



Course Specification

Part A

**MEng Mechanical Engineering (EECU090)
BEng (Honours) Mechanical Engineering (EECU090)**

**Faculty of Engineering, Environment and Computing
School of Mechanical, Aerospace and Automotive Engineering
Academic Year:2021/2022**

Please note: This specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided.

We regularly review our course content, to make it relevant and current for the benefit of our students. For these reasons, course modules may be updated

More detailed information on the learning outcomes, content, and teaching, learning and assessment methods of each module can be found in the Module Information Directory (MID), student module guide(s) and the course handbook.

The accuracy of the information contained in this document is reviewed by the University and may be verified by the Quality Assurance Agency for Higher Education.

PART A Course Specification (Published Document)

BEng/MEng Mechanical Engineering

1. Introduction

The BEng/MEng in Mechanical Engineering seeks to produce mechanical engineering graduates with the versatility and depth of understanding to deal with new and unusual challenges in mechanical engineering, alongside the necessary imagination and creativity to innovate.

It is designed to equip graduates with relevant, up-to-date skills and knowledge to work as a mechanical engineer in a broad variety of businesses, including engineering management, research, engineering design, development and consultancy. This accredited degree will prepare students for chartership and hence to pursue successful careers and be leaders in the mechanical engineering related industries.

This course specification describes the programme of study for BEng/MEng Mechanical Engineering at Coventry University. This course sits in the School of Mechanical, Aerospace and Automotive Engineering which has a global reputation for excellent teaching, outstanding student experience and exciting research, utilising a state-of the art building with modern equipment and student facilities.

The course is accredited by the Institution of Mechanical Engineers (IMechE). The BEng constitutes part of the academic requirements for Chartered Engineer status. The MEng constitutes the full academic requirement for Chartered Engineer status.

The student journey is one designed not only to provide technical excellence but also the skills required to work and integrate into a workplace. Level 4, the first year, provides foundation knowledge in the technical, scientific and mathematical subject areas. Level 5 continues with the first year themes but goes into greater depth. During level 5 students actively learn employability skills and are assisted by the School's award winning placements team. The aim is to look for industrial placements to gain experience (this cannot be guaranteed) but the team have and seek a variety of links into industrial partners to give opportunities to the students to undertake this.

Level 6 of the BEng course (the final year) is designed for students to be able to optimise their degree according to future aspirations. Option modules are available enabling students to individually tailor their programmes. These option modules are also available to MEng students who continue to study for another year at level 7.

Students on this course have access to the High Performance Engineering Centre (HPEC) which houses a 20% scale open jet wind tunnel commissioned by one of the most successful Formula 1 teams in recent years, Mercedes-AMG Petronas Motorsport, composites lab, metrology lab, shaker rig, flow lab, engine test cell, engineering workshop, equipment for fatigue and tensile testing (Instron), laser workshop, a small hydrogen vehicle manufacturing factory, a CRUDEN vehicle simulator, a fully equipped model making shop, a range of CNC machinery and a full size Harrier Jump Jet.

The MEng route is designed for high achieving students to continue their studies and to develop advanced technical, application and leadership skills to meet the full academic requirements for Engineering Chartership. A highly successful feature of this course is its ability to draw on the existing industrial and research experience of academics in order to cover established and emerging specialisms. Research informed teaching is the norm, especially with individual projects.

This course has two entry points, September and January.

Upon completion of the course, graduates can expect to find employment in a variety of industries. Engineering generates nearly one quarter of the UK's turnover and employs almost one fifth of the UK's labour force. The importance of engineering is reflected around the globe. According to recent reports (Engineering UK, 2018) there will be an annual shortfall of up to 59000 engineering graduates and technicians to fill core engineering roles. This is a very good time to study engineering. Working closely with industry and the Institution of Mechanical Engineers, the School is justifiably proud to be leading the way in producing relevant, up-to-date and professionally accredited courses creating students that are industry ready for their future careers.

Engineering UK (2018) Engineering UK 2018 Synopsis and recommendations [online] available from:
https://www.engineeringuk.com/media/1576/7444_enguk18_synopsis_standalone_aw.pdf [17th December 2019].

2 Available Award(s) and Modes of Study			
Title of Award	Mode of attendance	UCAS Code	FHEQ Level
MEng Mechanical Engineering	FT 4 year SW 5 years PT 6 years	H300	7
BEng Honours Mechanical Engineering	FT 3 year SW 4 years PT 6 years		6
Diploma in Engineering Certificate in Engineering			
3 Awarding Institution/Body	Coventry University		
4 Collaboration	None		
5 Teaching Institution and Location of delivery	Coventry University		
6 Internal Approval/Review Dates	Date of approval/latest review: 07/2019 Date for next review: 2024/2025		
7 Course Accredited by	<p>Students completing an IMechE accredited degree are deemed to have met part or all of the academic requirements for registration as a Chartered or Incorporated Engineer and are in a strong position to move on to achieve professional engineering status after a period of initial professional development in industry.</p> <ul style="list-style-type: none"> The accredited BEng (Hons) will meet, in part, the exemplifying academic benchmark requirements for registration as a Chartered Engineer and Students will need to complete an approved format of further learning pursuant to the requirements of UK-SPEC. <p>The accredited BEng (Hons) will also automatically meet in full, the exemplifying academic benchmark requirements for registration as an Incorporated Engineer (IEng).</p> <ul style="list-style-type: none"> The accredited MEng fully meets the exemplifying academic benchmark requirements, for registration as a Chartered Engineer (CEng). 		
8 Accreditation Date and Duration	<p>This course is accredited by the IMechE up to and including the intake for 2025 for both the BEng and MEng courses.</p> <p>Previous accreditation visit undertaken in October 2020.</p>		
9 QAA Subject Benchmark Statement(s) and/or other external factors	<p>Developed in line with The Framework for Higher Education Qualifications https://www.qaa.ac.uk/docs/qaa/quality-code/qualifications-frameworks.pdf according to the Subject Benchmark for Engineering statements https://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/subject-benchmark-statement-engineering.pdf?sfvrsn=1f2c881_16the Engineering Council UK-SPEC Fourth edition https://www.engc.org.uk/media/3417/uk-spec-fourth-edition.pdfand Professional Body, Institution of Mechanical Engineering (IMechE).</p>		
10 Date of Course Specification	February 2021		
11 Course Director	Reza Ali		

12 Outline and Educational Aims of the Course

This MEng/BEng in Mechanical Engineering aims to provide students with a comprehensive understanding of mechanical engineering and develop knowledge, skills and expertise that can be applied to the engineering sector. The educational experience also aims to develop students' intellectual and personal skills, and give them the capability to undertake a practical research study and publish results. This will prepare students to pursue careers and be leaders in industry.

Specifically, the course aims to:

1. Create an educational environment that enables students to explore the current and emerging technologies, applications and digital tools used in Mechanical Engineering.
2. Provide a global experience and the opportunity for students to advance their engineering proficiency, develop new skills and knowledge.
3. Prepare students to become Chartered Mechanical Engineers and make significant contributions to the mechanical engineering profession, the economy and society.
4. Highlight the importance of research through research-based teaching and research-based group and individual projects, underpinned by activity led learning.
5. Create an educational environment that gives access to both academic and industrial experience.
6. Provide students with the opportunity to deal with complex issues, demonstrate creativity, self-direction and develop transferable skills.
7. Provide students with the opportunity to secure and experience an industrial engineering placement or year abroad.
8. Mentor students to be professional in their outlook, be capable of team working, be effective communicators, and be able to exercise responsibility and sound management approaches.
9. Plan self-learning and improve performance as the foundation of lifelong learning and continuous professional development.

13 Course Learning Outcomes

A student who successfully completes the course will be able to:

BEng and MEng Mechanical Engineering

1. Apply the necessary study and research skills to support the analytical, critical and reflective requirements of written, oral and group assessments.
2. Contribute to a team with the necessary planning, reviewing, adaptability, drive and leadership to achieve the required objectives and observe work schedules.
3. Clearly communicate research, concepts, solutions and recommendations, and demonstrate an approach to written and oral presentations appropriate to an engineering professional.
4. Demonstrate knowledge and understanding of the principles, theories and practices found in engineering management and leadership, consultancy and entrepreneurship.
5. Develop independent learning and problem-solving skills appropriate to current and future study and employment.
6. Apply engineering principles, science, mathematics, processes, materials, design and management to solve problems of increasing complexity.
7. Apply engineering analysis methods when solving complex problems and develop extended experience in solving problems related to a broad range of mechanical systems and components.
8. Generate, and appropriately communicate, design solutions through the application and comprehensive understanding of the engineering design processes.
9. Critically assess data and information using practical laboratory skills, experimentation and research, and establish the effect on design.
10. Understand risk assessment and the need for professional and ethical conduct in commercial and social contexts, informed by a knowledge of sustainable development and the regulations/legislation governing engineering activities.
11. Understand and evaluate a range of appropriate engineering materials, components and systems, identifying their limitations and likely developments.

MEng Mechanical Engineering

- M6 Apply a comprehensive understanding of mechanical engineering principles together with a critical awareness of current issues at the forefront of the specialism.
- M7 Apply and evaluate engineering analysis methods when solving complex problems and assess their limitations, especially when applied to new or unfamiliar technology.
- M8 Generate and appraise innovative design solutions through the application and comprehensive understanding of the engineering design processes.
- M9 Critically assess data and information that may be uncertain or incomplete and quantify the effect on design using practical laboratory skills and experimental research.
- M10 Critically appraise management, business and ethical practice and their limitations informed by a knowledge of sustainable development, customer requirements and the regulations/legislation governing engineering activities in a commercial, social and international
- M11 Critically evaluate a range of current and emerging engineering materials, components and systems, identifying their limitations and likely developments/adaptations together with commercial and industrial constraint.

14 Course Structure and Requirements, Levels, Modules, Credits and Awards

Both MEng and BEng Mechanical Engineering students study the same modules at level 4 and 5. BEng students study 120 credits at level 6. In order to comply with the Bologna Agreement, MEng students study 60 credits at level 6 and 180 credits at level 7 distributed over the final two years.

MEng and BEng students have a choice of 2 option modules from 6, at level 6. MEng students have a choice of 1 from 3 pathways at level 7. There is an opportunity for BEng students to progress to MEng, subject to a satisfactory level 5 grade point average, normally above 65% with no individual module mark below 50% (please note taking the MEng route impacts the fallback awards, please refer to later in this section for clarification). The Placement year or Year Abroad takes place after completion of level 5.

Module code and name		Credit level	Credit Value (Ass. credit)	M/O		Course Learning Outcomes
				BEng	MEng	
BEng L4						
4038CEM	Engineering Mathematics 1	4	20 (20)	M		3,5,6,7
4025MAA	Mechanical Science	4	20 (20)	M		3,6,8,9,11
4026MAA	Manufacturing Technology and Materials	4	20 (20)	M		5,6,7,9,11
4027MAA	Design	4	20 (20)	M		1,2,3,5,6,8,10,11
4028MAA	Engineering Applications	4	20 (20)	M		1,2,3,5,6,8,9,10
4014CEM	Electrical Science	4	10 (10)	M		5,6,7,11
	One 10-Credit Year 1 Add+Vantage Module	4	10 (10)	M		
BEng L5						
5032MAA	Engineering Management	5	10 (10)	M		3,4,6,10
5035MAA	Solid Mechanics and Dynamics	5	20 (20)	M		5,6,7,9,11
5033MAA	Thermofluid Mechanics	5	20 (20)	M		5,6,7,9
5034MAA	Analytical Modelling	5	20 (20)	M		5,6,7,9
5036MAA	Design and Sustainability	5	20 (20)	M		1,2,3,5,6,8,9,11
5037MAA	Instrumentation and Control	5	20 (20)	M		5,6,7
	One 10-Credit Year 2 Add+Vantage Module	5	10 (10)	M		
PLACEMENT						
5012CEM	Professional Training**	0	0	O		
5013CEM	Study Abroad*	0	0	O		

BEng L6						
6050MAA	Professional Development and Project Planning	6	10 (10)	M	M	1,2,4,10
6051MAA	Individual Project	6	20 (20)	M		1,3,5,7,9,10
6052MAA	Mechanical Product Innovation	6	20 (20)	M		1,2,3,4,8,9,10
6056MAA	Stress and Dynamics Analysis	6	20 (20)	M		3,5,6,7,9,11
	One 10-Credit Year 3 Add+Vantage Module	6	10 (10)	M		
OPTIONS	2 from 6					
6062MAA	Finite Element Analysis and Optimisation	6	20 (20)	O		3,5,6,7,9,11
6023MAA	Propulsion Systems (Aero) and Aerodynamics	6	20 (20)	O		3,5,6,7,9,11
6063MAA	Computational Thermo-fluids	6	20 (20)	O		3,5,6,7,9
6064MAA	Materials Analysis and Advanced Manufacturing	6	20 (20)	O		3,5,6,8,9,11
6065MAA	Control Systems Engineering	6	20 (20)	O		5,6,7,9
6066MAA	Electric Vehicle Technology	6	20 (20)	O		5,6,7,9,11
MEng L6						
6050MAA	Professional Development and Project Planning	6	10 (10)	M	M	1,2,4,10
6069MAA	Individual Project Dissertation	7	40 (40)		M	1,3,4,5,M7,M9,M11
6071MAA	Further Stress and Dynamics Analysis	7	20 (20)		M	1,3,M6,M7,M8,M11
	One 10-Credit Year 3 Add+Vantage Module	6	10 (10)		M	
OPTIONS	2 from 6					
6062MAA	Finite Element Analysis and Optimisation	6	20 (20)		O	3,6,5,7,9,11
6023MAA	Propulsion Systems and Aerodynamics	6	20 (20)		O	3,5,6,7,9,11
6063MAA	Computational Thermo-fluids	6	20 (20)		O	3,5,6,7,9
6064MAA	Materials Analysis and Advanced Manufacturing	6	20 (20)		O	3,5,6,8,9,11
6065MAA	Control Systems Engineering	6	20 (20)		O	5,6,7,9
6066MAA	Electric Vehicle Technology	6	20 (20)		O	5,6,7,9,11
MEng L7						
7144MAA	Industrial Group Project Proposal	7	20 (20)		M	1,2,3,4,M8,M10,M11
7145MAA	Industrial Group Project Dissertation	7	40 (40)		M	1,2,3,4,M8,M9,M11
7146MAA	Business Innovation and Sustainability	7	20 (20)		M	1,3,4,M8,M10
PATHWAYS	1 pathway from 3					
	Pathway 1 – Mechanical					
7147MAA	Engineering Simulation and Analysis	7	20 (20)		O	3,5,M6,M7,M9
7152MAA	Advanced Control Systems Engineering	7	20 (20)		O	3,5,M6,M7,M9
	Pathway 2 – Manufacturing					
7141MAA	Advanced Manufacturing Simulation	7	20 (20)		O	3,5,M6,M7,M9
7140 MAA	Vision Systems and Sensors in Industry (MEng)	7	20 (20)		O	3,5,M6,M7,M9
	Pathway 3 - Propulsion System					
7132MAA	Structural Analysis and Material	7	20 (20)		O	3,5,M6,M7,M9
7133MAA	Advanced Propulsion Systems	7	20 (20)		O	3,5,M6,M7,M9

**Students must have normally passed all modules required to progress to the follow year to be able to undertake the placement year.

All students are strongly encouraged to spend a year on industrial training and/or an international year abroad studying at another university. This takes place between level 5 and level 6 modules. Assistance with organising this year is provided by an industrial placement co-ordinator.

Cascade of Awards:

The requirements for progression and awards:

Progression requirements are based on the standard University academic regulations and satisfaction of the pre-requisites for a valid programme of study. In addition: Progression to Level 6 MEng/BEng 5037MAA should be passed.

MEng (Hons) Mechanical Engineering (accredited)



BEng Mechanical Engineering (non accredited)



Diploma (DipHE) Engineering



Certificate (CertHE) Engineering

MEng (Hons) Mechanical Engineering (accredited)



BEng Mechanical Engineering (non accredited)



Diploma (DipHE) Engineering



Certificate (CertHE) Engineering

BEng Awards

To achieve the award of an Honours or Unclassified degree a student must achieve the minimum credits specified in the University Academic Regulations. All classifications are based on the calculation method described in the University Academic Regulations.

The modules counted in the classification calculation must include the following modules:

For Honours Degree (Accredited)	For Unclassified Degree (Not accredited)
6051MAA: Individual project and 6052MAA: Mechanical Product Innovation	No module requirement.

Fallback Awards

Students failing to meet the award requirements of the programme will be considered for alternative awards for which they satisfy the credit score count and other requirements. Fallback awards are BEng Mechanical Engineering (ordinary degree, non accredited), Diploma of Higher Education or Certificate of Higher Education as appropriate. The requirements for these awards are as specified in the University Academic Regulations.

MEng Awards

To achieve the award of MEng degree a student must achieve the appropriate progression requirements and the minimum credits specified in the University Academic Regulations. Classification is based on the calculation method described in the University Academic Regulations. A student studying for an MEng will only be awarded an MEng title at the end of their degree, not a BEng and MEng. The modules counted in the classification must include the following:

For MEng Degree (Accredited)
180 level 7 credits
To include
7144MAA Industrial Group Project Definition, Objectives and Constraints
7145MAA Industrial Group Project Dissertation
7146MAA Business Innovation and Sustainability

Fallback Awards

Students failing to meet the award requirements of the programme will be considered for alternative awards for which they satisfy the credit score count and other requirements. "Further" modules will be counted as equivalents to the normal module resulting in the awards of BEng Automotive Engineering (ordinary degree, non accredited), Diploma of Higher Education or Certificate of Higher Education as appropriate. The requirements for these awards are as specified in the University Academic Regulations. Note: any student undertakeing the MEng route, cannot fallback onto an honours or accredited degree (this is because if the L7 is not completed the student will not have undertaken the required group and individual projects required for both BEng and MEng).

15 Criteria for Admission

UCAS entry profiles may be found on the main website (<http://www.ucas.ac.uk>). Candidates for admission to the course will normally be expected to fulfil the entry requirements which can be found through the main university site on the course finder pages (<https://www.coventry.ac.uk>).

Students who do not fit with the above entry requirements can gain entry but their qualification and experience will be assessed for appropriate content by the admissions office and course director in line with the university's academic regulations.

This section summarises the main admissions criteria for entry to year 1 of the programme. For international qualifications or direct entry to later years please contact the admissions office.

16 Academic Regulations and Regulations of Assessment

This course conforms to the standard [University Regulations](#) Mode E

17 Indicators of Quality Enhancement

The Course is managed by the School of Mechanical, Aerospace and Automotive Engineering Board of Study of the Faculty of Engineering, Environment and Computing.

The Programme Assessment Board (PAB) for the Faculty of Engineering, Environment and Computing is responsible for considering the progress of all students and making awards in accordance with both University and course-specific regulations.

The assurance of the quality of modules is the responsibility of the Boards of Study which contribute modules to the course.

External Examiners have the opportunity to moderate all assessment tasks and a sample of assessed work for each module. They will report annually on the course and/or constituent modules and their views are considered as part of the Course Quality Enhancement Monitoring (CQEM). Details of the CQEM process can be found on the Registry's web site.

Students are represented on the Student Forum, Board of Study and Faculty/School Board, all of which normally meet two or three times per year.

Student views are also sought through module and course evaluation questionnaires.

The QAA's Higher Education Review undertaken in February 2015 confirmed that Coventry University meets the UK expectations regarding the:

- Setting and maintenance of the academic standards of awards
- Quality of student learning opportunities
- Quality of the information about learning opportunities
- Enhancement of student learning opportunities

This Engineering Course has been designed in accordance with the:

- QAA Engineering Subject Benchmark statement [February 2015]
- UK Standards for Professional Engineering Competence [Third Edition]
- Engineering Council Accreditation of Higher Education Programmes

The School of Mechanical, Aerospace and Automotive Engineering

- The BEng/MEng course sits within the School of Mechanical, Aerospace and Automotive Engineering.
- The School works closely with the Institution of Mechanical Engineers and other professional bodies who inform on the curriculum.
- The School engages in a wide variety of research and attracts governmental funding.
- The School engages with industry through advisory boards to inform curriculum design.

The School conducts themed research within a number of Research Centres:

- The Institute for Future Transport and Cities
- The Centre for Fluid and Complex Systems
- The Centre for Manufacturing and Materials Engineering

18 Additional Information

Enrolled students have access to additional, key sources of information about the course and student support including:

- Student Handbook
- Course Handbook
- Module Guides
- Aula Course & Module Webs
- Module Information Directory
- EEC Student Portal <https://share.coventry.ac.uk/students/EC/Pages/Home.aspx>
- Coventry University Student Portal <https://share.coventry.ac.uk/students/Pages/Index.aspx>