UNIVERSITY OF Southampton

Programme Specification

MSc in Advanced Mechanical Engineering Science 2020/21

This specification provides a concise summary of the main features of the programme 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.

Awarding Institution	University of Southampton
Teaching Institution	University of Southampton
Mode of study	Full time
Duration in years	1 year
Accreditation details	Institution of Mechanical Engineers (IMechE)
Final award	Master of Science
Name of award	Computational Engineering and Design/Advanced Mechanical Engineering Science Engineering Materials/Advanced Mechanical Engineering Science Mechatronics /Advanced Mechanical Engineering Science Propulsion and Engine Systems Engineering/Advanced Mechanical Engineering Science
Interim Exit awards	Post Graduate Certificate Post Graduate Diploma
FHEQ level of final award	Level 7
UCAS code	N/A
QAA Subject Benchmark or other external reference	QAA Subject Benchmark – Engineering 2015; Accreditation of Higher Education Programmes, Edition 3, Engineering Accreditation Board Characteristic Statement: Master's Degree, QAA 2015
Programme Lead	Professor John Atkinson
Date specification was written	September 2014
Date Programme was validated	April 2019
Date specification last updated	June 2019

Programme Overview

Brief outline of the programme

The programme provides an academically challenging exposure to modern issues in Advanced Mechanical Engineering Science (AMES). It is suitable for engineering, mathematics or physical sciences graduates who wish to specialise in advanced mechanical engineering science or to support continued professional development. It offers a sound understanding of the relevant fundamental science, methods, analysis and engineering applications.

Your contact hours will vary depending on your module/option choices. Full information about contact hours is provided in individual module profiles

Learning and teaching

The different subject matter of the modules lends itself to different teaching and learning techniques but these include lectures, tutorials, individual and group planning exercises and practical exercises. You are encouraged throughout to contribute your own professional experiences and thoughts to the learning of the whole class through a free exchange of ideas. One-to-one tutorials are arranged to compensate for individual learning differences, when required.

Many modules include assessed coursework assignments which require you to carry out a substantial study of selected topics, either as individuals or in groups, leading to considerable depth of understanding and specialist knowledge. Assessment is designed to show that you can rationally use taught material and have a fundamental understanding of the subject matter. Feedback on progress is given to students on all submitted work.

Assessment

Testing of the knowledge base is through a combination of unseen written examinations and assessed coursework in the form of problem solving exercises, laboratory reports, design exercises, essays, and individual and group projects. Analysis and problem-solving skills are assessed through unseen written

examinations and problem based exercises. Experimental, research and design skills are assessed through laboratory reports, coursework exercises, project reports and oral presentations.

Please note: As a research-led University, we undertake a continuous review of our programmes to ensure quality enhancement and to manage our resources. As a result, this programme may be revised during a student's period of registration; however, any revision will be balanced against the requirement that the student should receive the educational service expected. Please read our Disclaimer to see why, when and how changes may be made to a student's programme.

Programmes and major changes to programmes are approved through the University's programme validation process which is described in the University's Quality handbook.

Educational Aims of the Programme

Within this programme of study, we aim to develop and enhance your knowledge of, and enthusiasm for Advanced Mechanical Engineering Science which can be taken in a number of themes (currently, Mechatronics, Engineering Materials, Computational Engineering Design, and Propulsion and Engine Systems Engineering).

This programme aims to provide science and engineering graduates from diverse backgrounds with an academically challenging exposure to current Advanced Mechanical Engineering Science.

The aims of the programme are to:

- Enable you to acquire advanced knowledge and practical skills needed for a professional career in your chosen specialist theme and to provide you with specialist knowledge and skills relevant to that theme
- Provide you with a sound understanding of the fundamental principles, operation requirements, design criteria and engineering applications in advanced mechanical engineering science
- Enhance your transferable skills, including critical analysis, problem solving, project management, decision making, leadership, and communication by oral, visual and/or written means
- Equip you with specialist knowledge, scientific and technical expertise and research skills for further research in Advanced Mechanical Engineering Science.

Programme Learning Outcomes

The programme provides opportunities for you to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the areas detailed below. The programme learning outcomes have been developed with reference to the Subject Benchmark Statement for engineering (https://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/sbs-engineering-15.pdf) and the Characteristics Statement for Master's Degrees (https://www.qaa.ac.uk/docs/qaa/quality-code/masters-degree-characteristics-statement.pdf?sfvrsn=6ca2f981_10) . The former of these is aligned with the Engineering Council publication Accreditation of Higher Education Programmes (AHEP): UK Standard for Professional Engineering Competence (third edition) (https://www.engc.org.uk/engcdocuments/internet/Website/Accreditation%20of%20Higher%20Education%20Programmes%20third%20edition%20(1).pdf

The MSc programme provides opportunities for you to achieve and demonstrate the learning outcomes described below. If students opt for the shorter PG Diploma or PG Certificate, the research training element is not included.

Codes in the left hand column below indicate the related Engineering Accreditation Board learning outcome.

Knowledge and Understanding

Having successfully completed this programme you will be able to demonstrate knowledge and understanding of:

	Science and mathematics Engineering is underpinned by science and mathematics, and other associated disciplines, as defined by the relevant professional engineering institution(s). On graduation you will have achieved:
SM7	A comprehensive understanding of the relevant scientific principles of Advanced Mechanical Engineering Science
SM8	A critical awareness of current problems and/or new insights most of which is at, or informed by, the forefront of aerodynamic and computation

SM9	Understanding of concepts relevant to Advanced Mechanical Engineering Science, some from outside engineering, and the ability to evaluate them critically and to apply them effectively, including in engineering projects

	Design Design at this level is the creation and development of an economically viable product, process or system to meet a defined need. It involves significant technical and intellectual challenges and can be used to integrate all engineering understanding, knowledge and skills to the solution of real and complex problems. On graduation you will have the knowledge, understanding and skills to:
D9	Knowledge, understanding and skills to work with information that may be incomplete or uncertain, quantify the effect of this on the design and, where appropriate, use theory or experimental research to mitigate deficiencies
D10	Knowledge and comprehensive understanding of design processes and methodologies and the ability to apply and adapt them in unfamiliar situations

	Economic, legal, social, ethical and environmental context Engineering activity can have impacts on the environment, on commerce, on society and on individuals. On graduation you will have the skills to manage your activities and to be aware of the various legal and ethical constraints under which you are expected to operate, including:
EL8	Awareness of the need for a high level of professional and ethical conduct in engineering
EL9	Awareness that engineers need to take account of the commercial and social contexts in which they operate
EL10	Knowledge and understanding of management and business practices, their limitations, and how these may be applied in the context of Advanced Mechanical Engineering Science
EL11	Awareness that engineering activities should promote sustainable development and ability to apply quantitative techniques where appropriate
EL12	Awareness of relevant regulatory requirements governing engineering activities in the context of Advanced Mechanical Engineering Science
EL13	Awareness of and ability to make general evaluations of risk issues in the context of Advanced Mechanical Engineering Science, including health & safety, environmental and commercial risk

	Engineering practice This is the practical application of engineering skills, combining theory and experience, and use of other relevant knowledge and skills. On graduation you will have achieved:
P9	A thorough understanding of current Advanced Mechanical Engineering Science practice and its limitations, and some appreciation of likely new developments
P11	Understanding of different roles within an engineering team and the ability to exercise initiative and personal responsibility, which may be as a team member or leader
P12	Advanced level knowledge and understanding of a wide range of engineering materials and components

Teaching and Learning Methods

Acquisition of core knowledge and understanding is through lectures, seminars, tutorials, field and laboratory classes, computer classes, workshops, and independent study and research. You are encouraged from an early stage to supplement and consolidate your understanding and knowledge by independent study.

Assessment methods

Testing of the knowledge base is through a combination of unseen written examinations and assessed coursework in the form of problem solving exercises, laboratory reports design exercises, essays and individual and group projects.

Skills

Having successfully completed this programme you will be able to:

	Engineering analysis Engineering analysis involves the application of engineering concepts and tools to the solution of

	engineering problems. On graduation you will have achieved:
EA5	Ability to use fundamental knowledge to investigate new and emerging technologies
EA6M	Ability both to apply appropriate engineering analysis methods for solving complex problems in engineering and to assess their limitations
EA7	Ability to collect and analyse research data and to use appropriate engineering analysis tools in tackling unfamiliar problems, such as those with uncertain or incomplete data or specifications, by the appropriate innovation, use or adaptation of engineering analytical methods

	Design Design at this level is the creation and development of an economically viable product, process or system to meet a defined need. It involves significant technical and intellectual challenges and can be used to integrate all engineering understanding, knowledge and skills to the solution of real and complex problems. On graduation you will have the knowledge, understanding and skills to:
D11	Ability to generate an innovative design for products, systems, components or processes to fulfil new needs

	Engineering practice This is the practical application of engineering skills, combining theory and experience, and use of other relevant knowledge and skills. On graduation you will have achieved:
P10	Ability to apply engineering techniques taking account of a range of commercial and industrial constraints

	Additional general skills On graduation you will have developed transferable skills, additional to those set out in the other learning outcomes, that will be of value in a wide range of situations, including the ability to:
G1	Apply their skills in problem solving, communication, working with others, information retrieval, and the effective use of general IT facilities
G2	Plan self-learning and improve performance, as the foundation for lifelong learning/CPD
G3	Monitor and adjust a personal programme of work on an on-going basis
G4	Exercise initiative and personal responsibility, which may be as a team member or leader

	Discipline Specific Skills On completion of the Advanced Mechanical Engineering Science programme you will be able to:
	Design and conduct an appropriate programme of work to set objectives for research in the context of Advanced Mechanical Engineering Science
	Use scientific and technical literature in support of research
	Apply fundamental knowledge and understanding of essential facts, concepts and principles relevant to Advanced Mechanical Engineering Science in researching complex problems

Teaching and Learning Methods

Intellectual skills are developed through the teaching and learning activities. Analysis and problem solving skills are further developed through regular problem sheets issued by module lecturers and through small group teaching. Experimental, research and design skills are further developed through coursework exercises, laboratory work, and design and research projects. Individual feedback is provided on all work submitted. Appreciation of the practical applications of these skills is provided by interaction with industry through visiting lecturers and industrial visits.

Assessment methods

Analysis and problem solving skills are assessed through unseen written examinations and problem based exercises. Experimental, research and design skills are assessed through laboratory reports, coursework exercises, project reports and oral presentations. Skills are formatively assessed through written reports and

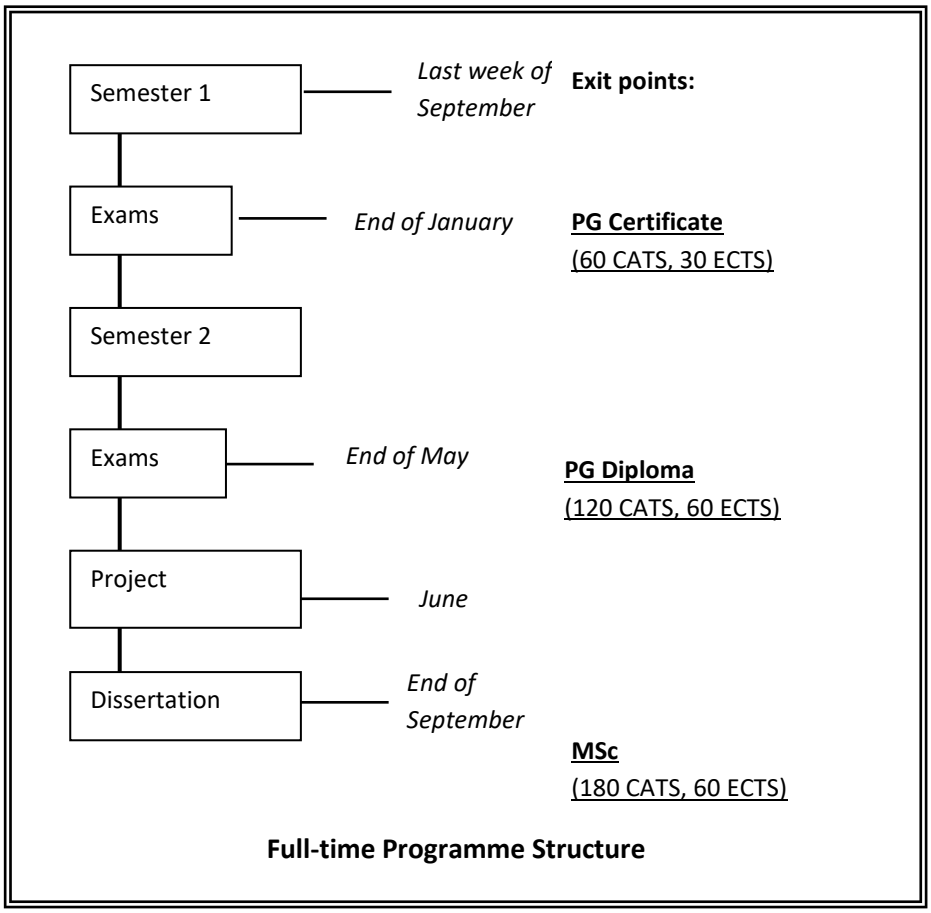
oral presentations, practical and laboratory reports. Summative assessment is through unseen examinations, extended essays, written reports and oral presentations, and completion of a research project.

Programme Structure

The University uses the European Credit Transfer Scheme (ECTS) to indicate the approximate amount of time a typical student can expect to spend in order to complete successfully a given module or programme, where 1 ECTS indicates around 20 nominal hours of study. Previously, Credit Accumulation and Transfer Scheme (CATS) points were used for this purpose where 1 CATS credit was 10 nominal hours of study. The University credit accumulation and transfer scheme is detailed at
https://www.southampton.ac.uk/calendar/sectioniv/index.page

The full-time MSc programme lasts for 12 months. The first 8 months are spent mainly on the taught component, with lectures divided into two 12-week periods (Semesters 1 and 2), with exams at the end of each semester. The final four months are spent full-time on a research project, for which a considerable amount of preparation is undertaken in Semester 2. A strict timetable of milestones for the starting in Semester 2 ensures maximum time is devoted to the project as the manufacture, integration and testing of physical artefacts is often involved.

The MSc award depends on passing the examinations and on successful completion of a dissertation on the project. The diagram below shows the overall structure and possible exit points.



Full-time Programme Structure

The taught component of each Theme consists of four compulsory modules (five for the MSc Engineering Materials) plus option modules chosen to total 60 ECTS/120 CATS, at least 45 ECTS/90 CATS of which must be at level 7 (level M). The research project and dissertation are equivalent to 30 ECTS/60 CATS at level 7 (level M).

You will select all your option taught modules at the start of the programme and to achieve a balance in study commitments throughout the year it is recommended you take either four or five modules in semester 1.

The most up to date description of the content is in the on-line programme catalogue: https://studentrecords.soton.ac.uk.

The 'online programme catalogue' allows viewing of full content for each theme for each year and contains hyperlinks to online module specifications. To find links to broad generic descriptions of the programmes and modules, follow links to your programme starting from:

http://www.southampton.ac.uk/engineering/what_we_do/mechanical_engineering.page?#education

The programme structure tables below reflects the taught modules offered in 2019-20, and is subject to minor alteration from year to year. Where optional modules have been specified, the following is an indicative list of available optional modules, which are subject to change each academic year. Please note in some instances modules have limited spaces available.

MSc Computational Engineering and Design

Core Modules

FEEG6012	MSc Research Project	30/60	7	1&2

Compulsory modules: 30 ECTS (60 CATS)		ECTS/CATS	Level	Sem.
FEEG6002	Advanced Computational Methods I	7.5/15	7	1
FEEG6009	Design Search and Optimisation	7.5/15	7	2
MATH6141	Numerical Methods	7.5/15	7	1
SESM6039	Introduction to Advanced Mechanical Engineering Sciences	7.5/15	7	1
Option modules: choose 30 ECTS (60 CATS) (maximum 30 CATS at level 6)				
FEEG3001	Finite Element Analysis in Solid Mechanics	7.5/15	6	1
FEEG6005	Applications of CFD	7.5/15	7	1
FEEG6010	Advanced Finite Element Analysis	7.5/15	7	2
MANG6318	Advanced Management	7.5/15	7	2
MATH3083	Advanced Partial Differential Equations	7.5/15	6	1
SESA3026	Aircraft Structural Design	7.5/15	6	2
SESA6077	Aeroelasticity	7.5/15	7	1
SESM3029	Engineering Design with Management	7.5/15	6	2
SESM6038	Computational Methods in Biomedical Engineering Design	7.5/15	7	2

MSc Engineering Materials

Core Modules

FEEG6012	MSc Research Project	30/60	7	1&2

Compulsory modules: 37.5 ECTS (75 CATS)		ECTS/CATS	Level	Sem.
SESG6034	Surface Engineering	7.5/15	7	1
SESG6040	Failure of Materials and Components	7.5/15	7	2
SESG6042	Microstructural Engineering for Transport Applications	7.5/15	7	1
SESG6044	Microstructural and Surface Characterisation	7.5/15	7	1&2
SESM6039	Introduction to Advanced Mechanical Engineering Sciences	7.5/15	7	1
Option modules: choose 22.5 ECTS (45 CATS) (maximum 15 ECTS (30 CATS) from level 6 modules)				

FEEG3001	Finite Element Analysis in Solid Mechanics	7.5/15	6	1
FEEG6007	Fuel Cells, batteries and photovoltaic systems I	7.5/15	7	1
FEEG6008	Fuel Cells, batteries and photovoltaic systems II	7.5/15	7	2
MANG6318	Advanced Management	7.5/15	7	2
SESA3026	Aircraft Structural Design	7.5/15	6	2
SESA6075	Aircraft Propulsion	7.5/15	7	1
SESG3024	Manufacturing and Materials	7.5/15	6	1
SESG6039	Composites Engineering Design and Mechanics	7.5/15	7	1
SESG6045	Experimental Mechanics	7.5/15	7	2
SESM3028	Biomaterials	7.5/15	6	2
SESM6034	Advanced Electrical Systems	7.5/15	7	1
SESM6035	Bio, Nano and Modelling Aspects of Tribology	7.5/15	7	2

MSc Mechatronics

Core Modules

FEEG6012	MSc Research Project	30/60	7	1&2

Compulsory modules: 37.5 ECTS (75 CATS)		ECTS/CATS	Level	Sem.
SESG6036	Advanced Control Design	7.5/15	7	2
SESM3030	Control and Instrumentation	7.5/15	6	1
SESM6034	Advanced Electrical Systems	7.5/15	7	1
SESM6039	Introduction to Advanced Mechanical Engineering Sciences	7.5/15	7	1
Option modules: choose 22.5 ECTS (60 CATS) (maximum 7.5 ECTS (15 CATS) at level 6)				
ELEC3201	Robotic Systems	7.5/15	6	1
FEEG3001	Finite Element Analysis in Solid Mechanics	7.5/15	6	1
FEEG6002	Advanced Computational Methods I	7.5/15	7	1
FEEG6007	Fuel Cells and Photovoltaic Systems I	7.5/15	7	1
FEEG6008	Fuel Cells and Photovoltaic Systems II	7.5/15	7	2
MANG6318	Advanced Management	7.5/15	7	2
MATH6141	Numerical Methods	7.5/15	7	1
SESM3029	Engineering Design with Management	7.5/15	6	2
SESM6037	Automotive Propulsion	7.5/15	7	2
CENV6016	Transport Economics	7.5/15	7	2
SESG6035	Advanced Sensors and Condition Monitoring	7.5/15	7	1
SESM6035	Bio, Nano and Modelling Aspects of Tribology	7.5/15	7	2

MSc Propulsion and Engine Systems Engineering

Core Modules

FEEG6012	MSc Research Project	30/60	7	1&2

Compulsory modules: 30 ECTS (60 CATS)		ECTS/CATS	Level	Sem.
SESA6075	Aircraft Propulsion	7.5/15	7	1
SESM6034	Advanced Electrical Systems	7.5/15	7	2
SESM6037	Automotive Propulsion	7.5/15	7	2

SESM6039	Introduction to Advanced Mechanical Engineering Sciences	7.5/15	7	1
Option modules: choose 30 ECTS (60 CATS) (max 15 ECTS (30 CATS) at level 6)				
CENV6016	Transport Economics	7.5/15	7	2
FEEG6005	Applications of CFD	7.5/15	7	1
FEEG6007	Fuel Cells and Photovoltaic Systems I	7.5/15	7	1
ISVR6136	Fundamentals of Acoustics	7.5/15	7	1
MANG6318	Advanced Management	7.5/15	7	2
SESA6071	Spacecraft Propulsion	7.5/15	7	1
SESG6035	Advanced Sensors and Condition Monitoring	7.5/15	7	1
SESG6040	Failure of Materials and Components	7.5/15	7	2
SESG6042	Microstructural Engineering Transport Applications	7.5/15	7	1
SESG6044	Microstructure and Surface Characterisation	7.5/15	7	1&2
SESM3029	Engineering Design with Management	7.5/15	6	2
SESM6033	Tribological Engineering and Engine Tribology	7.5/15	7	1
SESM6040	Thermo-fluid Engineering for Low-Carbon Energy	7.5/15	7	1

Note: It is possible that module prerequisites may be omitted at the discretion of the module lecturer depending on previous experience.

Typical course content

The programme involves 90 ECTS/180 CATS credit points distributed between taught and research components. The taught component consists of modules worth 60 ECTS/120 CATS, of which at least 45 ECTS/90 CATS are at level 7. You will take the compulsory modules and select the remaining from a given list. The list is specific to your chosen specialisation within the themes as shown above. Any of these taught modules can form part of a Postgraduate Certificate. In addition to the taught modules, the MSc also requires completion of a research project worth 30 ECTS/60 CATS. To achieve a Postgraduate Diploma 60 ECTS/120 CATS need to be completed and passed.

The programme follows university guidelines for inclusivity and flexibility and provides and array of teaching and learning approaches that will enable any student who meets the entry requirements to access the curriculum and demonstrate achievement of all the intended learning outcomes.

Progression Requirements

The programme follows the University's regulations for ***Progression, Determination and Classification of Results: Postgraduate Master's Programmes*** as set out in the University Calendar https://www.southampton.ac.uk/calendar/sectioniv/index.page

Intermediate exit points (where available)

You will be eligible for an interim exit award if you complete part of the programme but not all of it, as follows:

Qualification	Minimum overall credit in ECTS/CATS credits	Minimum ECTS/CATS credits required at level of award
Postgraduate Diploma	at least 60/120	45/90
Postgraduate Certificate	at least 30/60	20/40

Programme outcomes for different exit points

Level 7 (MSc)	Much of the study undertaken at Masters level reflects research at the forefront of Mechanical Engineering. You will have shown originality in the application of knowledge, and you will understand how the boundaries of knowledge are advanced through research. You will be able to deal with complex issues both systematically and creatively, and show originality in tackling and solving problems individually and as part of a team. You will have the qualities needed for employment in circumstances requiring sound judgement, personal responsibility and initiative, in complex and unpredictable professional environments.
PGDip	You will have attained knowledge of research being undertaken by academic staff at the forefront of Mechanical Engineering. You will have shown that you are capable of applying knowledge to solve problems, and you will understand how the boundaries of knowledge are advanced through research. You will be able to deal with complex issues both systematically and creatively, and be able to contribute to solving problems individually and as part of a team. You will have the qualities needed for employment in circumstances requiring sound judgement and personal responsibility under the guidance of others, in complex and unpredictable professional environments.
PGCert	You will have been exposed to research being undertaken by academic staff at the forefront of Mechanical Engineering. You will have gained experience in applying knowledge to solve problems, and you will understand how the boundaries of knowledge are advanced through research. You will be able to deal with complex issues by following existing procedures, and will be able to contribute to solving problems individually and as part of a team. You will have some of the qualities needed for employment in circumstances requiring sound judgement and personal responsibility under the guidance of others, in complex and unpredictable professional environments.

Additional Costs

Students are responsible for meeting the cost of essential textbooks, and of producing such essays, assignments, laboratory reports and dissertations as are required to fulfil the academic requirements for each programme of study. Costs that students registered for this programme typically also have to pay for are included in Appendix 1.

Support for student learning

There are facilities and services to support your learning some of which are accessible to students across the University and some of which will be geared more particularly to students in your particular Faculty or discipline area.

The University provides:

- library resources, including e-books, on-line journals and databases, which are comprehensive and up-to-date; together with assistance from Library staff to enable you to make the best use of these resources
- high speed access to online electronic learning resources on the Internet from dedicated PC Workstations onsite and from your own devices; laptops, smartphones and tablet PCs via the Eduroam wireless network. There is a wide range of application software available from the Student Public Workstations.
- computer accounts which will connect you to a number of learning technologies for example, the Blackboard virtual learning environment (which facilitates online learning and access to specific learning resources)
- standard ICT tools such as Email, secure filestore and calendars.

- access to key information through the MySouthampton Student Mobile Portal which delivers timetables, Module information, Locations, Tutor details, Library account, bus timetables etc. while you are on the move.
- IT support through a comprehensive website, telephone and online ticketed support and a dedicated helpdesk in the Hartley Library.
- Enabling Services offering support services and resources via a triage model to access crisis management, mental health support and counselling.
- assessment and support (including specialist IT support) facilities if you have a disability, long term health problem or Specific Learning Difficulty (e.g. dyslexia)
- the Student Services Centre (SSC) to assist you with a range of general enquiries including financial matters, accommodation, exams, graduation, student visas, ID cards
- Career Destinations, advising on job search, applications, interviews, paid work, volunteering and internship opportunities and getting the most out of your extra-curricular activities alongside your degree programme when writing your CV
- Other support that includes health services (GPs), chaplaincy (for all faiths) and 'out of hours' support for students in Halls (18.00-08.00), a Centre for Language Study, providing assistance in the development of English language and study skills for non-native speakers.

The Students' Union provides

- an academic student representation system, consisting of Course Representatives, Academic Presidents, Faculty Officers and the Vice-President Education; SUSU provides training and support for all these representatives, whose role is to represent students' views to the University.
- opportunities for extracurricular activities and volunteering
- an Advice Centre offering free and confidential advice including support if you need to make an academic appeal
- Support for student peer-to-peer groups, such as Nightline.

Associated with your programme you will be able to access:

- Induction programme for orientation, introduction of the programme and staff, and dissemination of materials.
- Student Coursebook, including guidance on selection of study programmes.
- Administrative and academic material on the Faculty, Programme and individual module web sites and/or Blackboard.
- A personal tutor to assist with organisational and personal matters.
- Further support is provided by the project supervisor when the research project starts.
- Careers advice and dissemination of available job advertisements.
- Personal e-mail account and e-mail access to staff via University system.
- School clusters of computers with relevant specialist software.
- Formal progress monitoring during research project.
- Support for international students.

Methods for evaluating the quality of teaching and learning

You will have the opportunity to have your say on the quality of the programme in the following ways:

- Completing student evaluation questionnaires for each module of the programme
- Acting as a student representative on various committees, e.g. Staff: Student Liaison Committees, Faculty Programmes Committee OR providing comments to your student representative to feed back on your behalf.
- Serving as a student representative on Faculty Scrutiny Groups for programme validation
- Taking part in programme validation meetings by joining a panel of students to meet with the Faculty Scrutiny Group

The ways in which the quality of your programme is checked, both inside and outside the University, are:

- Discipline, Part, education and project boards, convening regularly during each academic year, which consider the outcomes of each module's delivery and evaluation.
- Moderation of examination papers, coursework and projects, both internally and externally.
- Annual examiners' meetings and examiners' boards.
- Annual programme and module reviews considering your feedback from all sources, feedback from teaching panels, external examiners and other bodies and student performance.
- Periodic meetings of the School Industrial Advisory Board.
- Response to results from the National Student Survey.
- Revalidation by the University at least every five years.

Each of the modules that make up the programme will be taught at the University of Southampton. The academic coordinator of the module is responsible for ensuring appropriate content of modules and quality of delivery.

Each research project will be supervised by a member of academic staff. A co-supervisor will be allocated who will normally be an academic or senior consulting engineer from within the Faculty; in the case of projects carried out externally, the co-supervisor may be from the institution/ company offering project facilities. The supervisor and co-supervisor conduct a formal progress review with the student, normally during July/August.

Career Opportunities

AMES graduates are in strong demand in a wide range of application sectors which results in good starting salaries and excellent career progression opportunities. In the UK our graduates work across many different organisations and in many application areas, including for example the aerospace, automotive, power generation, biomedical and finance sectors. In addition to engineering careers, many of our graduates go into other graduate employment destinations such as finance and consultancy, where the numeracy and excellent communication skills developed on the programme are also highly valued. Our high entry standards and rigorous course results in a graduating class with excellent analytical skills as well as significant project management and leadership skills. Throughout their time at Southampton, students are supported by the University's Careers service, the Mechanical Engineering Employability coordinator and their academic tutor in preparing for their future career. CV writing, interview and technical assessment centre workshops all help students demonstrate their skills in pursuing employment prospects.

External Examiner(s) for the programme

Name Professor Stephen Eichhorn
Institution. University of Bristol

Students must not contact External Examiner(s) directly, and external examiners have been advised to refer any such communications back to the University. Students should raise any general queries about the assessment and examination process for the programme with their Course Representative, for consideration through Staff: Student Liaison Committee in the first instance, and Student representatives on Staff: Student Liaison Committees will have the opportunity to consider external examiners' reports as part of the University's quality assurance process.

External examiners do not have a direct role in determining results for individual students, and students wishing to discuss their own performance in assessment should contact their personal tutor in the first instance.

Please note: This specification provides a concise summary of the main features of the programme 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. More detailed information can be found in the programme handbook (or other appropriate guide) or online at http://www.southampton.ac.uk/studentservices/academiclife/faculty-handbooks.page and at http://www.southampton.ac.uk/engineering/postgraduate/taught_courses/engineering.page .

Appendix 1:

Additional Costs

Students are responsible for meeting the cost of essential textbooks, and of producing such essays, assignments, laboratory reports and dissertations as are required to fulfil the academic requirements for each programme of study. In addition to this, students registered for this programme typically also have to pay for the items listed in the table below.

In some cases you'll be able to choose modules (which may have different costs associated with that module) which will change the overall cost of a programme to you. Details of such costs will be listed in the Module Profile. Please also ensure you read the section on additional costs in the University's Fees, Charges and Expenses Regulations in the University Calendar available at www.calendar.soton.ac.uk.

Main Item	Sub-section	PROGRAMME SPECIFIC COSTS
Approved Calculators		Students may use calculators in the examination room only as specified by the University and as permitted by the rubric of individual examination papers. The University specifies permissible models from time to time and these may be purchased from any source.
Stationery		You will be expected to provide your own day-to-day stationary items, e.g. pens, pencils, notebooks, etc). · The third year module FEEG3003 Individual Project requires you to print an Al portrait poster on paper. The typical cost for this is in the range £5 to £20.
Textbooks		Where a module specifies core texts these should generally be available on the reserve list in the library. However due to demand, students may prefer to buy their own copies. These can be purchased from any source. Some modules suggest reading texts as **optional** background reading. The library may hold copies of such texts, or alternatively you may wish to purchase your own copies. Although not essential reading, you may benefit from the additional reading materials for the module.
Equipment and Materials	Design equipment and materials:	We provide a wide range of resources to support project based modules and activities and these will allow you to complete your assessed exercises to the highest standard. However, you may wish to customise your project by purchasing additional resource e.g. alternative manufacturing materials, electronic components, etc. You may also incur additional costs for printing e.g. large format drawings.
Clothing	Fieldcourse clothing:	You will need to wear suitable clothing when attending fieldcourses, e.g. waterproofs, walking boots. You can purchase these from any source.
Printing and Photocopying Costs		In some cases, coursework and/or projects may be submitted electronically. Where it is not possible to submit electronically students will be liable for printing costs. Students are expected to cover the costs associated with the printing of drawings and graphic presentations. These are typically expected to be of the order of £20 - 50 per student. The third year module FEEG3003 Individual Project requires you to print an Al portrait poster on paper at a typical cost of £20. A list of the University printing costs can be found here: https://www.southampton.ac.uk/isolutions/students/printing-for-students.page.
Optional Visits		Some modules may include additional optional visits. You will normally be expected to cover the cost of travel and admission, unless otherwise specified in the module profile. For costs related to study abroad please see the relevant module profile