



Course Specification

Part A

MEng Automotive Engineering (EECU089) BEng (Honours) Automotive Engineering (EECU089)

**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 Automotive Engineering (EECU089)

1. Introduction

Coventry has been at the heart of the UK automotive industry for over 100 years and is home to some of its most iconic designs. The industry changed much during that time and it continues to change and evolve. Our Automotive Engineering courses also change and adapt to produce Automotive Engineers ready to meet the challenges of the future. Our BEng and MEng Automotive Engineering graduates will be responsible for seeing the automotive industry through arguably its biggest change since the adoption of mass production. The vehicles of the future will be powered in different ways, will be driven in different ways and will even be owned in different ways from the way most are now.

The BEng and MEng in Automotive Engineering build on this history and produce the Automotive Engineers with the versatility and depth of understanding to deal with new and unusual challenges in automotive engineering, alongside the necessary imagination and creativity to innovate. They are designed to equip graduates with relevant, up-to-date skills and knowledge to work as an automotive engineer in a broad variety of businesses, including engineering management, research, engineering design, development and consultancy. These degree will prepare students to pursue successful careers and be leaders in the automotive engineering related industries.

This course specification describes the programme of study for BEng/MEng Automotive 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 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 and starts to introduce application of knowledge in specific Automotive topics. 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:

- 20% scale open jet wind tunnel commissioned by one of the most successful Formula 1 teams in recent years, Mercedes-AMG Petronas Motorsport used by our undergraduate students for fluid mechanics experiments and Aero design and test projects.
- The composites lab is used for project work and the large design build projects.
- A metrology lab and equipment for fatigue and tensile testing (Instron), both used for part validation.
- A shaker rig used for vehicle dynamic testing
- A flow lab and engine test cell used for lab experiments and in the Powertrain modules ,
- An engineering workshop with a range of state of the art CNC machines, a model shop, a suite of 3D printers and laser cutting facilities, all used for workshop skills and design build project work
- Two CRUDEN F1 6DoF vehicle simulators, used to quickly simulate and assess vehicle setup modifications and vehicle data engineering work

The MEng route is designed for high achieving students to continue their studies and to develop advanced technical, application and leadership skills.

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 59,000 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 Automotive Engineering	FT 4 year SW 5 years PT 6 years	H300	7
BEng Honours Automotive 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_16 the Engineering Council UK-SPEC Fourth edition</p>

	https://www.engc.org.uk/media/3417/uk-spec-fourth-edition.pdf and Professional Body, Institution of Mechanical Engineering (IMechE).
10 Date of Course Specification	February 2021
11 Course Director	Mark Bevan

12 Outline and Educational Aims of the Course

This MEng/BEng in Automotive Engineering aims to provide students with a comprehensive understanding of automotive 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 Automotive Engineering and gives access to both academic and industrial experience.
2. Provide a global experience and the opportunity for students to advance their engineering proficiency, develop new skills and knowledge.
3. Prepare students to be able to make significant contributions to the Automotive 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. Engage the students in real world projects through specific automotive topics, such as Vehicle dynamics, Aerodynamics and Powertrain systems, culminating with a final year industry-focussed Innovation Project to enable them to graduate with industry ready skills and knowledge.
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 Automotive 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. Design, optimise and communicate the performance of a vehicle; through the application of vehicle systems knowledge to achieve the performance, safety, sustainability and cost requirements of the Automotive industry.
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 engineering 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/legislations governing engineering activities.
11. Understand and evaluate a range of appropriate engineering materials, components and systems, identifying their limitations and likely developments.

MEng Automotive Engineering

- 6m. Apply a comprehensive understanding of Automotive engineering principles together with a critical awareness of current issues at the forefront of the specialism.
 - 7m. Apply and evaluate engineering analysis methods when solving complex problems and assess their limitations, especially when applied to new or unfamiliar technology.
 - 8m. Generate and appraise innovative design solutions through the application and comprehensive understanding of the engineering design processes.
 - 9m. Critically assess data and information that may be uncertain or incomplete and quantify the effect on design using practical laboratory skills and experimental research.
 - 10m. Critically appraise management, business and ethical practice and their limitations informed by a knowledge of sustainable development, customer requirements and the regulations/legislations governing engineering activities in a commercial, social and international contexts.
 - 11m. 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.
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14 Course Structure and Requirements, Levels, Modules, Credits and Awards

Both MEng and BEng Automotive 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.

At level 6 both MEng and BEng students have a choice of 1 option module from 5. MEng students can also choose 1 out of 3 Pathway options 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						
4025MAA	Mechanical Science	4	20 (20)	M	M	5,6,7,9,11
4026MAA	Manufacturing Technology and Materials	4	20 (20)	M	M	3,6,7,9,11
4027MAA	Design	4	20 (20)	M	M	1,2,3,5,6,8,10,11
4028MAA	Engineering Applications	4	20 (20)	M	M	1,2,3,5,6,8,9,10
4038CEM	Engineering Mathematics 1	4	20 (20)	M	M	3,5,6,7
4036MAA	Electrical Machines	4	10 (10)	M	M	5,6,7,11
	One 10-Credit Year 1 Add+Vantage Module	4	10 (10)	M	M	
BEng L5						
5032MAA	Engineering Management	5	10 (10)	M	M	3,4,6,10
5033MAA	Thermofluid Mechanics	5	20 (20)	M	M	5,6,7,9
5034MAA	Analytical Modelling	5	20 (20)	M	M	5,6,7,9
5035MAA	Solid Mechanics and Dynamics	5	20 (20)	M	M	5,6,7,9,11
5036MAA	Design and Sustainability	5	20 (20)	M	M	1,2,3,5,6,8,9,11
5038MAA	Vehicle Systems and Development	5	20 (20)	M	M	1,5,6,7,9,10
	One 10-Credit Year 2 Add+Vantage Module	5	10 (10)	M	M	
PLACEMENT						
5012CEM	Professional Training	0	0	O	O	
5013CEM	Study Abroad	0	0	O	O	
BEng L6						
OPTIONS Choose 1 from 5						
6062MAA	Finite Element Analysis and Optimisation	6	20 (20)	O	O	3,5,6,7,9,11
6063MAA	Computational Thermo-fluids	6	20 (20)	O	O	3,5,6,7,9
6064MAA	Materials Analysis and Advanced Manufacturing	6	20 (20)	O	O	3,5,6,8,9,11

6066MAA	Electric Vehicle & Future Transport	6	20 (20)	O	O	5,6,7,9,11
6067MAA	Vehicle Refinement, Durability and Reliability	6	20 (20)	O	O	3,5,6,7,9,11
Compulsory						
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
6053MAA	Automotive Product Innovation	6	20 (20)	M		1,2,3,4,8,9,10
6058MAA	Automotive Aerodynamics and Vehicle Dynamics	6	20 (20)	M	M	3,5,6,7,9,11
6059MAA	Automotive Powertrain	6	20 (20)	M		3,5,6,7,9,11
	One 10-Credit Year 3 Add+Vantage Module	6	10 (10)	M		
MEng L6						
OPTIONS Choose 1 from 5						
6062MAA	Finite Element Analysis and Optimisation	6	20 (20)	O	O	3,5,6,7,9,11
6063MAA	Computational Thermo-fluids	6	20 (20)	O	O	3,5,6,7,9
6064MAA	Materials Analysis and Advanced Manufacturing	6	20 (20)	O	O	3,5,6,8,9,11
6066MAA	Electric Vehicle & Future Transport	6	20 (20)	O	O	5,6,7,9,11
6067MAA	Vehicle Refinement, Durability and Reliability	6	20 (20)	O	O	3,5,6,7,9,11
Compulsory						
6050MAA	Professional Development and Project Planning	6	10 (10)	M	M	1,2,4,10
6058MAA	Automotive Aerodynamics and Vehicle Dynamics	6	20 (20)	M	M	3,5,6,7,9,11
6069MAA	Individual Project Dissertation (L7)	7	40 (40)		M	1,3,4,5,13,15,17
6072MAA	Further Automotive Powertrain	7	20 (20)		M	1,3,12,13,14,17
	One 10-Credit Year 3 Add+Vantage Module	6	10 (10)	M		
MEng L7						
7144MAA	Industrial Group Project Proposal	7	20 (20)		M	1,2,3,4,8m,10,11m
7145MAA	Industrial Group Project Dissertation	7	40 (40)		M	1,2,3,4, 8m,9m,11m
7146MAA	Business Innovation and Sustainability	7	20 (20)		M	1,3,4,8m,10m
PATHWAYS Choose 1 Pathway from 3						
Pathway 1 - Analysis						
7147MAA	Engineering Simulation and Analysis	7	20 (20)		M	3,5,6m,7m,9m

7148MAA	Structures Safety and Impact Analysis	7	20 (20)		M	3,5, 6m,7m,9m
	Pathway 2 - Dynamics					
7149MAA	Vehicle Development and Analysis	7	20 (20)		M	3,5, 6m,7m,9m
7150MAA	Advanced Ground Vehicle Dynamics and Aerodynamics	7	20 (20)		M	3,5, 6m,7m,9m
	Pathway 3 - Powertrain					
7149MAA	Vehicle Development and Analysis	7	20 (20)		M	3,5, 6m,7m,9m
7151MAA	Advanced Powertrain	7	20 (20)		M	3,5, 6m,7m,9m

Cascade of Awards:

The requirements for progression and awards:

Progression to each new level of study requires completion of a minimum of 100 credits at the previous level including all pre-requisite modules.

BEng (Hons) Automotive Engineering (accredited)



BEng Automotive Engineering (non accredited)



Diploma (DipHE) Engineering



Certificate (CertHE) Engineering

MEng (Hons) Automotive Engineering (accredited)



BEng Automotive 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 (non accredited)
6051MAA Individual Project and 6053MAA Automotive 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. Fall back awards are 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.

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 BEng and MEng. The modules counted in the classification must include the following:

For Degree (accredited)
120 M Level Credits To include 7144MAA Industrial Group Project Proposal 7145MAA Industrial Group Project Dissertation 7146MAA Business Innovation and Sustainability

Fall-Back 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 undertaking 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>