# Programme Specification

# MSc in Maritime Engineering Science 2018/19

This specification provides a concise summary of the main features of the programme and the learning outcomes that you might reasonably be expected to achieve and demonstrate if you take 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 | 1 year |
| Accreditation details | The Royal Institution of Naval Architects<br>The Institute of Marine Engineering, Science and Technology |
| Final award | Master of Science |
| Name of award | Maritime Engineering Science<br>Maritime Engineering Science/Advance Materials<br>Maritime Engineering Science/Marine Engineering<br>Maritime Engineering Science/Maritime Computational Fluid Dynamics<br>Maritime Engineering Science/Naval Architecture<br>Maritime Engineering Science/Offshore Engineering<br>Maritime Engineering Science/Yacht and Small Craft |
| Interim Exit awards | Postgraduate Certificate<br>Postgraduate Diploma |
| FHEQ level of final award | Level 7 |
| UCAS code | Not Applicable |
| QAA Subject Benchmark or other external reference | Engineering. Quality Assurance Agency's Framework for higher education qualifications<br>Engineering Council, UK-SPEC |
| Programme Lead | Dr Gabriel Weymouth |
| Date specification was written | April 2002 |
| Date programme was validated | July 2014 |
| Date specification last updated | May 2018 |

## Programme Overview

This programme covers the core subjects and in-depth knowledge of Maritime Engineering Science for both design and analysis of marine craft and structures within the marine environment.

The programme will prepare students well for careers in a variety of professions in maritime sector, as well as those that are perhaps thinking of pursuing a PhD in this field.

The taught element of the programme consists of 8 modules totalling 60 ECTS, depending on the theme, 5 to 7 of which (52.5 ECTS /105 CATS) are compulsory. This is followed by a substantial research project leading to a dissertation (30 ECTS /60 CATS). The specific educational aims are outlined in Educational Aims of the Programme, below.

**Learning and teaching**

The different subject matter of the modules lends itself to different teaching and learning techniques but these include lectures, tutorials, individual and group projects, assignments and practical exercises. You are encouraged throughout to contribute your own professional experiences and thoughts to the learning of the whole class through a free exchange of ideas.

**Assessment**

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

The assessment on the programme is undertaken through a variety of methods, enabling students to experience different ways to demonstrate their learning and understanding.

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

***Research Project***

Candidates wishing to obtain an MSc carry out a research project finishing with a dissertation. Research projects may concern any of the areas covered by the programme. The research project is intended to bring together the full range of skills in the programme and to provide you with an opportunity to build on all of the learning outcomes described above, while demonstrating in-depth knowledge and understanding of one or more of the areas covered by the programme. It involves information gathering and handling, critical analysis and evaluation, and presentation skills. The key requirement, however, is that the project must contain your own ideas and proposals: it should not simply be a technical design carried out to existing standards, but a problem with an element of novelty requiring the application of new information and concepts.

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 Faculty of Engineering and Physical Sciences hosts a spectrum of exciting and challenging programmes at undergraduate and postgraduate levels. Within this particular programme of study, we aim to provide you with a thorough professional knowledge of Maritime Engineering Science, be that for design or fundamental analysis. It has been configured for graduates, or similarly qualified individuals, with an engineering, scientific or mathematical background, who desire specialisation in Maritime Engineering Science.

There are six specialist themes within the MSc programme:

- Yacht and Small Craft
- Naval Architecture
- Marine Engineering
- Maritime Computational Fluid Dynamics
- Advanced Materials
- Offshore Engineering

Each theme covers a broad context together with an in-depth specialisation. These themes aim to provide students with a wide range of specialist areas within the broad field of maritime engineering science. This programme also consistently develops new themes to ensure that the programme meets the perceived future requirements of the international maritime industry.

The MSc programme aims to:

- **Provide** you with an advanced knowledge and a sound understanding of the fundamental principles, methods, analysis, synthesis and engineering applications appropriate to Maritime Engineering Science.
- **Encourage** you with the capability to formulate, analyse, make decisions based on engineering and scientific judgements and to solve engineering problems in a logical and well-argued manner, taking account of technical, social, environmental and economic constraints.
- **Expose** you to an intellectually stimulating environment that encourages an attitude of independent self-learning and enquiry and fosters an ethos of lifetime learning and continuing professional development.
- **Develop** a range of transferable skills, including the ability to communicate engineering concepts and solutions precisely by oral, visual or written means.
- **Present** specialist knowledge, technical expertise and research skills that will equip you for a professional career in your chosen specialist theme in the Maritime Engineering Science sector.
- Offer you a range of courses and research projects, integrated within a structured taught programme, that is relevant to industry and the research base and which remains responsive to changes in technology and the needs of society.

The MSc programme provides opportunities for you to achieve and demonstrate the learning outcomes described below. The Postgraduate (PG) Diploma and PG Certificate programmes do not include the research training element.

## 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 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

Having successfully completed this programme you will be able to demonstrate:

a) Detailed knowledge and understanding of the fundamental physical principles and concepts which underpin Maritime Engineering Science.
b) Knowledge and application of analytical, numerical and computational tools appropriate to the discipline of Maritime Engineering Science.
c) Awareness and comprehension of the broader physical, commercial, regulatory and societal contexts in which Maritime Engineering Science takes place.
d) Application of information and communication technology relevant to the practice of Maritime Engineering Science.
e) Critical awareness of current problems and developments in Maritime Engineering Science, informed by the forefront of research within the field.
f) Fundamental knowledge and understanding of essential facts, concepts and principles relevant to your chosen specialisation within the Maritime Engineering Science sector.

At the PG Diploma level you are expected to reach broadly MSc-equivalent level for items (a), (b), (c) and (d), with some elements of (e) and (f).

At the PG Certificate level you are expected to reach PG Diploma level over a restricted range of topics.

***Teaching and Learning Methods***

Items (a) and (b) are delivered through lectures in designated common and core engineering modules (levels 6 and 7), supported through directed example questions together with coursework assignments and laboratory experiments.

Items (c) include a combination of special lectures, group project work and coursework assignments in modules delivered by Faculties across the University as well as the staff of the Ship Science disciple.

Items (d) through a combination of lectures, coursework and project work using specialist and commercial off-the-shelf software and facilities within the University and the Faculty.

Items (e) through lectures and project work in modules at level 7, together with a major research project into a specific aspect of Maritime Engineering Science.

Items (f) include a combination of lectures, directed example questions and coursework assignments, chosen from a range of specialist optional modules at level 7 and further developed in the individual research project.

Items (c), (e) and (f) are also developed through your attendance of research seminars and technical meetings of learned societies purposely arranged in each semester.

***Assessment Methods***

Your knowledge base and understanding will be assessed through a combination of unseen written examinations [items (a)-(c), (e)], problem-solving exercises [(a)-(d), (f)], laboratory assignments [(a)-(e)], individual and group project reports [(a)-(f)], interim project presentation [(c)-(e)] and a major research dissertation [(e), (f)] and oral presentation [(e), (f)].

**Subject Specific Intellectual Skills**

On successful completion of the programme, you will be able to:

a) Identify information needs and assembling information from different sources, in order to build a clear overall picture of a complex problem or situation.
b) Evaluate different types of information critically in a variety of formats.
c) Analyse and solve engineering problems, using appropriate mathematical methods and models as necessary.
d) Select appropriate computational methods to model engineering problems and critically appraise the results of such modelling.
e) Apply creative and original thought in order to propose appropriate new solutions to complex problems.

At the PG Diploma level you are expected to reach broadly MSc-equivalent level for skills (a), (b) and (c).

At the PG Certificate level you are expected to develop skills (b) and (c) within the limited range of subjects studied.

***Teaching and Learning Methods***

Skills (a) and (b) are acquired through your self-learning associated with specific taught modules in your chosen theme, coursework assignments together with individual-project work on these modules. A further source is provided by the research project, through its requirement that you critically appraise the state of knowledge in your selected research field.

Skill (c) is acquired through the solution of directed examples given in taught modules and in individual and group project work in modules, together with the research project.

Skills (d) and (e) are acquired through your individual project work in specified modules and the research project.

***Assessment Methods***

Assessment of [(a)-(c)] is through directed problem-solving questions, individual and group project reports and unseen written examinations.
Assessment of [(d),(e)] is achieved through your individual project reports and the research dissertation.

## Subject Specific Practical Skills

During this programme, you will learn to:

a) Use computational tools and packages effectively for the solution of engineering problems.
b) Use appropriate mathematical models for analysing Maritime Engineering Science problems.
c) Design and conduct an appropriate programme in order to obtain research objectives.
d) Evaluate computational or experimental results and their validity.
e) Use scientific and technical literature effectively.

***Teaching and Learning Methods***

Skill (a) is acquired through your individual project work associated with specific taught modules.

Skill (b) is acquired through directed problem-solving exercises and your self-learning associated with taught modules, coursework assignments and your research project.

Skills (c) and (d) are acquired in core and optional modules in your chosen Maritime Engineering Science specialisation, and your research project.

Acquisition of skills (e) is accomplished through your own research project, together with group project work associated with, for example, the core module (level 7) in Maritime Safety and Environmental Engineering.

***Assessment Methods***

Practical skills are assessed through problem-solving exercises, individual- and group-project reports and your individual research-led project dissertation and oral presentation.

## Transferable and Generic Skills

The following skills are developed progressively throughout the MSc programme.

a) Communicate effectively both in writing and verbally.
b) Work effectively as part of a team.
c) Manage time and resources.
d) Manipulate, sort and present data in a variety of ways.
e) Use generic ICT tools effectively.
f) Apply critical analysis and judgement to the solution of problems.
g) Learn independently for the purposes of continuing professional development and in a wider context throughout your career.
h) Employ innovation, creativity and research skills to the solution of problems.

The levels attained by MSc/PG Diploma/PG Certificate students will reflect the differing length of study.

***Teaching and Learning Methods***

Skill (a) is acquired through individual and group project work together with your research project and coursework assignments.

Acquisition of (b) is formally acquired through the core module (level 7) in Maritime Safety and Environmental Engineering and informally developed throughout the course.
Skills (c-f) are acquired through individual and group project work, coursework assignments together with your research project.
Acquisition of skills (g) and (h) is through coursework assignments and particularly through your research project.

***Assessment Methods***
Skill (a) is assessed through individual and group project reports and presentations together with your research dissertation.

Assessment of skill (b) is through a group project report and verbal presentation.

Skill (c) is assessed through individual project reports, your research dissertation and by applying penalties for late submission of such reports.

Skills (d-f) are assessed through individual and group project reports, coursework assignments and the research dissertation.

Skills (g) and (h) are assessed through the research dissertation.

## Programme Structure

The programme involves 180 credit points (CP) distributed between taught and research components. The taught component consists of modules worth 120 credit points (60 ECTS/120 CATS credits), of which at least 90 are at level 7. You will take a number of compulsory modules and select the remaining from a given list. The list is specific to your chosen specialisation within Maritime Engineering Science. Details of the compulsory and optional modules for each specialisation within Maritime Engineering Science are shown in Appendix 1. Any of these modules can form part of a Postgraduate Certificate. A Postgraduate Diploma or an MSc requires all 120 credit points. In addition to the taught modules, the MSc also requires completion of a research project worth 60 credit points (30 ECTS /60 CATS credits).

***Full-Time MSc***

The full-time MSc programme lasts for 12 months. The first 8 months are spent mainly on the taught component, with lectures divided into two 12-week periods (Semesters 1 and 2), with exams at the end of each semester. The final four months are spent full-time on a research project, for which some preparation is done in Semester 2. It is important that you commence project work before the Semester 2 exams to allow yourself maximum time, especially where practical work is involved.

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

Detailed assessment and examination regulations may be found in Appendix 2.

Further details are available at
http://www.calendar.soton.ac.uk/sectionIV/progression-regs-standalonemasters.html

## Typical course content

You will study a number of core and optional subjects during both semesters (see appendix 1for details). These provide sound preparation for the final part of the degree, the Research Project.

## Special Features of the programme

Since the programme is designed for students with different backgrounds who desire specialisation in Maritime Engineering Science, so in order to provide students with the initial fundamental knowledge of Ship Science necessary in their studies, there is a compulsory introductory module called Fundamentals of Ship Science and lectures of this module are delivered in teaching weeks 0 and 1 of the academic year.

## 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 2.

## Progression Requirements

The programme follows the University's regulations for ***Progression, Determination and Classification of Results: Standalone Masters Programmes*** as set out in the University Calendar:
http://www.calendar.soton.ac.uk/sectionIV/sectIV-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/CATS credits | Minimum ECTS/CATS credits required at level of award |
|---|---|---|
| Postgraduate Diploma | at least 60/120 | 45/90 |
| Postgraduate Certificate | at least 30/60 | 20/40 |

# Programme outcomes for different exit points

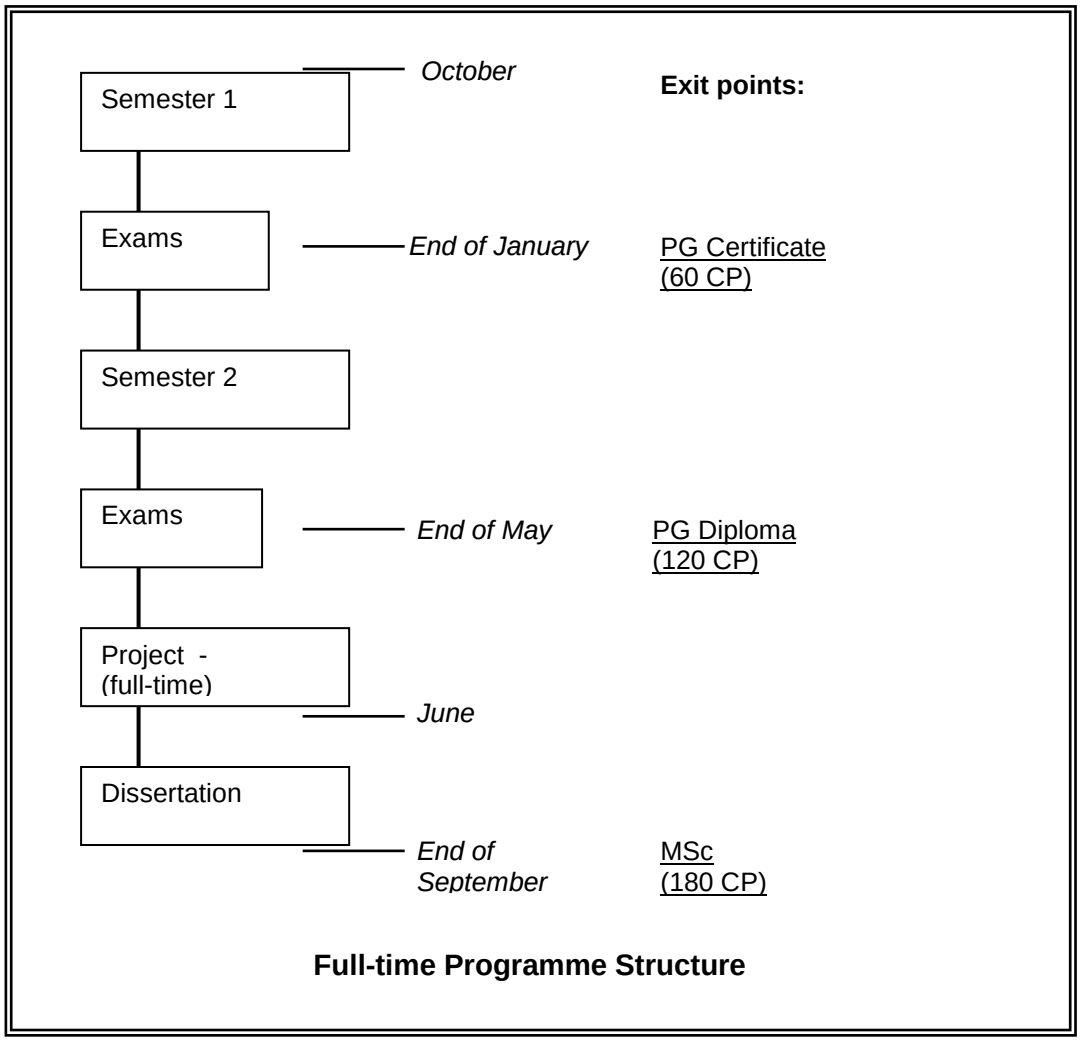
| | |
|---|---|
| Level 7 | You will have shown originality in the application of knowledge, and you will understand how the boundaries of knowledge are advanced through research. You will be able to deal with complex issues both systematically and creatively, and show originality in tackling and solving 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. |

***Postgraduate Certificate***
Systematic knowledge and critical understanding of one or more topic areas in the discipline of Maritime Engineering Science.

***Postgraduate Diploma***
Detailed systematic knowledge of a broad range of topic areas, and a comprehensive conceptual understanding of the discipline of Maritime Engineering Science.

***MSc***
Detailed systematic knowledge of a broad range of topic areas, a comprehensive conceptual understanding of the discipline of Maritime Engineering Science. Capacity for original self-directed work on the development of appropriate solutions to complex problems.

The following reference points have been used in designing the programme:
- European and governmental policy statements (EU Fifth Framework, UK Government Foresight initiative).
- Liaison with industry.
- Collaboration with professional bodies.
- Staff research.
- Networking with other universities.
- University teaching and learning strategy.




**Full-time Programme Structure**

## Support for Student Learning

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

The University provides:

- Public workstations supporting a comprehensive range of computer packages, internet and email.
- Well stocked central library, including access to a wide range of paper and electronic journals and information search facilities.
- Counselling service.
- Two Health Centres on the main campus.
- Assistive Technology Service offering support for dyslexia and other learning differences.
- Student Services Centre.
- Disability Service.
- Adviser to overseas students.
- Language support for international students (if required).
- Academic skills support (see https://www.southampton.ac.uk/learnwithustransition/academic-skills-guides/index.page and the student portal at http://www.sussed.soton.ac.uk)
- Social and sporting facilities (mainly though the Students Union)

- Careers advice via Career Destinations (see http://www.southampton.ac.uk/careers/)

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 you will be able to access:

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

## Methods for Evaluating the Quality of Teaching and Learning

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

- Anonymous student evaluation surveys for each module.
- Student representation on the Staff-Student Liaison Committee, the Ship Science Education Board and the Faculty Programme Committee.
- National Student Survey.

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

- External examiners, who produce an annual report.
- Annual review of the modules via Subject Panels and Module Co-ordinators.
- Annual appraisal of academic staff and staff development activity.
- Informal and Formal Examination Boards.
- Professional body accreditation visits.
- Periodic programme review.

***Taught Component***

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

Assessment procedures for each module will be administered by Faculty in accordance with University policy.

***Research Component***

Each research project will be supervised by a member of academic staff. A co-supervisor will be allocated who will normally be an academic or senior consulting engineer from within the Faculty.

## Career Opportunities

The maritime sector provides many and varied career opportunities in engineering and project management related roles. Maritime Engineering Science graduates are in strong demand with good starting salaries and excellent career progression opportunities.

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, etc.

## External Examiners(s) for the programme

**Name** Professor Richard Bucknall
**Institution** University College London

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.

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**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) and at http://www.southampton.ac.uk/engineering/postgraduate/taught_courses/engineering.page

**Revision History**
October 2005 (DAH)
October 2006 (YPX)
November 2007 (YPX)
April 2008 (YPX)
August 2012 (GEH)
Regulations updated March 2013 (D Mead)
June 2013 (DAH)_CQA_251113
MT 07052014
June 2014 – R Stanton, new template _15 July 2014_cqa
February 2015 – M Tan
Update to Programme Overview (CMA changes) – September 2015
CQA textual updates August 2016, August 2017
Updated to reflect 201819 and removal of criteria for admission – May 2018
Updated Faculty name to Faculty of Engineering and Physical Sciences July 2018

# Appendix 1

## Methods of Assessment for MSc Maritime Engineering Science

| MSc Maritime Engineering Science | | | | Methods of Assessment | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | CODE | Level | CATS points | Exam | Teamwork | Lab | Report | Presentation | Assessed Problems & Case Studies | Project | CAA |
| Advanced Control Design | SESG6036 | 7 | 15 | 70% | | | | | 30% | | |
| Advanced Electrical Systems | SESM6034 | 7 | 15 | 100% | | | | | | | |
| Advanced Sensors and Condition Monitoring | SESG6035 | 7 | 15 | 70% | Yes | | 30% | | | | |
| Advances in Ship Resistance and Propulsion | SESS6063 | 7 | 15 | 70% | | | | | 30% | | |
| Finite Element Analysis in Solid Mechanics | FEEG3001 | 6 | 15 | 70% | | 20% | | | 10% | | |
| Fuel Cells and Photovoltaic Systems 1 | FEEG6007 | 7 | 15 | 80% | | | | | 20% | | |
| Fundamentals of Ship Science | SESS6065 | 7 | 15 | 50% | | | | | 50% | | |
| Marine Engineering | SESS3025 | 6 | 15 | 50% | | | | | 50% | | |
| Marine Hydrodynamics | SESS3023 | 6 | 15 | 70% | | | | | 30% | | |
| Marine Law and Management | SESS6069 | 7 | 15 | | | | | | 50% | 50% | |
| Marine Safety and Environvmental Eng. | SESS6068 | 7 | 15 | 75% | | | | | 25% | | |
| Marine Structures | SESS3026 | 6 | 15 | 100% | | | | | | | |
| Marine Structures in Fluids | SESS6071 | 7 | 15 | 70% | | | | | 30% | | |
| Microstructural Eng. for Transport Applications | SESG6042 | 7 | 15 | 100% | | | | | | | |
| Offshore Engineering & Analysis | SESS6070 | 7 | 15 | 60% | | 10% | | | 30% | | |
| Research Project MSc | FEEG6012 | 7 | 60 | | | | 90% | 10% | | | |
| Ship Manoeuvring and Conrol | SESS3022 | 6 | 15 | 70% | | | | | 30% | | |
| Tribological Engineering | SESM6033 | 6 | 15 | 80% | | | | | 20% | | |

**MSc in Maritime Engineering Science Themes**

The list below reflects the modules currently offered and is subject to minor alteration from year to year. Each module has a ECTS value of 7.5ECTS (15 CATS)at level 6 or 7. A maximum of 15 ECTS (30 CATS) can be taken at level 6.

**MSc Maritime Engineering Science with Advanced Materials**

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

| | Sem | | ECTS (CATS) | Level |
|---|---|---|---|---|
| FEEG6012 | 2+ | MSc Research Project | 30(60) | 7 |
| SESG6040 | 2 | Failure of Materials and Components | 7.5(15) | 7 |
| SESG6042 | 1 | Microstructural Engineering for Transport Applications | 7.5(15) | 7 |
| SESS6065 | 1 | Fundamentals of Ship Science | 7.5(15) | 7 |
| SESS6068 | 2 | Marine Safety and Environmental Engineering | 7.5(15) | 7 |
| SESS6069 | 1/2 | Marine Law and Management | 7.5(15) | 7 |

Choose 3 (with maximum of 2 at level 6) from:

| | Sem | | ECTS (CATS) | Level |
|---|---|---|---|---|
| FEEG3001 | 1 | Finite Element Analysis in Solid Mechanics | 7.5(15) | 6 |
| SESG3024 | 1 | Manufacturing and Materials | 7.5(15) | 6 |
| SESG6034 | 1 | Surface Engineering | 7.5(15) | 7 |
| SESG6039 | 1 | Composite Engineering Design and Mechanics | 7.5(15) | 7 |
| SESG6044 | 1/2 | Microstructure and Surface Characterisation | 7.5(15) | 7 |
| SESS3022 | 2 | Ship Manoeuvring and Control | 7.5(15) | 6 |
| SESS3023 | 2 | Marine Hydrodynamics | 7.5(15) | 6 |
| SESS3026 | 2 | Marine Structures | 7.5(15) | 6 |
| SESS3027 | 1 | Yacht and High Performance Craft | 7.5(15) | 6 |
| SESS6071 | 2 | Marine Structures in Fluids | 7.5(15) | 7 |

**MSc Maritime Engineering Science with Marine Engineering**

This theme enables students to understand component and systems engineering on board ships and fixed and offshore platforms that facilitate their functional capability. Electrical theory, control, sensing, thermodynamics, engine and machine tribology are all key elements.

| | Sem | | ECTS (CATS) | Level |
|---|---|---|---|---|
| FEEG6012 | 2+ | MSc Research Project | 30(60) | 7 |
| SESG6035 | 1 | Advanced Sensors and Conditioning Monitoring | 7.5(15) | 7 |
| SESG6036 | 2 | Advanced Control Design | 7.5(15) | 7 |
| SESM6034 | 2 | Advanced Electrical Systems | 7.5(15) | 7 |
| SESS3025 | 1 | Marine Engineering | 7.5(15) | 6 |
| SESS6065 | 1 | Fundamentals of Ship Science | 7.5(15) | 7 |
| SESS6068 | 2 | Marine Safety and Environmental Engineering | 7.5(15) | 7 |
| SESS6069 | 1/2 | Marine Law and Management | 7.5(15) | 7 |

Choose 1 from:

| | Sem | | ECTS (CATS) | Level |
|---|---|---|---|---|
| FEEG6007 | 1 | Fuel Cells, batteries and Photovoltaic Systems I | 7.5(15) | 7 |
| SESM3030 | 1 | Control and Instrumentation | 7.5(15) | 6 |
| SESM6033 | 1 | Tribological Engineering with Engine Tribology | 7.5(15) | 7 |
| SESS6063 | 1 | Advances in Ship Resistance and Propulsion | 7.5(15) | 7 |
| SESS6072 | 2 | Maritime Robotics | 7.5(15) | 7 |

**MSc Maritime Engineering Science with Computational Fluid Dynamics**

This theme concentrates on the theoretical and computational aspects of fluid behaviour and its interaction with structure, core to the fundamentals of engineering in the maritime environment.

| | Sem | | ECTS (CATS) | Level |
|---|---|---|---|---|
| FEEG6005 | 1 | Applications of CFD | 7.5(15) | 7 |
| FEEG6012 | 2+ | MSc Research Project | 30(60) | 7 |
| SESS3023 | 2 | Marine Hydrodynamics | 7.5(15) | 6 |
| SESS6063 | 1 | Advances in Ship Resistance and Propulsion | 7.5(15) | 7 |
| SESS6065 | 1 | Fundamentals of Ship Science | 7.5(15) | 7 |
| SESS6068 | 2 | Marine Safety and Environmental Engineering | 7.5(15) | 7 |

Choose 3 (with maximum 1 at level 6) from:

| | Sem | | ECTS (CATS) | Level |
|---|---|---|---|---|
| FEEG3001 | 1 | Finite Element Analysis in Solid Mechanics | 7.5(15) | 6 |
| FEEG6002 | 1 | Advanced Computational Methods I | 7.5(15) | 7 |
| FEEG6009 | 2 | Design Search and Optimisation | 7.5(15) | 7 |
| SESA6061 | 1 | Turbulence: Physics and Modelling | 7.5(15) | 7 |
| SESA6067 | 1 | Flow Control | 7.5(15) | 7 |
| SESA6077 | 1 | Aeroelasticity | 7.5(15) | 7 |
| SESS3022 | 2 | Ship Manoeuvring and Control | 7.5(15) | 6 |
| SESS3026 | 2 | Marine Structures | 7.5(15) | 6 |
| SESS6070 | 1 | Offshore Engineering and Analysis | 7.5(15) | 7 |
| SESS6071 | 2 | Marine Structures in Fluids | 7.5(15) | 7 |

**MSc Maritime Engineering Science with Naval Architecture**

This theme provides a detailed insight into core naval architecture subject areas, such as resistance and propulsion, maritime structures, manoeuvring, hydrodynamics and materials.

| | Sem | | ECTS (CATS) | Level |
|---|---|---|---|---|
| FEEG6012 | 2+ | MSc Research Project | 30(60) | 7 |
| SESS6063 | 1 | Advances in Ship Resistance and Propulsion | 7.5(15) | 7 |
| SESS6065 | 1 | Fundamentals of Ship Science | 7.5(15) | 7 |
| SESS6068 | 2 | Marine Safety and Environmental Engineering | 7.5(15) | 7 |
| SESS6069 | 1/2 | Marine Law and Management | 7.5(15) | 7 |
| SESS6071 | 2 | Marine Structures in Fluids | 7.5(15) | 7 |

Choose 3 (with maximum 2 at level 6) from:

| | Sem | | ECTS (CATS) | Level |
|---|---|---|---|---|
| FEEG3001 | 1 | Finite Element Analysis in Solid Mechanics | 7.5(15) | 6 |
| FEEG6005 | 1 | Applications of CFD | 7.5(15) | 7 |
| FEEG6009 | 2 | Design Search and Optimisation | 7.5(15) | 7 |
| MATH6141 | 1 | Numerical Methods | 7.5(15) | 7 |
| SESG6040 | 2 | Failure of Materials and Components | 7.5(15) | 7 |
| SESS3022 | 2 | Ship Manoeuvring and Control | 7.5(15) | 6 |
| SESS3023 | 2 | Marine Hydrodynamics | 7.5(15) | 6 |
| SESS3026 | 2 | Marine Structures | 7.5(15) | 6 |
| SESS3027 | 1 | Yacht and High Performance Craft | 7.5(15) | 6 |
| SESS6067 | 2 | Renewable Energy from Environmental Flows | 7.5(15) | 7 |
| SESS6070 | 1 | Offshore Engineering and Analysis | 7.5(15) | 7 |

**MSc Maritime Engineering Science with Offshore Engineering**

This theme 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.

| | Sem | | ECTS (CATS) | Level |
|---|---|---|---|---|
| FEEG3001 | 1 | Finite Element Analysis in Solid Mechanics | 7.5(15) | 6 |
| FEEG6012 | 2+ | MSc Research Project | 30(60) | 7 |
| SESS6065 | 1 | Fundamentals of Ship Science | 7.5(15) | 7 |
| SESS6068 | 2 | Marine Safety and Environmental Engineering | 7.5(15) | 7 |
| SESS6069 | 1/2 | Marine Law and Management | 7.5(15) | 7 |
| SESS6070 | 1 | Offshore Engineering and Analysis | 7.5(15) | 7 |
| SESS6071 | 2 | Marine Structures in Fluids | 7.5(15) | 7 |
| SESS6072 | 2 | Maritime Robotics | 7.5(15) | 7 |

Choose 1 from:

| | Sem | | ECTS (CATS) | Level |
|---|---|---|---|---|
| FEEG6005 | 1 | Applications of CFD | 7.5(15) | 7 |
| FEEG6009 | 2 | Design Search and Optimisation | 7.5(15) | 7 |
| SESM6040 | 1 | Thermofluid Engineering for Low Carbon Energy | 7.5(15) | 7 |
| SESS3022 | 2 | Ship Manoeuvring and Control | 7.5(15) | 6 |
| SESS3023 | 2 | Marine Hydrodynamics | 7.5(15) | 6 |
| SESS3026 | 2 | Marine Structures | 7.5(15) | 6 |
| SESS6063 | 1 | Advances in Ship Resistance and Propulsion | 7.5(15) | 7 |
| SESS6067 | 2 | Renewable Energy from Environmental Flows | 7.5(15) | 7 |

**MSc Maritime Engineering Science with Yacht and Small Craft**

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

| | Sem | | ECTS (CATS) | Level |
|---|---|---|---|---|
| FEEG6012 | 2+ | MSc Research Project | 30(60) | 7 |
| SESS3027 | 1 | Yacht and High Performance Craft | 7.5(15) | 6 |
| SESS6065 | 1 | Fundamentals of Ship Science | 7.5(15) | 7 |
| SESS6066 | 2 | Sailing Yacht and Powercraft Design | 7.5(15) | 7 |
| SESS6068 | 2 | Marine Safety and Environmental Engineering | 7.5(15) | 7 |
| SESS6069 | 1/2 | Marine Law and Management | 7.5(15) | 7 |

Choose 3 (with maximum 1 at level 6) from:

| | Sem | | ECTS (CATS) | Level |
|---|---|---|---|---|
| FEEG3001 | 1 | Finite Element Analysis in Solid Mechanics | 7.5(15) | 6 |
| FEEG6005 | 1 | Applications of CFD | 7.5(15) | 7 |
| FEEG6009 | 2 | Design Search and Optimisation | 7.5(15) | 7 |
| SESG3024 | 1 | Manufacturing and Materials | 7.5(15) | 6 |
| SESG6035 | 1 | Advanced Sensors and Conditioning Monitoring | 7.5(15) | 7 |
| SESG6039 | 1 | Composites Engineering Design and Mechanics | 7.5(15) | 7 |
| SESS3022 | 2 | Ship Manoeuvring and Control | 7.5(15) | 6 |
| SESS3023 | 2 | Marine Hydrodynamics | 7.5(15) | 6 |
| SESS3026 | 2 | Marine Structures | 7.5(15) | 6 |
| SESG6040 | 2 | Failure of Materials and Components | 7.5(15) | 7 |
| SESS6063 | 1 | Advances in Ship Resistance and Propulsion | 7.5(15) | 7 |
| SESS6067 | 2 | Renewable Energy from Environmental Flows | 7.5(15) | 7 |

# Appendix 2:

## Additional Costs

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

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

| Main Item | Sub-section | PROGRAMME SPECIFIC COSTS |
|---|---|---|
| **Approved Calculators** | | 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** | | 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. |
| T**extbooks** | | 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.<br><br>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 |

| Main Item | Sub-section | PROGRAMME SPECIFIC COSTS |
|---|---|---|
| | | benefit from the additional reading materials for the module. |
| **Equipment and Materials** | Design equipment and materials: | Standard construction/modelling materials will be provided where appropriate, unless otherwise specified in a module profile.<br><br>For customisation of designs/models calling for material other than standard construction/ modelling materials, students will bear the costs of such alternatives. |
| | Excavation equipment and materials: | |
| | Field Equipment and Materials: | |
| | Photography: | |
| | Recording Equipment: | |
| | | |
| **Clothing** | Lab Coats | |
| | Protective Clothing:<br><br>Hard hat; safety boots; hi-viz vest/jackets; | |
| | Fieldcourse clothing: | You will need to wear suitable clothing when attending fieldcourses, e.g. waterproofs, walking boots. You can purchase these from any source. |
| | Wet Suits? | |

| Main Item | Sub-section | PROGRAMME SPECIFIC COSTS |
|---|---|---|
| | Uniforms? | |
| **Printing and Photocopying Costs** | | In some cases, coursework and/or projects may be submitted electronically. Where it is not possible to submit electronically students will be liable for printing costs, which are detailed in the individual Module Profile and can be found in Appendix 2. |
| **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. |