



PROGRAMME SPECIFICATION

Part 1: Information	
Awarding Institution	UWE-Bristol
Teaching Institution	City of Bristol College (CoBC) or University College Weston (UCW) (level 1); UWE-Bristol (levels 2 and 3)
Delivery Location	CoBC or University College Weston (UCW) (as above) UWE Bristol (as above)
Study abroad / Exchange / Credit recognition	Not applicable
Faculty responsible for programme	Faculty of Environment and Technology
Department responsible for programme	Engineering, Design and Mathematics
Professional Statutory or Regulatory Body Links	IET accreditation will be sought
Highest Award Title	BEng(Hons) Mechanical Engineering with Manufacturing
Default Award Title	Not applicable.
Interim Award Titles	Certificate of Higher Education - Mechanical Engineering. Diploma of Higher Education – Mechanical Engineering with Manufacturing BEng Mechanical Engineering with Manufacturing
UWE Progression Route	N/A
Mode of Delivery	Years 1 to 4 part-time (attendance)
ISIS code/s	H3H743
For implementation from	September 2018

Part 2: Description
<p>The Mechanical Engineering with Manufacturing programme has been developed to provide future graduates with the effective theoretical and practical knowledge of a range of engineering principles. The programme presents an exciting course of study that will prepare graduate engineers for the rapidly developing field of manufacturing engineering, its supporting technologies and operational systems. Graduates from the programme will have the intellectual, creative and personal qualities necessary for undertaking a leadership role and a depth of knowledge that will enable the application of new and emerging technologies to the solution of manufacturing problems. The core aims of the programme are, that graduates will be able to:</p> <ol style="list-style-type: none"> 1. apply established and novel mechanical analysis concepts to the solution of engineering problems involving design, operations and manufacture. 2. use systems incorporating digital hardware, software, communication, processing algorithms, interfacing circuits and parameter sensing and actuating devices. 3. model mechanical engineering systems so as to be able to specify and assess the technical design. 4. identify and evaluate the manufacturing, financial and marketing implications of design proposals. 5. understand the interrelationship between design, manufacturing and production management. 6. make considered judgements and decisions on complex engineering issues in which not all facts and consequences are accurately known. <p>Encompassed within these aims are the Manufacturing Engineering Apprenticeship Standard, and the Aerospace Engineer Apprenticeship Standard, which define the mandatory qualification requirements which all apprentices must achieve in order to complete an apprenticeship, alongside the development of foundation and development competencies. Full details how the BEng(Hons) Mechanical Engineering with Manufacturing align to the Apprenticeship Standards are shown in appendices 1 and 2.</p>
Programme requirements for the purposes of the Higher Education Achievement Record (HEAR)
<p>Graduates of this programme will be equipped with a broad understanding of mechanical analysis and design, combined with knowledge of engineering practice, information technology, project management and manufacturing.</p> <p>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.</p>
Regulations
<p>A: Approved to University Regulations and Procedures</p>

Part 3: Learning Outcomes of the Programme																							
	Module No: UFMFH3-30-1	Module No: UFMFJ9-30-1	Module No: UFMFN3-30-1	Module No: UFMFG3-15-1	Module No: UFMFF3-15-1	Module No: UFMF88-30-2	Module No: UFMFQA-15-2	Module No: UFMFHA-15-2	Module No: UFMFP7-15-2	Module No: UFMFG8-15-2	Module No: UFMFN8-15-2	Module No: UFMFXA-15-2	Module No: UFMFU7-15-3	Module No: UFMFU6-15-3	Module No: UFMFSL-15-3	Module No: UFMFM7-15-3	Module No: UFMF89-30-3	Module No: UFMFTB-15-3	Module No: UFMFPB-15-3	Module No: UFMF7K-15-3	Module No: UFMFX8-30-3		
<ul style="list-style-type: none"> ✓ PLO meet ○ PLO Partially met <p>Learning Outcomes:</p>																							
A Knowledge and understanding of																							
The principles governing the behavior of mechanical components and systems.	○		✓			✓	✓																
The mathematical methods appropriate to the mechanical engineering and manufacturing field.		✓								✓													
The properties, characteristics and selection of materials used in mechanical components and systems.			✓			✓								✓							✓		
The core engineering science and technologies with greater depth in areas pertinent to mechanical systems.	✓		✓	✓	✓		✓				✓	✓								✓		○	
The principles of information technology and data communications from a user's perspective.			✓			✓																○	
The social, environmental, ethical, financial, marketing and commercial factors.						✓					✓											○	

Part 3: Learning Outcomes of the Programme																			
the responsibilities of engineering practitioners.																			
Subject, Professional and Practical Skills																			
Appropriate skills including safe working in experimental work in laboratories and workshops.	✓	✓	✓	✓	✓														
Demonstrate practical testing of engineering ideas through laboratory work or simulation with supporting technical analysis and critical evaluation of results.	✓	✓	✓	✓	✓									✓					○
Understanding and execution of the design process.		✓			✓							✓							
Use of a range of computer software for design, analysis and control.		✓			✓				✓	✓		✓	✓						
Execution and management of multi-disciplinary projects, both individually and as a member of a group.					✓	✓								✓	✓				○
Transferable Skills and other attributes																			
Communication skills: to communicate orally or in writing, including, for instance, the results of technical investigations, to peers and/or to “problem owners”.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Self-management skills: to plan and manage time, to meet deadlines and to work with others.	✓				✓	✓							✓	✓	✓				✓

Part 3: Learning Outcomes of the Programme																					
IT Skills in Context (to use software in the context of problem-solving investigations, and to interpret findings)						✓							✓		✓			✓	✓		
Problem formulation and solution.						o												✓	✓	✓	
Progression to independent learning: To gain experience of and to develop skills independently of structured class work.															✓	✓	✓	✓	✓	✓	✓
Comprehension of professional literature: to read and to use literature sources appropriate to the discipline to support learning activities.																✓	✓				✓

Part 4: Programme Structure

This structure diagram demonstrates the student journey from Entry through to Graduation for a typical part time undergraduate student including:

- level and credit requirements
- interim award requirements
- module diet, including compulsory and optional modules

ENTRY		Compulsory Modules	Optional Modules	Awards
Year 1 Taught at FE Partner	Level 1	UFMFJ9-30-1 Engineering Mathematics	None	Interim award: Cert He Mechanical Engineering (120 credits)
		UFMFN3-30-1 Design, Materials and Manufacturing		
		UFMFH3-30-1 Stress & Dynamics		
		UFMFF3-15-1 Energy & Thermodynamics		
		UFMFG3-15-1 Fluid Dynamics		

		Compulsory Modules	Optional Modules	Interim Awards
Year 2 Taught at UWE	Level 2	UFMF8C-15-2 Project Management (WBL)		Interim award: Cert He Mechanical Engineering (120 credits)
		UFMFG8-15-2 Mathematics for Manufacturing		
		UFMF88-30-2 Design & Electromechanical Systems		
		UFMFP7-15-2 Manufacturing Technology		
		UFMFQA-15-2 Stress analysis		

Year Out:

Not Applicable for Degree Apprenticeship.

Year 3 Taught at UWE	Level 2	Compulsory Modules	Optional Modules	Interim Awards
		UFMFN8-15-2 Design for Manufacture, Assembly and Environment.	UFMFU6-15-3 Composite Engineering Or	
	UFMFXA-15-2 Quality Control Systems	UFMF7K-15-3 Materials & Structures for Special Applications (in year 4).		
	UFMFU7-15-3 Computational Methods	UFMFM7-15-3 Business Environment		
	UFMFSL-15-3 Integrated Electro-Mechanical Systems	Or UFMF89-30-3 Industrial placement		

Year 4 Taught at UWE	Level 3	Compulsory Modules	Optional Modules	Interim Awards	
		UFMFX8-30-3 Individual Project.	UFMF7K-15-3 Materials & Structures for Special Applications		Interim awards: Dip He Mechanical Engineering with Manufacturing (240 credits); BEng Mechanical Engineering with Manufacturing (300 credits) Award: BEng (Hons) Mechanical Engineering with Manufacturing
		UFMFTB-15-3 Lean Factory Design	(If UFMFU6-15-3 has not been taken in year 3).		
		UFMFPB-15-3 Reliability Engineering and Asset Management			

Part 5: Entry Requirements

The university's minimum requirements for entry to a degree apply to this programme. In addition for entry to year 1 of the BEng Mechanical Engineering with Manufacturing, the tariff point requirement is normally 112 points. This should include the equivalent of A level Mathematics Grade C plus another science or technology subject. Equivalent qualifications include Scottish Highers, the European Baccalaureate, the International Baccalaureate; and other European and international qualifications which are nationally recognised. Students with a BTEC National Diploma must have passed Further Mathematics, and those with the 14 – 19 Diploma must also offer the Additional Specialised Learning in Mathematics.

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 6: Reference Points and Benchmarks

Set out which reference points and benchmarks have been used in the design of the programme:

[QAA UK Quality Code for HE](#)

- Framework for higher education qualifications (FHEQ)
- Subject benchmark statement for Higher Education qualifications in engineering (Feb 2015)
- Qualification characteristics for [Degree Apprenticeships](#)

[Strategy 2020](#)

[University policies](#)

Staff research projects

Any relevant PSRB requirements: AHEP3

Manufacturing Engineer Degree Apprenticeship [Standard](#)

Aerospace Engineer Degree Apprenticeship Standard

Appendix 1 - presents the Programme/Apprenticeship Standard mapping to Aerospace standard

Appendix 2 - presents the Programme/Apprenticeship Standard mapping to Manufacturing standard

Appendix 1: Mapping of learning outcomes from BEng (Hons) Mechanical Engineering with Manufacturing to the Aerospace Engineer Apprenticeship Standard				
Knowledge and Skills		Assessment method	Covered in degree (yes/no)	Module code(s)
Understand engineering process & practices covering:	Mechanical/electrical/electronic systems design	Degree/ Workplace Logbook- Portfolio	Yes	UFMFN3-30-1, UFMF88-30-2, UFMFSL-15-3
	Design and Stress Analysis (e.g. computer aided engineering techniques)		Yes	UFMFH3-30-1, UFMFQA-15-2, UFMFU7-15-3
	System design		Yes	UFMFN3-30-1, UFMF88-30-2, UFMFSL-15-3, UFMFN8-15-2
	Integration and test		Yes	UFMFSL-15-3
	In-service and through product life support		Yes	UFMFPB-15-3, UFMFXA-15-2, UFMFN8-15-2
	Advanced manufacturing		Yes	UFMFP7-15-2, UFMFN8-15-2
	Aerospace quality and governance		No	UFMFXA-15-2
Understand the applicable regulatory and quality requirements	As systems and products mature through their development	Degree/ Workplace Logbook- Portfolio	Yes	UFMFN8-15-2, UFMF88-30-2
	Qualification and in-service phases		Yes	UFMFPB-15-3
Understand and apply analytical methods – Engineering Mathematics	Algebra, differentiation, function, geometry, trigonometry	Degree	Yes	UFMFJ9-30-1
	Statistics		Yes	UFMFK9-15-2
Understand aeronautical sciences	Stress and strain	Degree	Yes	UFMFH3-30-1, UFMFQA-15-2
	Static and dynamic systems		Yes	UFMFH3-30-1, UFMFQA-15-2
	Force, resistance, mass and weight, motion		Yes	UFMFH3-30-1
	Electrical power		Yes	UFMFQ8-30-2, UFMF88-30-2
Understand material sciences	Selection and application	Degree	Yes	UFMFN3-30-1, UFMF88-30-2, UFMFU6-15-3, UFMF7K-15-3
	Structures and properties		Yes	UFMFN3-30-1, UFMF88-30-2, UFMFU6-15-3, UFMF7K-15-3
	Analytical testing		Yes	UFMFN3-30-1, UFMFQA-15-2, UFMF7K-15-3, UFMFU7-15-3
Knowledge and Skills		Assessment method	Covered in degree (yes/no)	Module code(s)

Regulations	Demonstrate the ability to comply with statutory, organisational, environmental, health and safety regulations/	Degree/ Workplace Logbook- Portfolio	Yes	UFMFN8-15-2, UFMFXA-15-2 , UFMFY8-30-3,
Business improvement techniques	Apply business improvement techniques ensuring optimisation of processes, resources and budgets	Degree/ Workplace Logbook- Portfolio	Yes	UFMFHA-15-2, UFMFM7-15-3
Apply a wide range of technical skill sets applied to a range of aerospace disciplines and contexts	To be evidence in the workplace.	Degree/ Workplace Logbook- Portfolio		UFMFY8-30-3
	Research	Degree / Workplace Logbook- Portfolio		UFMFY8-30-3
	Development	Degree / Workplace Logbook- Portfolio		UFMFN8-15-2
	Design	Degree / Workplace Logbook- Portfolio		UFMFN3-30-1, UFMFN8-15-2
	Procurement	Workplace Logbook- Portfolio		
	Logistics	Workplace Logbook- Portfolio		
	Planning	Degree / Workplace Logbook- Portfolio		UFMFQA-15-2
	Production	Degree / Workplace Logbook- Portfolio		UFMFXA-15-2, UFMFTB-15-3
	Quality Assurance	Degree / Workplace Logbook- Portfolio		UFMFXA-15-2
	Inspection	Degree / Workplace Logbook- Portfolio		UFMFXA-15-2
	Testing	Degree / Workplace Logbook- Portfolio		UFMFY8-30-3
	Installation	Degree / Workplace		UFMFTB-15-3

		Logbook-Portfolio		
	Commissioning	Degree / Workplace Logbook-Portfolio		UFMFTB-15-3
	Life cycle management	Degree / Workplace Logbook-Portfolio		UFMFN8-15-2
	Decommissioning	Workplace Logbook-Portfolio		
	Environmental Compliance	Degree / Workplace Logbook-Portfolio		UFMFN8-15-2, UFMFTB-15-3
<p>With respect to the above can the apprentice demonstrate</p> <ul style="list-style-type: none"> • Planning what has to be done, when and by whom • Ensuring that resources are available and capable of achieving the required outcomes • Allocating and deploying resources in a timely manner • Completing/project managing work outputs/programmes to the required specification • Monitoring programmes of work and report progress to appropriate personnel • Agreeing any amendments to work specification/work requirements • Ensuring that quality assurance requirements are adhered to • Retaining and storing documentation and records for traceability <p><i>Definitions:</i></p> <p>Monitoring: The regular checking of specific aerospace engineering activities or outcomes to ensure that they are being achieved according to requirements. Monitoring includes observation; data collection; sampling, and can be continuous; periodic; on demand; random; scheduled; formal; informal.</p> <p>Resources: The available means to undertake processes and achieve aerospace work outcomes. Resources include equipment; facilities; finance; material; people; information/data, and are obtained from customers; suppliers; or from within their own organisation.</p> <p>Specifications are precise technical descriptions of the characteristics of an Aerospace engineered product or Aerospace engineered process such as performance, function, quality, materials, aesthetics, life cycle, technologies, performance/capability, delivery schedule, interfacing, environmental/sustainability, branding, safety, budget, volume, timing.</p>				
<u>Behaviours</u>	<u>What is required</u>	<u>Assessment method</u>	<u>Covered in degree (yes/no)</u>	<u>Module code(s)</u>
Knowledge and understanding	Commitment to continue personal development, refreshing and expanding Engineering knowledge through a variety of methods	Workplace Logbook-Portfolio		
Design and development of processes, systems, services and products	Contributing to the continuing development of Engineering within their domain	Degree / Workplace Logbook-Portfolio		UFMFF3-15-1, UFMFN3-30-1
Responsibility, management or leadership	Taking personal responsibility for their actions, managing projects, including resource management within their remit	Degree / Workplace Logbook-Portfolio		UFMFHA-15-2

Communication and inter-personal skills	Be able to demonstrate a range of communication styles and methods. Understanding the importance of network within and across functions	Degree / Workplace Logbook-Portfolio		UFMFY8-30-3
Professional commitment	Demonstrating a personal and professional commitment to society, their profession and the environment, adopting a set of values and behaviours that will maintain and enhance the reputation of the profession.	Workplace Logbook-Portfolio		

Appendix 2: Mapping of learning outcomes from BEng (Hons) Mechanical Engineering with Manufacturing to the Manufacturing Engineering Apprenticeship Standard

<u>Vocational Skills</u>	<u>Assessment method</u>	<u>Covered in degree (yes/no)</u>	<u>Module code(s)</u>	
Complying with statutory regulations and stringent organisational safety requirements	Degree/ Workplace Logbook-Portfolio	Yes	UFMFM7-15-3	
Undertake project management and scheduling of engineering activities	Degree/ skills phase	Yes	UFMFHA-15-2	
Securing and manage appropriate resources	Workplace			
Manage budgets	Skills phase			
Implement engineering processes	Degree/work place	Yes	UFMFPB-15-3, UFMFN8-15-2	
Monitoring and evaluate engineering processes	Degree/work place	Yes	UFMFPB-15-3	
<u>Academic Knowledge</u>	<u>What is required</u>	<u>Assessment method</u>	<u>Covered in degree (yes/no)</u>	<u>Module code(s)</u>
Mathematics and science for engineers	To have a solid grasp of	Degree	Yes	UFMFJ9-30-1, UFMFG8-15-2
Materials and manufacture	To have a solid grasp of	Degree / Workplace	Yes	UFMFN3-30-1, UFMF88-30-2, UFMFP9-15-3,

Appendix 2: Mapping of learning outcomes from BEng (Hons) Mechanical Engineering with Manufacturing to the Manufacturing Engineering Apprenticeship Standard				
		Logbook-Portfolio		UFMFU6-15-3, UFMF7K-15-3.
3D Computer Aided design and Computer Aided Engineering	To have a solid grasp of	Degree / Workplace Logbook-Portfolio	Yes	UFMFN3-30-1, UFMF88-30-2, UFMFU7-15-3
How to run and manage Business led projects	To have a solid grasp of	Degree / Workplace Logbook-Portfolio	Yes	UFMFM7-15-3
Engineering operations and Business Management	To have a solid grasp of	Degree / Workplace Logbook-Portfolio	Yes	UFMFHA-15-2, UFMFM7-15-3
Manufacturing Processes	To have a solid grasp of	Degree / Workplace Logbook-Portfolio	Yes	UFMF7C-30-1, UFMFP7-15-2, UFMFTB-15-
Product Improvement and engineering project management	To have a solid grasp of	Degree / Workplace Logbook-Portfolio	Yes	UFMFM7-15-3, UFMFN8-15-2, UFMFPB-15-3
Occupational Behaviours				
Safety Mindset	Strict compliance and a disciplined and responsible approach to manage, mitigate and avoid risk	Workplace Logbook-Portfolio		Workplace activities reinforced by UFMFX8-15-m project
Strong Work ethic	Positive attitude, motivated by engineering; dependable, ethical, responsible and reliable.	Workplace Logbook-Portfolio		
Logical approach	Able to structure a plan and develop activities following a logical thought process, but also able to think quickly "think on	Degree / Workplace Logbook-Portfolio	Yes	Workplace activities reinforced by UFMFX8-15-m project

Appendix 2: Mapping of learning outcomes from BEng (Hons) Mechanical Engineering with Manufacturing to the Manufacturing Engineering Apprenticeship Standard				
	feet" when working through them.			
Problem solving orientation	Identifies issues quickly, enjoys solving complex problems and applies appropriate solutions. Has a strong desire to push to ensure the true root cause of any problem is found and a solution identified which prevents further recurrence	Workplace Logbook-Portfolio	Yes	Workplace activities reinforced by UFMFX8-15-m project
Quality focus	Follows rules, procedures and principles in ensuring work completed is fit for purpose and pays attention to detail/error checks throughout activities.	Degree/ Workplace Logbook-Portfolio	Yes	UFMFXA-15-2
Personal responsibility and resilience	Motivated to succeed, accountable and persistent to complete task	Workplace Logbook-Portfolio	No	

Appendix 2: Mapping of learning outcomes from BEng (Hons) Mechanical Engineering with Manufacturing to the Manufacturing Engineering Apprenticeship Standard				
Clear communicator	Use a variety of appropriate communication methods to give/receive information accurately, and in a timely and positive manner.	Degree / Workplace Logbook-Portfolio	Yes	Workplace Logbook-Portfolio
Team player	Not only plays own part but able to work and communicate clearly and effectively within a team and interacts/helps others when required. In doing so, applies these skills in a respectful and professional manner	Degree / Workplace Logbook-Portfolio	Yes	
Applies lean manufacturing principles	Continuous improvement in driving effectiveness and efficiency		Yes	UFMFTB-15-3,
Adaptability	Able to adjust to different conditions technologies, situations and environments		No	
Self-motivation	A "self-starter" who always wants to give their best, sets themselves challenging			Workplace activities reinforced by UFMFX8-15-m project

Appendix 2: Mapping of learning outcomes from BEng (Hons) Mechanical Engineering with Manufacturing to the Manufacturing Engineering Apprenticeship Standard				
	targets, can make their own decisions			
Willingness to learn	Wants to drive their continuous professional development			
Commitment	Able to commit to the beliefs, goals and standards of their own employer and to the wider industry and its professional standards.			Workplace activities reinforced by UFMFX8-15-m project

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First CAP Approval Date	17/08/18			
Revision CAP Approval Date		Version	1	Link to PAMI- 4717
Next Periodic Curriculum Review due date				
Date of last Periodic Curriculum Review				