

# Programme Specification

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## MEng (Hons), BEng (Hons) Aeronautics & Astronautics 2018/19

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, University of Southampton
Mode of study	Malaysia Campus (international students for Parts I and II only)
Duration	Full time 5 years (MEng with Industrial Placement Year), 4 years (MEng) (BEng with Industrial Placement Year), 3 years (BEng)
Accreditation details	Royal Aeronautical Society Institute of Mechanical Engineers MEng accredited for registration as a Chartered Engineer for graduates with a 2.2 and above BEng (Honours) accredited for registration as a Chartered Engineer subject to the completion of approved additional learning
Final award	Bachelor of Engineering (with Honours) (BEng) Bachelor of Engineering with Industrial Placement Year (with Honours) (BEng)Master of Engineering (MEng)
Name of award	Aeronautics & Astronautics Aeronautics & Astronautics/Aerodynamics Aeronautics & Astronautics/Airvehicle Systems & Design Aeronautics & Astronautics/Computational Engineering & Design Aeronautics & Astronautics/Engineering Management- Aeronautics & Astronautics/Materials & Structures Aeronautics & Astronautics/Semester Abroad Aeronautics & Astronautics/Semester in Industry Aeronautics & Astronautics/Spacecraft Engineering  All of the MEng degrees above may also be taken with an Industrial Placement Year and will then have 'with Industrial Placement Year' appended to the degree title
Interim Exit awards	Certificate of Higher Education Diploma of Higher Education Bachelor of Science (Ordinary)
FHEQ level of final award	Level 6 (BEng), Level 7 (MEng)
UCAS code	H422, BEng Aeronautics & Astronautics H40P, BEng Aeronautics & Astronautics with Industrial Placement Year (2018/19)  H401, MEng Aeronautics & Astronautics

UCAS code	H490, MEng Aeronautics & Astronautics/Aerodynamics
	H491, MEng Aeronautics & Astronautics/Airvehicle Systems & Design
	09F4, MEng Aeronautics & Astronautics/Computational Engineering & Design
	HN42, MEng Aeronautics & Astronautics/Engineering Management
	7T32, MEng Aeronautics & Astronautics/Materials & Structures
	39C5, MEng Aeronautics & Astronautics/Semester Abroad
	32F6, MEng Aeronautics & Astronautics/Semester in Industry
	H493, MEng Aeronautics & Astronautics/Spacecraft Engineering
	H414, MEng Aeronautics & Astronautics with Industrial Placement Year
	HH41 MEng Aeronautics & Astronautics/Aerodynamics with Industrial Placement Year
	H41H MEng Aeronautics & Astronautics/Airvehicle Systems & Design with Industrial Placement Year
	H4H1 MEng Aeronautics & Astronautics/Computational Engineering & Design with Industrial Placement Year
	HH44 MEng Aeronautics & Astronautics/Engineering Management with Industrial Placement Year
	H44H MEng Aeronautics & Astronautics/Materials & Structures with Industrial Placement Year
	H4HH MEng Aeronautics & Astronautics/Semester Abroad with Industrial Placement Year
	H444 MEng Aeronautics & Astronautics/Semester in Industry with Industrial Placement Year
	H400 MEng Aeronautics & Astronautics/Spacecraft Engineering with Industrial Placement Year
QAA Subject Benchmark or other external reference	Engineering, Engineering Council, UK-SPEC
Director of Programme	Dr Scott Walker
Programme Lead	Dr David Angland
Date specification was written	March 2003 (A.R.L Tatnall) Amended January 2016 to include Industrial Placement Year for MEng (A Barney/H Glasspool)
Date programme was validated	July 2014
Date specification last updated	August 2017

## Programme Overview

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### Brief outline of the programme

The aim of this range of programmes is to give students a thorough background in engineering principles as applied to the design and operation of aerospace vehicles (aircraft and spacecraft) and to equip them well for future careers in the aerospace and other engineering or technical industries. It also offers students the opportunity to specialise in certain areas of the discipline, according to their wishes and future career aspirations.

The first two years of this MEng are identical to that of the BEng. Towards the end of Part II you will be invited to transfer onto one of our specialist MEng programmes for Parts III and IV along with selecting your optional module/s for Part III.

For those that elect to stay on this programme, in Part III most of the modules you will study are related to the aerospace discipline, including an aircraft design group project and an individual project. In Part IV you will undertake a Group Design Project and you have a great deal of flexibility to choose more advanced aerospace topics or to broaden your education by taking some modules outside the aerospace discipline (e.g. Human Factors in Engineering, modern languages, etc.).

### Learning and teaching

Knowledge and Understanding on this integrated masters in Aeronautics and Astronautics course is gained through a combination of formal and special lectures, tutorials (small group teaching), example classes, laboratory experiments, coursework and individual and group projects at all Levels. Throughout the programme you are encouraged to use additional recommended reading material for private study to consolidate the formal learning process, and to broaden and deepen your understanding. You are encouraged to become student members of the professional institution, to use their libraries and resources, and attend their lectures and meetings.

### 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.

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

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The aims of the programme are to:

(Blue only = both BEng & MEng; Green only = MEng only, orange = Industrial Placement Year for both BEng & MEng)

- Provide you with a sound understanding of the fundamental principles, methods, analysis and synthesis in engineering design and applications appropriate to the Aeronautics, Astronautics and Space Systems disciplines that comprise Aerospace Engineering.
- Provide you with a comprehensive understanding of the fundamental Principles, methods, analysis and synthesis in engineering design and applications appropriate to the Aeronautics, Astronautics and Space Systems disciplines that comprise Aerospace Engineering.
- Provide you with opportunities to study specialist modules integrated within the structured learning environment, reflecting the internationally-renowned research expertise within the Faculty.
- Provide you with a range of specialist modules integrated within the structured learning environment, reflecting the internationally-renowned research expertise within the Faculty, in order to broaden and deepen your educational experience.
- Train you to enable you to become professional aerospace engineers that meet many of the educational requirements of the Engineering Council (i.e. UK-SPEC), and to have a broad range of knowledge and skills (including IT and communication) capable of meeting the present and future demands of industry and commerce.
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- Offer you a degree structure that is relevant to industry and responsive to changes in technology and the needs of the community.

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- Provide you with a supportive and intellectually stimulating environment that encourages an attitude of independent learning and enquiry, and fosters an ethos of lifetime learning and professional development.
- Provide you with a supportive and intellectually stimulating environment that encourages an attitude of independent learning and enquiry, and fosters an ethos of lifetime learning and professional development.
- Offer you individual projects and assignments which are supported by the research activities within the Faculty and stimulate individual innovation and self-assessment required in engineering design.
- Offer you a range of individual and group projects and assignments which are supported by the research activities within the Faculty and stimulate individual innovation, self-assessment and teamwork skills required in engineering design.
- BEng/MEng with Industrial Placement Year offers you an opportunity to apply the knowledge you have developed during your studies in Parts I and II and gain experience of working within an engineering based organisation

## Programme Learning Outcomes

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The programme provides opportunities for you to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas. The programme outcomes have been developed with reference to the Accrediting Institution guidelines and the UK-SPEC Degree Output Standards General and Specific Learning Outcomes.

### Knowledge and Understanding

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

1. Mathematics and science that are relevant to Aerospace Engineering.  
Mathematics and science that are relevant to Aerospace Engineering.
2. The fundamental concepts, principles and theories of Aerospace Engineering.  
The fundamental concepts, principles and theories of Aerospace Engineering, and an appreciation of their limitations
3. Knowledge and understanding of the essential facts, concepts and principles relevant to the practice of Aerospace Engineering.  
Detailed knowledge and understanding of the essential facts, concepts and principles relevant to the practice of Aerospace Engineering.
4. The principles of engineering design and manufacture and their application to conceptual and detailed design.  
The principles of engineering design and manufacture and their application to conceptual and detailed design
5. Information and communication technology relevant to the practice of Aerospace Engineering.  
Information and communication technology relevant to the practice of Aerospace Engineering.
6. Management and business practices that are relevant to the Aerospace manufacturing industry  
Advanced management and business practices that are relevant to the Aerospace manufacturing industry.
7. Health and safety issues, risk assessment and regulatory frameworks.  
Health and safety issues, risk assessment and regulatory frameworks.
8. The social and professional responsibilities of Aerospace engineers.  
The social and professional responsibilities of Aerospace engineers.
9. Environmental issues and the importance of Aerospace Engineering to the quality of the environment.  
Environmental issues and the importance of Aerospace Engineering to the quality of the environment.
10. The role of the engineers in society and the constraints within which their engineering judgement will be exercised.  
The role of the engineers in society and the constraints within which their engineering judgement will be exercised.
11. Material relevant to your specialist theme at an advanced level

### **Teaching and Learning Methods**

- Acquisition of 1 is through a combination of lectures, tutorials (small group teaching), example classes, laboratory experiments, coursework and projects.
- Acquisition of 2 - 5 is through a combination of lectures, tutorials, example classes, laboratory experiments, coursework and individual and group projects at all Levels.
- Acquisition of 6, 7 9 and 11 (MEng only) is through a combination of formal and special lectures, coursework and projects throughout the course. Acquisition of 6 is further enhanced when you opt for the Engineering Management theme.
- Acquisition of 8 is through lectures and coursework throughout the programme.
- Throughout the programme you are encouraged to use additional recommended reading material for private study to consolidate the formal learning process, and to broaden and deepen your understanding. You are encouraged to become student members of the professional institution, to use their libraries and resources, and attend meetings.
- Acquisition of 10 is through the project activities at level 6 (BEng and MEng) and 7.(MEng only)

### **Assessment Methods**

Testing of the knowledge base is through a combination of unseen written examinations (1, 2, 5, 6, 11) and assessed coursework in the form of problem solving exercises (1-4), laboratory reports (2-4), design exercises (4, 6-9), essays (7-9) and individual and group projects (2-10, 11).

### **Subject Specific Intellectual and Research Skills**

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Having successfully completed this programme you will be able to:

1. **Plan, conduct and report on an individual research programme.**  
Plan, conduct and report on individual and group research programmes
2. **Analyse and solve engineering problems, using appropriate mathematical and software methods as necessary.**  
Analyse and solve complex engineering problems, using appropriate mathematical and software methods as necessary, demonstrating the ability to define the limitations of your chosen methods
3. **Be creative in the solution of problems and in design development.**  
Be creative in the solution of problems, in design development showing significant originality
4. **Design engineering elements and systems to meet a need, evaluate outcomes and make improvements.**  
Design engineering elements and integrated systems to meet a need, evaluate outcomes critically and comprehensively & make improvements.
5. **Integrate and evaluate information and data from a variety of sources.**  
Integrate and evaluate complex information and data from a wide variety of sources.
6. **Take a structured approach to solving problems and designing systems, applying professional judgement to balance risks, cost, benefits, safety, reliability, aesthetics and environmental impact.**  
Take a holistic approach to solving problems and designing systems, applying professional judgement to balance risks, cost, benefits, safety, reliability, aesthetics and environmental impact.

### **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, and design and research projects. Individual feedback is provided on all work submitted.
- Appreciation of the practical applications of these skills, in particular skill 6, is provided by interaction with industry through visiting lectures 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.

### **Transferable and Generic Skills**

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Having successfully completed this programme you will be able to:

1. **Communicate effectively – in writing, verbally and through drawings**  
Communicate effectively – in writing, verbally and through drawings
2. **Apply mathematical skills – algebra, geometry, modelling and analysis**  
Apply a wide range of mathematical skills – algebra, geometry, advanced modelling and analysis.
3. **Learn independently in familiar and unfamiliar situations with open-mindedness and self-reflection**  
Learn independently in familiar and unfamiliar situations with open-mindedness and in a spirit of critical enquiry.
4. **Work constructively as a member of a team.**  
Work constructively as a member of a team able to take a variety of roles.
5. **Manage time and resources.**  
Manage time and resources.
6. **Use Information and Communications Technology.**  
Use Information and Communications Technology.
7. **Use the library, internet and other sources effectively.**  
Use the library, internet and other sources effectively and critically
8. **Manage tasks and solve problems, transfer techniques and solutions from one area to another, apply judgement.**  
Manage tasks and solve novel problems, transfer techniques and solutions from one area to another, apply critical analysis and judgement.
9. **Learn effectively for the purpose of continuing professional development and in a wider context throughout their career**  
Learn effectively for the purpose of continuing professional development and in a wider context throughout their career.
10. **Communicate in a foreign language when you select a language option**  
Communicate in a foreign language when you select a language option or study abroad.

### **Teaching and Learning Methods**

Transferable skills are developed through the teaching and learning activities.

- Skill 1 is taught at Level 3 and developed through coursework, presentations and project reports.
- Skill 2 is taught formally at Levels 3 and 4 and developed throughout the programme.
- Skill 4 is developed through group project work.
- Skill 5 is developed through the setting and strict enforcement of coursework deadlines.
- Skill 6 is developed through computing modules, laboratory experiments, project work, presentations, other coursework activities and individual learning.
- Skill 7 is developed through individual research projects and group projects.
- Skill 8 is developed in the technical subject areas of the programme as well as project work.
- Skill 10 is developed if you opt for studying abroad for one semester, normally in Part III. Skill 10 is also cultivated if you select a language option

Although not explicitly taught, other skills (including skill 3 and skill 9) are nurtured and developed throughout the programme, which is structured and delivered in such a way as to promote this.

### **Assessment Methods**

- Skill 1 is assessed through coursework exercises, laboratory and field study reports and presentations.
- Skill 2 is assessed through unseen written examinations and coursework exercises.
- Skill 4 is assessed in group projects.
- Skill 5 is assessed by applying penalties for failure to meet deadlines.

- Skill 6 is assessed formally in the Computing modules at Level C and Level H and further assessed throughout the course where ICT is used.
- Skills 7 and 8 are assessed through unseen written examinations, coursework exercises, design work and individual and group project work.
- Skill 9 is essential for success on the programme and future professional development but is not formally assessed.
- Skill 10 is assessed through coursework and written examinations as part of the specialist language modules.

## Subject Specific Practical Skills

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Having successfully completed this programme you will be able to:

1. **Carry out safely a series of planned experiments**  
Carry out safely a series of planned experiments.
2. **Use laboratory equipment to generate data**  
Use laboratory equipment to generate data.
3. **Analyse experimental results and assess their validity.**  
Analyse complex experimental results and assess their validity and applicability.
4. **Prepare technical drawings including the use of CAD and freehand sketching.**  
Prepare technical drawings including the use of CAD and freehand sketching
5. **Prepare technical reports.**  
Prepare technical reports individually and by contributing as part of a group
6. **Give technical presentations using a variety of media.**  
Give technical presentations using a variety of media.
7. **Use computer packages and write computer programs**  
Use computer packages and write computer programs showing awareness of the limitations of such numerical methods engineering applications.
8. **Make effective use of scientific literature**  
Make effective use of scientific literature from various sources.

## Teaching and Learning Methods

- Practical skills are developed through the teaching and learning programme.
- Experimental skills are developed through laboratory experiments and project work, if relevant.
- Workshop skills are developed through the workshop practice at level C.
- Skill 4 is taught in the Design module at Level C and further developed through design coursework exercises.
- Skills 5 and 6 are acquired through guidelines set out in relevant coursebooks and reports and project presentations throughout the programme.
- Skill 7 is taught in relevant modules at Levels C and I and further developed through coursework exercises and project work.
- Skill 8 is acquired through information retrieval in preparation for project work.

## Assessment Methods

Practical skills are assessed through laboratory experiment reports, coursework exercises, project reports and presentations.

## Programme Structure

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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 <http://www.calendar.soton.ac.uk/sectionIV/cats.html>.

In Parts II – IV the teaching is structured on a semester pattern, whereas for pedagogical reasons in Part I the modules are delivered across both semesters. You study modules comprising 60 ECTS (120 CATS) in each of Parts I (level 4), II (level 5) and III (level 6), and 75 ECTS (150 credits) in Part IV (level 7). There are several degree possibilities in the programme of study:

- Three years full-time, leading to a Bachelor of Engineering (BEng).
- Four years full-time, leading to a Bachelor of Engineering with Industrial Placement Year (BEng with IPY)
- Four years full-time, leading to a Master of Engineering (MEng).
- Five years full-time, leading to a Master of Engineering with Industrial Placement Year (MEng with IPY)

In addition there are the following exit points:

- Certificate of Higher Education, following successful completion of Part I.
- Diploma of Higher Education, following successful completion of Part II.
- Bachelor of Science (Ordinary Degree) following successful completion of at least 150 ECTS (300 CATS), including 30 ECTS (60 CATS) at level 6.

Each module is a self-contained part of the programme of study and carries a credit rating.

The duration of all the programmes may be extended by one year through enrolment on the Engineering Foundation Year. This does not apply to those students on the MEng Acoustical Engineering with Industrial Placement Year

The Programme Structure is outlined in Appendix 1a.

### **Typical course content**

On both the MEng and BEng degrees in Aeronautics and Astronautics programme you will study a number of core general engineering and aerospace-related subjects during the first two years. These provide sound preparation for the final part of the degree. You will concentrate on the fundamentals of engineering and gain the skills and understanding required to use information technology in an engineering context.

In the MEng you will have the opportunity to specialise by selecting a particular theme/programme of study in Parts III and IV. On the BEng there are no specialist themes but you will be able to select an optional module from a wide range that are available. On both programmes you will also undertake an individual project that usually takes the form of a design or research exercise, and involves the production of a formal report. A group aircraft (or spacecraft) design exercise is completed in Part III.

In Part IV, MEng students participate in a Group Design Project (GDP). These projects are often linked to current research activities or topics that have practical relevance to industry.

### **Special Features of the programme**

The programme is delivered at the University of Southampton, Southampton, UK, with all Programme Boards, Subject Panels, Exam Boards and Faculty Programme meetings held at Southampton. All module activities are based at or close to the Highfield Campus, Southampton, except for the following. Parts I and II are also delivered at University of Southampton Malaysia Campus (USMC), south Johor, Malaysia. You can elect to study one or both parts at USMC. (For UK and EU nationals, Government funding/loan for fees may be restricted.) The Study Abroad themes involve a semester study at a university in Europe or the USA. International study opportunities may be dependent on visa requirements. The Semester in Industry theme includes a 5 month period at a company. Study Abroad and Semester in Industry themes are not applicable to USMC students.

### **Programme details**

The programme follows university guidelines for inclusivity and flexibility and provides an 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.

### **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 4.

## Progression Requirements

The programme follows the University's regulations for *Progression, Determination and Classification of Results: Undergraduate and Integrated Masters Programmes*

Additional regulations applying to the assessment of Part I of your programme, the Industrial Placement Year and our other BEng (Hons)/MEng regulations may be found here:

<http://www.calendar.soton.ac.uk/sectionVIII/sectVIII-index.html>

## Intermediate exit points

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 credits	Minimum ECTS Credits required at level of award
Bachelor of Science	at least 150	30
Diploma of Higher Education	at least 120	45
Certificate of HE	at least 60	45

## Programme outcomes for different exit points

Level 4 (Part I)	You will have a sound knowledge of the basic concepts in Aeronautics & Astronautics and will have learned how to take different approaches to solving problems. You will be able to communicate accurately, and will have the qualities needed for employment requiring the exercise of some personal responsibility.
Level 5 (Part II)	You will have developed a sound understanding of the principals involved in a range of core Aeronautics & Astronautics subjects, and will have learned to apply those principles more widely. Through this, you will have learned to evaluate the appropriateness of different approaches to solving problems. You will have the qualities necessary for employment in situations requiring the exercise of personal responsibility and decision-making.
Level 6 (Part III) BEng	You will have developed an understanding of a complex body of knowledge relevant to Aeronautics & Astronautics/Space Systems Engineering, some of it at the forefront of current developments. Through this, you will have developed analytical techniques and problem-solving skills that can be applied to a range of engineering problems, and learned to communicate these effectively. As an Honours graduate you will be able to evaluate evidence, arguments and assumptions, and to reach sound judgements. You should have the qualities needed for employment in situations requiring the exercise of personal responsibility, and decision-making in complex and unpredictable circumstances
Level 7 (Part IV) MEng	Much of the study undertaken at Masters level reflects research at the forefront of Aeronautics & Astronautics/Space Systems 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.

## Support for Student Learning

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There are systems for the support of student learning in the Faculty as well as available from central University facilities.

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 Student Services Centre
- Enabling Services offering assessment and support (including specialist IT support) facilities if you have a disability, dyslexia, mental health issue or specific learning difficulties
- 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
- a range of personal support services : mentoring, counselling, residence support service, chaplaincy, health service
- 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.

In the Faculty and your Discipline you will be able to access:

- Coursebooks for each year of the programme.
- Introductory sessions for all years of the programme.
- Library information retrieval seminar.
- Workshop training.
- Small group tutorials in Part of the programmes.
- Engineering Development and Manufacturing Centre (EDMC) equipped with a range of workshop equipment, CAD/CAM.
- Engineering and specific software available on all computers.
- Personal tutors to assist you with personal problems and to advise on academic issues (contact maintained during periods of studying abroad). A senior tutor is also available.
- Access to academic staff through an open door policy as well as timetabled tutor meetings, appointment system and e-mail.

- Research seminars and invited lectures.
- Faculty Student Office for the administration of your programme.

## Methods for Evaluating the Quality of Teaching and Learning

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

- Anonymous evaluation questionnaires for each module of the programme.
- Acting as or represented by Student Representatives on the staff-student liaison committee. You are also represented on the Faculty Programmes Committee
- Meetings, individually or as group, with programme external examiner.

It should be noted that meetings with personal tutor can also be used to comment on quality related issues.

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

- Evaluation for each module of the programme based on your feedback from evaluation questionnaires and carried out by lecturer(s) involved in the module and a colleague acting as advisor.
- Subject oriented Teaching Panels, convening at the end of each academic year, which consider the outcomes of each module's evaluation.
- Moderation of examination papers, coursework and projects, both internally and externally.
- Comments by external examiners, who produce an annual report.
- Peer observation of teaching for each member of staff contributing to learning and teaching, once per academic year.
- 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 Faculty Industrial Advisory Board.
- Response to results from the National Student Survey
- Accreditation by professional institutions.
- Periodic Programme Review by the University.

Note that quality assurance of part of the programme taken abroad, where applicable, is subject to the quality procedures of the relevant institutions. These procedures are subject to periodic monitoring by members of staff of the Faculty of Engineering and Physical Sciences.

## Career Opportunities

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Our Aeronautics and Astronautics degrees open up a wide range of exciting career opportunities. Previous graduate jobs have included aerospace engineer, pilot, race car designer, IT and management consultant, software and systems engineer, as well as roles in research and postgraduate study.

If you are considering a career in the armed forces, Southampton is one of the universities designated for the Defence Technical Undergraduate Scheme, which provides sponsored places to students on specific courses, including Aeronautics and Astronautics, and has active Army, Navy and Air Force units.

Among our many successful Aeronautics and Astronautics graduates is Adrian Newey, who has worked as an F1 designer for Williams and McLaren, and is now the chief technical officer of Red Bull F1 racing team. Top motor racing teams look to Southampton for the best new aerodynamics talent for the future.

## External Examiner(s) for the programme

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**Name:** Professor Mark Lowenberg

**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/academic-life/faculty-handbooks.page>

## Appendix 1a

### Programme Structure

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The information within this Appendix is liable to change in minor ways from year to year. It is accurate at the time of writing.

#### Part 1 (Level 4)

The first year provides a background in engineering science, emphasising aerospace engineering aspects. We have an award winning induction programme during which teams of new students work together to design and build projects. This exciting introduction provides the opportunity to get to know fellow students and gain hands-on experience.

All modules below are at level 4 and are core, i.e. all required assessments must be taken and passed at the required pass mark. They total 60 ECTS (120 CATS). No optional modules will be undertaken in Part I. All modules in Part I are taught over two semesters with any formal examinations held at the end of semester 2. Feedback on progress is provided throughout the year in many ways including via laboratory work, example sheets, tests and coursework.

For information on summative assessment of Part I please see Appendix 2

Module Code	Module Name	Semester	Credit Points (ECTS/CATS)
FEEG1001	Design & Computing	1,2	15/30
FEEG1002	Mechanics, Structures & Materials,	1,2	15/30
FEEG1003	Thermofluids	1,2	7.5/15
FEEG1004	Electrical & Electronic Systems	1,2	7.5/15
MATH1054	Maths for Engineering and the Environment I	1,2	7.5/15
SESA1015	Aircraft Operations & Flight Mechanics	1,2	7.5/15

#### Part II (Level 5)

The second year covers the main Aeronautics and Astronautics subjects with modules tailored to the discipline. The modules total 60 ECTS (120 CATS) across two semesters. Towards the end of Part II you have the opportunity to select the specialist or interdisciplinary theme that you will follow in Parts III and IV (MEng only, see Part III for details), as well as your Part III Individual Project.

Students selecting the Industrial Placement Year theme will take the placement module FEEG3009 between Parts II and III. They may not start their placement until Part II has been passed. Should the placement not be passed students can transfer back to the substantive programme.

**Modules at level 5 totalling 60 ECTS (120 CATS); all modules are compulsory**

Module Code	Module Name	Semester	Credit Points (ECTS/CATS)
FEEG2001	Systems Design & Computing	1,2	7.5/15
FEEG2005	Materials & Structures	2	7.5/15
FEEG2006	Engineering Management & Law	1,2	7.5/15
MATH2048	Maths for Engineering and the environment II	1	7.5/15
SESA2022	Aerodynamics	1	7.5/15
SESA2023	Propulsion	2	7.5/15
SESA2024	Astronautics	1	7.5/15
SESA2025	Mechanics of Flight	2	7.5/15

**Part III/IV Specialist Themes (MEng only)**

Aerodynamics	Materials & Structures
Air Vehicle Systems & Design	Semester Abroad
Computational Engineering & Design	Semester in Industry
Engineering Management	Spacecraft Engineering

## BEng Aeronautics & Astronautics

**Part III Modules at level 6 totalling 60 ECTS (120 CATS)**

*Compulsory modules (C), Optional modules (O)*

Module Code	Module Title	Credit Points (ECTS/CATS)	Choice Type	Semester
<b>FEEG3003</b>	<b>Individual Project (core)</b>	15/30	C	1,2
SESA3026	Aircraft Structural Design	7.5/15	C	2
SESA3040	Introduction to Aircraft Design	7.5/15	C	2
SESA3029	Aerothermodynamics	7.5/15	C	1
SESA3030	Aerospace Control Systems	7.5/15	C	1
	Option	7.5/15	O	1
	Option	7.5/15	O	2

See Appendix 1b for optional modules (O) available at level 6 and level 7.

## MEng Aeronautics & Astronautics

**Part III Modules at level 6 totalling 60 ECTS (120 CATS)**

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	Credit Points ECTS/CATS	Choice Type	Semester
<b>FEEG3003</b>	<b>Individual Project (core)</b>	15/30	C	1,2
MANG3048	Management Science for Engineers	7.5/15	T	1
SESA3026	Aircraft Structural Design	7.5/15	C	2
SESA3040	Introduction to Aircraft Design	7.5/15	C	2
SESA3029	Aerothermodynamics	7.5/15	C	1
SESA3030	Aerospace Control Systems	7.5/15	C	1
	Option	7.5/15	O	2

**Part IV Modules at levels 7 (min 60 ECTS/120 CATS) and 6 (max 15 ECTS/30 CATS) totalling 75 ECTS (150 CATS)**

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	Credit Points ECTS/CATS	Choice Type	Semester
<b>FEEG6013</b>	<b>Group Design Project (core)</b>	22.5/45	C	1,2
LAWS3130	Industrial Law	7.5/15	T	1
	Option	7.5/15	O	1/2
	Option	7.5/15	O	1/2
	Option	7.5/15	O	1/2
	Option	7.5/15	O	1/2
	Option	7.5/15	O	1/2
	Option	7.5/15	O	1/2

Options (O) may be theme-specific modules from other themes (subject to prerequisites) or interdisciplinary modules (e.g. Human Factors in Engineering, Management, Modern Languages, etc.). At least 30 ECTS (60 CATS) of options must be from modules originating within the Faculty and no more than 7.5 ECTS (15 CATS) at level 6. See Appendix 1b for details.

## MEng Aeronautics & Astronautics/Aerodynamics

**Part III Modules at level 6 totalling 60 ECTS (120 CATS)**

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	Credit Points ECTS/CATS	Choice Type	Semester
<b>FEEG3003</b>	<b>Individual Project (core)</b>	15/30	C	1,2
SESA3026	Aircraft Structural Design	7.5/15	C	2
SESA3040	Introduction to Aircraft Design	7.5/15	C	2
SESA3029	Aerothermodynamics	7.5/15	C	1
SESA3030	Aerospace Control Systems	7.5/15	C	1
SESA3033	Wing Aerodynamics	7.5/15	T	2
	Option	7.5/15	O	1

**Part IV Modules at levels 7 (min 60 ECTS/120 CATS) and 6 (max 15 ECTS/30 CATS) totalling 75 ECTS (150 CATS)**

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	Credit Points ECTS/CATS	Choice Type	Semester
<b>FEEG6013</b>	<b>Group Design Project (core)</b>	22.5/45	C	1,2
	Theme-specific option	7.5/15	T	1/2
	Theme-specific option	7.5/15	T	1/2
	Theme-specific option	7.5/15	T	1/2
	Theme-specific option	7.5/15	T	1/2
	Option	7.5/15	O	1/2
	Option	7.5/15	O	1/2
	Option	7.5/15	O	1/2

Theme specific options (T) are as follows:

FEEG6004-Aeroacoustics (Sem 2); FEEG6005-Applications of CFD (Sem 1); SESA6066-Biological Flow (Sem 2); SESA6070-Experimental Methods for Aerodynamics (Sem 1); SESA6067-Flow Control (Sem 1); SESA6074-Hypersonic & High Temperature Gas Dynamics (Sem 2); SESA6061-Turbulence: Physics & Modelling (Sem 1); SESA6072-Race Car Aerodynamics (Sem 2).

Options (O) may be theme-specific modules from other themes (subject to prerequisites) or interdisciplinary modules (e.g. Human Factors in Engineering, Industrial Law, Management, Modern Languages, etc.) and no more than 15 ECTS (30 CATS) at level 6. See Appendix 1b for details.

## MEng Aeronautics & Astronautics/ Air Vehicle Systems & Design

### Part III Modules at level 6 totalling 60 ECTS (120 CATS)

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	Credit Points ECTS/CATS	Choice Type	Semester
<b>FEEG3003</b>	<b>Individual Project (core)</b>	15/30	C	1,2
SESA3026	Aircraft Structural Design	7.5/15	C	2
SESA3040	Introduction to Aircraft Design	7.5/15	C	2
SESA3029	Aerothermodynamics	7.5/15	C	1
SESA3030	Aerospace Control Systems	7.5/15	C	1
SESA3033	Wing Aerodynamics	7.5/15	T	2
	Option	7.5/15	O	1

### Part IV Modules at levels 7 (min 60 ECTS/120 CATS) and 6 (max 15 ECTS/30 CATS) totalling 75 ECTS (150 CATS)

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	Credit Points ECTS/CATS	Choice Type	Semester
<b>FEEG6013</b>	<b>Group Design Project (core)</b>	22.5/45	C	1,2
	Theme-specific option	7.5/15	T	1/2
	Theme-specific option	7.5/15	T	1/2
	Theme-specific option	7.5/15	T	1/2
	Theme-specific option	7.5/15	T	1/2
	Option	7.5/15	O	1/2
	Option	7.5/15	O	1/2
	Option	7.5/15	O	1/2

Theme-specific options (T) are as follows:

SESA6075-Aircraft Propulsion (Sem 1); SESA6064-Aircraft Structures (Sem 2); SESA6069-Avionics (Sem 2); FEEG6009-Design Search & Optimisation (Sem 2); SESA6073-Powered Lift (Sem 2); FEEG6006-Systems Reliability (Sem 1).

Options (O) may be theme-specific modules from other themes (subject to prerequisites) or interdisciplinary modules (e.g. Human Factors in Engineering, Industrial Law, Management, Modern Languages, etc.) and no more than 15 ECTS (30 CATS) at level 6. See Appendix 1b for details.

## MEng Aeronautics & Astronautics/Computational Engineering & Design

### Part III Modules at level 6 totalling 60 ECTS (120 CATS)

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	Credit Points ECTS/CATS	Choice Type	Semester
FEEG3001	FEA in Solid Mechanics	7.5/15	T	1
<b>FEEG3003</b>	<b>Individual Project (core)</b>	15/30	C	1,2
SESA3026	Aircraft Structural Design	7.5/15	C	2
SESA3040	Introduction to Aircraft Design	15/30	C	2
SESA3029	Aerothermodynamics	7.5/15	C	1
SESA3030	Aerospace Control Systems	7.5/15	C	1
	Option	7.5/15	O	2

**Part IV Modules at levels 7 (min 60 ECTS/120 CATS) and 6 (max 15 ECTS/30 CATS) totalling 75 ECTS (150 CATS)**

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	Credit Points ECTS/CATS	Choice Type	Semester
<b>FEEG6013</b>	<b>Group Design Project (core)</b>	22.5/45	C	1,2
	Theme-specific option	7.5/15	T	1/2
	Theme-specific option	7.5/15	T	1/2
	Theme-specific option	7.5/15	T	1/2
	Theme-specific option	7.5/15	T	1/2
	Option	7.5/15	O	1/2
	Option	7.5/15	O	1/2
	Option	7.5/15	O	1/2

Theme specific options (T) are as follows:

FEEG6002-Advanced Computational Methods I (Sem 1); FEEG6010-Advanced FEA (Sem 2); FEEG6005-Applications of CFD (Sem 1); FEEG6009-Design Search & Optimisation (Sem 2); FEEG6006-Systems Reliability (Sem 1); MATH6141-Numerical Methods (Sem 1); SESM6038 Computational Methods in Biomedical Engineering Design (Sem 2).

Options (O) may be theme-specific modules from other themes (subject to prerequisites) or interdisciplinary modules (e.g. Human Factors in Engineering, Industrial Law, Management, Modern Languages, etc.) and no more than 15 ECTS (30 CATS) at level 6. See Appendix 1b for details.

## **MEng Aeronautics & Astronautics/Engineering Management**

**Part III Modules at level 6 totalling 60 ECTS (120 CATS)**

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	Credit Points ECTS/CATS	Choice Type	Semester
<b>FEEG3003</b>	<b>Individual Project (core)</b>	15/30	C	1,2
MANG3048	Management Science for Engineers	7.5/15	T	1
SESA3026	Aircraft Structural Design	7.5/15	C	2
SESA3040	Introduction to Aircraft Design	7.5/15	C	2
SESA3029	Aerothermodynamics	7.5/15	C	1
SESA3030	Aerospace Control Systems	7.5/15	C	1
	Option	7.5/15	O	2

**Part IV Modules at levels 7 (min 60 ECTS/120 CATS) and 6 (max 15 ECTS/30 CATS) totalling 75 ECTS (150 CATS)**

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	Credit Points ECTS/CATS	Choice Type	Semester
<b>FEEG6013</b>	<b>Group Design Project (core)</b>	22.5/45	C	1,2
	Theme-specific option	7.5/15	T	1/2
	Theme-specific option	7.5/15	T	1/2
	Theme-specific option	7.5/15	T	1/2
	Theme-specific option	7.5/15	T	1/2
	Option	7.5/15	O	1/2
	Option	7.5/15	O	1/2
	Option	7.5/15	O	1/2

Theme specific options (T) are as follows:

LAW53130 Industrial Law (Sem 1); MANG3049-Accounting & Finance for Engineers (Sem 2); MANG6028 Corporate Finance (Sem 2); MANG6045 Consultancy Skills (3.75 ECTS/7.5 CATS), Sem 1); MANG6130 Strategic Management (3.75 ECTS, Sem 1); MANG6247 Information Systems Management & Strategy (Sem 1); MANG6292 Operations Management (3.75 ECTS/7.5 CATS), Sem 2); MANG6293 Project Management (3.75 ECTS/7.5CATS, Sem 2); MANG6143 Project Risk Management (Sem 2); MANG6318 Advanced Management (Sem 2).

Options (O) may be theme-specific modules from other themes (subject to prerequisites) and limited to modules originating within the Faculty. See Appendix 1b for details.

## MEng Aeronautics & Astronautics/Materials & Structures

### Part III Modules at level 6 totalling 60 ECTS (120 CATS)

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	Credit Points ECTS/CATS	Choice Type	Semester
<b>FEEG3003</b>	<b>Individual Project (core)</b>	15/30	C	1,2
SESA3026	Aircraft Structural Design	7.5/15	C	2
SESA3040	Introduction to Aircraft Design	7.5/15	C	2
SESA3029	Aerothermodynamics	7.5/15	C	1
SESA3030	Aerospace Control Systems	7.5/15	C	1
SESG3024	Manufacturing & Materials	7.5/15	T	1
	Option	7.5/15	O	2

### Part IV Modules at levels 7 (min 60 ECTS/120 CATS) and 6 (max 15 ECTS/30 CATS) totalling 75 ECTS (150 CATS)

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	Credit Points ECTS/CATS	Choice Type	Semester
<b>FEEG6013</b>	<b>Group Design Project (core)</b>	22.5/45	C	1,2
FEEG3001	Finite Element Analysis in Solid Mechanics	7.5/15	T	1
	Theme-specific option	7.5/15	T	1/2
	Theme-specific option	7.5/15	T	1/2
	Theme-specific option	7.5/15	T	1/2
	Option	7.5/15	O	1/2
	Option	7.5/15	O	1/2
	Option	7.5/15	O	1/2

Theme-specific options (T) are as follows:

FEEG6010 Advanced Finite Element Analysis (Sem 2); SESA6064 Aircraft Structures (Sem 2); SESG6039 Composites Engineering Design & Mechanics (Sem 1); SESG6040 Failure of Materials and Components (Sem 2); SESG6042 Microstructural Engineering for Transport Applications (Sem 1); SESG6044 Microstructural and Surface Characterisation (Sem 1 & 2); SESA6059 Spacecraft Structural Design (Sem 1).

Options (O) may be theme-specific modules from other themes (subject to prerequisites) or interdisciplinary modules (e.g. Human Factors in Engineering, Industrial Law, Management, Modern Languages, etc.) and no more than 7.5 ECTS (15 CATS) credits at level 6. See Appendix 1b for details.

## MEng Aeronautics & Astronautics/Semester Abroad

An opportunity to spend a semester abroad studying at one of our partner institutions in Part III is offered. Students will be taught in English and are to take modules totalling 30 ECTS (60 CATS). The assessment of these modules will be carried out by the host institution and an ECTS-weighted average mark for the semester abroad will be inserted into the appropriate (semester 1 or semester 2) Semester Abroad module (weighted at 30 ECTS/60 ECTS). The University-approved marks conversion formula will be employed to do this.

### Part III Semester 1 spent abroad:

#### Part III Modules at level 6 totalling 60 ECTS/120 CATS

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	Credit Points ECTS/CATS	Choice Type	Semester
<b>FEEG3003</b>	<b>Individual Project (core)</b>	15/30	C	2
FEEG3005	Semester Abroad module Option 1 (Semester 1)	30/60	C	1
	<b>In liaison with the lead for Semester Abroad all students must take, either here or abroad the following modules (or their equivalents at the other institution).</b>			
SESA3026	Aircraft Structural Design	7.5/15		2
SESA3029	Aerothermodynamics	7.5/15		1
SESA3030	Aerospace Control Systems	7.5/15		1
SESA3040	Introduction to Aircraft Design	7.5/15		2
	<b>Instead of SESA3040 students may take, either here or abroad the following modules (or their equivalents at the other institution):</b>			
SESA3037	Concurrent Spacecraft Design	7.5/15		2
SESA3041	Spacecraft Systems Engineering and Design	7.5/15		1
	<b>For each module equivalent to SESA3026 and SESA3037 or SESA3040 taken abroad or deferred to Part IV, a theme-specific optional module may be chosen.</b>	7.5/15	T	2

Theme-specific options (T) are as follows:

FEEG3001-Finite Element Analysis in Solid Mechanics (Sem 1); FEEG3004-Human Factors in Engineering (Sem 1); FEEG6005-Applications of CFD (Sem 1); FEEG3011-Introduction to Turbulence and Mixing (Sem 2); MANG3048-Management Science for Engineers (Sem 1); MANG3049-Accounting and Finance for Engineers (Sem 2); SESA3038-Space Environment (Sem 2); SESA3039-Advanced Astronautics (Sem 1); SESA3033- Wing Aerodynamics (Sem 2); SESA6070

-Experimental Methods for Aerodynamics (Sem 1); SESG3024-Manufacturing and Materials (Sem 1); SESM-3028-Biomaterials (Sem 2); SESM3029-Engineering Design with Management (Sem 2); SESM3030-Control and Instrumentation (Sem 1); SESM3031-Automobile Systems (Sem 1); SESM3032-Heat Transfer and Applications (Sem 2); SESM3033-Orthopaedic Biomechanics (Sem 1)

#### Part IV Modules at levels 7 (min 60) and 6 (max 15) totalling 75 ECTS

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	Credit Points ECTS/CATS	Choice Type	Semester	Level
<b>FEEG6013</b>	<b>Group Design Project (core)</b>	22.5/45	C	1,2	7
	<b>If the module requirements shown for Part III above were <u>not</u> met in Part III up to 15 ECTS credits to be taken in Part IV from the following level 6 modules in liaison with the lead for Semester Abroad:</b>				
SESA3026	Aircraft Structural Design	7.5/15	T	2	6
SESA3029	Aerothermodynamics	7.5/15	T	1	6

SESA3030	Aerospace Control Systems	7.5/15	T	1	6
SESA3037	Concurrent Spacecraft Design	7.5/15	T	2	6
SESA3040	Introduction to Aircraft Design	7.5/15	T	2	6
SESA3041	Spacecraft Systems Engineering and Design	7.5/15	T	1	6
	<b>If all module requirements for Part III can be met in Part IV by taking less than 15 ECTS credit from above list, theme-specific optional modules may be chosen instead.</b>				
	<b>And at least 22.5 ECTS from Level 7 options</b>				
	Option	7.5/15	O	1/2	7
	Option	7.5/15	O	1/2	7
	Option	7.5/15	O	1/2	7

Part IV Theme-specific options (T) and options (O) a maximum of 15 ECTS at level 6 including those shown above, remaining must be level 7 and may be theme-specific modules from other themes (subject to prerequisites) or interdisciplinary modules. At least 15 ECTS of theme-specific options (T) and options must be from modules originating within the Faculty. See Appendix 1b for details.

### Part III Semester 2 spent abroad:

#### Part III Modules at level 6 totalling 60 ECTS/120 CATS

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	Credit Points ECTS/CATS	Choice Type	Semester
<b>FEEG3003</b>	<b>Individual Project (core)</b>	15/30	C	2
FEEG3006	Semester Abroad module Option 1 (Semester 2)	30/60	C	1
	<b>In liaison with the lead for Semester Abroad all students must take, either here or abroad the following modules (or their equivalents at the other institution).</b>			
SESA3026	Aircraft Structural Design	7.5/15		2
SESA3029	Aerothermodynamics	7.5/15		1
SESA3030	Aerospace Control Systems	7.5/15		1
SESA3040	Introduction to Aircraft Design	7.5/15		2
	<b>Instead of SESA3040 students may take, either here or abroad the following modules (or their equivalents at the other institution):</b>			
SESA3037	Concurrent Spacecraft Design	7.5/15		2
SESA3041	Spacecraft Systems Engineering and Design	7.5/15		1
	<b>For each module equivalent to SESA3029, SESA3030 and SESA3041 taken abroad or deferred to Part IV, a theme-specific optional may be chosen.</b>	7.5/15	T	1

Theme-specific options (T) are as follows:

FEEG3001-Finite Element Analysis in Solid Mechanics (Sem 1); FEEG3004-Human Factors in Engineering (Sem 1); FEEG6005-Applications of CFD (Sem 1); FEEG3011-Introduction to Turbulence and Mixing (Sem 2); MANG3048-Management Science for Engineers (Sem 1); MANG3049-Accounting and Finance for Engineers (Sem 2); SESA3038-Space Environment (Sem 2); SESA3039-Advanced Astronautics (Sem 1); SESA3033- Wing Aerodynamics (Sem 2); SESA6070-Experimental Methods for Aerodynamics (Sem 1); SESG3024-Manufacturing and Materials (Sem 1); SESM-3028-Biomaterials (Sem 2); SESM3029-Engineering Design with Management (Sem 2); SESM3030-Control and Instrumentation (Sem 1); SESM3031-Automobile Systems (Sem 1); SESM3032- Heat Transfer and Applications (Sem 2); SESM3033-Orthopaedic Biomechanics (Sem 1)

## MEng Aeronautics & Astronautics/Semester in Industry

### Part III Semester 1 spent on industrial placement:

For this theme an industrial placement will be taken from July (at the end of Part II) to the end of December (near the end of semester 1 in Part III). The placement must involve an individual project, the scope of which must be agreed by the Employability Coordinator. If, by the end of the summer vacation, insufficient progress has been made on the project, or the project itself is deemed by the Employability Coordinator to be unsatisfactory, the student must transfer to another theme and return to University to undertake Part III or suspend his/her studies for a year and continue the placement as an extra-curricular activity, returning to take Part III in the following academic year.

### Part III Modules at level 6 totalling 60 ECTS (120 CATS)

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	ECTS/ CATS Credit Points	Choice Type	Semester
<b>SESA3034</b>	<b>Semester in Industry Project (Aero) (core)</b>	15/30	T	1
SESA3029	Aerothermodynamics	7.5/15	C	1
SESA3030	Aerospace Control Systems	7.5/15	C	1
SESA3026	Aircraft Structural Design	7.5/15	C	2
SESA3033	Wing Aerodynamics	7.5/15	T	2
SESM3029	Engineering Design (with Management)	7.5/15	T	2
MANG3049	Accounting & Finance for Engineers	7.5/15	T	2

Note: Aerothermodynamics and Aerospace Control Systems will be undertaken as distance-learning modules. Assessment of these modules will be via coursework and examination, the latter taken in the examination period at the end of semester 1.

### Part IV Modules at levels 7 (min 60 ECTS/120 CATS) and 6 (max 15 ECTS/30 CATS) totalling 75 ECTS (150 CATS)

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	ECTS/ CATS Credit Points	Choice Type	Semester	Level
<b>FEEG6013</b>	<b>Group Design Project (core)</b>	22.5/45	C	1,2	7
SESA3040	Introduction to Aircraft Design	7.5/15	T	2	6
	Option	7.5/15	O	1/2	7
	Option	7.5/15	O	1/2	7
	Option	7.5/15	O	1/2	7
	Option	7.5/15	O	1/2	7
	Option	7.5/15	O	1/2	7
	Option	7.5/15	O	1/2	7

Options (O) a maximum of 15 ECTS at level 6 including the above, remainder should be level 7 only and may be theme-specific modules from other themes (subject to prerequisites) or interdisciplinary modules (e.g. Human Factors in Engineering, Industrial Law, Management, Modern Languages, etc.). At least 15 ECTS (30 CATS) of options must be from modules originating within the Faculty. See Appendix 1b for details.

## MEng Aeronautics & Astronautics/Spacecraft Engineering

### Part III Modules at level 6 totalling 60 ECTS (120 CATS)

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	ECTS/CATS Credit Points	Choice Type	Semester
<b>FEEG3003</b>	<b>Individual Project (core)</b>	15/30	C	1,2
SESA3026	Aircraft Structural Design	7.5/15	C	2
SESA3029	Aerothermodynamics	7.5/15	C	1
SESA3030	Aerospace Control Systems	7.5/15	C	1
SESA3039	Advanced Astronautics	7.5/15	C	1
SESA3041	Spacecraft Systems Engineering and Design	7.5/15	C	1
	Theme-specific option	7.5/15	T	2

Theme-specific options (T) are as follows:

SESA3037 Concurrent Spacecraft Design (Sem 2); SESA3038 Space Environment (Sem 2)

### Part IV Modules at levels 7 (min 60 ECTS/120 CATS) and 6 (max 15 ECTS/30 CATS) totalling 75 ECTS (150 CATS)

*Compulsory modules (C), Theme-specific modules (T), Optional modules (O)*

Module Code	Module Title	ECTS/CATS Credit Points	Choice Type	Semester	Level
<b>FEEG6013</b>	<b>Group Design Project (core)</b>	22.5/45	C	1,2	7
SESA6081	Spacecraft Instrumentation	7.5/15	T	2	7
SESA6059	Spacecraft Structural Design	7.5/15	T	1	7
SESA6076	Spacecraft Orbital Mechanics and Control	7.5/15	T	2	7
SESA6071	Spacecraft Propulsion	7.5/15	T	1	7
	Option	7.5/15	O	1/2	7
	Option	7.5/15	O	1/2	6 or 7
	Option	7.5/15	O	1/2	6 or 7

Options (O) may be theme-specific modules from other themes (subject to prerequisites) or interdisciplinary modules (e.g. Human Factors in Engineering, Industrial Law, Management, Modern Languages, etc.) and no more than 15 ECTS (30 CATS) at level 6. See Appendix 1b for details.

## Appendix 1b:

### List of level 6 and level 7 modules available:

Modules are categorised as Compulsory ©, Theme Specific (T) or Optional (O). Note that theme-specific modules may be taken as options by students following other themes, subject to satisfying any pre-requisites.

#### Level 6 Modules

Module Code	Module Title	ECTS/ CATS Credit Points	Choice Type	Semester
FEEG3001	Finite Element Analysis in Solid Mechanics	7.5/15	T	1
FEEG3003	Individual Project	15/30	C	1,2
FEEG3004	Human Factors in Engineering	7.5/15	O	1
FEEG3005	Semester Abroad module Option 1 (Semester 1)	30/60	T	1
FEEG3006	Semester Abroad module Option 1 (Semester 2)	30/60	T	2
FEEG3007	Semester Abroad module Option 2 (Semester 1)	15/15	T	1
FEEG3008	Semester Abroad module Option 2 (Semester 2)	22.5/45	T	2
FEEG3011	Introduction to Turbulence and Mixing	7.5/15	O	2
SESA3026	Aircraft Structural Design	7.5/15	C	2
SESA3029	Aerothermodynamics	7.5/15	C	1
SESA3030	Aerospace Control Systems	7.5/15	C	1
SESA3033	Wing Aerodynamics	7.5/15	T	2
SESA3034	Semester in Industry Project (Aero)	15/30	T	1
SESA3037	Concurrent Spacecraft Design	7.5/15	O	2
SESA3038	Space Environment	7.5/15	O	2
SESG3019	UG Ambassador Scheme	7.5/15	O	1
SESG3024	Manufacturing & Materials	7.5/15	T	1
SESM3028	Biomaterials	7.5/15	T	2
SESM3029	Engineering Design with Management	7.5/15	T	2
SESM3030	Control & Instrumentation	7.5/15	O	1
SESM3031	Automobile Systems	7.5/15	O	1
SESM3032	Heat Transfer and Applications	7.5/15	O	2
SESM3033	Orthopaedic Biomechanics	7.5/15	O	1

#### Level 6 External to Faculty Modules

Module Code	Module Title	ECTS Credit Points	Choice Type	Semester
LAWS3130	Industrial Law	7.5/15	T	1
MANG3048	Management Science for Engineers	7.5/15	T	1
MANG3049	Accounting & Finance for Engineers	7.5/15	T	2
MATH3081	Operational Research	7.5/15	O	1
MATH3082	Optimisation	7.5/15	O	2
MATH3083	Advanced Partial Differential Equations	7.5/15	O	1

#### Language Studies

The Centre for Language Study offers the following language modules; these are offered at seven stages of proficiency, summarized below:

Stage 1 =	complete beginner	Stage 5 =	A level plus one year of study
Stage 2 =	post GCSE	Stage 6 =	A level plus two years of study
Stage 3 =	post AS/A level	Stage 7 =	virtually native speaker
Stage 4 =	good A Level standard		

Module Code	Module Title	Choice Type	Semester
LANGXXXX	Language	O	1,2

Note: Students are not permitted to take language modules in their native language, or one in which they are already fluent.

## Level 7 Modules

Module Code	Module Title	ECTS/ CATS Credit Points	Choice Type	Sem
FEEG6002	Advanced Computational Methods I	7.5/15	T	1
FEEG6005	Applications of CFD	7.5/15	T	1
FEEG6006	Systems Reliability	7.5/15	T	1
FEEG6007	Fuel Cells, Photovoltaic Systems I	7.5/15	O	1
FEEG6008	Fuel Cells, Photovoltaic Systems II	7.5/15	O	2
FEEG6009	Design Search & Optimisation	7.5/15	T	2
FEEG6010	Advanced Finite Element Analysis	7.5/15	T	2
FEEG6013	Group Design Project	22.5/45	C	1,2
FEEG6033	Semester Abroad module Option 2 (Semester 1)	15/30	T	1
FEEG6034	Semester Abroad module Option 2 (Semester 2)	7.5/15	T	2
SESG6042	Microstructural Engineering for Transport Applications	7.5/15	T	1
FEEG6004	Aeroacoustics	7.5/15	T	2
SESA6059	Spacecraft Structural Design	7.5/15	T	1
SESA6061	Turbulence: Physics & Modelling	7.5/15	T	1
SESA6064	Aircraft Structures	7.5/15	T	2
SESA6069	Avionics	7.5/15	T	2
SESA6066	Biological Flow	7.5/15	T	2
SESA6067	Flow Control	7.5/15	T	1
SESA6070	Experimental Techniques for Aerodynamics	7.5/15	T	1
SESA6071	Spacecraft Propulsion	7.5/15	T	1
SESA6072	Race Car Aerodynamics	7.5/15	T	2
SESA6073	Powered Lift	7.5/15	T	2
SESA6074	Hypersonic & High Temperature Gas Dynamics	7.5/15	T	2
SESA6075	Aircraft Propulsion	7.5/15	T	1
SESA6076	Spacecraft Orbital Mechanics and Control	7.5/15	O	2
SESA6077	Aeroelasticity	7.5/15	O	1
SESA6081	Spacecraft Instrumentation	7.5/15	C	2
SESG6036	Advanced Control Design	7.5/15	O	2
SESG6039	Composites Engineering Design & Mechanics	7.5/15	T	1
SESG6040	Failure of Materials & Components	7.5/15	T	2
SESG6044	Microstructural & Surface Characterisation	7.5/15	T	1,2
SESM6037	Automotive Propulsion	7.5/15	O	2
SESM6032	Sustainable energy systems, resources and usage	7.5/15	O	1
SESM6038	Computational methods in biomedical engineering design	7.5/15	O	2
SESS6067	Renewable energy from environmental flows	7.5/15	O	2

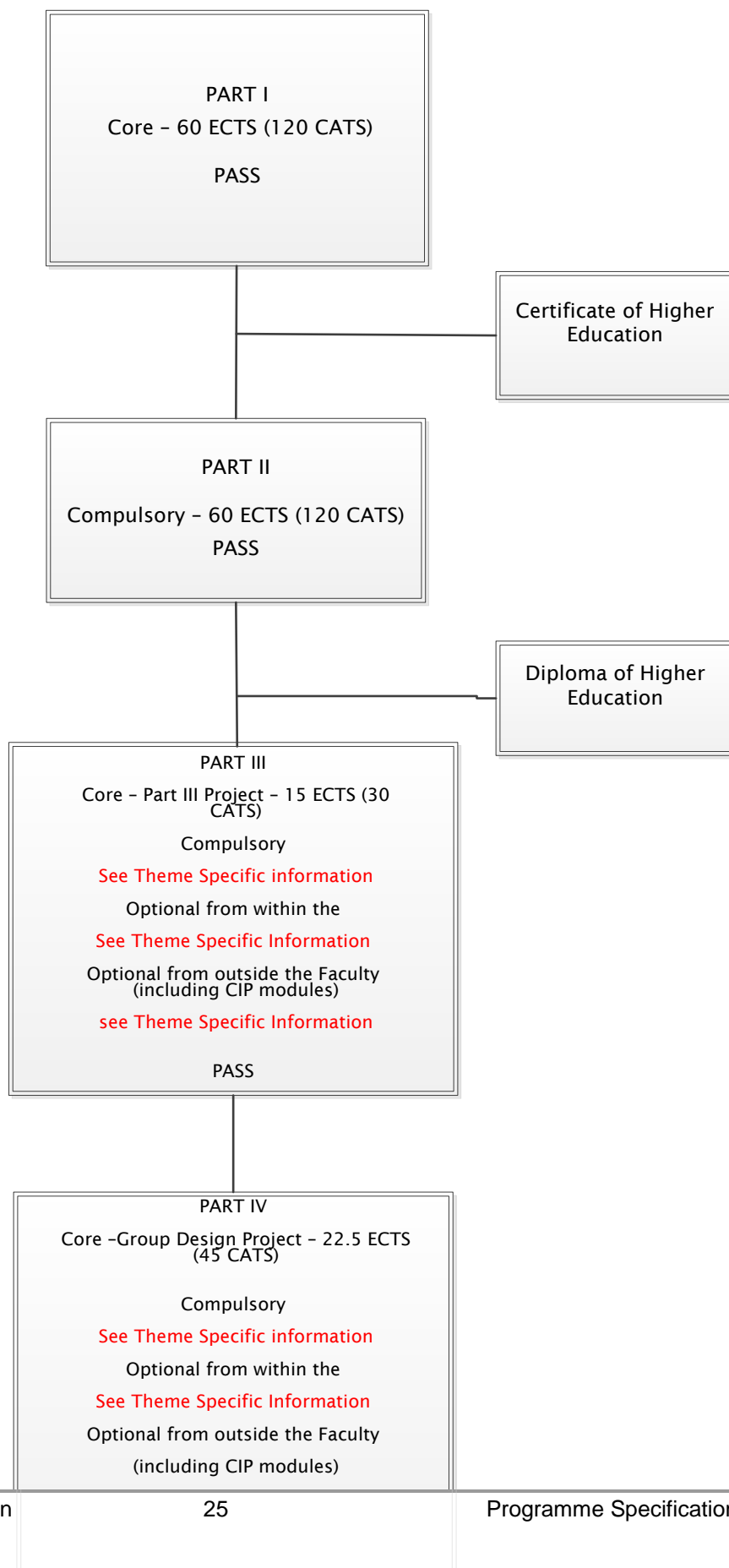
## Level 7 External to Faculty Modules

Module Code	Module Title	ECTS/ CATS Credit Points	Choice Type	Sem
MANG6028	Corporate Finance	7.5/15	T	1
MANG6045	Consultancy Skills	3.75/7.5	T	1
MANG6130	Strategic Management	3.75/7.5	T	1

MANG6143	Project Risk Management	7.5/15	T	2
MANG6247	Information Systems Management & Strategy	7.5/15	T	1
MANG6292	Operations Management	3.75/7.5	T	2
MANG6293	Project Management	3.75/7.5	T	2
MANG6318	Advanced Management	7.5/15	T	2
MATH6141	Numerical Methods	7.5/15	T	1

# [name of programme ] programme structure

[suggested programme diagram]



## **Revision History**

October 2004 (N.D. Sandham)

October 2005 (N.D. Sandham)

September 2006 (N.D. Sandham)

September 2007 (A Bhaskar)

April 2008 (A Bhaskar)

February 2012 (A Barney)

July 2013 (G.T. Roberts)\_(CQA 23/11/13)

June 2014 (G.T.Roberts)

April 2015\_CQA

CQA\_addition of disclaimer\_August 2015

January 2016 addition of Semester Abroad options

August 2016 CQA textual edits and addition of Industrial Placement Year

July/August 2017 – module changes, textual edits and addition of part 1 summative assessment information

Updated to reflect 201819 version and removal of Admissions Criteria – CQA March 2018

Updated Faculty name to Faculty of Engineering and Physical Sciences July 2018

## Appendix 2

### Part 1 Modules Assessment

Module	Title	CATS	Teamwork	Report	Essay	Exam	Other	LO info	Repeat internal only
<b>FEEG1001</b>	Design and Computing	30	√	√			100%		√
<b>FEEG1002</b>	Mech, Structures & Materials	30				100%			
<b>FEEG1003</b>	ThermoFluids	15				100%			
<b>FEEG1004</b>	Elec and Electronic Syst	15				100%			
<b>SESA1015</b>	Aircraft Operations and Mechanics of Flight	15				√			
<b>MATH1054</b>	Math for E and E	15				100%			
				√				G1, G2, G3b	√
					√			G1, G2, G3b	

## Appendix 3

The table below shows the summative assessment structure:

<b>Schedule A</b>			
	<b>Approximate Timing</b>	<b>Pass Mark</b>	<b>Repeat Assessment mode</b>
Multiple Choice Exam: Engineering Fundamentals	Semester 2 exam period. 2 hours	60%	Internal & External
Long Answer Exam: Engineering Problem Solving	Semester 2 exam period. 2 hours	40%	Internal & External
Discipline Specific Assessment	Semester 2 exam period	40%	Internal & External
Mathematics Exam	Semester 2 exam period. 2 hours	40%	Internal & External
<b>Schedule B</b>			
	<b>Timing</b>	<b>Pass Mark</b>	<b>Repeat Assessment mode</b>
Assessment in Design	End of Semester 2	40%	Internal only
Laboratory Report	End of Semester 2	40%	Internal only
Technical Essay	End of Semester 2	40%	Internal & External

## Appendix 4:

### 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](http://www.calendar.soton.ac.uk).

Main Item	Sub-section	PROGRAMME SPECIFIC COSTS
Approved Calculators		<p>Students will require a scientific calculator. This will need to be purchased by the student.</p> <p>Candidates 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 approved models are Casio FX-570 and Casio FX-85GT Plus. These may be purchased from any source and no longer need to carry the University logo.</p>
Stationery		<p>You will be expected to provide your own day-to-day stationary items, e.g. pens, pencils, notebooks, etc). Any specialist stationery items will be specified under the Additional Costs tab of the relevant module profile.</p>

Main Item	Sub-section	PROGRAMME SPECIFIC COSTS
Textbooks		<p>It will be useful to purchase Callister, cost circa £60, but a large number are available in the library. (FEEG1002)</p> <p>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.</p> <p>Some modules suggest reading texts as <b>optional</b> 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.</p>
Equipment and Materials	Design equipment and materials:	<p>Standard construction/modelling materials will be provided where appropriate, unless otherwise specified in a module profile.</p> <p>For customisation of designs/models calling for material other than standard construction/ modelling materials, students will bear the costs of such alternatives.</p>
	Excavation equipment and materials:	
	Laboratory Equipment and Materials:	<p>Students are required to source and purchase their own batteries for the Odometry Exercise in week 6 and should be prepared to spend up to £50 per group of their own money. Receipts should be retained as expenditure may be subject to auditing. (FEEG2001)</p> <p>Students should be prepared to spend up to £100 per group of their own money in relation to the purchase of components for the Semester 2 Group Design Project. Receipts should be retained as expenditure may be subject to auditing (FEEG2001)</p>
IT	Computer Discs	
	Software Licenses	

Main Item	Sub-section	PROGRAMME SPECIFIC COSTS
	Hardware	
Clothing	Lab Coats	
	Protective Clothing: Hard hat; safety boots; hi-viz vest/jackets;	
Printing and Photocopying Costs		<p>Students are responsible for the printing costs of their poster for the Poster Presentation Day. This may range from approximately £5 - £20.</p> <p>Students are expected to cover the costs associated with the printing and binding of reports and the printing of drawings and graphic presentations. These are typically expected to be of the order of £100 per group, also depending on the quality of printing and binding chosen Note that funds from the project's budget cannot be used for this purpose.(FEEG6013 MEng only)</p> <p>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, which are detailed in the individual Module Profile and can be found in Appendix 2.</p>
Travel and subsistence	Accommodation and Travel	FEEG3009 Industrial Placement year. You will need to find your own accommodation near to your place of work
Optional Visits (e.g. museums, galleries)		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.