



Course Specification Part A

MSc Automotive Engineering EECT041

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.

Coventry University's accreditation with CMI is currently ongoing for the relevant modules and is regularly reviewed and monitored by the CMI through their quality systems. Whilst Coventry University anticipates that these reviews will continue to be successful, if they were to be unsuccessful, the relevant module in this course would no longer be accredited and we would notify applicants and students of this change as soon as possible.

PART A Course Specification (Published Document)

MSc Automotive Engineering

1. Introduction

This course has firm footings in traditional automotive technology but looks to the future. Today, automotive companies require engineers who are highly qualified and possess current, specialised skills. This course will enable students to develop and critically analyse technologies and applications for automotive transportation and engineering. The course is designed for engineering students that are interested in working in the global automotive sector as it continues its rapid growth. Students will learn how to apply their engineering knowledge to address the rapid development of automotive technology and the requirement for cost-effective carbon reduction solutions.

This course not only addresses the overall design of a vehicle but will also introduce students to various specialised areas. The course is aimed at students who possess a mechanical or automotive background.

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 including, aerodynamics, internal combustion, hybrid and electric powertrains, connected vehicles, vehicle safety and vehicle dynamics. These subject areas continue to evolve and are regularly used to support industry with our continuing professional development (CPD) courses and modules.

Embedded in the course is also a project management module and a CMI management module. Students can gain industrial experience and develop transferable skills, develop their team working and communication skills. Students who successfully complete the CMI module will also gain a L7 Certificate in Strategic Leadership and Management and a L7 Award in Professional Consulting.

The course has also been design around the engineering benchmarks which means it aligns to the academic standards expected of a graduate. As such the course is also accredited by the Institution of Mechanical Engineers (IMechE). This means the MSc meets, in part, the exemplifying academic benchmark requirements for registration as a Chartered Engineer. Accredited MSc graduates who also have a BEng (Hons) accredited for CEng will be able to show that they have satisfied the educational base for CEng registration.

Research informed teaching is the norm, especially with individual projects. Students will attend a project fair to select from an extensive list of projects that are directly linked with industrial partners or the research. An Activity Led Learning (ALL) approach (student centred) is promoted within the course, with group work introduced to develop transferable skills helping the students to be industry ready.

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, a 4 pot vehicle shaker rig, flow lab, and state of the art AVL engine test cell, automotive workshop where a number of vehicles are available, including the Coventry University-designed and built vehicles (such as Formula Student), equipment for fatigue and tensile testing (Instron), laser workshop, a small hydrogen vehicle manufacturing factory, a motion based vehicle driving simulator from Cruden, a fully equipped model making shop, a range of CNC machinery and a full size Harrier Jet.

To improve the global experience, in the past, Collaborative Online International Learning (COIL) projects, where Coventry University students worked alongside students from international partner institutions, ran. Embedded at module level, the impact climate and legislation has on the overall design of the same vehicle sold across the globe is discussed. Students are also encouraged to join the Global Leaders Programme.

Students on this course will be assigned to an academic personal tutor (APT) which will act as a first point of reference for pastoral support.

This course has two entry points, September and January.

For students in today's competitive employment markets having work experience can significantly enhance employment prospects. For this reason, the course offers students the opportunity to undertake a work placement, extending the main provision to a two-year course. The work placement could be International or UK with a focus which may be industry or research. Following a selection process within the first semester and subject to securing an approved placement opportunity, students would move onto the two-year course. International students who are interested in a work placement will be supported in completing an application for extending their Tier 4 visa by

international student support services. Upon completion of their placement, students will return to complete the course and the final project for the full award.

As part of this course you will undertake a professional development module which is currently accredited by the Chartered Management Institute (CMI). Upon successful completion of the module, you will gain the CMI Level 7 Certificate in Strategic Management and Leadership Practice at no additional cost.

Upon completion of the course, graduates can expect to find employment with Automotive original equipment manufacturers (OEMs) or their suppliers in a variety of engineering jobs ranging from chassis, thermal management and aerodynamics, design, validation/homologation, powertrain and testing to name but a few.

2 Available Award(s) and Modes of Study

Title of Award	Mode of attendance	UCAS Code	FHEQ Level
MSc in Automotive Engineering	FT 1 year 2 years with Work Placement PT 2 years	N/A	7
Fall-back award PG Diploma in Automotive Engineering PG Certificate in Automotive 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: 01/2019 Date for next review: 2024/2025		
7 Course Accredited by	Institute for Mechanical Engineering (IMEchE): The accredited MSc will meet, in part, the exemplifying academic benchmark requirements for registration as a Chartered Engineer. Accredited MSc graduates who also have a BEng (Hons) accredited for CEng will be able to show that they have satisfied the educational base for CEng registration.		
8 Accreditation Date and Duration	14 th January 2021, accreditation up to and including 2025 intakes		
9 QAA Subject Benchmark Statement(s) and/or other external factors	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 https://www.engc.org.uk/media/3417/uk-spec-fourth-edition.pdf		
10 Date of Course Specification	February 2021		
11 Course Director	Mr Remus Cirstea		

12 Outline and Educational Aims of the Course

This MSc 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 automotive 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 the automotive 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
2. Provide a global experience and the opportunity for students to advance their engineering proficiency, develop new skills and knowledge
3. Prepare students to make significant contributions to their professions, the economy and society
4. Use activity-led learning, underpinned by research inspired teaching, to provide students with a transformative learning experience
5. Provide students with the opportunity to deal with complex issues, demonstrate self-direction and develop transferable skills, plan self-learning and improve performance as the foundation of lifelong learning and continuous professional development.
6. 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

13 Course Learning Outcomes

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

1. Demonstrate a comprehensive understanding of the relevant scientific principles together with a critical awareness of current issues at the forefront of the automotive sector and from outside of engineering and apply them critically and effectively.
2. Apply and evaluate engineering analysis methods when solving complex problems and assess their limitations, to collect and analyse research data and use fundamental knowledge to analyse new and emerging technologies.
3. Demonstrate a comprehensive understanding of automotive design processes and methodologies and be able to generate and innovate design solutions.
4. Critically assess information that may be uncertain or incomplete and quantify, using experimental research, the effect on design.
5. Demonstrate critical awareness of the need for professional and ethical conduct in commercial and social contexts, a knowledge of management and business practice and their limitations together with an understanding of sustainable development and the relevant regulations governing automotive engineering activities in order to critically appraise risk.
6. Show an advanced level knowledge of a wide range of engineering components and materials with an appreciation of their limitations and likely developments together with commercial and industrial constraints.
7. Apply the necessary study and research skills to support the analytical, critical and reflective requirements of written, oral and group assessments.
8. Contribute to a team with the necessary planning, reviewing, adaptability, drive and leadership to achieve the required objectives and observe work schedules.
9. Clearly communicate research, concepts, solutions and recommendations, and demonstrate a professional approach to written and/or oral presentations.
10. Critically evaluate the principles of developing and proposing strategy for leading strategic change.

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

The MSc Automotive Engineering is a 1-year full-time course, which will have September and January intakes. The following table is a typical delivery pattern for this course based on the Teach-Teach-Project Cycle being used during the entry year. Personalised timetables will be issued to students prior to their course start date.

September intake	January intake	Module code and name		Credit level	Credit Value (Assessment credit)	Course Learning Outcomes
Semester 1 Modules	Semester 2 Modules	7017MAA	Project Management	7	15 (15)	1,2,5,6,9,10
		7040MAA	Design Principles and Practice	7	15 (15)	2,3,4,6,9
		7080MAA	CAV Contextualisation	7	15 (15)	1,3,4,6,7
		7041MAA	Engineering Analysis and Simulation	7	15 (15)	1,2,6,8
Semester 2 Modules	Semester 1 Modules	7039MAA	Ground Vehicle Dynamics	7	15 (10)	1,2,6,7,8
		7051CRB	Leading Strategic Change through Creativity and Innovation	7	10 (10)	5,8,9,10
		7038MAA	Ground Vehicle Aerodynamics	7	15 (10)	1,2,3,4,6,7,8,9
		7042MAA	Advanced Propulsion Systems	7	20 (20)	1,2,3,4,6,7,8
		7043MAA	Dynamics Theme Viva	7	0 (10)	1,2,3,4,6,8,9
Semester 3 Module	Semester 3 Module	7166MAA	Individual Project	7	60 (60)	1,2,3,4,5,6,9,10

Work Placement

During semester 1, students who have expressed an interest in undertaking a work placement should begin the application process for placement opportunities. Students have the responsibility for securing a placement, but they will be supported throughout the application process by a specialist employer engagement team. The university will work with employers to identify opportunities. Subject to securing a placement, the International Student Support team will work with international students to obtain UK study visa extensions. Visas required to work in other countries will be the responsibility of the student.

The course is structured so that students complete two semesters of taught modules and then spend three semesters on placement. During this time students would be enrolled onto modules 7102CEM Extended Masters Work Placement A, 7103CEM Extended Masters Work Placement B and 7104CEM Extended Masters Work Placement C. The modules are zero credit and do not contribute to the classification or name of the award but must be passed to complete the placement. Upon completion of the work placement, students are expected to return to Coventry to complete the final semester during which time they undertake their project module. Successful completion of the Work Placement is reflected in the final student transcript.

Credit level	Module Code	Title	Credit Value	Mandatory/ Optional	Course Learning Outcomes
Subject to securing an appropriate placement opportunity and fulfilling the selection requirements, students will be transferred to the two-year course and the Work Placement modules listed below are to be taken.					
7	7102CEM	Extended Masters Work Placement A	0	Optional	
7	7103CEM	Extended Masters Work Placement B	0	Optional	
7	7104CEM	Extended Masters Work Placement C	0	Optional	

The work placement is to be taken over three semesters and prior to the final semester of the course.

Cascade of Awards:

The requirements for progression and awards:

Awards for Taught Masters programmes may be made with Distinction or with Merit as per the Academic Regulations.

MSc Automotive Engineering – The full curriculum (180 credits)



PG Diploma (PG Dip) Automotive Engineering – 120 credits (any modules)



PG Certificate (PG Cert) Automotive Engineering – 60 credits (any modules, excluding 7043MAA and 7051CRB)

CMI Certificate:

Students who successfully complete the module and meet the CMI learning outcomes will gain a Level 7 Certificate in Strategic Management and Leadership Practice based on the following CMI units: Developing Organisational Strategy (Unit 704); Leading Strategic Change (unit 705).

Students who successfully complete this module will be awarded Foundation Chartered Manager status and be able to use the designation 'fCMgr' after their name.

15 Criteria for Admission and Selection Procedure

To commence the full-time MSc Automotive Engineering course, applicants must:

- Be an honours graduate of Mechanical, Automotive or related discipline (minimum 2:2 or higher), obtained from a recognised university/HE institution, or hold an equivalent qualification acceptable to Coventry University
- Hold IELTS 6.5 or equivalent if English is not the applicant's first language.

Students who do not fit with the above entry requirements can gain entry but their degrees and experience will be assessed for appropriate content by the course director.

There is an accreditation for Recognised Prior Learning (RPL) process available which is in accordance with University regulations for taught postgraduate courses. The accreditation for Recognised Prior Experiential Learning (RPEL) will only be awarded for achievements equivalent to master's level. RPEL will be assessed in line with University Regulations.

16 Academic Regulations and Regulations of Assessment

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

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 MSc Automotive Engineering 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 & Aula 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>