



ACADEMIC SERVICES

PROGRAMME SPECIFICATION

Part 1: Basic Data			
Awarding Institution	University of The West of England		
Teaching Institution	Weston College (University Centre Weston)		
Delivery Location	Weston College (University Centre Weston)		
Study abroad / Exchange / Credit recognition	Not applicable		
Faculty responsible for programme	Faculty of Environment and Technology		
Department responsible for programme	Engineering, Design and Mathematics		
Modular Scheme Title			
Professional Statutory or Regulatory Body Links			
Highest Award Title	FdSc Mechanical Engineering		
Default Award Title			
Fall-back Award Title			
Interim Award Titles	Certificate of Higher Education in Mechanical Engineering		
UWE Progression Route	BEng(Hons)/MEng Mechanical Engineering		
Mode(s) of Delivery	PT only		
Codes	UCAS:		JACS:
	ISIS2: H30E		HESA:
Relevant QAA Subject Benchmark Statements	Subject benchmark statements: Engineering QAA (2015), Foundation Degree Qualification Benchmark (2010)		
First CAP Approval Date	2 June 2016	Valid from	September 2016
Revision CAP Approval Date		Revised with effect from	
Version	1		
Review Date	June 2022		

Part 2: Educational Aims of the Programme

The aim of the Mechanical Engineering Foundation Degree is to produce graduates with a broad understanding of mechanical analysis and design, combined with awareness of engineering practice, information technology and project management. The graduates from this programme will be equipped to solve multi-disciplinary projects with a greater emphasis upon critical appraisal of existing ideas and practice original thought and creative ability.

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, Stress & Dynamics, 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.

Foundation Degrees are intended to provide the knowledge and skills that are necessary to enable employees to be versatile and adaptable in progressing to and within work. Employability is a key aspect in Foundation Degree programmes and its inclusion should equip and assist learners to enhance their employment opportunities, and/or allow them to prepare for a career change.

Authentic and innovative work-based learning is an integral part of the Foundation Degrees. It enables learners to take on appropriate role(s) within the workplace, giving them the opportunity to learn and apply the skills and knowledge they have acquired as an integrated element of the programme. It involves the development of higher-level learning within both the institution and the workplace. It should be a two-way process, where the learning in one environment is applied in the other. Work-based learning can be achieved through many forms, including full-time or part-time work, integrated work placements, and real work environments. As a component of the Higher Apprenticeship Framework the Foundation Degree will enable employers to fill higher level skills gap and for students to be immediately productive within the industry on graduation.

The aims are that graduates shall be able to:

1. Apply established and novel Mechanical Analysis concepts to the solution of engineering problems involving Design, Operations and Manufacture.;
2. Model mechanical engineering systems so as to be able to specify and assess the technical design;
4. Understand the design, material and manufacturing.
5. Identify the links between design, manufacturing and production management, modification, maintenance and control of manufacturing facilities;
6. Operate effectively either as individuals or as members of a multi-disciplinary team;
7. Communicate effectively both orally and in written form;
8. Pursue independent study, undertake enquiry into novel and unfamiliar concepts and implement change in an Engineering environment.

Programme requirements for the purposes of the Higher Education Achievement Record (HEAR)

Foundation Degrees are intended to provide the knowledge and skills that are necessary to enable employees to be versatile and adaptable in progressing to and within work. Employability is a key aspect in Foundation Degree programmes and its inclusion should equip and assist learners to enhance their employment opportunities, and/or allow them to prepare for a career change.

The aim of the Mechanical Engineering Foundation Degree is to produce graduates with a broad understanding of mechanical analysis and design, combined with awareness of engineering practice, information technology and project management. The programme covers a broad range of disciplines such as Mechanical Analysis, Mathematics, and Stress & Dynamics. Evidence from local industries indicates a solid demand for graduates with a broad-based 'systems' approach to engineering problem solving. The graduates from this programme will be equipped to solve multi-disciplinary projects with a greater emphasis upon critical appraisal of existing ideas and practice, original thought and creative ability.

Part 3: Learning Outcomes of the Programme

The award route provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas:

Learning Outcomes:	UFMFJ9-30-1	UFMF7C-30-1 (WBL)	UFMFH3-30-1	UFMFF3-15-1	UFMFG3-15-1	UFMF88-30-2	UFMFL8-15-2	UFMF8C-15-2 (WBL)	UFMFK9-15-2	UFMQA-15-2	UFMFW8-30-2
A) Knowledge and understanding of:											
1. The principles governing the behavior of mechanical components and systems.		X	X	X	X	X	X	X		X	X
2. Mathematical methods appropriate to mechanical engineering and related fields.	X		X		X		X		X	X	
3. The properties, characteristics and selection of materials used in mechanical components and systems.		X		X	X	X			X		X
4. Core engineering science and technologies with greater depth in areas pertinent to mechanical systems.		X				X			X	X	X
5. The principles of information technology and data communications from a user's perspective.						X		X			
6. Management principles								X			
(B) Intellectual Skills											
1. The ability to produce novel solutions to problems through the application of engineering knowledge and understanding		X				X					X
2. The skills of selecting and applying scientific principles in the modelling and analysis of mechanical engineering problems		X	X	X	X	X	X			X	X
3. The ability to use a broad spectrum of technologies/techniques to solve design problems.						X	X			X	X
4. The capability to use scientific/technological principles in the development of engineering solutions to practical problems in the domain of mechanical engineering.		X	X	X	X	X	X			X	X
5. The ability to understand issues relating to the management processes associated with their design and manufacture.		X						X			
6. The ability to use independent thinking and analysis in the development of engineering solutions.		X	X	X	X	X	X		X	X	X
7. The capability to review available literature on topics related to mechanical engineering.						X	X			X	X
8. The capability to evaluate evidence to support conclusions, reviewing its reliability, validity and significance. Also to be able to investigate contradictory information and identify reasons for contradictions.		X					X	X		X	X
(C) Subject/Professional/Practical Skills											
1. Use appropriate methods for modeling and analysing problems.	X		X	X	X	X	X		X	X	X
2. Use relevant design, test and measurement equipment.		X	X	X	X	X			X	X	X

Part 3: Learning Outcomes of the Programme

3. Use experimental methods in the laboratory relating to engineering manufacture and test		X			X	X				X	X
4. Demonstrate practical testing of engineering ideas through laboratory work or simulation with technical analysis and critical evaluation of results.		X	X	X	X	X				X	X
5. Act autonomously, with minimal supervision or direction, within agreed guidelines.		X				X					X
6. Execute and manage multi-disciplinary projects.								X			
(D) Transferable skills and other attributes											
1. Communication skills: To communicate orally or in writing, including, for instance, the results of technical investigations, to peers and/or to "problem owners".		X	X	X	X	X		X			
2. Self-management skills: To manage one's own time; to take responsibility for the quality of the work; to meet deadlines; to work with others having gained insights into the problems of team-based systems development.	X	X	X	X	X	X	X	X	X	X	X
3. IT Skills in Context: To use software in the context of problem-solving investigations, and to interpret findings.	X			X	X			X			
4. Problem formulation: To express problems in appropriate notations.	X	X	X	X	X	X	X		X	X	X
5. Progression to independent learning: To gain experience of, and to develop skills in, learning independently of structured class work. For example, to develop the ability to use on-line facilities to further self-study.	X	X	X	X	X	X	X	X	X	X	X
6. Comprehension of professional literature: To read and to use literature sources appropriate to the discipline to support learning activities.		X	X	X	X	X	X	X	X	X	X
7. Group Working: To be able to work as a member of a team; to be aware of the benefits and problems which teamwork can bring.		X						X			
8. Information Management: To be able to select and manage information, competently undertaking reasonably straight-forward research tasks with minimum guidance.						X		X			X
9. Self-evaluation: To be confident in application of own criteria of judgement and can challenge received opinion and reflect on action. Can seek and make use of feedback.		X				X		X			X

Part 4: Student Learning and Student Support

Students undertake a minimum average of 12 hours/week contact time over the course of the full undergraduate programme. This contact time encompasses a range of face-to-face activities as described below. In addition a range of other learning activities will be embedded within the programme which, together with the contact time, will enable learning outcomes to be achieved and demonstrated. The FdSc will typically be in excess of this minimum due to the significant proportion of laboratory based study. PSRB recommendation for engineering programmes is 18 hours contact per week in the first year of study.

Supplemental instruction will also be provided informally in the workplace, training facilities as well as formally for modules delivered as work based learning.

Induction is undertaken at both University Centre Weston (Weston College) and at UWE Frenchay as

Part 4: Student Learning and Student Support

the students will be expected to use systems and resources at both sites. They are encouraged to see themselves as UWE students.

On the FdSc Mechanical Engineering programme, teaching is a mix of scheduled, independent and work-based learning. For the programme:

Scheduled learning includes lectures, tutorials, project supervision, demonstration, practical classes and workshops; work based learning and supervised time in workshop.

Independent learning includes hours engaged with essential reading, case study preparation, assignment preparation and completion etc. These sessions constitute an average time per level as indicated in the table below.

Work-based Learning includes time spent exploring issues within their organisation, using the knowledge gained on the course to address a problem(s) related to systems engineering and/or management processes and practice within their own working environment. Work based modules will be supported in the workplace by a work-based supervisor/mentor from within their own organisation. This supervisor will be approved by University Centre Weston and will engage with the College visiting tutor/assessor to ensure that the student gains maximum benefit from the work based learning opportunities.

Academic Support

Academic advice and support is the responsibility of the staff delivering the module in question. Staff are expected to be available outside normal timetabled hours, either by appointment or through published staff availability, in order to offer advice and guidance on matters relating to the material being taught and on its assessment.

Technology Enhanced Learning

All modules on the Mechanical Engineering programme are available on the Virtual Learning Environment "Blackboard/Moodle". Additionally, computer based e-assessment / online is implemented in a number of modules, so that students can take regular short tests with automated computer generated feedback.

Description of the teaching resources provided for students

Working Environment

Distinctive Features

The FdSc is delivered by University Centre Weston to which the following statements apply:

1. Staff

Academic staff who teach on this programme are academically well qualified up to PhD level, have relevant extensive industrial experience and have extensive teaching experience. They hold teaching qualifications and are experienced in dealing with the needs of a wide variety of students

2. Teaching Facilities

Students on this programme will benefit from excellent teaching facilities including well- equipped workshops and laboratories in the new South West Skills Campus, well-equipped Mechanical workshop and state-of-the-art classrooms with Interactive Whiteboards and Internet connections. The Labs are equipped with PCs and Laptops with specialist software. Virtual Learning Environment that the students can access 24/7. The students also have full access to the engineering and library facilities at UWE.

3. Equipment

The educational experience of students on this programme will be enhanced by the use of equipment such as computer based test instrumentation, microprocessor and microcontroller development systems, PLC Trainers electro mechanical rigs and specialist software, including electronic and mechanical Computer Aided Design

4. Student Support

Part 4: Student Learning and Student Support

University Centre Weston is committed to widening participation in learning, including enhancing progression into HE provision. The College has high quality learning support services which are used to address the barriers to learning faced by many students in the area. There are specific learner support arrangements for flexible learners in the workplace and extensive support mechanisms for managing and mentoring programmes. All students receive tutorials for academic and pastoral support. Additional support will be provided through:

- The personal tutor assigned to the programme
- Specialist support and welfare services
- HE student support service provided by the HE Academic Registry Team (HEART) at University Centre Weston.
- An apprenticeship team and assessors to support work placements

5. Industrial Support

University Centre Weston has strong employer links that are used to inform the curriculum by identifying changing skills needs and gaps in provision. Employers also actively participate in aspects of course delivery

Students also have access to facilities and student support services at UWE.

Progression to Independent Study Many modules require students to carry out independent study, such as research for projects and assignments. A full range of facilities are available to help students with these. The philosophy is accordingly to offer students both guided support and opportunities for independent study. Guided support, mainly in the form of timetabled sessions, takes the form of lectures, tutorials, seminars and practical laboratory sessions. Students are expected to attend all sessions on their timetable, this is especially important because of the high content of practical lab work in the programme. The progression to independent study is also assisted by the nature of the support offered in individual modules. Typically, module leaders will provide a plan for the module indicating the activities to be carried out and the forms of learning to be undertaken during the delivery of the module, with a view to encouraging students to plan ahead and to take responsibility for managing their time and resources. The assessment processes and timetable for assessments adheres to UWE requirements.

6. Engineering Facilities

Students can take full advantage of the fully stocked and dedicated laboratories, machining, welding & fabrication workshops, laboratories equipped with the latest CAD/CAM, CNC, Materials, Pneumatic/Hydraulics, Programmable Logic Control, Electronics and Process Control Technology. These facilities will give them access to industry standard training and education. Dedicated PCs and Laptops with industry standard software are available to students. To further enhance our CAD/CAM provision we recently purchased a new CNC machining centre enabling the link between 3D modelling software, machining simulation, stress analysis rigs, a sub-sonic wind tunnel and computerised manufacturing. In addition, we have 3D prototyping technologies, standard Robotics, PLC, Process Control and other Instrumentation and Control technologies and hardware. Foundation degree students will have full access to the above facilities as well as to general purpose teaching rooms and ILT equipped teaching spaces. The students also have access to a well-stocked library with virtual learning facility and electronic resources.

7. Library and IT Provision

The University Centre Weston main library site is located centrally within the Winter Gardens. We subscribe to a wide range of electronic resources to support the whole curriculum including eBooks and databases. All our e-resources are available through the virtual learning environment, MOODLE and we are linking relevant curriculum resources directly to courses within MOODLE. As students of The University of the West of England students have the opportunity to access a range of:

- specialist laboratories and IT rooms at UWE in addition to the College facilities.
- the University's library and online resources.

The current software resources available include the standard Windows Office packages plus specialist software to service the current engineering curriculum needs. The current list of specialist engineering software is included.

Part 4: Student Learning and Student Support

University Centre Weston and UWE library services work closely together.

8. Technology Enhanced Learning (TEL)

The main repository for on-programme learning materials at HE level will be the VLE (Blackboard/Moodle) as well as a move to Office 365. This is now extensively used by all engineering staff as well as students as the first port of call for unit specific materials. The vast majority of learning materials have been developed and been made available by the teaching staff of UWE, but will be augmented and enhanced by University Centre Weston staff, and include subject and lesson notes, presentations, schemes of work and assignments as well as links to other resources (e.g. hyperlinks). All networked, Office 365 and VLE resources, including networked software applications, are available via any internet connection for any enrolled student via the remote access link on the College website.

9. Pastoral Care

The HE Academic Registry Team (HEART) offer wide range of support for students with additional learning needs and disabilities. HEART also offers welfare support and has a Mental Health Specialist available to all students regardless of a diagnosis. Study Skills specialist support is arranged and provided by HEART, and students are able to contact them directly to discuss any issues they may be having; personal or academic.

Students can disclose a learning need or disability at any point during the application and enrolment process.

10. Student Representatives

The University of the West of England requires each programme to have at least one student representative from each year of the programme. Student Representatives are elected by the student group and will attend the Programme Committee meetings at University Centre Weston. He or she will be able to raise issues and concerns on behalf of fellow students with members of the Programme Team. The student representative can also relay student concerns to module leaders or HEART at any time.

11. Employability

The majority of students on FdSc Mechanical Engineering will be employed and the course will offer them career progression through academic and professional development. The college has a dedicated career advice and guidance team to support the students throughout the course.

Students also have access to the University Centre Weston Careers Service which is provided by UWE but available to students at the Winter Gardens campus.

Description of any Distinctive Features

The College has strong employer links which are used to inform the curriculum by identifying changing skill needs and gaps in provision. Employers also actively participate in aspects of course delivery

Students also have access to the all facilities and student support services at UWE.

Part 5: Assessment

A: Approved to [University Regulations and Procedures](#)

Assessment Strategy

A broad range of assessment strategies are used ensuring that both theoretical and practical aspects of the learning outcomes are assessed. There will be a strong focus on learning through the work environment through work-based projects and learning in the workplace. Students will be expected to draw on their professional and work experience to conceptualise their learning.

Part 5: Assessment

Testing of the knowledge base is through assessed coursework (individual and group), laboratory work, oral presentation, observed group meetings, through tasks undertaken under controlled conditions and through formal examinations.

Comprehension of and ability to apply intellectual skills are tested in all engineering modules through coursework, lab and computer exercises and examinations.

Part 6: Programme Structure

This structure diagram demonstrates the student journey from Entry through to Graduation for a typical **part time student**, including: level and credit requirements; interim award requirements module diet, including compulsory and optional modules.

ENTRY

	Compulsory Modules	Optional Modules	Interim Awards
Year 1	UFMFJ9-30-1 Engineering Mathematics UFMF7C-30-1 Design, Materials and Manufacturing (WBL) UFMFH3-30-1 Stress & Dynamics UFMFF3-15-1 Energy & Thermodynamics UFMFG3-15-1 Fluid Dynamics	NONE	Cert HE Mechanical Engineering 120 credits at appropriate level

			Interim Awards
Year 2	UFMF8C-15-2 Project Management (WBL) UFMFK9-15-2 Engineering Mathematics 2 UFMF88-30-2 Design & Electromechanical Systems	NONE	Cert HE Mechanical Engineering 120 credits at appropriate level

	Compulsory Modules	Optional Modules	Interim Awards
Year 3	UFMFL8-15-2 Dynamics UFMFQA-15-2 Stress Analysis UFMFW8-30-2 Heat Transfer, Power and the Environment	NONE	Cert HE Mechanical Engineering 120 credits at appropriate level

GRADUATION

Achievement of FdSc allows progression to Level 3 of BEng (Hons) Mechanical Engineering. If students achieve at least a 60% average across level 2 modules, then they will have achieved the criteria for progression to MEng

Part 7: Entry Requirements

In addition to the University's Standard Entry Requirements

- **GCSE:** Mathematics and English Language at grade C or above required.
- **Specific subjects:** A level Mathematics grade C; IB Mathematics (Higher) grade 5; BTEC unit Further Mathematics for Engineering Technicians; or equivalent. Also one of the following: Chemistry, Computing/Computer Science, Design and Technology, Electronics, Engineering, Information and Communications Technology, Music Technology, Physics.
- **Relevant subjects:** Physics, Computing, ICT, Engineering, Science
- **EDEXCEL (BTEC) Diploma:** BTEC Nationals accepted: Aerospace Engineering; Communications Technology; Electrical/Electronic Engineering; Engineering; Manufacturing Engineering; Mechanical Engineering; Operations and Maintenance Engineering; Polymer Processing and Materials Technology; Telecommunications.
- Students with a BTEC National Diploma must have passed Further Mathematics for Engineering Technicians, and those with the 14 – 19 Diploma must also offer the Additional Specialised Learning in Mathematics.
- **Access:** Achievement of the Access to HE Diploma; achievement of Level 3 credits in Mathematics to include algebra and calculus (please contact us for further information and advice); plus at least one other Science or Technology subject; achievement of Level 2 credits in Mathematics, English Language and Science.
- **Baccalaureate IB:** Accepted (see the UCAS website for the UCAS tariff points that you can gain from the IB to put towards our points requirements)
- **An interview may also be required**

For the University's general entry requirements please see

<http://www.uwe.ac.uk/study/entryReqs.shtml>

Mature applicants with relevant experience who do not have the stated entry requirements are encouraged to apply.

Tariff points as appropriate for the year of entry - up to date requirements are available through the [courses database](#)

Part 8: Reference Points and Benchmarks

Description of **how** the following reference points and benchmarks have been used in the design of the programme:

The engineering benchmarks for foundation degree qualifications and undergraduate degrees ([QAA UK Quality Code for HE](#)) provided the guidelines for the design of the programme in conjunction with SEMTA. In particular, the Engineering Subject Benchmark Statement (2015) regarding the characteristics of engineering graduates, and the Foundation Degree Qualification Benchmark (2010) defining the characteristics of foundation degrees have influenced the design of the programme. The learning outcomes, professional practice and transferable skills that have been written into the Foundation Degree has taken these Benchmark statements into consideration addressing them in order to ensure the graduates are have the required level of skills, knowledge within a vocational workplace context.

(*QAA Foundation Degree Benchmark*) <http://www.qaa.ac.uk/en/Publications/Documents/Foundation-Degree-qualification-benchmark-May-2010.pdf>

In addition, all modules in the programme have been written to conform to the learning outcomes required by the Engineering Council UK. This is mandatory for accredited engineering programmes. The specific outcomes are largely based on:

Part 8: Reference Points and Benchmarks

The IET Handbook of Learning Outcomes for BEng and MEng Programmes

The Engineering Council learning outcomes have been used to allow for a smooth transition to a BEng Hons or MEng programme and to prepare for accreditation of the FdSc to IEng.

The modules have been designed to ensure adequate and appropriate coverage of these outcomes across the levels of study.

University strategies and policies

The programme is designed to address skills shortages in the STEM related sectors. It provides an alternative route into HE for apprentices and first time entrants to HE, thus addressing the aim of widening participation. It enhances collaborative opportunities with regional and multi-national employers.

The programme design strives to address UWE's 2020 strategy priorities "Ready and Able Graduates" and "Strategic Partnerships- Connections and Networks".

University Centre Weston's Teaching, Learning and Assessment Strategy and Workbased Learning policy has informed the development, structure and planned delivery of the FdSc Mechanical Engineering.

What methods have been used in the development of this programme to evaluate and improve the quality and standards of learning? This could include consideration of stakeholder feedback from, for example current students, graduates and employers.

University Centre Weston has strong employer links which are used to inform the curriculum by identifying changing skill needs and gaps in provision. Feedback from employers has formed an important part of the development of this programme.

The programme has been designed in conjunction with industrial partners to provide a study route for higher engineering apprentices in the mechanical engineering and related industries.

Modules within the programme are also delivered within UWE and in partner institutions. This Foundation degree has been developed in conjunction with academic and industrial partners with the intention of being a feed into the MEng/BEng (Hons) Mechanical Engineering. This ensures that the programme meets the requirements of major employers regionally, nationally and globally in providing the blend of academic and vocational skills needed by modern engineers.

This programme is designed to provide the opportunity for advanced entry into any of the following undergraduate programmes subject to satisfactory completion of the foundation degree:

MEng/BEng (Hons) Mechanical Engineering degrees

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of individual modules can be found in module specifications, available on the [University's website](#).