UNIVERSITY OF Southampton

Programme Specification

Title of programme:

BEng (Hons) Ship Science
BEng (Hons) Ship Science with Industrial Placement Year
MEng (Hons) Ship Science
MEng (Hons) Ship Science with Industrial Placement Year
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	5 years (MEng with Industrial Placement Year), 4 years (MEng), 3 years (BEng)
Accreditation details	• The Royal Institution of Naval Architects • The Institute of Marine Engineering, Science and Technology • Institution 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) Bachelor of Engineering with Industrial Placement Year (Hons) Master of Engineering Master of Engineering with Industrial Placement Year (Hons)
Name of award	Ship Science Ship Science/Naval Architecture Ship Science/Yacht and High Performance Craft Ship Science/International Naval Architecture Ship Science/Marine Engineering and Autonomy Ship Science/Ocean Energy and Offshore Engineering Ship Science/Advance Computational Engineering
Interim Exit awards	All of the MEng degrees above may also be taken with an Industrial Placement Year (IPY) and will then have 'with Industrial Placement Year' appended to the degree title Certificate of Higher Education Diploma of Higher Education Bachelor of Science (Ordinary)
FHEQ level of final award	Level 7 (MEng), Level 6 (BEng)
UCAS code	J640, BEng Ship Science J60P, BEng Ship Science with IPY J641, MEng Ship Science H52H, MEng Ship Science with IPY
QAA Subject Benchmark or other external reference	Engineering, Engineering Council, UK-SPEC
Director of Programmes	Dr S W Boyd
Programme Lead	Mrs G A Keane

Date specification was written	February 2019 (Dr S W Boyd)
Date Programme was validated	April 2019
Date specification last updated	February 2019

Programme Overview

Brief outline of the programme
The aim of the range of Ship Science programmes is to provide you with the necessary academic background for a career that covers the design, construction, maintenance and operation of marine vessels and structures. The flexible structure of the programmes allows you to choose a specialist pathway yet at the same time providing a common framework that ensures that all aspects of core Naval Architecture and Marine Engineering are covered. There is an increasing emphasis on discipline specific subjects as progress is made through the programme. Wherever possible in Parts I and II attention will be drawn to the application of the common framework as it relates for instance to ships, yachts, powercraft, deep ocean structures, naval vessels etc.

The first two years provide the fundamentals in basic engineering and Ship Science. These two years are common for the BEng and MEng programmes. As you move through the programme the application of knowledge and skills developed becomes a feature. Design, both generally and in a Maritime context permeates through the programme and ensures that you can apply your theoretical understanding to real design problems. In addition, computational methods are used throughout to provide the tools necessary for the analysis of engineering problems. Specialist knowledge in specific pathways is available through optional module choices in the MEng final year. The programmes are designed in accordance with the Engineering Council requirements as a pathway, partially with the BEng and fully with the MEng, to become a professional engineer.

Special Features of the programme
A full week long induction activity is held at the beginning of the first year. This is a team activity designed to explore the principles of Naval Architecture and to act as a cohort building exercise. It culminates in the award of the Royal Institution of Naval Architects (RINA) award.

At the end of the second year, students can apply to spend a semester abroad. We have identified a number of partner institutions where the final years are taught in English. In most cases these study periods are cost-neutral from the students' point of view, as they form part of exchange agreements. The agreements are based on a close analysis of the syllabi and educational standards of the partner institutions to ensure compatibility of the two courses. Each student receives personalised advice from a member of academic staff on selecting the appropriate set of modules at the foreign institution and their progress is monitored throughout the semester.

Students also have the opportunity to go on an Industrial Placement Year between either the second and third year, or the third and fourth year. You will need to organise your own placement, although some assistance can be provided by the University. Students on the Industrial Placement Year will receive personalised advice on the placement from a member of academic staff and their progress monitored throughout the placement.

Learning and teaching
The first year provide the fundamentals in basic engineering with second year adding depth to this knowledge moving more towards discipline specific application. In third year specialist discipline specific knowledge is added adding breadth across multiple subject areas and an increasing element of independent learning. The final MEng year emphasis the commercial application of learning in highly specialised subjects and to demonstrate the ability to work as part of a team on a large industrially focused project. Acquisition of core knowledge and understanding is through lectures, seminars, tutorials, laboratory 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
Testing of the knowledge base and development of skills 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.

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

The aims of the programme are to:
(Blue only = both BEng & MEng; Green only = MEng only, Orange = Industrial Placement Year for BEng and MEng)

- Provide you, in Parts I and II, with a sound understanding of the fundamental principles, methods, analysis and synthesis in engineering design and applications appropriate to the discipline of Ship Science.
- Provide you, in Part III with opportunities to study specialist modules integrated within the structured learning environment, reflecting the internationally renowned research expertise within the Faculty,
- Provide you, in Part IV 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 so that you are able to become a professional engineer meeting many of the requirements of the Engineering Council (i.e. UK-SPEC), and to have a broad range of knowledge and skills (including I.T. and communication skills) capable of meeting the present and future demands of the mechanical engineering profession.
- Train you so that you are able to become a professional engineer meeting the requirements of the Engineering Council (i.e. UK-SPEC), and to have a broad range of knowledge and skills (including I.T. and communication skills) capable of meeting the present and future demands of the mechanical engineering profession.
- Offer you a degree structure that is relevant to industry, and responsive to changes in technology and the needs of the community.
- 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.
- Offer 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

The programme provides opportunities for you to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas. 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) which 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 combined BEng and MEng column shows the learning outcomes with a mixture of Full CEng (indicated with a (m)) and Partial BEng (indicated with a (b)) learning outcomes which are met at FHEQ Level 6. The MEng only column indicates all of the remaining Full CEng AHEP3 learning outcomes being met at FHEQ Level 7.

Some of the BEng programme learning outcomes are partially met at a higher level and these are indicated with *italics*.

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:		
	BEng and MEng		MEng only
SM1(m)	A comprehensive knowledge and understanding of the scientific principles and methodology necessary to underpin their education in their engineering discipline, and an understanding and know-how of the scientific principles of related disciplines, to enable appreciation of the scientific and engineering context, and to support their understanding of relevant historical, current and future developments and technologies	SM1(m)	
SM2(m)	Knowledge and understanding of mathematical and statistical methods necessary to underpin their education in their engineering discipline and to enable them to apply a range of mathematical and statistical methods, tools and notations proficiently and critically in the analysis and solution of engineering problems	SM2(m)	
SM4(m)	*Awareness of developing technologies related to own specialisation.*	SM4(m)	Awareness of developing technologies related to own specialisation.
SM5(m)	*A comprehensive knowledge and understanding of mathematical and computational models relevant to the engineering discipline, and an appreciation of their limitations*	SM5(m)	A comprehensive knowledge and understanding of mathematical and computational models relevant to the engineering discipline, and an appreciation of their limitations
SM6(m)	*Understanding of concepts from a range of areas, including some outside engineering, and the ability to evaluate them critically and to apply them effectively in engineering projects*	SM6(m)	Understanding of concepts from a range of areas, including some outside engineering, and the ability to evaluate them critically and to apply them effectively in engineering projects

	Engineering analysis Engineering analysis involves the application of engineering concepts and tools to the solution of engineering problems. On graduation you will have achieved:		
	BEng and MEng		MEng only

EA1(m)	Understanding of engineering principles and the ability to apply them to undertake critical analysis of key engineering processes		
EA4(m)	Understanding of, and the ability to apply, an integrated or systems approach to solving complex engineering problems		

	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:		
	BEng and MEng		MEng only
D1(m)	Understand and evaluate business, customer and user needs, including considerations such as the wider engineering context, public perception and aesthetics		

	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:		
	BEng and MEng		MEng only
EL1(m)	Understanding of the need for a high level of professional and ethical conduct in engineering, a knowledge of professional codes of conduct and how ethical dilemmas can arise		
EL2(m)	Knowledge and understanding of the commercial, economic and social context of engineering processes		
EL3(b)	Knowledge and understanding of management techniques, including project management, that may be used to achieve engineering objectives	EL3(m)	Knowledge and understanding of management techniques, including project and change management, that may be used to achieve engineering objectives, their limitations, and how they may be applied appropriately
EL4(m)	Understanding of the requirement for engineering activities to promote sustainable development and ability to apply quantitative techniques where appropriate		
EL5(m)	Awareness of relevant legal requirements governing engineering activities, including personnel, health & safety, contracts, intellectual property rights, product safety and liability issues, and an awareness that these may differ internationally		
EL6(b)	Knowledge and understanding of risk issues, including health & safety, environmental and commercial risk, and of risk assessment and risk management techniques	EL6(m)	Knowledge and understanding of risk issues, including health and safety, environmental and commercial risk, risk assessment and risk management techniques and an ability to evaluate commercial risk
EL7 (m)	*Understanding of the key drivers for business success, including innovation, calculated commercial risks and customer satisfaction*	EL7(m)	Understanding of the key drivers for business success, including innovation, calculated commercial risks and customer satisfaction

	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:		
	BEng and MEng		MEng only
P1(m)	Understanding of contexts in which engineering knowledge can be applied (eg operations and management, application and development of technology, etc)		
P2(b)	Knowledge of characteristics of particular equipment, processes or products, with extensive knowledge and understanding of a wide range of engineering materials and components		
P4(m)	Understanding of the use of technical literature and other information sources		
P5(m)	Knowledge of relevant legal and contractual issues		
P6(m)	Understanding of appropriate codes of practice and industry standards		
P7(m)	Awareness of quality issues and their application to continuous improvement		
P9(m)	*A thorough understanding of current practice and its limitations, and some appreciation of likely new developments*		A thorough understanding of current practice and its limitations, and some appreciation of likely new developments
P11(m)	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		

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:

	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:		
	BEng and MEng		MEng only
SM3(m)	Ability to apply and integrate knowledge and understanding of other engineering disciplines to support study of their own engineering discipline and the ability to evaluate them critically and to apply them effectively	SM3(m)	

	Engineering analysis Engineering analysis involves the application of engineering concepts and tools to the solution of engineering problems. On graduation you will have achieved:		
	BEng and MEng		MEng only
EA2(m)	Ability to identify, classify and describe the performance of systems and		

	components through the use of analytical methods and modelling techniques		
EA3(m)	Ability to apply quantitative and computational methods, using alternative approaches and understanding their limitations, in order to solve engineering problems and implement appropriate action		
EA5(m)	*Ability to use fundamental knowledge to investigate new and emerging technologies*	EA5(m)	Ability to use fundamental knowledge to investigate new and emerging technologies
EA6(m)	*Ability to extract and evaluate pertinent data and to apply engineering analysis techniques in the solution of unfamiliar problems*	EA6(m)	Ability to extract and evaluate pertinent data and to apply engineering analysis techniques in the solution of unfamiliar problems

	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:		
	BEng and MEng		MEng only
D2(m)	Investigate and define the problem, identifying any constraints including environmental and sustainability limitations; ethical, health, safety, security and risk issues; intellectual property; codes of practice and standards		
D3(m)	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		
D4(m)	Apply advanced problem-solving skills, technical knowledge and understanding, to establish rigorous and creative solutions that are fit for purpose for all aspects of the problem including production, operation, maintenance and disposal		
D5(m)	Plan and manage the design process, including cost drivers, and evaluate outcomes		
D6(m)	Communicate their work to technical and non-technical audiences		
D7(m)	*Demonstrate wide knowledge and comprehensive understanding of design processes and methodologies and the ability to apply and adapt them in unfamiliar situations*	D7(m)	Demonstrate wide knowledge and comprehensive understanding of design processes and methodologies and the ability to apply and adapt them in unfamiliar situations
D8(m)	*Demonstrate the ability to generate an innovative design for products, systems, components or processes to fulfil new needs*	D8(m)	Demonstrate the 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:

	BEng and MEng		MEng only
P3(m)	Ability to apply relevant practical and laboratory skills		
P8(m)	Ability to work with technical uncertainty		
P10(m)	*Ability to apply engineering techniques taking account of a range of commercial and industrial constraints*		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:		
	BEng and MEng		MEng only
G1(m)	Apply their skills in problem solving, communication, working with others, information retrieval, and the effective use of general IT facilities		
G2(m)	Plan self-learning and improve performance, as the foundation for lifelong learning/CPD		
G3(m)	Monitor and adjust a personal programme of work on an on-going basis		
G4(m)	Exercise initiative and personal responsibility, which may be as a team member or leader.		

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

The teaching is structured on a semester pattern. You study modules comprising 60 ECTS (120 CATS) in each of Parts I (level 4), II (level 5) and III (level 6), and 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).
- 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)

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

Part I is assessed through an integrated set of assessments under the regulations at https://www.southampton.ac.uk/calendar/sectionvi/feps.page. In Parts II and III, progression through the programme and classification of degrees are regulated by the standard university progression and classification rules which may be found in section IV of the University Calendar (https://www.southampton.ac.uk/calendar/sectioniv/index.page).

The duration of all the programmes may be extended by one year through enrolment on the Engineering Foundation Year.

The Programme Structure is outlined in Appendix 1.

Typical course content

Parts 1 and 2 of the Ship Science BEng and MEng programmes are common and compulsory. These two years are designed to transition you from school, embed fundamental engineering knowledge and skills and to broaden that knowledge into the Ship Science discipline. Each module, at this stage usually consists of formal lectures and tutorial sessions. The tutorials are to allow a deeper exploration of the subject through small group working.

In Part 3 for the MEng programme you make a choice as to which pathway of Ship Science you wish to pursue. The choice of pathway dictates the Part 3 modules. At this stage of the programme more independent learning is expected. You will undertake an individual project in an area of your choice. Part 4 further broadens Ship Science specific knowledge through optional modules to provide you with the knowledge and skills necessary for the workplace. Your learning becomes more industrially focused and you will undertake a Group Design Project in an area of your choice.

As part of the programmes, you can choose to spend a semester abroad at one of our partner intuitions. The modules taken abroad are aligned with those being taken by those not abroad. All semester abroad opportunities are at institutions where the final years are taught in English. In addition between the 2nd and 3rd year or between the 3rd and 4th year you can choose to have an industrial placement year. You must organise this placement but support and guidance will be provided. In both the semester abroad and industrial placement year a dedicated member of staff will maintain contact with you.

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

Additional regulations applying to the assessment of Part I of your programme, the Industrial Placement Year and our other MEng regulations may be found here:
https://www.southampton.ac.uk/calendar/sectionvi/feps.page

Intermediate exit points (where available)

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	at least 120	45
Certificate of HE	at least 60	45

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:

- Student handbook for Ship Science students.
- Introductory sessions for all years of the programme.
- Library information retrieval seminar.
- Workshop training.
- Small group tutorials in Part I and Part II of the programmes.
- SMMI Design Studio equipped with 48 computers.
- Engineering and Ship Science specific software available on all computers.
- Extensive, well equipped Engineering and Ship Science laboratories (e.g. Towing Tank)
- Advice from engineers in the Wolfson Unit for Marine Technology and Industrial Aerodynamics (WUMTIA) on specialised subject areas (e.g. yacht design and experimentation; software).
- Personal tutors to assist you with personal problems and to advise on academic issues (contact maintained during periods of studying abroad).
- Access to academic staff through an open door policy as well as timetabled tutor meetings and email.
- Research seminars and invited lectures.
- Maritime Society, organised by students on the programme.
- School Student Office for the administration of your programme

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

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

- Regular module and programme reports which are monitored by the School
- Programme validation, normally every five years.
- External examiners, who produce an annual report
- Professional body accreditation/inspection
- A national Research Assessment Exercise (our research activity contributes directly to the quality of your learning experience)
- Institutional Review by the Quality Assurance Agency

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

- Discipline, Part, subject and project boards, 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.
- 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
- 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

Worldwide the maritime sector is buoyant with many and varied career opportunities in engineering and project management related roles. Ship Science and Maritime Engineering Science graduates are in strong demand which results in high starting salaries and excellent career progression opportunities. Typically these are much higher than other mechanical engineering disciplines. Such strong performance is reflected in our consistently high employment statistics.

In the UK our graduates work across many different organisations. The Solent region around Southampton is the main UK hub for the maritime sector with organisations such as Lloyd's Register, Carnival, BMT Nigel Gee, Maritime and Coastguard agency and many others based nearby. Organisations such BAE Systems, QinetiQ and Babcock support primarily the defence sector and employ a good number of our graduates. The offshore and marine renewable developments are offering excellent prospects both to work in the UK (locally, London or Aberdeen) or worldwide in places such as Singapore, Houston or Perth, WA. For many years we have excelled in the development of high calibre individuals to work in the yacht and high performance craft sector. Southampton graduates work throughout the ocean racing, America's cup and luxury yacht world. This expertise has also supported other sports with our graduates working with UKSport on projects such as the skeleton 'Arthur' which Amy Williams rode to Gold in the Vancouver Olympic games.

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 Ship Science Employability coordinator and their academic tutor in preparing for their future career. Students are strongly encouraged and practically supported in gaining valuable paid internships with leading engineering employers in the summer vacation as well as the ability to take a year in industry opportunity typically in between year 3 and 4 of their undergraduate course. CV writing, interview and technical assessment centre workshops all help students best sell their skills.

External Examiner(s) for the programme

Name: Dr Maurizio Collu
Institution: University of Strathclyde

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 https://www.southampton.ac.uk/studentservices/academic-life/faculty-handbooks.page.

Appendix 1: Programme Structure

The programme structure is outlined below

MEng and BEng Part 1

The first year provides a background in engineering science, emphasising ship science 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 for the new students to get to know fellow students and gain hands-on experience.

All modules below are at level 4 and all required assessments are core, i.e. must be taken and passed at the required pass mark. They total 60 ECTS (120 CATS). No option 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 3.

Module Title	Code	Semester	ECTS(CATS)
Basic Naval Architecture	SESS1015	Full	7.5(15)
Design and Computing	FEEG1001	Full	15(30)
Mechanics, Structures and Materials	FEEG1002	Full	15(30)
Thermofluids	FEEG1003	Full	7.5(15)
Electrical and Electronic Systems	FEEG1004	Full	7.5(15)
Mathematics for Engineering and the Environment	MATH1054	Full	7.5(15)

MEng and BEng Part 2

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

Module Title	Code	Semester	ECTS(CATS)
Materials and Structures	FEEG2005	2	7.5(15)
Engineering Management and Law	FEEG2006	Full	7.5(15)
Mathematics for Engineering & the Environment	MATH2048	1	7.5(15)
Hydrodynamics and Seakeeping	SESS2015	Full	7.5(15)
Ship Structural Design and Production	SESS2016	2	7.5(15)
Ship Design and Economics	SESS2017	2	7.5(15)
Resistance and Propulsion	SESS20xx	1	7.5(15)
Systems Design and Computing for Ships	SESS2019	1	7.5(15)

Students selecting the Industrial Placement Year programme may take the placement module FEEG3009 between Parts 2 and 3. 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.

BEng Part 3

Modules at level 6 totalling 60 ECTS (120 CATS)

The individual Project (FEEG3003) is a core module. Compulsory modules are marked "C" and account for 52.5 ECTS (105 CATS) an additional 7.5ECTS (15 CATS) must be selected from the optional modules marked "O".

Module Title	Code	Semester	ECTS(CATS)	Type
Individual project (core)	FEEG3003	Full	7.5(15)	C
Ship Manoeuvring and Control	SESS3022	2	7.5(15)	C
Marine Hydrodynamics	SESS3023	2	7.5(15)	C
Marine Craft Concept Design	SESS3024	1	7.5(15)	C
Marine Engineering	SESS3025	1	7.5(15)	C
Marine Structures	SESS3026	2	7.5(15)	C
Manufacturing and Materials	SESG3024	1	7.5(15)	O
Yacht and High Performance Craft	SESS3027	1	7.5(15)	O
Maths option	MATH3xxx		7.5(15)	O
Accounting and Finance for Engineers	MANG3049	2	7.5(15)	O
Finite Element Analysis	FEEG3003	1	7.5(15)	O
Management Science for Engineers	MANG3048	1	7.5(15)	O

MEng Parts 3 and 4

At the end of Part II students progressing to Part 3 MEng will select pathways with distinct programmes

MEng Pathways:

- Ship Science
- Naval Architecture
- International Naval Architecture
- Marine Engineering and Autonomy
- Yacht and High Performance Craft
- Ocean Energy and Offshore Engineering
- Advanced Computational Engineering

MEng Ship Science

This interdisciplinary pathway is designed to provide broader coverage of fundamental engineering subjects within the context of Ship Science. So in the final two years there are broader project-based and engineering management-related subjects.

Part 3 Modules at level 6 totalling 60 ECTS (120 CATS)

The individual Project (FEEG3003) is a core module. Compulsory modules are marked "C" and account for 52.5 ECTS (105 CATS) an additional 7.5ECTS (15 CATS) must be selected from the optional modules marked "O".

Module Title	Code	Semester	ECTS(CATS)	Type
Individual project (core)	FEEG3003	Full	7.5(15)	C
Ship Manoeuvring and Control	SESS3022	2	7.5(15)	C
Marine Hydrodynamics	SESS3023	2	7.5(15)	C
Marine Craft Concept Design	SESS3024	1	7.5(15)	C
Marine Engineering	SESS3025	1	7.5(15)	C
Marine Structures	SESS3026	2	7.5(15)	C
Manufacturing and Materials	SESG3024	1	7.5(15)	O
Yacht and High Performance Craft	SESS3027	1	7.5(15)	O
Maths option	MATH3xxx		7.5(15)	O
Accounting and Finance for Engineers	MANG3049	2	7.5(15)	O
Finite Element Analysis	FEEG3003	1	7.5(15)	O
Management Science for Engineers	MANG3048	1	7.5(15)	O

Part 4 Modules at level 7 totalling 60 ECTS (120 CATS)

The Group Design Project (FEEG6013) is a core module. Compulsory modules are marked "C" and account for 45 ECTS (90 CATS) an additional 15 ECTS (30 CATS) must be selected from the optional modules marked "O".

Module Title	Code	Semester	ECTS(CATS)	Type
Group Design Project (core)	FEEG6013	Full	22.5(45)	C
Project Risk Management	MANG6143	2	7.5(15)	C
Maritime Safety and Law	SESS60xx	Full	7.5(15)	C
Advances in Resistance and Propulsion	SESS6063	1	7.5(15)	O
Applications of CFD	FEEG6005	1	7.5(15)	O
Failure of Materials and Components	SESG6040	2	7.5(15)	O
Offshore Engineering and Analysis	SESS6070	1	7.5(15)	O
Renewable Energy from Environmental Flows	SESS6067	2	7.5(15)	O
Maritime Robotics	SESS6072	1	7.5(15)	O
Marine Structures in Fluids	SESS6071	2	7.5(15)	O
Design Search and Optimisation	FEEG6009	2	7.5(15)	O

MEng Ship Science/Naval Architecture

This theme enables the students to specialise in core naval architecture subject areas in addition to the in-depth study of engineering materials.

Part 3 Modules at level 6 totalling 60 ECTS (120 CATS)

The individual Project (FEEG3003) is a core module. Compulsory modules are marked "C" and account for 60 ECTS (120 CATS).

Module Title	Code	Semester	ECTS(CATS)	Type
Individual project (core)	FEEG3003	Full	15(30)	C
Ship Manoeuvring and Control	SESS3022	2	7.5(15)	C
Marine Hydrodynamics	SESS3023	2	7.5(15)	C
Marine Craft Concept Design	SESS3024	1	7.5(15)	C
Marine Engineering	SESS3025	1	7.5(15)	C
Marine Structures	SESS3026	2	7.5(15)	C
Finite Element Analysis in Solid Mechanics	FEEG3003	1	7.5(15)	C

Part 4 Modules at level 7 totalling 60 ECTS (120 CATS)

The Group Design Project (FEEG6013) is a core module. Compulsory modules are marked "C" and account for 45 ECTS (90 CATS) an additional 15 ECTS (30 CATS) must be selected from the optional modules marked "O".

Module Title	Code	Semester	ECTS(CATS)	Type
Group Design Project (core)	FEEG6013	Full	22.5(45)	C
Maritime Safety and Law	SESS60xx	Full	7.5(15)	C
Advances in Resistance and Propulsion	SESS6063	1	7.5(15)	C
Marine Structures in Fluids	SESS6071	2	7.5(15)	C
Composite Engineering, Design and Mechanics	SESG6039	1	7.5(15)	O
Offshore Engineering and Analysis	SESS6070	1	7.5(15)	O
Maritime Robotics	SESS6072	1	7.5(15)	O
Design Search and Optimisation	FEEG6009	2	7.5(15)	O
Renewable Energy from Environmental Flows	SESS6067	2	7.5(15)	O
Failure of Materials and Components	SESG6040	2	7.5(15)	O

MEng Ship Science/Marine Engineering and Autonomy

This theme focuses on the analysis and specification of marine engineering and autonomy systems used on board ships and other marine structures.

Part 3 Modules at level 6 totalling 60 ECTS (120 CATS)

The individual Project (FEEG3003) is a core module. Compulsory modules are marked "C" and account for 60 ECTS (120 CATS).

Module Title	Code	Semester	ECTS(CATS)	Type
Individual project (core)	FEEG3003	Full	15(30)	C
Ship Manoeuvring and Control	SESS3022	2	7.5(15)	C
Marine Hydrodynamics	SESS3023	2	7.5(15)	C
Marine Craft Concept Design	SESS3024	1	7.5(15)	C
Marine Engineering	SESS3025	1	7.5(15)	C
Marine Structures	SESS3026	2	7.5(15)	C
Control and Instrumentation	SESM3030	1	7.5(15)	C

Part 4 Modules at level 7 totalling 60 ECTS (120 CATS)

The Group Design Project (FEEG6013) is a core module. Compulsory modules are marked "C" and account for 45 ECTS (90 CATS) an additional 15 ECTS (30 CATS) must be selected from the optional modules marked "O".

Module Title	Code	Semester	ECTS(CATS)	Type
Group Design Project (core)	FEEG6013	Full	22.5(45)	C
Advanced Sensors and Condition Monitoring	SESG6035	1	7.5(15)	C
Maritime Safety and Law	SESS60xx	Full	7.5(15)	C
Advanced Control Design	SESG6036	2	7.5(15)	C
Principles of Photovoltaics, Fuel Cells and Batteries	FEEG6007	1	7.5(15)	O
Tribological Engineering with Engine Tribology	SESM6033	1	7.5(15)	O
Maritime Robotics	SESS6072	1	7.5(15)	O
Advances in Resistance and Propulsion	SES6063	1	7.5(15)	O
Renewable Energy	SESS6067	2	7.5(15)	O
Failure of Materials and Components	SESG6040	2	7.5(15)	O
Design Search and Optimisation	FEEG6009	2	7.5(15)	O

MEng Ship Science /Yacht and High Performance Craft

This theme provides an opportunity to specialise in the analysis, design and performance of yachts, small craft and other high-performance vessels.

Part 3 Modules at level 6 totalling 60 ECTS (120 CATS)

The individual Project (FEEG3003) is a core module. Compulsory modules are marked "C" and account for 60 ECTS (120 CATS).

Module Title	Code	Semester	ECTS(CATS)	Type
Individual project (core)	FEEG3003	Full	15(30)	C
Ship Manoeuvring and Control	SESS3022	2	7.5(15)	C
Marine Hydrodynamics	SESS3023	2	7.5(15)	C
Marine Craft Concept Design	SESS3024	1	7.5(15)	C
Marine Engineering	SESS3025	1	7.5(15)	C
Marine Structures	SESS3026	2	7.5(15)	C
Yacht and High Performance Craft	SESS3027	1	7.5(15)	C

Part 4 Modules at level 7 totalling 60 ECTS (120 CATS)

The Group Design Project (FEEG6013) is a core module. Compulsory modules are marked "C" and account fo 52.5 ECTS (105 CATS) an additional 7.5 ECTS (15 CATS) must be selected from the optional modules marked "O".

Module Title	Code	Semester	ECTS(CATS)	Type
Group Design Project (core)	FEEG6013	Full	22.5(45)	C
Advances in Resistance and Propulsion	SESS6063	1	7.5(15)	C
Sailing Yacht and Powercraft Design	SESS6066	2	7.5(15)	C
Maritime Safety and Law	SESS60xx	Full	7.5(15)	C
Composite Engineering, Design and Mechanics	SESG6039	1	7.5(15)	C
Applications of CFD	FEEG6005	1	7.5(15)	O
Failure of Materials and Components	SESG6040	2	7.5(15)	O
Marine Structures in Fluids	SESS6071	2	7.5(15)	O
Renewable Energy from Environmental Flows	SESS6067	2	7.5(15)	O
Design Search and Optimisation	FEEG6009	2	7.5(15)	O

MEng Ship Science/International Naval Architecture

This pathway is the Naval Architecture pathway but it provides the opportunity for thestudents to study abroad in the second semester of their third year at one of our carefully selected partner institutions (Webb Institute in the USA, NTNU in Norway or KTH in Sweden, among others)

Part 3 Modules at level 6 totalling 60 ECTS (120 CATS)

The individual Project (FEEG3003) is a core module. Compulsory modules are marked "C" and account for 60 ECTS (120 CATS).

Module Title	Code	Semester	ECTS(CATS)	Type
Individual project (core)	FEEG3003	Full	15(30)	C
Semester Abroad : Semester Two	FEEG3006	2	30(60)	C
Marine Craft Concept Design	SESS3024	1	7.5(15)	C
Marine Engineering	SESS3025	1	7.5(15)	C

Part 4 Modules at level 7 totalling 60 ECTS (120 CATS)

The Group Design Project (FEEG6013) is a core module. Compulsory modules are marked "C" and account for 45 ECTS (90 CATS) an additional 15 ECTS (30 CATS) must be selected from the optional modules marked "O".

Module Title	Code	Semester	ECTS(CATS)	Type
Group Design Project (core)	FEEG6013	Full	22.5(45)	C
Maritime Safety and Law	SESS60xx	Full	7.5(15)	C
Advances in Resistance and Propulsion	SESS6063	1	7.5(15)	C
Marine Structures in Fluids	SESS6071	2	7.5(15)	C
Composite Engineering, Design and Mechanics	SESG6039	1	7.5(15)	O
Offshore Engineering and Analysis	SESS6070	1	7.5(15)	O
Maritime Robotics	SESS6072	1	7.5(15)	O
Design Search and Optimisation	FEEG6009	2	7.5(15)	O
Renewable Energy from Environmental Flows	SESS6067	2	7.5(15)	O
Failure of Materials and Components	SESG6040	2	7.5(15)	O

MEng Ship Science/Ocean Energy and Offshore Engineering

This pathway explores sustainable energy sources from the ocean and allows students to design and undertake the structural and hydrodynamic analyses for offshore engineering of fixed and floating structures. In particular their studies incorporate feasibility analysis of designs and probabilistic theory of the operating climate.

Part 3 Modules at level 6 totalling 60 ECTS (120 CATS)

The individual Project (FEEG3003) is a core module. Compulsory modules are marked "C" and account for 60 ECTS (120 CATS).

Module Title	Code	Semester	ECTS(CATS)	Type
Individual project (core)	FEEG3003	Full	15(30)	C
Ship Manoeuvring and Control	SESS3022	2	7.5(15)	C
Marine Hydrodynamics	SESS3023	2	7.5(15)	C
Marine Craft Concept Design	SESS3024	1	7.5(15)	C
Marine Engineering	SESS3025	1	7.5(15)	C
Marine Structures	SESS3026	2	7.5(15)	C
Manufacturing and Materials	SESG3024	1	7.5(15)	C

Part 4 Modules at level 7 totalling 60 ECTS (120 CATS)

The Group Design Project (FEEG6013) is a core module. Compulsory modules are marked "C" and account for 45 ECTS (90 CATS) an additional 7.5 ECTS (15 CATS) must be selected from the optional modules marked "O".

Module Title	Code	Semester	ECTS(CATS)	Type
Group Design Project (core)	FEEG6013	Full	22.5(45)	C
Maritime Safety and Law	SESS60xx	Full	7.5(15)	C
Offshore Engineering and Analysis	SESS6070	1	7.5(15)	C
Maritime Robotics	SESS6072	1	7.5(15)	C
Renewable Energy from Environmental Flows	SESS6067	2	7.5(15)	C
Marine Structures in Fluids	SESS6071	2	7.5(15)	O
Design Search and Optimisation	FEEG6009	2	7.5(15)	O
Applications of CFD	FEEG6005	1	7.5(15)	O
Failure of Materials and Components	SESG6040	2	7.5(15)	O

MEng Ship Science/Advanced Computational Engineering

This pathway explores sustainable energy sources from the ocean and allows students to design and undertake the structural and hydrodynamic analyses for offshore engineering of fixed and floating structures. In particular their studies incorporate feasibility analysis of designs and probabilistic theory of the operating climate.

Part 3 Modules at level 6 totalling 60 ECTS (120 CATS)

The individual Project (FEEG3003) is a core module. Compulsory modules are marked "C" and account for 60 ECTS (120 CATS).

Module Title	Code	Semester	ECTS(CATS)	Type
Individual project (core)	FEEG3003	Full	15(30)	C
Optimisation	MATH3082	2	7.5(15)	C
Marine Hydrodynamics	SESS3023	2	7.5(15)	C
Marine Craft Concept Design	SESS3024	1	7.5(15)	C
Finite Element Analysis in Solid Mechanics	FEEG3003	1	7.5(15)	C
Marine Engineering	SESS3025	1	7.5(15)	C
Marine Structures	SESS3026	2	7.5(15)	C

Part 4 Modules at level 7 totalling 60 ECTS (120 CATS)

The Group Design Project (FEEG6013) is a core module. Compulsory modules are marked "C" and account for 45 ECTS (90 CATS) an additional 7.5 ECTS (15 CATS) must be selected from the optional modules marked "O".

Module Title	Code	Semester	ECTS(CATS)	Type
Group Design Project (core)	FEEG6013	Full	22.5(45)	C
Maritime Safety and Law	SESS60xx	Full	7.5(15)	C
Design Search and Optimisation	FEEG6009	2	7.5(15)	C
Applications of CFD	FEEG6005	1	7.5(15)	C
Offshore Engineering and Analysis	SESS6070	1	7.5(15)	C
Maritime Robotics	SESS6072	1	7.5(15)	O
Renewable Energy from Environmental Flows	SESS6067	2	7.5(15)	O
Marine Structures in Fluids	SESS6071	2	7.5(15)	O
Advanced Finite Element Analysis	FEEG6010	2	7.5(15)	O

Appendix 2: Additional Costs

Students are responsible for meeting the cost of essential textbooks, and of producing documents such as essays, assignments, laboratory reports and dissertations as 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 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		*Suggested generic statement:* 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.
Stationery		*Suggested generic statements:* You will be expected to provide your own day-to-day stationery items, e.g. pens, pencils, notebooks, etc). Any specialist stationery items will be specified under the Additional Costs tab of the relevant module profile.
Textbooks		*Suggested generic statement:* 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 Equipment	Design equipment and materials:	Standard construction/modelling materials will be provided where appropriate, unless otherwise specified in a module profile. For customisation of designs/models calling for material other than standard construction/ modelling materials, students will bear the costs of such alternatives.
Clothing	Field trip clothing:	A number of essential items will be provided to you e.g. safety hat and Hi-Vis vest. You will need to wear suitable clothing when attending field trips, e.g. waterproofs, walking boots. You can purchase these from any source.
Printing and Photocopying Costs		In the majority of cases, coursework such as essays; projects; dissertations is likely to be submitted on line. However, there are some items where it is not possible to submit on line and students will be asked to provide a printed copy. A list of the University printing costs can be found here: https://www.southampton.ac.uk/isolutions/students/printing-for-students.page

Appendix 3: Part 1 Summative Assessment

The table below shows the summative assessment structure:

Schedule A			
	Approximate Timing	**Pass Mark**	**Repeat Assessment mode**
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
Schedule B			
	Timing	**Pass Mark**	**Repeat Assessment mode**
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