title: Automotive Engineering [Sep][SW][Frenchay][5yrs]

Highest award: MEng Automotive Engineering

Interim award: BEng (Hons) Automotive Engineering

Interim award: BEng Automotive Engineering

Interim award: DipHE Automotive Engineering

Interim award: CertHE Automotive 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: H335-SEP-SW-FR-H335

Section 2: Programme Overview, Aims and Learning Outcomes

Part A: Programme Overview, Aims and Learning Outcomes

Overview: 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.

Educational Aims: The aim of the Automotive Engineering programme is to produce graduates with a broad understanding of mechanical analysis and design, combined with awareness of engineering practice, information technology, assembly and manufacture, project management and business issues, all contextualised to the automotive environment. Graduates with MEng will be equipped to solve multi-disciplinary problems and lead future developments in industry. It is anticipated that graduates from the course will play a major role in the design, management and co-ordination of multi-disciplinary projects.

The development of the award was undertaken with reference to the QAA Subject Benchmark in Engineering (2010) with particular reference to the learning outcomes and ethos of the MEng degree.

The engineering provision at UWE is entirely in alignment with the subject benchmark statements, and the design of this MEng properly reflects the QAA in its statement regarding MEng degrees: "Crucially, they will have the ability to integrate their knowledge and understanding....to solve a substantial range of Engineering problems....through involvement in individual and group design projects...."

The aims of the programme are:

To prepare students for careers in automotive engineering and related disciplines. The content of the programme ensures that students will have the appropriate level of knowledge and understanding of mechanical engineering so that they will also be suitable for employment in the wider engineering domain and not be restricted only to the automotive environment.

To provide knowledge and understanding of scientific principles and methods necessary to underpin the students' education in engineering. To provide insight into, and practical skills in, the creation of complex engineering products, particularly in relation to automotive engineering. This involves understanding the opportunities provided by vehicle power trains, chassis configurations, various materials, aerodynamics assembly and manufacture; all considered within the constraints imposed by the relevant regulations. In addition, issues relating to efficient and effective use of resources within the power train and the reduction of environmental impact will be explored.

To provide the students with the 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.

To prepare students for progression to study for higher degrees in appropriate engineering subjects.

To continue the development of those general study skills that will enable students to become independent, lifelong learners.

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

Programme Learning Outcomes:

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

Knowledge and Understanding

- A1. Automotive and Mechanical Engineering principles and design
- A2. Generic engineering topics, plus additional specialist subjects relating to automotive engineering (such as vehicle dynamics, aerodynamics and power train systems)
- A3. Structures, materials and safety
- A4. Integration of mechanical and nonmechanical elements in complex engineering systems
- A5. Business issues relating to automotive engineering products and manufacture
- A6. Social, environmental, ethical, economic and commercial factors and their influence on engineering practice. The effect of legislation.
- A7. The complexity of large-scale engineering systems and projects, with particular emphasis upon automotive 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 and solve complex engineering problems
- B4. Adoption of a creative and innovative approach to solving problems and design and manage conflicting objectives and constraints
- B5. Comprehension of the broad picture and demonstration of of a professional attitude to the responsibilities of engineering practitioners
- B6. Critical Thinking: The ability to select and apply appropriate mathematical and computer based methods for modelling and analysing problems in fields relating to the design, manufacture and control of automotive components and systems

- 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 multi- disciplinary 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
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 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
UFMFMC-30-2	Automotive Technology 2020-21	30
UFMF88-30-2	Design and Electromechanical Systems 2020-21	30
UFMFLP-15-2	Dynamics (PBL) 2020-21	15
UFMFKP-15-2	Engineering Mathematics 2 (PBL) 2020-21	15
UFMFHA-15-2	Project Management 2020-21	15
UFMFMP-15-2	Stress Analysis (PBL) 2020-21	15

Year 3

Students on the Sandwich route take spend a year on a work or study placement after Year 2. Students on the sandwich route will undertake UFMF89-15-3 Industrial Placement

Year 3 Compulsory Placement Modules

The student must take 15 credits from the modules in Compulsory Placement Modules.

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

Year 4

The student must take 105 credits from the modules in Year 4.

Year 4 Compulsory Modules

Please note: The MEngA 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
UFMFXJ-15-3	Vibrational Dynamics 2022-23	15

Year 4 Optional Modules

Students must choose one module from Group 1 and one module from Group 2.

Year 4 Optional Modules Group 1

Students choose one of the following modules

Module Code	Module Title	Credit
UFMFNC-30-3	Automotive Manufacturing 2022-23	30
UFMFT9-30-3	Motorsport Performance 2022-23	30

Year 4 Optional Modules Group 2

Students choose one of the following modules

Module Code	Module Title	Credit
UFMFU6-15-3	Composite Engineering 2022-23	15
UFMFYJ-15-3	Control Engineering 2022-23	15
UFMF7K-15-3	Materials and Structures for Special Applications 2022-23	15

Year 5

The student must take 120 credits from the modules in Year 5.

Year 5 Compulsory Modules

The student must take 105 credits from the modules in Compulsory Modules.

Module Code	Module Title	Credit
UFMEVE-15-M	Advanced Chassis 2023-24	15
UFMF8E-15-M	Advanced Powertrain Technologies 2023-24	15
UFMF7L-15-M	Computational Fluid Dynamics 2023-24	15
UFMERY-30-M	Individual Project MEng B 2023-24	30
UFMFXC-15-M	Masters Group Project 2023-24	15
UFMFVL-15-M	Mechanics of Composites 2023-24	15

Year 5 Optional Modules

The student must take 15 credits from the modules in Optional Modules.

Module Code	Module Title	Credit
UFMEEA-15-M	Electromechanical Systems Integration 2023-24	15
UFMEBP-15-M	Structural Integrity in Design 2023-24	15

Part C: Higher Education Achievement Record (HEAR) Synopsis

The IMechE accredited programmes are designed to provide graduates with the skills and capabilities being demanded by the sector including technical topics such as powertrain technology, vehicle dynamics and aerodynamics and advanced manufacturing. The programmes are delivered in a way that develops technically competent individuals who think and communicate effectively and who can conduct inquiry, solve problems, undertake critical analysis and deliver effective Automotive Engineering solutions in a constantly changing business context.

The programmes provide a foundation for lifelong learning, emphasising the development of knowledge, skills and professional values essential to the Automotive Engineering industry.

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 specialised publications relating to motorsport education, as referenced below.

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 Teaching and Learning Methods.

Part E: Regulations

Approved to a variant of the University 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 Automotive Engineering is determined as follows:

Distinction

An overall average of 70% has been achieved across 210 credits at level 3 or above (FHEQ level 6). This average will be calculated based upon the marks for all of the level M modules (FHEQ level 7) and at level 3, must include the marks and whole credit for the project followed by the marks for the best remaining level 3 modules (FHEQ level 6) which are then required to make up the credit total.

Merit

An overall average of 60% has been achieved across 210 credits at level 3 or above (FHEQ level 6). This average will be calculated based upon the marks for all of the level M modules (FHEQ level 7) and at level 3, must include the marks and whole credit for the project followed by the marks for the best remaining level 3 modules (FHEQ level 6).