

Title of Programme: Modular Masters in Aerospace, Automotive, and Mechanical Engineering

Programme Code: EIMASTAD

# Programme Specification

This programme specification is relevant to students entering:  
01 September 2023

Associate Dean of School (Academic Quality Assurance):  
Mariana Lilley



A programme specification is a collection of key information about a programme of study (or course). It identifies the aims and learning outcomes of the programme, lists the modules that make up each stage (or year) of the programme, and the teaching, learning and assessment methods used by teaching staff. It also describes the structure of the programme, its progression requirements and any programme-specific regulations. This information is therefore useful to potential students to help them choose the right programme of study, to current students on the programme, and to staff teaching and administering the programme.

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## Summary of amendments to the programme

Date	Section	Amendment

If you have any queries regarding the changes, please email [AQO@herts.ac.uk](mailto:AQO@herts.ac.uk)

# Programme Specification Modular Masters in Aerospace, Automotive, and Mechanical Engineering

This programme specification (PS) is designed for prospective students, enrolled students, academic staff and potential employers. It provides a concise summary of the main features of the programme and the intended learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the teaching, learning and assessment methods, learning outcomes and content for each module can be found in Definitive Module Documents (DMDs) and Module Guides.

## Section 1

<b>Awarding Institution/Body</b>	University of Hertfordshire
<b>Teaching Institution</b>	University of Hertfordshire
<b>University/partner campuses</b>	College Lane
<b>Programme accredited by</b>	See Section D
<b>Final Award (Qualification)</b>	MSc
<b>All Final Award titles</b>	MSc Aerospace Engineering
<b>(Qualification and Subject)</b>	MSc Automotive Engineering
	MSc Mechanical Engineering
<b>FHEQ level of award</b>	7

### A. Programme Rationale

This programme consists of a number of specialist Masters awards with an expectation that students will have studied a related engineering discipline to a Bachelor's level or equivalent, as opposed to a conversion masters philosophy aimed at students from a non-engineering background. The MSc awards are normally studied over three semesters with the final semester being a 60-credit point individual project.

The MSc has two starting points. This has been adopted to meet the demand from international students whose previous studies were conducted with a different academic year to the normal September to September year operated in the UK. The consequence of this is that the modules that make up the MSc curriculum need to be independent of each other as the two intake groups of students will not necessarily take modules in the same order. Students entering in semester B will therefore complete their studies over an 18-month period rather than 12 months.

The successful postgraduates of the programme will acquire the knowledge and understanding, intellectual, practical and transferable skills necessary for the analysis and synthesis of problems in engineering and manufacturing through a combination of experimental, simulation, research methods and case studies. They can expect to gain work in a range of disciplines within a variety of industries from specialist technical roles to positions of management responsibility.

On the **MSc Aerospace Engineering**, the development of skills and advancement of knowledge focus on:

- dynamic structural and aeroelastic analysis of aerospace vehicles, flight dynamics, stability and control and the implications for the design and construction of aerospace vehicles;
- the construction of CFD models and to assess implications of results, the limitations of present techniques and the potential future direction of developments in the CFD and aerodynamics field;
- appreciation of the need for process, product development and quality and reliability issues relevant to the introduction of products in a cost effective and timely manner;
- critical review of the present knowledge base, its applicability, usage and relevance to enhance product and enterprise performance;
- industrial-relevant topics, enabling students to develop knowledge and skills sought by aerospace companies such as Airbus, Rolls Royce, Bombardier, BAE Systems, and MBDA, for example.

On the **MSc Automotive Engineering**, the development of skills and advancement of knowledge focus on:

- the selection of materials, process and techniques for the structural analysis and the design and construction of automotive components such as body and chassis, in relation to vibration and vehicle dynamics;
- understanding of alternative power train and fuel technologies, their impact on vehicle performance and environment;
- the construction of CAE models and to assess implications of the results, the limitations of present techniques and the potential future direction of developments in the CAE field;
- appreciation of the need for process and product development relevant to the introduction of products in a cost effective and timely manner;
- critical review of the present knowledge base, its applicability, usage and relevance to enhance product and enterprise performance.

On the **MSc Mechanical Engineering**, the development of skills and advancement of knowledge focus on:

- the selection of materials, process and techniques for the structural analysis, design and construction of engineered components;
- the understanding of the control and dynamics theories used in the design of systems and more specifically their application in a wide variety of engineered systems and subsystems;
- the construction of CAE models and evaluation of results, the limitations of present techniques and the potential future direction of developments in the CAE field;
- appreciation of the need for process, product development and quality and reliability issues relevant to the introduction of products in a cost effective and timely manner;
- critical review of the present knowledge base, its applicability, usage and relevance to enhance product and enterprise performance.

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## B. Educational Aims of the Programme

The programme has been devised in accordance with the University's graduate attributes of programmes of study as set out in [UPR TL03](#).

**Additionally this programme aims to:**

- provide a quality education at postgraduate level in the disciplines of aerospace, automotive and mechanical engineering;
- provide an educational opportunity and experience to graduates and/or those with appropriate previous experience which enhances their prospects of professional employment with industry;
- provide a variety of awards of study through which the postgraduate may demonstrate competence, knowledge, skills and understanding, in and of, selected disciplines in the field of engineering, management and technology;
- provide the students with the knowledge and understanding to equip them for a career in technical and engineering management;
- provide and equip the students with theory and the practice of process and technology management, system design and implementation.

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## C. Intended Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills and other attributes in the following areas. The programme outcomes are referenced the Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies (2014), and relate to the typical student.

Additionally, the SEEC Credit Level Descriptors for Further and Higher Education (2021) have been used as a guiding framework for curriculum design.

Knowledge and Understanding:	Teaching/learning methods & strategies	Assessment
<p><b>Aerospace Engineering (AM), Automotive Engineering (AUM) and Mechanical Engineering (MECM)</b></p> <p>A1 (AM)- The advanced CAE and simulation methods employed by aerospace engineers.            A1 (AUM)- The advanced CAE and simulation methods employed by automotive engineers.            A1 (MECM)- The advanced CAE and simulation methods employed by mechanical engineers.</p> <p>A2 (AM)- The fundamental sciences appropriate to aerospace engineering.            A2 (AUM)- The fundamental sciences appropriate to automotive engineering.            A2 (MECM)- The fundamental sciences appropriate to mechanical engineering.</p> <p>A3- Appropriate research methods employed in analysis of technical and commercial problems.</p> <p>A4- The product/process definition and systems design process.</p> <p>A5- Understanding of business practice and the limitations within an engineering specialisation.</p> <p>A6- Understand the roles in an engineering team and personal responsibilities.</p>	<p>Acquisition of knowledge and understanding is through a combination of lectures, seminars, group discussions and assignments.</p> <p>Throughout, the learner is encouraged to undertake independent study both to supplement and consolidate what is being taught/learnt and to broaden their individual knowledge and understanding of the subject.</p>	<p>Knowledge and understanding are assessed through a series of case studies, assignments, project reports and unseen examinations.</p>
Intellectual skills:	Teaching/learning methods & strategies	Assessment
<p>B1- Analyse and solve engineering problems using appropriate techniques.</p> <p>B2- Design/model/analyse relevant engineering systems/subsystems.</p>	<p>Intellectual skills are developed throughout the programme by the methods and strategies outlined in section A, above.</p> <p>Analysis, problem solving, and modelling skills are further developed through case studies, class discussion, in-course</p>	<p>Intellectual skills B1-B6 are assessed through case studies, experiential work, tutorials, assignment and examinations. These are supported by work centred on analysis and synthesis, problem solving, in technical and managerial contexts.</p>

<p>B3- Critically review and select appropriate research methods to solve engineering and commercial problems.</p> <p>B4- Evaluate external influences on the design process.</p> <p>B5- Develop skills in ethical operations and show insight on the commercial and social context.</p> <p>Additionally, for</p> <p><b>Aerospace &amp; Mechanical Engineering</b></p> <p>B6 (AM) (MECM)- Evaluate external influences on the design process in the context of Supply Chain Management.</p>	<p>exercises, assignments and exams.</p> <p>Throughout, the learner is encouraged to develop intellectual skills further by independent study</p>	
<p>Practical skills:</p>	<p>Teaching/learning methods &amp; strategies</p>	<p>Assessment</p>
<p>C1 (AM)- Apply appropriate experimental, analytical and modelling techniques to a range of aerospace engineering problems draw conclusions.</p> <p>C1 (AUM)- Apply appropriate experimental, analytical and modelling techniques to a range of automotive engineering problems and draw conclusions.</p> <p>C1 (MECM)- Apply appropriate experimental, analytical and modelling techniques to a range of mechanical engineering problems and draw conclusions.</p> <p>C2- Use advanced computer-aided engineering tools.</p> <p>C3- Prepare technical documentation.</p> <p>C4- Evaluate the design of appropriate systems, components or processes.</p> <p>C5- Plan and manage project, taking into account</p>	<p>Practical skills are developed throughout the programme through a series of case studies, experimental and simulation exercises, project reports and viva.</p> <p>Skills are developed through the programme of study and associated written reports and submissions.</p> <p>C5 is developed throughout the programme of the study, with one-to-one supervision during the individual project.</p>	<p>Practical skills C1-C5 are formerly assessed through assignment work on case studies and the individual project.</p>

commercial, industrial and resource constraints.		
Transferable skills:	Teaching/learning methods & strategies	Assessment
D1- Communicate information effectively, orally and/or in writing.	<p>Transferable skills are developed throughout the programme by using group discussions and report writing and require students to manage their own time for achieving targets.</p> <p>Skill D1 is developed through coursework reports, oral presentations, research methods and the project report.</p> <p>Skill D2 is developed through meeting deadlines for scheduled assignments and the individual project.</p> <p>Skills D3, D4 and D5 are developed throughout most modules; through lectures, group work, assessments and the individual project.</p> <p>Skill D6 is encouraged and developed by the nature of the programme of study and the acquisition of transferable skills.</p>	Transferable skills D1-D6 are assessed through assignment work and the project.
D2- Manage time and resources effectively.		
D3- Work effectively individually and/or within a team.		
D4- Solve problems in a logical and coherent manner.		
D5- Manipulate, sort and present data.		
D6- Learn effectively and independently, in preparation for lifelong learning.		

## D. Programme Structures, Features, Levels, Modules, and Credits

The programme is offered in full-time mode only.

Full-time students may enter the programme for a Semester A entry option 1 start in September when it runs over one calendar year or Semester A entry option 2 when it will run for a period of 18 months. Semester B entry in January runs over 18 months. Identical modules will be studied on both September and January intakes. Students on the September and January intakes complete their projects in Semesters C, A or B respectively. In summary:

- Semester A Entry, Option 1: presents an earlier start project module in a study pattern of Semesters A (September), B (January) and C (May).
- Semester A Entry, Option 2: presents a longer study time in a study pattern of Semesters A, B and A.
- Semester B Entry: presents a pattern of study of Semesters B, A and B.

Entry is normally at Masters Level 7 with related degree qualifications.

The Programme Learning Outcomes detailed in section C are developed and assessed through the constituent modules. Table 2 (at the end of this document) identifies where each learning outcome is developed and assessed.

### **Professional and Statutory Regulatory Bodies**

The following Masters degrees be accredited as meeting the academic requirement as Further Learning for Chartered Engineer registration from the 2023 cohort intake up to, and including, the 2025 intake:

- MSc in Automotive Engineering
- MSc in Mechanical Engineering

The following programme is accredited by the Royal Aeronautical Society as meeting the further learning requirements for CEng registration, for intake years 2022-2026:

- MSc Aerospace Engineering

Please note that the Washington Accord recognition requires a combination of a recognised CEng bachelors-level degree course with recognised further learning to masters level.

### Programme Structure

The programme structure and progression information below (Table 1a and 1b) is provided for the award. Any interim awards are identified in Table 1b. The Programme Learning Outcomes detailed above are developed and assessed through the constituent modules. Table 2 identifies where each learning outcome is assessed.

Table 1a Outline Programme Structure

#### **MSc Aerospace Engineering**

**Mode of study:** Full-time

**Entry point:** Semester A

<b>Compulsory Modules</b> Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Sustainable Business of Engineering	7ENT1126	15	0	100	0	A
CFD & Applications	7ENT1133	15	50	50	0	A
Flight Simulation	7ENT1134	15	0	100	0	A
Aeroelasticity	7ENT1135	15	60	40	0	A
Flight Mechanics	7AAD0038	15	60	40	0	B
Procurement & Supply Chain Management	7ENT1069	15	60	40	0	B
CAE & Applications	7ENT1131	15	50	50	0	B
Aerospace Aerodynamics	7ENT1139	15	60	40	0	B
MSc Individual Project	7ENT1072	60	0	100	0	C/A

#### **MSc Aerospace Engineering**

**Mode of study:** Full-time

**Entry point:** Semester B

<b>Compulsory Modules</b> Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Flight Mechanics	7AAD0038	15	60	40	0	B
Procurement & Supply Chain Management	7ENT1069	15	60	40	0	B
CAE & Applications	7ENT1131	15	50	50	0	B

Aerospace Aerodynamics	7ENT1139	15	60	40	0	B
Sustainable Business of Engineering	7ENT1126	15	0	100	0	A
CFD & Applications	7ENT1133	15	50	50	0	A
Flight Simulation	7ENT1134	15	0	100	0	A
Aeroelasticity	7ENT1135	15	60	40	0	A
MSc Individual Project	7ENT1072	60	0	100	0	B

### MSc Automotive Engineering

**Mode of study:** Full-time

**Entry point:** Semester A

	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
<b>Compulsory Modules</b>						
Module Title						
Automotive Electrical Systems	7AAD0056	15	0	100	0	A
Sustainable Business of Engineering	7ENT1126	15	0	100	0	A
CFD & Applications	7ENT1133	15	50	50	0	A
Automotive Materials & Manufacture	7ENT1141	15	0	100	0	A
Automotive Dynamics & Safety	7AAD0054	15	50	50	0	B
CAE & Applications	7ENT1131	15	50	50	0	B
Electric Vehicle Technology	7ENT1132	15	50	50	0	B
Advanced Engines & Power Systems	7ENT1138	15	60	40	0	B
MSc Individual Project	7ENT1072	60	0	100	0	C/A

### MSc Automotive Engineering

**Mode of study:** Full-time

**Entry point:** Semester B

	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
<b>Compulsory Modules</b>						
Module Title						
Automotive Dynamics & Safety	7AAD0054	15	50	50	0	B
CAE & Applications	7ENT1131	15	50	50	0	B
Electric Vehicle Technology	7ENT1132	15	50	50	0	B
Advanced Engines & Power Systems	7ENT1138	15	60	40	0	B
Automotive Electrical Systems	7AAD0056	15	0	100	0	A
Sustainable Business of Engineering	7ENT1126	15	0	100	0	A
CFD & Applications	7ENT1133	15	50	50	0	A
Automotive Materials & Manufacture	7ENT1141	15	0	100	0	A
MSc Individual Project	7ENT1072	60	0	100	0	B



## MSc Mechanical Engineering

Mode of study: Full-time

Entry point: Semester A

Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
<b>Compulsory Modules</b>						
Dynamics and Performance of Mechanical Systems	7ENT1081	15	0	100	0	A
Sustainable Business of Engineering	7ENT1126	15	0	100	0	A
CFD & Applications	7ENT1133	15	50	50	0	A
Integrated Product Engineering	7ENT1137	15	0	100	0	A
Procurement & Supply Chain Management	7ENT1069	15	60	40	0	B
Advanced Materials & Manufacturing Technology	7ENT1129	15	0	100	0	B
CAE & Applications	7ENT1131	15	50	50	0	B
Advanced Thermodynamics and Thermal Systems	7ENT1136	15	0	100	0	B
MSc Individual Project	7ENT1072	60	0	100	0	C/A

## MSc Mechanical Engineering

Mode of study: Full-time

Entry point: Semester B

Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
<b>Compulsory Modules</b>						
Procurement & Supply Chain Management	7ENT1069	15	60	40	0	B
Advanced Materials & Manufacturing Technology	7ENT1129	15	0	100	0	B
CAE & Applications	7ENT1131	15	50	50	0	B
Advanced Thermodynamics and Thermal Systems	7ENT1136	15	0	100	0	B
Dynamics and Performance of Mechanical Systems	7ENT1081	15	0	100	0	A
Sustainable Business of Engineering	7ENT1126	15	0	100	0	A
CFD & Applications	7ENT1133	15	50	50	0	A
Integrated Product Engineering	7ENT1137	15	0	100	0	A
MSc Individual Project	7ENT1072	60	0	100	0	B

### Table 1b Final and interim awards available

The programme provides the following final and interim awards:

Final Award	Award Title	Minimum requirements	Available at end of (normally):	Programme Learning Outcomes developed (see above)
MSc	Aerospace Engineering	180 credit points	3 Semesters	A subset of the programme learning outcomes (see Table 2) depending on core modules for the award.
MSc	Automotive Engineering			
MSc	Mechanical Engineering			
Interim Award	Award Title	Minimum requirements	Available at end of	Programme Learning Outcomes developed (see above)
Postgraduate Diploma	Aerospace Engineering	120 credit points, including at least 90 at level 7	2, 3 Semesters	A subset of the programme learning outcomes (see Table 2) depending on the student's individual modules passed.  For Aerospace Engineering, must include A1 (AM), A2 (AM), C1 (AM).  For Automotive Engineering, must include A1 (AUM), A2 (AUM), C1 (AUM).  For Mechanical Engineering, must include A1 (MECM), A2 (MECM), C1 (AUM).
Postgraduate Diploma	Automotive Engineering			
Postgraduate Diploma	Mechanical Engineering			
Postgraduate Certificate		60 credit points	1-2 Semesters	See UPR AS11, section 13: <a href="http://sitem.herts.ac.uk/secreg/upr/AS11.htm">http://sitem.herts.ac.uk/secreg/upr/AS11.htm</a>

Masters and Diploma awards can be made "with Distinction" or "with Commendation" where criteria as described in [UPR AS14](#), Section D and the students' handbook are met.

## Programme-specific assessment regulations

The programme is compliant with the University's academic regulations (in particular, [UPR AS11](#), [UPR AS12/UPR AS13](#) and [UPR AS14](#)) with the exception of those listed below, which have been specifically approved by the University:

- A maximum of 15 credit points can be compensated for an accredited award;
- MSc Individual Project 7ENT1072 cannot be compensated;
- In order to enrol on the MSc Individual Project 7ENT1072 module, students must have studied 120 credits and passed at least 60 credits;
- A minimum of 40% (in any allowable attempt), at level 7, must be obtained before the board of examiners will be able to consider compensation for an accredited award.

Course Code	Course Instance	Award Title	Modules (child instance codes & title)	Must be included in classification algorithm?
EIMASTADAE	AM1F-1, AMA2F,	Masters in Aerospace Engineering	MSc Individual Project 7ENT1072-0901, 0206, 0609	Yes

	AMB1F-2			
EIMASTADAU	AUM1F-1, AUMA2F, AUMB1F-2	Masters in Automotive Engineering	MSc Individual Project 7ENT1072-0901, 0206, 0609	Yes
EIMASTADME	MECM1F-1, MECMA2F, MECMB1F-2	Masters in Mechanical Engineering	MSc Individual Project 7ENT1072-0901, 0206, 0609	Yes

## E. Management of Programme & Support for student learning

### Management

The programme is managed and administered through:

- The Programme Leader, who is responsible for advising students on the programme as a whole and chairing the programme committee;
- Student representatives on programme committees;
- Module Leaders;
- A designated administrative team to deal with day-to-day administration associated with the modules within the programme.

### Support

Students are supported by:

- An induction week at the beginning of each new academic session.
- Overseas Orientation.
- You will have a Personal Tutor who will be an important point of contact, able to help you gain a good understanding of the School and programme you are studying.
- A substantial Student Centre that provides advice on issues such as finance, University regulations, legal matters, accommodation, international student support, etc.
- Office of Dean of Students, Student Wellbeing (incorporating Counselling, Mental Health and Disability Support), Chaplaincy, and Day Nursery.
- A versatile on-line inter-active intranet and learning environment.
- Guided student-centred learning on Canvas module sites.
- Access to extensive digital and print collections of information resources.
- Attractive modern study environments in 2 Learning Resources Centres.
- Student Success Hubs, which include a Mathematics Drop-in Centre.
- Medical Centre.
- University Disability Advisors.
- Careers and Employment.
- Hertfordshire Student's Union.
- Dedicated programme site.

## F. Other sources of information

In addition to this Programme Specification, the University publishes guidance to registered students on the programme and its constituent modules:

- A Programme (or Student) Handbook;
- A Definitive Module Document (DMD) for each constituent module.

The [Ask Herts](#) website provides information on a wide range of resources and services available at the University of Hertfordshire including academic support, accommodation, fees, funding, visas, wellbeing services and student societies.

As a condition of registration, all students of the University of Hertfordshire are required to comply with the University's rules, regulations and procedures. These are published in a series of documents called 'University

Policies and Regulations' (UPRs). The University requires that all students consult these documents which are available on-line, on the UPR web site, at: <http://www.herts.ac.uk/secreg/upr/>. In particular, [UPR SA07](#) 'Regulations and Advice for Students' Particular Attention - Index' provides information on the UPRs that contain the academic regulations of particular relevance for undergraduate and taught postgraduate students.

In accordance with section 4(5) of the Higher Education and Research Act 2017 (HERA), the UK Office for Students (OfS) has registered the University of Hertfordshire in the register of English higher education providers. The Register can be viewed at: <https://www.officeforstudents.org.uk/advice-and-guidance/the-register/the-ofs-register/>.

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## G. Entry requirements

For current entry tariff point requirements, please refer to the relevant page for the Course on the University website or on the online prospectus.

The programme is subject to the University's Principles, Policies and Regulations for the Admission of Students to Undergraduate and Taught Postgraduate Programmes (in [UPR SA03](#)), along with associated procedures. These will take account of University policy and guidelines for assessing accredited prior certificated learning (APCL) and accredited prior experiential learning (APEL).

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If you would like this information in an alternative format, please contact: [hhaq@herts.ac.uk](mailto:hhaq@herts.ac.uk)

If you wish to receive a copy of the latest External Examiner's Report for the programme, please email a request to [aqo@herts.ac.uk](mailto:aqo@herts.ac.uk)

## MSc Aerospace Engineering

**Table 2:** This map identifies where the programme learning outcomes are assessed in the constituent modules. It provides (i) an aid to academic staff in understanding how individual modules contribute to the programme aims (ii) a checklist for quality control purposes and (iii) a means to help students monitor their own learning, personal and professional development as the programme progresses.

Module titles	Code	Programme Learning Outcomes (as defined in section 1 and below)																							
		Knowledge & Understanding						Individual Skills						Practical Skills					Transferable Skills						
		A1am	A2am	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6	C1am	C2	C3	C4	C5	D1	D2	D3	D4	D5	D6	
Flight Mechanics	7AAD0038	X	X		X			X	X					X	X		X		X						
Procurement & Supply Chain Management	7ENT1069			X		X	X					X	X		X	X		X			X	X		X	
Individual Masters Project	7ENT1072			X	X		X	X	X	X	X					X	X	X	X		X		X	X	
Sustainable Business of Engineering	7ENT1126			X	X	X	X	X	X		X	X	X			X	X	X	X	X	X	X		X	
CAE & Applications	7ENT1131	X	X	X	X			X	X	X				X	X		X						X	X	
CFD & Applications	7ENT1133	X	X	X	X			X	X	X				X	X		X						X	X	
Flight Simulation	7ENT1134	X		X	X				X		X			X	X		X						X	X	
Aeroelasticity	7ENT1135	X	X		X			X	X					X	X		X		X				X		
Aerospace Aerodynamics	7ENT1139	X	X		X			X	X					X	X	X	X		X				X	X	

## Key to Programme Learning Outcomes

### Knowledge and Understanding

- A1am. The advanced CAE and simulation methods employed by aerospace engineers.
- A2am. The fundamental sciences appropriate to aerospace engineering.
- A3. Appropriate research methods employed in analysis of technical and commercial problems.
- A4. The product/process definition and systems design process.
- A5. Understanding of business practice and the limitations within an engineering specialisation.
- A6. Understand the roles in an engineering team and personal responsibilities.

### Intellectual Skills

- B1. Analyse and solve engineering problems using appropriate techniques.
- B2. Design/model/analyse relevant engineering systems/subsystems.
- B3. Critically review and select appropriate research methods to solve engineering and commercial problems.
- B4. Evaluate external influences on the design process.
- B5. Develop skills in ethical operations and show insight on the commercial and social context.
- B6. Evaluate external influences on the design process in the context of Supply Chain Management.

### Practical Skills

- C1am. Apply appropriate experimental, analytical and modelling techniques to a range of Aerospace engineering problems and draw conclusions.
- C2. Use advanced computer-aided engineering tools.
- C3. Prepare technical documentation.
- C4. Evaluate the design of appropriate systems, components or processes.
- C5. Plan and manage a project, taking into account commercial, industrial and resource constraints.

### Transferable Skills

- D1. Communicate information effectively, orally and/or in writing.
- D2. Manage time and resources effectively.
- D3. Work effectively individually and/or within a team.
- D4. Solve problems in a logical and coherent manner.
- D5. Learn effectively and independently, in preparation for lifelong learning.
- D6. Manipulate, sort and present data.

## MSc Aerospace Engineering: Mapping to AHEP3 learning outcomes

		AHEP3 Learning Outcomes																		
		Science & mathematics			Engineering analysis			Design			Economic, social, ethical, and environmental context						Engineering practice			
Module title	Code	SM1fi	SM2fi	SM3fi	EA1fi	EA2fi	EA3fi	D1fi	D2fi	D3fi	ET1fi	ET2fi	ET3fi	ET4fi	ET5fi	ET6fi	EP1fi	EP2fi	EP3fi	EP4fi
Flight Mechanics	7AAD0038		X		X		X	X									X			
Procurement & Supply Chain Management	7ENT1069		X				X	X			X	X	X				X		X	X
Individual Masters Project	7ENT1072			X	X				X		X			X		X		X		
Sustainable Business of Engineering	7ENT1126		X	X					X		X	X	X	X	X	X	X		X	X
CAE & Applications	7ENT1131	X				X	X			X							X		X	
CFD & Applications	7ENT1133			X			X					X						X		
Flight Simulation	7ENT1134				X	X	X		X	X					X					
Aeroelasticity	7ENT1135	X		X	X		X													
Aerospace Aerodynamics	7ENT1139		X		X	X		X				X								
	<b>Total</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>5</b>	<b>3</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>2</b>

## MSc Automotive Engineering

**Table 2:** This map identifies where the programme learning outcomes are assessed in the constituent modules. It provides (i) an aid to academic staff in understanding how individual modules contribute to the programme aims (ii) a checklist for quality control purposes and (iii) a means to help students monitor their own learning, personal and professional development as the programme progresses.

Module titles	Code	Programme Learning Outcomes (as defined in section 1 and below)																					
		Knowledge & Understanding						Individual Skills					Practical Skills					Transferable Skills					
		A1aum	A2aum	A3	A4	A5	A6	B1	B2	B3	B4	B5	C1aum	C2	C3	C4	C5	D1	D2	D3	D4	D5	D6
Automotive Dynamics & Safety	7AAD0054	X	X					X	X		X		X	X	X	X		X			X	X	
Automotive Electrical Systems	7AAD0056		X		X			X	X		X		X		X		X		X		X	X	
Advanced Engines & Power Systems	7ENT1138		X					X	X	X			X		X		X	X				X	
Individual Masters Project	7ENT1072			X	X		X	X	X	X					X		X	X			X		X
Sustainable Business of Engineering	7ENT1126			X	X	X	X	X	X		X	X			X	X	X	X	X	X	X		X
CAE & Applications	7ENT1131	X	X	X	X			X	X	X			X	X		X						X	X
Electrical Vehicle Technology	7ENT1132	X			X		X	X	X		X		X		X		X				X	X	
CFD & Applications	7ENT1133	X	X	X	X			X	X	X			X	X		X						X	X
Automotive Materials & Manufacture	7ENT1141		X					X	X		X	X			X	X		X					



## Key to Programme Learning Outcomes

### Knowledge and Understanding

A1aum. The advanced CAE and simulation methods employed by automotive engineers.

A2aum. The fundamental sciences appropriate to automotive engineering.

A3. Appropriate research methods employed in analysis of technical and commercial problems.

A4. The product/process definition and systems design process.

A5. Understanding of business practice and the limitations within an engineering specialisation.

A6. Understand the roles in an engineering team and personal responsibilities.

### Intellectual Skills

B1. Analyse and solve engineering problems using appropriate techniques.

B2. Design/model/analyse relevant engineering systems/subsystems.

B3. Critically review and select appropriate research methods to solve engineering and commercial problems.

B4. Evaluate external influences on the design process.

B5. Develop skills in ethical operations and show insight on the commercial and social context.

### Practical Skills

C1aum. Apply appropriate experimental, analytical and modelling techniques to a range of automotive engineering problems and draw conclusions.

C2. Use advanced computer-aided engineering tools.

C3. Prepare technical documentation.

C4. Evaluate the design of appropriate systems, components or processes.

C5. Plan and manage a project, taking into account commercial, industrial and resource constraints.

### Transferable Skills

D1. Communicate information effectively, orally and/or in writing.

D2. Manage time and resources effectively.

D3. Work effectively individually and/or within a team.

D4. Solve problems in a logical and coherent manner.

D5. Manipulate, sort and present data.

D6. Learn effectively and independently, in preparation for lifelong learning.

## MSc Automotive Engineering: Mapping to AHEP3 learning outcomes

		AHEP3 Learning Outcomes																		
		Science & mathematics			Engineering analysis			Design			Economic, social, ethical, and environmental context						Engineering practice			
Module title	Code	SM1fi	SM2fi	SM3fi	EA1fi	EA2fi	EA3fi	D1fi	D2fi	D3fi	ET1fi	ET2fi	ET3fi	ET4fi	ET5fi	ET6fi	EP1fi	EP2fi	EP3fi	EP4fi
Automotive Dynamics & Safety	7AAD0054	X			X		X		X							X				
Automotive Electrical Systems	7AAD0056		X		X		X	X											X	X
Advanced Engines & Power Systems	7ENT1138		X		X	X		X						X		X	X			
Individual Masters Project	7ENT1072			X	X				X		X			X		X		X		
Sustainable Business of Engineering	7ENT1126		X	X					X		X	X	X	X	X	X	X		X	X
CAE & Applications	7ENT1131	X				X	X			X							X		X	
Electrical Vehicle Technology	7ENT1132				X	X	X		X	X	X									
CFD & Applications	7ENT1133			X			X					X						X		
Automotive Materials & Manufacture	7ENT1141	X	X							X			X	X	X		X			
	<b>Total</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>5</b>	<b>3</b>	<b>5</b>	<b>2</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>2</b>

## MSc Mechanical Engineering

**Table 2:** This map identifies where the programme learning outcomes are assessed in the constituent modules. It provides (i) an aid to academic staff in understanding how individual modules contribute to the programme aims (ii) a checklist for quality control purposes and (iii) a means to help students monitor their own learning, personal and professional development as the programme progresses.

		Programme Learning Outcomes (as defined in section 1 and below)																							
		Knowledge & Understanding						Individual Skills						Practical Skills					Transferable Skills						
Module titles	Code	A1mecm	A2mecm	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6	C1mecm	C2	C3	C4	C5	D1	D2	D3	D4	D5	D6	
Procurement & Supply Chain Management	7ENT1069			X		X	X					X	X		X	X		X			X	X		X	
Individual Masters Project	7ENT1072			X	X		X	X	X	X	X						X	X	X	X		X		X	
Dynamics & performance of mechanical systems	7ENT1081	X	X					X	X					X	X	X	X					X	X		
Sustainable Business of Engineering	7ENT1126			X	X	X	X	X	X		X	X	X				X	X	X	X	X	X		X	
Advanced Materials and Manufacturing Technology	7ENT1129	X			X			X		X														X	
CAE & Applications	7ENT1131	X	X	X	X			X	X	X				X	X		X						X	X	
CFD & Applications	7ENT1133	X	X	X	X			X	X	X				X	X		X					X	X		
Advanced thermodynamics & thermal systems	7ENT1136		X					X	X					X		X	X					X	X		
Integrated Product Engineering	7ENT1137		X			X				X		X	X		X	x			X			X		X	

## Key to Programme Learning Outcomes

### Knowledge and Understanding

- A1mecm. The advanced CAE and simulation methods employed by mechanical engineers.
- A2mecm. The fundamental sciences appropriate to mechanical engineering.
- A3. Appropriate research methods employed in analysis of technical and commercial problems.
- A4. The product/process definition and systems design process.
- A5. Understanding of business practice and the limitations within an engineering specialisation.
- A6. Understand the roles in an engineering team and personal responsibilities.

### Intellectual Skills

- B1. Analyse and solve engineering problems using appropriate techniques.
- B2. Design/model/analyse relevant engineering systems/subsystems.
- B3. Critically review and select appropriate research methods to solve engineering and commercial problems.
- B4. Evaluate external influences on the design process.
- B5. Develop skills in ethical operations and show insight on the commercial and social context.
- B6. Evaluate external influences on the design process in the context of Operations and Supply Chain Management.

### Practical Skills

- C1mecm. Apply appropriate experimental, analytical and modelling techniques to a range of mechanical engineering problems and draw conclusions.
- C2. Use advanced computer-aided engineering tools.
- C3. Prepare technical documentation.
- C4. Evaluate the design of appropriate systems, components or processes.
- C5. Plan and manage a project, taking into account commercial, industrial and resource constraints.

### Transferable Skills

- D1. Communicate information effectively, orally and/or in writing.
- D2. Manage time and resources effectively.
- D3. Work effectively individually and/or within a team.
- D4. Solve problems in a logical and coherent manner.
- D5. Manipulate, sort and present data.
- D6. Learn effectively and independently, in preparation for lifelong learning.

## MSc Mechanical Engineering: Mapping to AHEP3 learning outcomes

		AHEP3 Learning Outcomes																		
		Science & mathematics			Engineering analysis			Design			Economic, social, ethical, and environmental context						Engineering practice			
Module title	Code	SM1fi	SM2fi	SM3fi	EA1fi	EA2fi	EA3fi	D1fi	D2fi	D3fi	ET1fi	ET2fi	ET3fi	ET4fi	ET5fi	ET6fi	EP1fi	EP2fi	EP3fi	EP4fi
Procurement & Supply Chain Management	7ENT1069		X				X	X			X	X	X				X		X	X
Individual Masters Project	7ENT1072			X	X				X		X			X		X		X		
Dynamics & performance of mechanical systems	7ENT1081				X		X	X								X				
Sustainable Business of Engineering	7ENT1126		X	X					X		X	X	X	X	X	X	X		X	X
Advanced Materials and Manufacturing Technology	7ENT1129	X	X			X			X								X		X	
CAE & Applications	7ENT1132	X				X	X			X							X		X	
CFD & Applications	7ENT1133			X			X					X						X		
Advanced thermodynamics & thermal systems	7ENT1136		X			X		X				X			X		X		X	
Integrated Product Engineering	7ENT1137			X						X	X	X	X					X		X
	<b>Total</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>5</b>	<b>3</b>	<b>5</b>	<b>3</b>

## Section 2

### Programme management

<b>Relevant QAA subject benchmarking statements</b>	Engineering
<b>Type of programme</b>	Taught postgraduate
<b>Date of validation/last periodic review</b>	February 20
<b>Date of production/ last revision of PS</b>	March 2023
<b>Relevant to level/cohort</b>	Level 7 entering September 2023
<b>Administrative School</b>	School of Physics, Engineering & Computer Science
<b>Language of Delivery</b>	English

Table 3 Course structure

Course details		
Course code	Course description	HECOS
EIMASTADAE	Masters in Aerospace Engineering	100115

Course details		
Course code	Course description	HECOS
EIMASTADAU	Masters in Automotive Engineering	100201

Course details		
Course code	Course description	HECOS
EIMASTADME	Masters in Mechanical Engineering	100190