University of Hertfordshire UH

School of Physics, Engineering and Computer Science

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 2021

Associate Dean of School (Academic Quality Assurance):
Dr 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.

Summary of amendments to the programme

Date	Section	Amendment
22.09.2020	Entry Point – Semester A	Dynamics and Performance of Mechanical Systems 7ENT1081 is offered in Year 2 (part-time mode)
22.09.2020	Entry Point – Semester A	Aeroelasticity 7ENT1135 is offered in Year 2 (part-time mode)
22.09.2020	Entry Point – Semester A	Integrated Product Engineering 7ENT1137 is offered in Year 2 (part-time mode)
22.09.2020	Entry Point – Semester A	Electric Vehicle Technology 7ENT1132 is offered in Year 2 (part-time mode)
22.09.2020	Entry Point – Semester B	Dynamics and Performance of Mechanical Systems 7ENT1081 is offered in Year 2 (part-time mode)
22.09.2020	Entry Point – Semester B	Aeroelasticity 7ENT1135 is offered in Year 2 (part-time mode)

22.09.2020	Entry Point – Semester B	Integrated Product Engineering 7ENT1137 is offered in Year 2 (part-time mode)
22.09.2020	Entry Point – Semester B	Electric Vehicle Technology 7ENT1132 is offered in Year 2 (part-time mode)
31.03.2021	D	**7AAD0038** adjusted from 60% exam/ 40% coursework to 100% coursework* in the academic 2021/22, due to the covid pandemic.
31.03.2021	D	**7ENT1069** adjusted from 60% exam/ 40% coursework to 100% coursework* in the academic 2021/22, due to the covid pandemic.
31.03.2021	D	**7ENT1136** adjusted from 60% exam/ 40% coursework to 100% coursework* in the academic 2021/22, due to the covid pandemic.
31.03.2021	D	**7ENT1138** adjusted from 60% exam/ 40% coursework to 100% coursework* in the academic 2021/22, due to the covid pandemic.
31.03.2021	D	**7ENT1139** adjusted from 60% exam/ 40% coursework to 100% coursework* in the academic 2021/22, due to the covid pandemic.
31.03.2021	D	**7AAD0054** adjusted from 50% exam/ 50% coursework to 100% coursework* in the academic 2021/22, due to the covid pandemic.
31.03.2021	D	**7ENT1131** adjusted from 50% exam/ 50% coursework to 100% coursework* in the academic 2021/22, due to the covid pandemic.
31.03.2021	D	**7ENT1132** adjusted from 50% exam/ 50% coursework to 100% coursework* in the academic 2021/22, due to the covid pandemic.

* Learning outcomes for this module will be assessed via 100% coursework using alternative modes of assessment. Alternative modes of assessment include, but are not limited to, take home coursework and online timed assessments.

If you have any queries regarding the changes, please email AQO@herts.ac.uk

Programme Specification
MSc Aerospace Engineering
MSc Automotive Engineering
MSc 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

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

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. It is also possible for a student to study these awards on a part-time basis over a three-year period.

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

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, mechanical, manufacturing management/technology and operations and supply chain management;
- 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

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 (2016) have been used as a guiding framework for curriculum design.

Knowledge and Understanding:	Teaching/learning methods & strategies	Assessment
Aerospace Engineering (AM), Automotive Engineering (AUM) and Mechanical Engineering (MECM) 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. 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. 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	Acquisition of knowledge and understanding is through a combination of lectures, seminars, group discussions and assignments. 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.	Knowledge and understanding are assessed through a series of case studies, assignments, project reports and unseen examinations
Intellectual skills:	**Teaching/learning methods & strategies**	**Assessment**
Aerospace Engineering, Automotive Engineering and Mechanical Engineering 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 Additionally, for **Aerospace & Mechanical Engineering** B6 Evaluate external influences on the design process in the context of Supply Chain Management.	Intellectual skills are developed throughout the programme by the methods and strategies outlined in section A, above. Analysis, problem solving and modelling skills are further developed through case studies, class discussion, in-course exercises, assignments and exams. Throughout, the learner is encouraged to develop intellectual skills further by independent study	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.
Practical skills:	Teaching/learning methods & strategies	Assessment
All awards C1 AM: Apply appropriate experimental, analytical and modelling techniques to a range of aerospace engineering problems draw conclusions. C1 AUM: Apply appropriate experimental, analytical and modelling techniques to a range of automotive engineering problems and draw conclusions. C1 MECM: 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 project, taking into account commercial, industrial and resource constraints.	Practical skills are developed throughout the programme through a series of case studies, experimental and simulation exercises, project reports and viva. Skills are developed through the programme of study and associated written reports and submissions. C5 is developed throughout the programme of the study, with one-to-one supervision during the individual project.	Practical skills C1-C5 are formerly assessed through assignment work on case studies and the individual project
Transferable skills:	Teaching/learning methods & strategies	Assessment
All awards 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.	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. Skill D1 is developed through coursework reports, oral presentations, research methods and the project report. Skill D2 is developed through meeting deadlines for scheduled assignments and the individual project. Skills D3, D4 and D5 are developed throughout most modules; through lectures, group work, assessments and the individual project. Skill D6 is encouraged and developed by the nature of the programme of study and	Transferable skills D1-D6 are assessed through assignment work and the project.

the acquisition of transferable skills.

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

The programme is offered in full-time and part-time modes.

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.

Semester A Entry Option 1 is to include an early start project module in a study pattern of A, B then C.
Semester A Entry Option 2 is to select a longer study time in a study pattern of A, B then A.
Semester B Entry study time is a pattern B, A then B.

In a part-time mode, the programme is normally offered in 3 years with identical modules studied with the full-time students.

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

Accreditation of prior learning (APEL/APCL) is available for this programme. Students wishing to claim APL must document their relevant prior learning in detail and must provide full evidence for their prior achievement of the learning outcomes of this programme.

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.

Semester A entry Option 1 is to include an early start project module (liked by Home/EU students) in a semester study pattern of A, B then C.
The longer study time (preferred by Overseas students) is a semester study pattern of A, B then A.

Semester A entry Option 2 is the semester study pattern is all changed to A, B then A
Semester B entry remains study pattern B, A then B

Professional and Statutory Regulatory Bodies

The following programmes are accredited by IMechE and satisfy, in part, the academic requirements for Chartered Engineer (CEng) registration for the cohort intakes from 2016 up to, and including, 2020. Accreditation by IMechE is being sought for the 2021 intake:

MSc Automotive Engineering (Full Time - 1 year duration; Part Time 2 years)
MSc Mechanical Engineering (Full Time - 1 year duration; Part Time 2 years)

Professional Accreditation by the RAeS

The following programme is accredited by RAeS and satisfy, in part, the academic requirements for Chartered Engineer (CEng) registration for the cohort intakes from 2016 up to, and including, 2021.

MSc Aerospace Engineering (Full Time - 1 year duration; Part Time 2 years)

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
See pages 9 and 10

Mode of study: Full-time/Part-time

Part time: A typical study pattern for a 3-year part-time student would be 60 credit points of taught modules in the first year, a further 60 credit points of taught modules in the second year and the project in the final year. The order of the modules is agreed in consultation with the Programme Leader with a maximum of 75 credit points within any one academic year.

Entry point: A or B

Note: Semester B entry students study the same modules as semester A entry students, except the MSc individual Project is studied in Semester B of the second year rather than semester C.

The following notations should be read in conjunction with tables below:

AM = Aerospace Engineering
AUM = Automotive Engineering
MECM = Mechanical Engineering
c = compulsory module
o = optional module.

Entry Point – Semester A

To progress to the project stage, the candidates are expected to have successfully completed a minimum of 90 credits.
The award of a Masters Degree requires 180 credit points passed at level 7, including the MSc Individual Project.

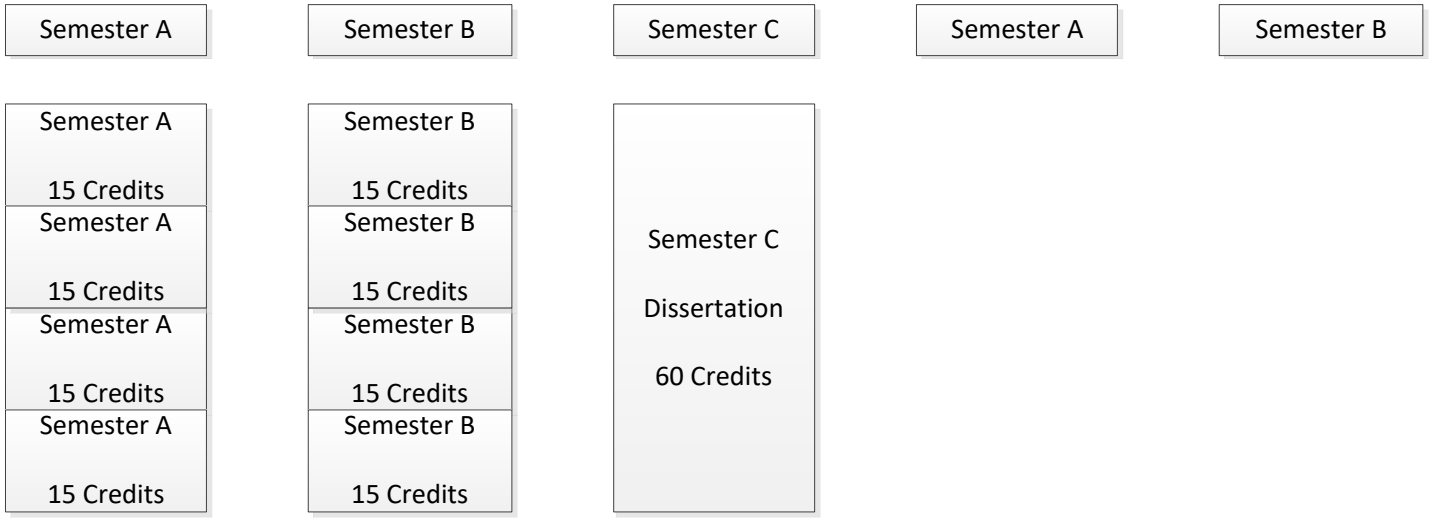
Module Title	Module Code	Award			Credit Pts.	Language of Delivery	% exam	% ICA	% Practical	Semester.	Year of Study	
		AM	AUM	MECM							Full Time Mode	Part Time Mode
Automotive Electrical Systems	7AAD0056		c		15	English	0	100	0	A	1	2
Dynamics and Performance of Mechanical Systems	7ENT1081			c	15	English	0	100	0	A	1	2
Sustainable Business of Engineering	7ENT1126	c	c	c	15	English	0	100	0	A	1	1
CFD & Applications	7ENT1133	c	c	c	15	English	0	100	0	A	1	1
Flight Simulation	7ENT1134	c			15	English	0	100	0	A	1	2
Aeroelasticity	7ENT1135	c			15	English	0	100	0	A	1	2
Integrated Product Engineering	7ENT1137			c	15	English	0	100	0	A	1	2
Automotive Materials & Manufacture	7ENT1141		c		15	English	0	100	0	A	1	2
Flight Mechanics	7AAD0038	c			15	English	0	100	0	B	1	2
Automotive Dynamics & Safety	7AAD0054		c		15	English	0	100	0	B	1	1
Procurement & Supply Chain Management	7ENT1069	c		c	15	English	0	100	0	B	1	2
Advanced Materials & Manufacturing Technology	7ENT1129			c	15	English	0	100	0	B	1	1
CAE & Applications	7ENT1131	c	c	c	15	English	0	100	0	B	1	1
Electric Vehicle Technology	7ENT1132		c		15	English	0	100	0	B	1	2
Advanced Thermodynamics and Thermal Systems	7ENT1136			c	15	English	0	100	0	B	1	2
Advanced Engines & Power Systems	7ENT1138		c		15	English	0	100	0	B	1	2
Aerospace Aerodynamics	7ENT1139	c			15	English	0	100	0	B	1	1
MSc Individual Projects	7ENT1072	c	c	c	60	English	0	100	0	C, A, B	2	3

Entry Point – Semester B

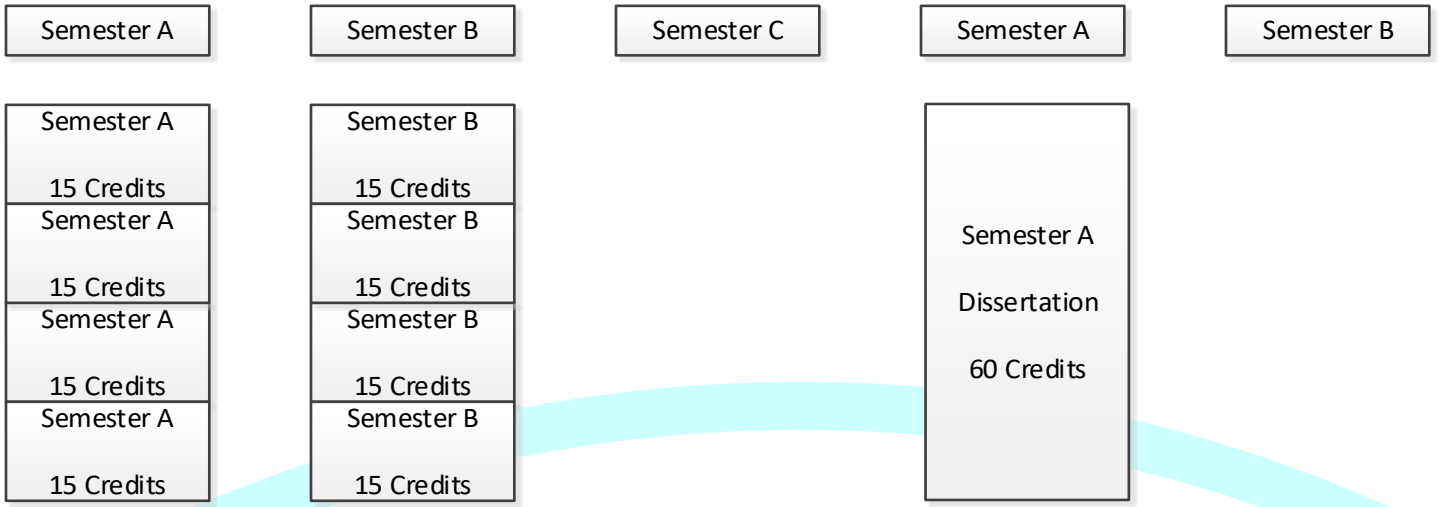
To progress to the project stage, the candidates are expected to have successfully completed a minimum of 90 credits.
The award of a Masters Degree requires 180 credit points passed at level 7, including the MSc Individual Project

Module Title	Module Code	Award			Credit Pts.	Language of Delivery	% exam	% ICA	% Practical	Semester.	Year of Study	
		AM	AUM	MECM							Full Time Mode	Part Time Mode
Flight Mechanics	7AAD0038	c			15	English	0	100	0	B	1	2
Automotive Dynamics & Safety	7AAD0054		c		15	English	0	100	0	B	1	1
Procurement & Supply Chain Management	7ENT1069	c		c	15	English	0	100	0	B	1	2
Advanced Materials & Manufacturing Technology	7ENT1129			c	15	English	0	100	0	B	1	1
CAE & Applications	7ENT1131	c	c	c	15	English	0	100	0	B	1	1
Electric Vehicle Technology	7ENT1132		c		15	English	0	100	0	B	1	2
Advanced Thermodynamics and Thermal Systems	7ENT1136			c	15	English	0	100	0	B	1	2
Advanced Engines & Power Systems	7ENT1138		c		15	English	0	100	0	B	1	2
Aerospace Aerodynamics	7ENT1139	c			15	English	0	100	0	B	1	1
Automotive Electrical Systems	7AAD0056		c		15	English	0	100	0	A	1	2
Dynamics and Performance of Mechanical Systems	7ENT1081			c	15	English	0	100	0	A	1	2
Sustainable Business of Engineering	7ENT1126	c	c	c	15	English	0	100	0	A	1	1
CFD & Applications	7ENT1133	c	c	c	15	English	0	100	0	A	1	1
Flight Simulation	7ENT1134	c			15	English	0	100	0	A	1	2
Aeroelasticity	7ENT1135	c			15	English	0	100	0	A	1	2
Integrated Product Engineering	7ENT1137			c	15	English	0	100	0	A	1	2
Automotive Materials & Manufacture	7ENT1141		c		15	English	0	100	0	A	1	2
MSc Individual Projects	7ENT1072	c	c	c	60	English	0	100	0	C, A, B	2	3

MSc (Semester A Entrant) – Full Time Structure Option 1



MSc (Semester A Entrant) – Full Time Structure Option 2



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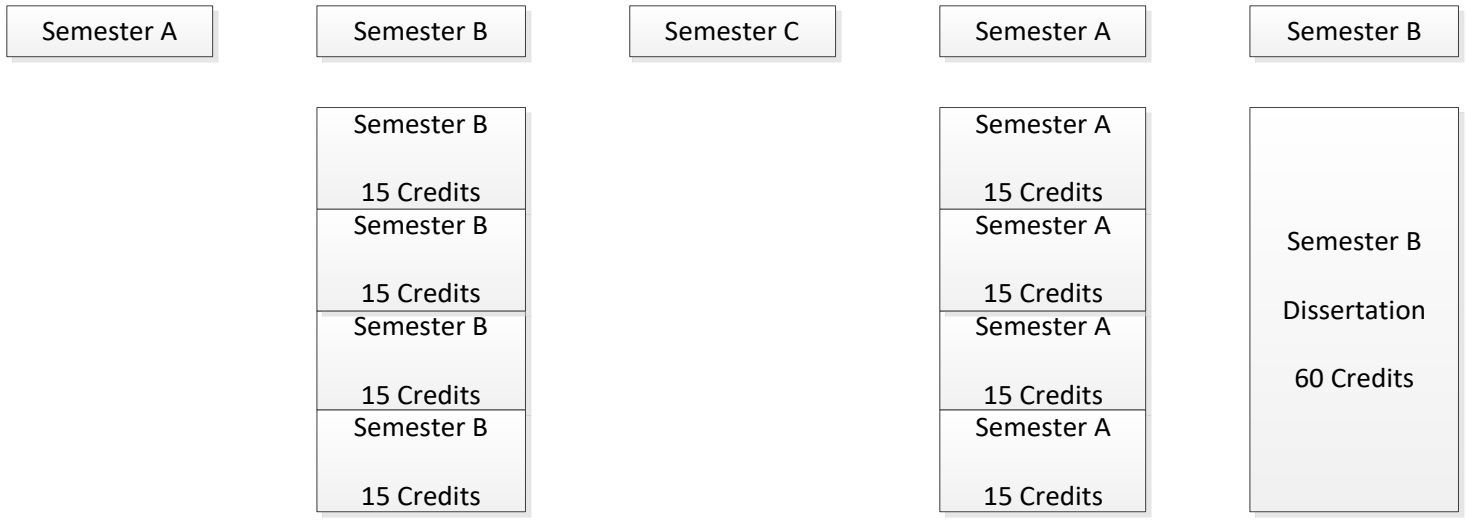
MSc (Semester B Entrant) – Full Time Structure



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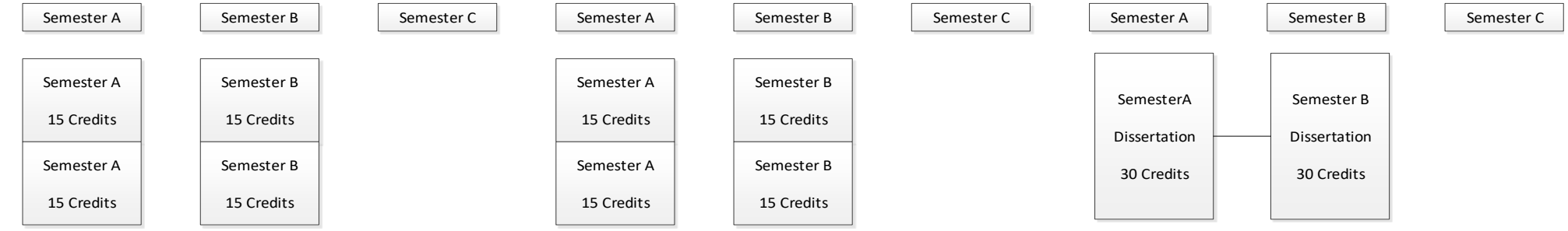
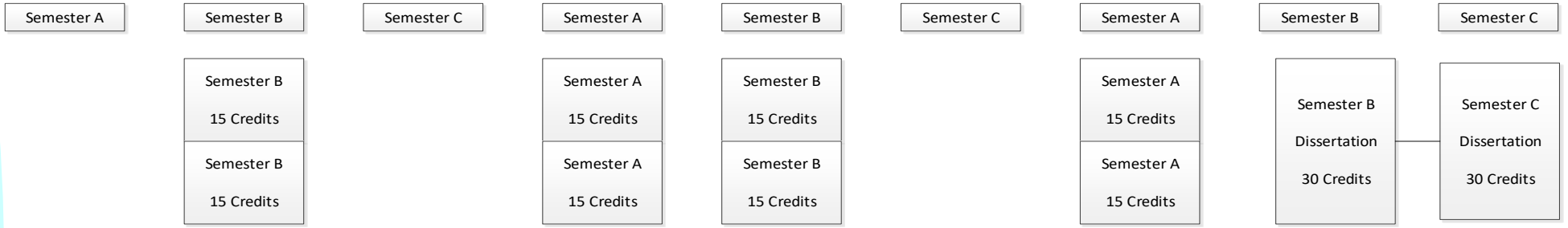
MSc (Semester A Entrant) Part Time Structure



MSc (Semester B Entrant) Part Time Structure



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The award of an MSc requires 180 credit points passed at level 7, including the Masters project.

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 in named award	Aerospace Engineering Automotive Engineering Mechanical Engineering	180 credit points	3 Semesters	All programme learning outcomes (see Table 2)
Interim Award	Award Title	Minimum requirements	Available at end of Level	Programme Learning Outcomes developed (see above)
Postgraduate Diploma	Aerospace Engineering Automotive Engineering Mechanical Engineering	120 credit points	2, 3 Semesters	List all relevant learning outcomes, e.g. A1, A3, A4, B1, B2, B6, C1, C2, C3, D1, D2, D3, D4, D5
Postgraduate Certificate	Untitled	60 credit points	1-2 Semesters	For untitled awards: See UPR AS11, section 13: http://sitem.herts.ac.uk/secreg/upr/AS11.htm

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 30 credit points can be compensated across the programme, in line with University regulations. For all awards compensation is not permitted for individual modules worth 30 or more credit points at level 7. **Major projects such as the MSc individual project cannot be compensated.**

In anticipation of gaining accreditation from the appropriate PSRBs, the programmes will comply with professional body regulations. 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. Maximum permissible compensation is 15 credits as per requirements of Professional Bodies.

E. Management of Programme & Support for student learning

Management

The programme is managed and administered through:

- Dean of School;
- Associate Dean of School (AQA) who has overall responsibility for Quality Assurance;
- Associate Dean of School (L&T) who has overall responsibility for Learning & Teaching;
- the Programme Leader who is responsible for chairing the programme committee and advising students on the programme as a whole;
- Programme Leaders who are responsible for the day to day management;
- an Admissions Tutor, with specific responsibility for selection;
- a programme committee that includes the above plus student representation;
- Module leaders who are responsible for individual modules.

Support

Students are supported by:

- an induction week at the beginning of each new academic session;
- an extensive Learning Resources Centre, incorporating a library and computer centre;
- guided student-centred learning through the use of StudyNet;
- a student handbook that is specific to the programme;
- a Programme Leader who can advise on programme issues;
- Module teaching teams who provide academic support;
- Computer and technical laboratories facilities and technical support staff;
- a project supervisor;
- student representatives on the programme committee;
- the Mathematics Drop-in Centre;
- the Careers, Employment and Enterprise Service that support students looking for either graduate employment or an industrial placement.
- a substantial Student Centre that provides advice on issues such as finance, University regulations, legal matters;
- the Medical Centre;
- the Accommodation Office;
- the International Students Centre who organise an Overseas Student Orientation induction programme;
- printing, photocopying, laminating and document binding facilities;
- a confidential counselling service;
- University Disability Advisors;
- an Equal Opportunities Officer;
- the Students' Union.

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;

- A Module Guide 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/. Furthermore, the OfS has judged that the University of Hertfordshire delivers consistently outstanding teaching, learning and outcomes for its students. It is of the highest quality found in the UK. Consequently, the University received a Gold award in the 2018 Teaching Excellence and Student Outcomes (TEF) exercise. This award was made in June 2018 and is valid for up to 3 years. The TEF panel's report and conclusions can be accessed at: https://www.officeforstudents.org.uk/advice-and-guidance/teaching/tef-outcomes/#/provider/10007147

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).

If you would like this information in an alternative format, please contact: School Administration Manager

If you wish to receive a copy of the latest Programme Annual Monitoring and Evaluation Report (AMER) and/or the External Examiner's Report for the programme, please email a request to hhaq@herts.ac.uk

Table 2:
Part 1 of 2 Development of Intended Programme Learning Outcomes in the Constituent Modules
Part 2 of 2 AHEP3 Mapped Learning Outcomes

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.

MSc Aerospace Engineering

Part 1: Programme learning outcomes

		Programme Learning Outcomes (as defined in section 1 and below)																					
		Knowledge & Understanding						**Individual Skills**						**Practical Skills**					**Transferable Skills**					
Module titles	**Code**	**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			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
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	
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

Part 2: Mapping to AHEP3 learning outcomes

		AHEP3 Learning Outcomes (as defined in Appendix 6)																		
		Science & mathematics			Engineering analysis			Design			Economic, social, ethical, and environmental context						Engineering practice			
Module title	**Code**	**SM1fl**	**SM2fl**	**SM3fl**	**EA1fl**	**EA2fl**	**EA3fl**	**D1fl**	**D2fl**	**D3fl**	**ET1fl**	**ET2fl**	**ET3fl**	**ET4fl**	**ET5fl**	**ET6fl**	**EP1fl**	**EP2fl**	**EP3fl**	**EP4fl**
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								
	Total	**2**	**4**	**4**	**5**	**3**	**6**	**3**	**3**	**2**	**3**	**4**	**2**	**2**	**2**	**2**	**4**	**2**	**3**	**2**

MSc Automotive Engineering

Part 1: Programme learning outcomes

		Programme Learning Outcomes (as defined in section 1 and below)																					
		Knowledge & Understanding						Individual Skills					Practical Skills					Transferable Skills					
Module titles	**Code**	**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		X
Sustainable Business of Engineering	7ENT1126			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

Part 2: Mapping to AHEP3 learning outcomes

		AHEP3 Learning Outcomes (as defined in Appendix 6)																		
		Science & mathematics			Engineering analysis			Design			Economic, social, ethical, and environmental context						Engineering practice			
Module title	**Code**	**SM1fl**	**SM2fl**	**SM3fl**	**EA1fl**	**EA2fl**	**EA3fl**	**D1fl**	**D2fl**	**D3fl**	**ET1fl**	**ET2fl**	**ET3fl**	**ET4fl**	**ET5fl**	**ET6fl**	**EP1fl**	**EP2fl**	**EP3fl**	**EP4fl**
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			
	Total	**3**	**4**	**3**	**5**	**3**	**5**	**2**	**4**	**3**	**3**	**2**	**2**	**4**	**2**	**4**	**4**	**2**	**3**	**2**

MSc Mechanical Engineering

Part 1: Programme learning outcomes

		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

Part 2: Mapping to AHEP3 learning outcomes

		AHEP3 Learning Outcomes (as defined in Appendix 6)																		
		Science & mathematics			Engineering analysis			Design			Economic, social, ethical, and environmental context						Engineering practice			
Module title	**Code**	**SM1fl**	**SM2fl**	**SM3fl**	**EA1fl**	**EA2fl**	**EA3fl**	**D1fl**	**D2fl**	**D3fl**	**ET1fl**	**ET2fl**	**ET3fl**	**ET4fl**	**ET5fl**	**ET6fl**	**EP1fl**	**EP2fl**	**EP3fl**	**EP4fl**
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	7ENT1131	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
	Total	**2**	**4**	**4**	**2**	**3**	**4**	**3**	**3**	**2**	**4**	**4**	**3**	**2**	**2**	**3**	**5**	**3**	**5**	**3**

University of Hertfordshire UH

Section 2

Programme management

Relevant QAA subject benchmarking statements	Engineering
Type of programme	Taught postgraduate
Date of validation/last periodic review	February 20
Date of production/ last revision of PS	March 2020
Relevant to level/cohort	Level 7 entering September 2021
Administrative School	School of Engineering and Computer Science

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