

UNIVERSITY OF  
**Southampton**  
School of Engineering Sciences

# Making waves. Ship Science



Ship Science at Southampton is world renowned for producing graduates who rapidly scale the heights of the marine profession. By working closely with industry, our award-winning teaching ensures that our students are ready to tackle tomorrow's tough engineering challenges today.



Teaching of the Ship Science programme is provided in the School of Engineering Sciences. As one of Europe's leading engineering schools, we have the highest reputation for teaching, research and professional consultancy services. The School is one of the top research-rated institutions in the UK and our internationally renowned academic staff work at the forefront of their fields. We are committed to addressing major scientific and technological issues relating to transport, energy and sustainability that affect the world.

We have strong industrial links across the marine and general engineering industry, based on a reputation built over several decades. This means that our graduates are in great demand. We work closely with other Schools across the University and pride ourselves on our multidisciplinary approach to research and teaching.

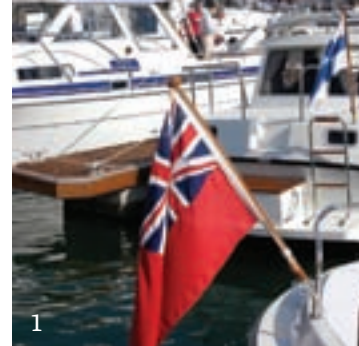
Our teaching is supported by dedicated laboratory and experimental facilities that we continually invest in, including a test tank for ship resistance and motion experiments, a transport systems research laboratory, a state-of-the-art manufacturing centre and six new Design Studios for hands-on teaching of Computer Aided Design (CAD) and Computer Aided Manufacture (CAM).

Our undergraduate programmes offer a great deal of choice and flexibility, so you can tailor your studies to suit your specific interests. A key feature is the individual and group design project work. Student projects link with our world-leading research and are often done in conjunction with industry.

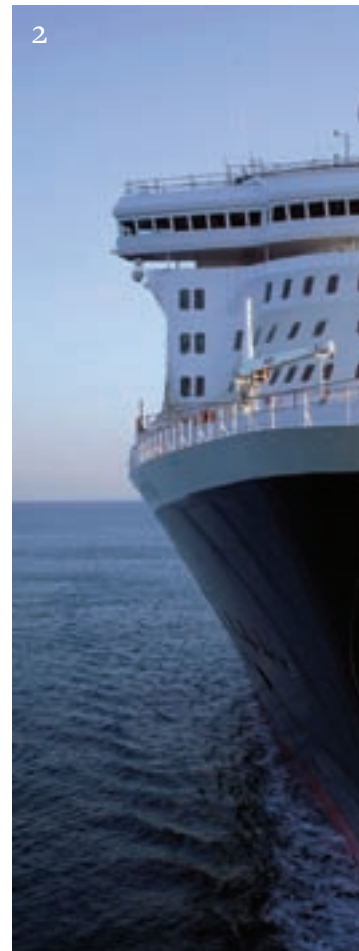
We recognise that university life is not just about your studies and we understand the importance of the student experience as a whole. On arrival at Southampton, you will be assigned a personal tutor who can provide help and support on academic and personal issues. We also help students run their own engineering society and members organise industrial visits, lectures by guest speakers, as well as sports and social activities.

I hope that you will find this booklet helpful and informative. It should give you, our future students, a glimpse of the opportunities facing engineering graduates and a flavour of the challenges that await you.

**Professor Mark Spearing**  
*Head of School*



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**1 Career opportunities**

Southampton graduates are highly sought after by the Marine industry. Page 10

**2 Links with industry**

The School has close links with partners in the Marine industry. Pages 12-13

**3 Degree programmes**

We offer an exciting portfolio of three-year and four-year programmes which are accredited by the Royal Institution of Naval Architects and the Institute of Marine Engineering, Science and Technology. Pages 14-23

**4 Teaching excellence**

Be taught by world class ship science academics who are leaders in their field. Pages 24-27

**5 Applications and offers**

How to apply and details of our entry requirements. Pages 30-31

**6 Southampton at a glance**

Ten reasons to study in the School of Engineering Sciences at the University of Southampton. Pages 32-33

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Designed and produced by Communications and the Print Centre

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# Ship Science is the study of vehicles and structures that use the ocean for transport, recreation and harnessing marine resources.

The professional ship scientist (or naval architect) is responsible for the design, construction and repair of cruise liners, high-speed ferries, container ships, oil tankers, sailing yachts, luxury motor craft, lifeboats, hydrofoils, hovercraft, submarines and underwater vehicles as well as fixed or floating offshore structures.

The design, construction and operation of vehicles that support maritime operations offers an exciting technological challenge and rewarding career opportunities. New types of vessel are continuously evolving in the form of new container ships, high-speed catamaran ferries, remotely operated submersibles or ocean-racing yachts. The latest science and technology is being used in the design and construction of these vessels, encompassing structural design techniques, advanced materials, propulsion devices and motion control.

The maritime field is very broad, covering varying aspects such as sea transportation, the marine leisure industries, strategic maritime defence and the recovery of minerals, mariculture and fish from the oceans. Maritime activities continue to make a major contribution to the UK economy and this ensures a strong demand for graduates with ship science degrees.

Here at Southampton, our Ship Science programme focuses on the engineering and science associated with marine vehicles, structures and their design. The course helps students to develop an understanding of physical processes through studies of fundamental principles, methods, analysis, synthesis and applications.

The ship scientist is primarily an engineer and he or she must therefore have an appreciation of a wide range of engineering disciplines associated with maritime engineering science. Our Ship Science programme is therefore based in the School of Engineering Sciences, and students take a number of subjects that are common across all engineering disciplines.

We have taught ship science at the University of Southampton for more than 40 years and high-quality teaching has always been our top priority. We are exceedingly proud of our graduates, many of whom have gone onto successful careers in leading organisations across the UK and internationally.

Beyond the outstanding educational opportunities offered at Southampton, our students have the chance to take part in top-class sporting, cultural and social activities at the University and in the city.





One of the most respected marine design consultancies in the world, the Wolfson Unit, an Enterprise Unit based within the University has worked with clients including America's Cup teams, Dame Ellen MacArthur and recently the designers of several yachts competing in round-the-world races in 2008 – the crewed Volvo Ocean Race and the single-handed Vendée Globe.



A significant feature of our work is the linking of teaching and fundamental research with industrial application. This is embodied in the Lloyd's Register University Technology Centre and the Advanced Technology Partnership with the Royal National Lifeboat Institution on Maritime Science and Engineering. These and other organisations offer summer placements and projects to our students.







# Careers opportunities

The breadth of our ship science programmes means that graduates can choose between careers in naval architecture/maritime engineering, associated engineering disciplines and other fields such as information technology, management consultancy and accountancy.

Naval architecture/maritime engineering offers a challenging and rewarding career, and employment opportunities are available in a wide range of areas within the maritime field. Many of our graduates have become designers and managers in the large and small ship fields. Some have joined shipbuilding companies and consultancies, including the offshore industry and others are involved in yacht design, including America's Cup challengers. Others embark on postgraduate courses at Southampton, and other universities, to further enhance their knowledge and skills.

**Our graduates are now employed in high-profile roles in organisations such as:**

Babcock Marine  
BAE Systems  
British Maritime Technology  
Burness Corlett – Three Quays  
BVT Surface Fleet  
Carnival Corporate Ship Building  
Dst/MOD  
Gurit  
Houlder Offshore  
Lloyd's Register  
London Offshore Consultants  
Maersk  
QinetiQ  
Royal National Lifeboat Institution (RNLI)  
Saipem

# Scholarships

Annual scholarships of £1000 to reward outstanding academic performance in each year of our undergraduate programmes (except in the final year). The maximum possible award is therefore £3000 over the duration of an MEng or £2000 over the duration of a BEng.

A range of entry and academic achievement scholarships are also offered to international students. For full details and terms and conditions, please go to:  
[www.southampton.ac.uk/ses](http://www.southampton.ac.uk/ses)

# Professional development

The goal of any engineering student is generally to gain a relevant professional qualification and ultimately become a Chartered Engineer through the relevant professional body. For graduates with ship science degrees, this is normally the Royal Institution of Naval Architects (RINA). Our Ship Science degree programmes are accredited with the Engineering Council through the RINA and the Institute of Marine Engineering, Science and Technology (IMarEST).

We recommend that you read the booklet "Careers in Naval Architecture", published by the RINA, which describes the various opportunities available to graduates. It also gives a very thorough description of the naval architecture profession and includes some useful contacts.

RINA  
10 Upper Belgrave Street  
London  
SW1X 8BQ  
Tel: +44 (0)20 7235 4622  
[www.rina.org.uk](http://www.rina.org.uk)

IMarEST  
80 Coleman Street  
London  
EC2R 5BJ  
Tel: +44 (0)20 7382 2600  
[www.imarest.org.uk](http://www.imarest.org.uk)





# Links with industry

**Most of our research, along with many individual and group student projects, has direct, practical relevance to industry.**

We aim to ensure that our degree programmes meet the needs of employers and are developed in consultation with senior industrialists on our advisory boards.

We receive a high level of research funding from government agencies and industry and we foster close collaboration through a number of industry partnerships. These include the Royal National Lifeboat Institution (RNLI) Advanced Technology Partnership, the Lloyd's Register University Technology Centre (UTC) and the MOD/Lloyd's Register Centre of Excellence for Marine Structures.

We have developed further links with industry through the Wolfson Unit for Marine Technology and Industrial Aerodynamics. The Wolfson Unit, which has a staff of 9 engineers, acts as a consultancy service for industry and provides additional links with the field of marine technology and small craft through research and development projects.

Staff in the Wolfson Unit have played an important role in high-performance yacht racing, offering consultancy services for many America's Cup campaigns and other high-profile transatlantic and global events. For further details, go to: [www.wumtia.soton.ac.uk](http://www.wumtia.soton.ac.uk)

## **Industrial work experience**

You may wish to obtain industrial work experience prior to starting your degree programme. The Year in Industry (YINI) scheme, co-ordinated by the Royal Academy of Engineering, provides excellent opportunities for students to obtain relevant industrial work experience. A new YINI 'Combo', which is a traditional placement followed by an overseas travel experience, has been launched recently. YINI's southern regional office is located at the University of Southampton. More information is available on their website at: [www.yini.org.uk](http://www.yini.org.uk)

## **Industrial placements**

Working in a company during your studies, either over the Summer vacation or through a year on placement, allows you to apply yourself on real-world projects. This industrial experience makes you stand out from the crowd. In some cases this leads to an offer of sponsorship during the final year and employment on graduation. We encourage our students to take advantage of these opportunities, and our courses are flexible to allow such placements. We have strong links with many companies who take on students for such placements each year. Our dedicated industrial liaison tutor will help you to make contact with sponsoring companies during your degree. The tutor maintains a register of organisations that have provided support for our students in the past, and also seeks to strengthen and create new links with industry.

## **Strategic partnerships**

We receive a high level of research funding from government agencies and industry and we have forged close links with a number of industrial partners on many different activities, including:

- Lloyd's Register UTC in Hydrodynamics, Hydroelasticity and Mechanics of Composites
- Ministry of Defence (MOD)/Lloyds Register Centre of Excellence for Marine Structures
- Royal National Lifeboat Institution Advanced Technology Partnership on Maritime Engineering and Safety.
- Rolls-Royce University Technology Centre (UTC) for Computational Engineering
- Airbus Noise Technology Centre
- Microsoft Institute for High Performance Computing
- National Centre for Advanced Tribology at Southampton
- DePuy International University Technology Partnership in Bioengineering Science

## **Defence Technical Undergraduate Scheme**

Southampton is one of only six universities to accept students sponsored by the MOD on the Defence Technical Undergraduate Scheme (DTUS). All of our ship science programmes are recognised under this scheme. The Thunderer Squadron provides a support unit for undergraduate engineering students who are already committed to a career in the Armed Forces and are sponsored by the MOD. For further details, please go to:

[www.thunderersquadron.mod.uk](http://www.thunderersquadron.mod.uk)



Stephen Payne, one of our graduates, was the chief designer of the luxury cruise liner the Queen Mary 2.

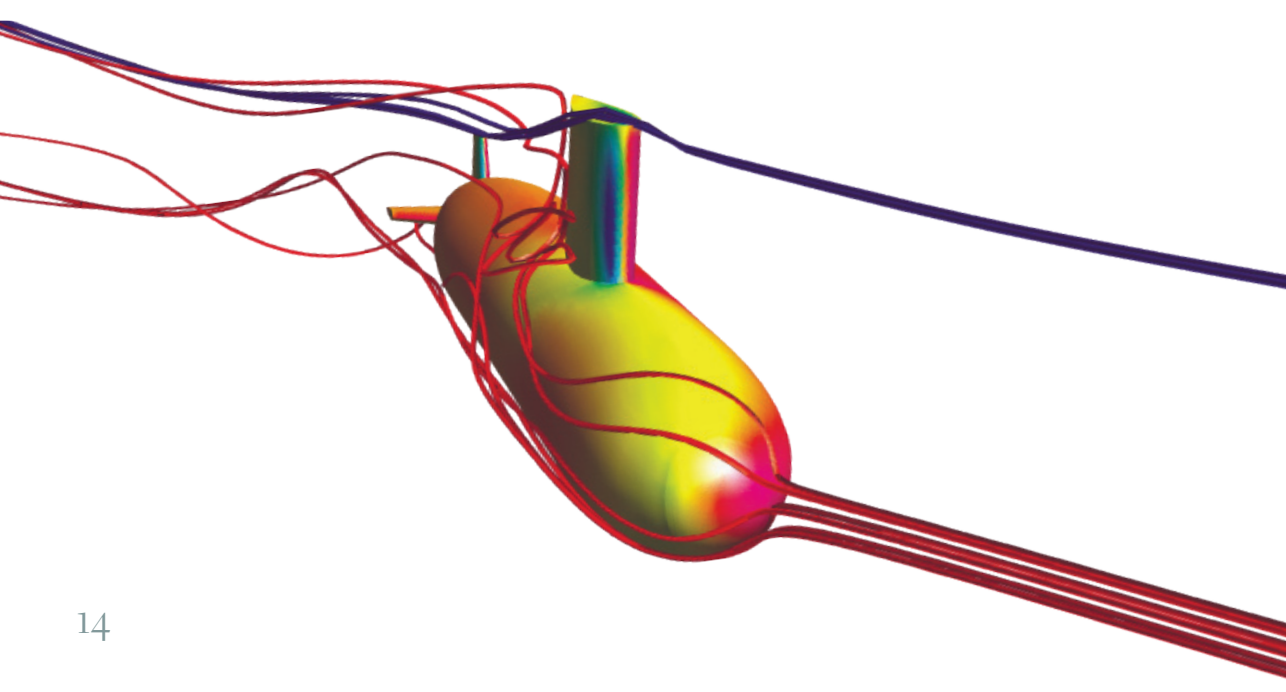
# Degree programmes

All of our courses are periodically reviewed and accredited by the Royal Institution of Naval Architects (RINA) and the Institute of Marine Engineering, Science and Technology (IMarEST). Our four-year MEng programmes meet all the academic requirements for registration as a Chartered Engineer. Our three-year BEng programme meets many of the academic requirements for registration as a Chartered Engineer, although graduates must undertake postgraduate study to achieve Chartered status.

The same entry requirements apply for both the BEng and MEng courses. You can transfer from BEng to MEng or vice versa during your studies. In most cases, you can transfer from one programme to another up to the end of the second year (subject to progression regulations).

Programmes	UCAS Code	Page
BEng Ship Science	J640	16
MEng Ship Science	J641	16
MEng Ship Science/Advanced Materials	J644	17
MEng Ship Science/Engineering Management	JN62	18
MEng Ship Science/Naval Architecture	J642	19
MEng Ship Science/Naval Engineering	H500	20
MEng Ship Science/Yacht and Small Craft	J643	21

These programmes are all full-time courses. The academic year lasts for 30 weeks and is divided into two semesters. The normal teaching timetable is from 9am to 6pm on Mondays, Tuesdays, Thursdays and Fridays and from 9am to 1pm on Wednesdays. The timetable allows plenty of time for private study.





# Programme structure



Starting out well at University is a key to future success. At Southampton we have an award winning induction programme during which teams of new students work together to design, build and test a bulk carrier. This exciting introduction provides the opportunity to get to know fellow students, gain hands-on experience and compete in a sea trial based in the University Jubilee swimming pool. It sets the context for the first year, and provides a preview of the Ship Science course that follows.

Whichever programme you choose, you will study a number of core subjects during the first two years. These provide sound preparation for the final part of the degree. You will concentrate on the fundamentals of engineering and gain the skills

and understanding required to use information technology in an engineering context.

In Year 3, you will have the opportunity to specialise or retain a broad-based study path through a wide selection of subject modules. You will also undertake an individual project that usually takes the form of a design or research exercise and involves significant literature reviews, experimentation, mathematical modelling or computation, and the production of a formal report.

In Year 4, MEng students participate in a Group Design Project (GDP). These projects are often linked to current research activities or topics that have practical relevance to industry.

Year 1
All compulsory modules:
Computational methods for ship design
Electrical systems
Fluid mechanics
Graphical communications and marine transportation
Mathematics for engineering sciences
Mechanics
Mechanics of solids
Modelling and computing
Properties of materials
Ship studies
Thermodynamics

Year 2
All compulsory modules:
Computing (Fortran)
Fluid mechanics
Management 1
Marine engineering
Materials
Mathematics for aerospace and ship science
Naval architecture dynamics
Resistance and propulsion
Ship design
Ship design and economics
Ship functional design
Ship production technology
Ship structures



## BEng/MEng Ship Science (UCAS code J640/ J641)

### **BEng** (UCAS code J640)

This programme is ideal if you wish or need to complete your studies in three years. The course content is identical to the MEng programme (UCAS code J641) throughout these three years. In the third and final year, you can follow a range of subject options, and maritime design course work forms an integral part of the programme. You will also carry out two projects – an individual-based project chosen from a wide selection available within the school and a small group concept design project. The latter provides valuable experience of conducting a design synthesis and working in a team.

### **MEng** (UCAS code J641)

This interdisciplinary programme, which is held in high regard in industry, is designed to provide broader coverage of fundamental engineering subjects within the context of ship science. Years 1 and 2 have the same format as the other MEng programmes in ship science and the final two years focus on broader project-based and engineering management-related studies rather than specific ship science themes.

In Years 3 and 4, students select options from discipline-specific core subjects such as advanced naval architecture and high performance craft. Students can also choose from more general engineering and non-discipline specific subjects such as finite element analysis, control, languages and industrial law.

Year 3
Mandatory modules:
Management II
Manufacturing with metals
Marine craft concept design
Marine hydrodynamics
Materials service performance
Ship control systems
Individual project
Optional modules: typical examples are listed on page 23

Year 4
Mandatory modules for MEng
Engineering management studies
Statistics for engineering systems
Group Design Project (GDP)
Optional modules: typical examples are listed on page 23

**Programme structure**  
For details of modules studied in Years 1 and 2, please see page 15. In addition to the mandatory modules listed above, you can also choose from a wide range of optional modules in Years 3 and 4.



## MEng Ship Science/Advanced Materials (UCAS code J644)

This programme enables you to specialise in core naval architecture subject areas in addition to the in-depth study of engineering materials. While the first two years of the programme have the same format across all ship science programmes, students have the opportunity to specialise in the final two years through discipline-based core modules.

The research activities carried out in the School's Fluid Structure Interactions and Engineering Materials research groups play an important role on this programme, which is reflected in the taught modules and in the range of group and individual projects on offer.

Typical projects have, in the past, looked at new materials and manufacturing procedures for applications in the marine and offshore environments, and the design and evaluation of composite structures for applications in yachts and powercraft.

Year 3	Year 4
Mandatory modules:	Mandatory modules:
Finite element analysis I	Failure of materials
Management II	Marine law
Manufacturing with metals	Marine safety and environmental engineering
Marine craft concept design	Materials for transport
Marine hydrodynamics	Structural integrity
Marine propulsion engineering	Group Design Project (GDP)
Materials service performance	+ optional modules: typical examples are listed on page 23
Theory of plate structures	
Individual project	
+ optional modules: typical examples are listed on page 23	

### Programme structure

For details of modules studied in Years 1 and 2, please go to page 15. In addition to the mandatory modules listed above, you can also choose from a wide range of optional modules in Years 3 and 4.





## MEng Ship Science/Engineering Management (UCAS code JN62)

This programme is designed to enable professional engineers to progress quickly into key management positions in the marine industry. You will develop the technical skills to understand, design and manufacture new products and the expertise to manage the process, people and finances. The first two years are identical to the BEng/MEng Ship Science programmes. However, in Years 3 and 4 students take a range of management modules and specialise in core naval architecture subject areas.

Year 3
Mandatory modules:
Accounting and finance for engineers
Management II
Management science for engineers
Manufacturing with metals
Marine craft concept design
Marine hydrodynamics
Marine propulsion engineering
Individual project
+ optional modules: typical examples are listed on page 23

Year 4
Mandatory modules:
Industrial law
Group Design Project (GDP)
+ optional modules: typical examples are listed on page 23

Typical Management modules (Year 4)
Corporate risk management
Information systems (management and development)
Managing resources and operations
Project risk management
+ optional modules: availability is subject to change

### Programme structure

For details of Year 1 and 2 modules, please go to page 15. In addition to the mandatory modules detailed above, you can choose from a wide range of optional modules in Years 3 and 4.



## MEng Ship Science/Naval Architecture (UCAS code J642)

This programme provides a detailed insight into core naval architecture subject areas, such as resistance and propulsion, maritime structures, manoeuvring, hydrodynamics and materials. Computing and Computer Aided Design (CAD) also feature strongly throughout the course. In Years 3 and 4, the mandatory modules in ‘Management’, ‘Marine law’ and ‘Marine safety and environmental engineering’ broaden your knowledge and expertise in subject areas that are particularly relevant for the Chartered Engineer.

Typical projects have, in the past, looked at designs for a trimaran, an autonomous underwater vehicle and a quadromaran.

Year 3	Year 4
Mandatory modules:	Mandatory modules:
Advanced naval architecture	Advances in resistance and propulsion
Management II	Marine law
Manufacturing with metals	Marine safety and environmental engineering
Marine craft concept design	Maritime fluid-structure interaction
Marine hydrodynamics	Structural integrity
Marine propulsion engineering	Group Design Project (GDP)
Ship control systems	
Theory of plate structures	
Individual project	
+optional modules: typical examples are listed on page 23	+optional modules: typical examples are listed on page 23

### Programme structure

For details of Year 1 and 2 modules, please go to page 15. In addition to the mandatory modules detailed above, you can choose from a wide range of optional modules in Years 3 and 4.



## MEng Ship Science/Naval Engineering (UCAS code H500)

This programme has been designed in collaboration with the Royal Navy and focuses on the analysis and specification of marine engineering systems used on board ships and other marine structures. It offers excellent preparation for a career as a seagoing engineering officer or the wider defence industry.

Year 3	Year 4
Mandatory modules:	Mandatory modules:
Management II	Advanced electrical systems
Manufacturing with metals	Instrumentation for marine engineering
Marine craft concept design	Main engine systems
Marine propulsion engineering	Marine auxiliary system design
Naval hydrodynamics	Marine law
Power transmissions and vibrations	Marine safety and environmental engineering
Ship control systems	Sensors and signal processing for condition monitoring
Theory of plate structures	Group Design Project (GDP)
Individual project	
+ optional modules: typical examples are listed on page 23	+ optional modules: typical examples are listed on page 23

### Programme structure

For details of Year 1 and 2 modules, please go to page 15. In addition to the mandatory modules detailed above, you can choose from a wide range of optional modules in Years 3 and 4.





## MEng Ship Science/Yacht and Small Craft (UCAS code J643)

This programme provides an opportunity to specialise in the analysis, design and performance of yachts, small craft and other high-performance vessels. Materials-related modules are an essential part of this programme due to the wide range of materials used in the design of yachts and small craft. Staff from the University's Wolfson Unit contribute to the 'Sailing yacht design', and 'Yacht experimental techniques' modules. In Years 3 and 4, the mandatory modules in 'Management', 'Marine law' and 'Marine safety and environmental engineering' broaden your knowledge and expertise in subject areas that are particularly relevant to the Chartered Engineer.

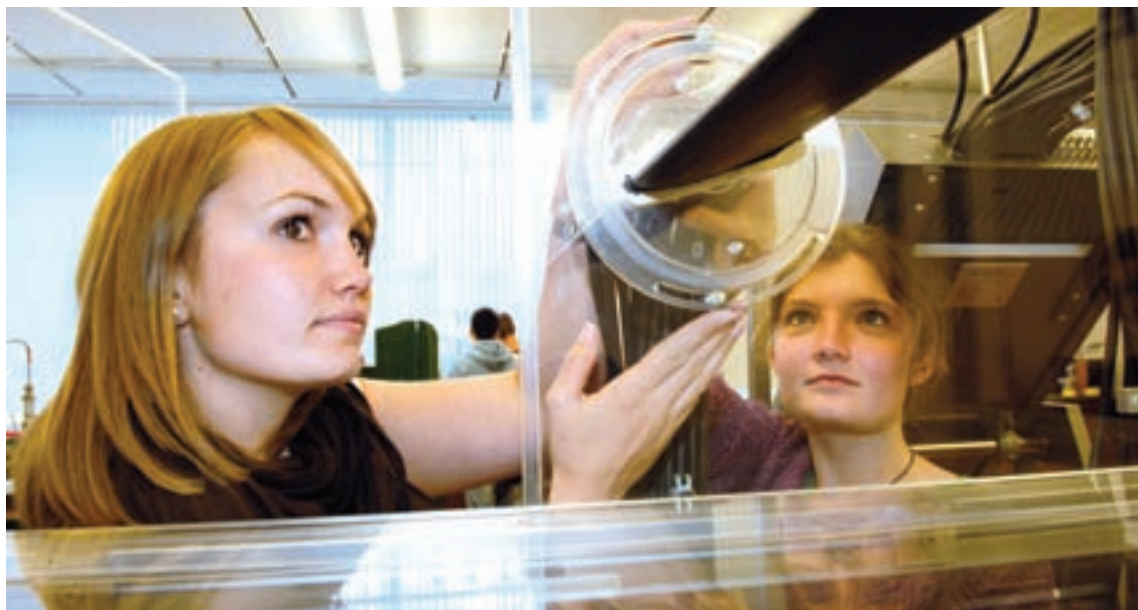
Typical projects have, in the past, looked at designs for an experimental yacht platform, Weymouth speed week craft, a quiet hovercraft, and a novel keel design for the America's Cup.

Year 3
Mandatory modules:
High performance craft
Management II
Manufacturing with metals
Marine craft concept design
Marine hydrodynamics
Powercraft, performance and design
Ship control systems
Theory of plate structures
Individual project
+ optional modules: typical examples are listed on page 23

Year 4
Mandatory modules:
Marine law
Marine safety and environmental engineering
Sailing yacht design
Structural integrity
Yacht experimental techniques
Group Design Project (GDP)
+ optional modules: typical examples are listed on page 23

### Programme structure

For details of Year 1 and 2 modules, please go to page 15. In addition to the mandatory modules detailed above, you can choose from a wide range of optional modules in Years 3 and 4.



## Engineering Foundation Year (UCAS code H008)

Talented applicants who do not have suitable qualifications in Mathematics and/or Physics for direct entry onto the three-year BEng or four-year MEng programmes may wish to apply for a preliminary Engineering Foundation Year.

This additional year of study is aimed specifically at:

- students taking A levels that do not include Mathematics and Physics
- students taking other Level 3 qualifications, such as BTEC National Diplomas or Certificates
- students from UK regions that use different qualifications from A levels
- mature students without recent formal qualifications
- students from outside the UK whose qualifications are not formally recognised by the National Recognition Information Centre.

The same Foundation Year course is taken by students from all Engineering Schools at Southampton. Prospective

students apply for the Foundation Year through the Universities and Colleges Admissions Service (UCAS) in the same way as all other applicants. University accommodation is available to Foundation Year applicants on the same terms as all other students.

Further information on the Foundation Year is available at: **[www.esm.soton.ac.uk/foundation/EFY.html](http://www.esm.soton.ac.uk/foundation/EFY.html)**

If you have any specific queries, please contact the Foundation Year Course Director on +44 (0)23 8059 3113 or email: [foundyr@soton.ac.uk](mailto:foundyr@soton.ac.uk)

## Typical optional modules – primarily taken in Year 3

Language
Various language options offered by the Centre for Language Study
Law
Industrial law I
Industrial law II
Mathematics
Complex variables and transform methods
Operational research
Optimisation
Partial differential equations
Ship Science
Advanced naval architecture
Finite element analysis
Heat transfer
High performance craft
Human factors in engineering
Marine propulsion engineering
Materials service performance
Powercraft performance and design
Power transmission and vibrations
Ship control systems
Theory of plate structures
Vibration measurement
Availability of modules is dependent on timetabling

## Typical optional modules – primarily taken in Year 4

Energy
Fuel cells and photovoltaic systems I + II
Nuclear energy technology
Renewable energy from the environment
Engineering
Advanced digital control
Advanced finite element analysis
Applications of Computational Fluid Dynamics
Biological flows
Computational Fluid Dynamics
Computational and experimental heat transfer
Computer-aided analysis
Design search and optimisation I – principles, methods and parameterisations
Design search and optimisation II – case studies
Flow control
Numerical and experimental heat transfer
Sensors and signal processing for condition monitoring
Turbulence: computation and modelling
Turbulence: physics and measurement
Materials
Composites engineering
Failure of materials
Materials for transport
Microstructural characterisation
Surface engineering
Mathematics
Numerical methods
Statistics for engineering systems
Other
Teaching and Communication and the Undergraduate Ambassadors Scheme
Ship Science
Advances in resistance and propulsion
Instrumentation for marine engineering
Maritime fluid structure interaction
Offshore mechanics and engineering analysis
Structural integrity
Yacht experimental techniques
Availability of modules is dependent on timetabling

Full details about programmes and modules are available in the Undergraduate Zone, which can be found in the student and staff resource section of our website at:

[www.southampton.ac.uk/ses/resources/ug.shtml](http://www.southampton.ac.uk/ses/resources/ug.shtml)



# Teaching excellence

We have world class ship science academics that are leaders in their field. Our staff are actively involved in the fields of ship dynamics, hydrodynamics, hydroelasticity, ship motions, manoeuvring, composite materials and structures. Many staff are also engaged in interdisciplinary research groups, including the Engineering Materials and Energy Technology (Maritime Energy) group. They are supported by researchers, technical staff and postgraduates who all make a contribution to teaching.

**Our lecture programme includes speakers from other Schools, including the Institute of Sound and Vibration Research, Mathematics, Law and Management. We also welcome visiting industrial lecturers and professors.**

Throughout your studies, you will have individual sessions with teaching staff through tutorials and laboratory classes, which are held in small groups. You will also be assigned a personal tutor who can provide guidance on academic and personal issues.

We have the best staff -student ratio of all leading UK engineering universities in this field, with over 90 academic staff and 670 full-time undergraduate students.

We use a variety of teaching methods that can include lectures, tutorials, workshops,

projects and practical sessions depending on the programme. Laboratory work, which forms an essential part of the engineering degree, provides practical opportunities to use key equipment and improve critical skills and engineering judgement. Other specialist exercises will help you to develop written and oral presentation skills using a range of learning methods.

The Engineering Design and Manufacturing Centre provides a professional engineering design service for the University and industry. The centre's staff make an essential contribution to the teaching of Computer Aided Design (CAD), Computer Aided Manufacture (CAM) and other design skills. Students also have access to powerful computing facilities in the School and across the University.

## Exchange opportunities

Here at Southampton, you will have the opportunity to spend a semester studying in Europe, Scandinavia or North America as part of your undergraduate degree. We have bilateral agreements with a number of European institutions as part of the Erasmus scheme.

Studying abroad can provide a very valuable experience of living and working in a different country. It helps students to develop independence, confidence and self-assurance. The year abroad can help you throughout your studies and could ultimately enhance your future employment prospects. The overseas section of the programme is taught in English but you will still have plenty of opportunities to improve your foreign language skills.

### Sotonclave

In industry, autoclaves are used to manufacture high-quality composite components. The purchase of a new autoclave was prohibitively expensive and a GDP was therefore set to design and manufacture a compact autoclave. The autoclave was designed and commissioned in two separate GDPs with key involvement from industry. The result was a high-quality tailored system that greatly improved manufacturing techniques available to researchers and undergraduates in the School, and attracted collaborative research with composite users. The project team acquired an in-depth understanding of design, finance and manufacturing concepts used in industry, which was particularly relevant to those studying the Advanced Materials degree programme.



### Soton Autonomous Underwater Vehicle

The Soton Autonomous Underwater Vehicle (AUV), which was designed and built by fourth-year students, won the 2007 European Student Autonomous Underwater Challenge competition. The team, which completed the work as part of a GDP, was praised for the high quality of its design.

The competition is sponsored by the MOD to develop innovative AUV technology. It attracts a large number of participants from across Europe, with funding for the design work and prize money for the winning student team. The competition encourages young engineers and scientists to think about future underwater technology as well as fostering links between students and organisations involved in AUV research.



### Trafalgar revisited

Around 200 years after the English and French fleets faced each other at Trafalgar, enthusiasts can fight the battle again thanks to a virtual marine environment developed by final-year students as a GDP. Maritime history was combined with modern advances in technology to develop a scientifically accurate computer simulation system that provides physically realistic performance comparisons of marine craft from HMS Victory to twenty-first century ocean-racing yachts. Original drawings of Nelson's flagship were used to build models that were tested in the wind tunnel and towing tank to provide new engineering data for the simulation. This information can now be used by modern tall ship designers drawing up plans for the Victory's successors.



### **Individual projects**

In addition to design-related group activities in Years 1 and 2, you will also complete an individual project (normally in the third year). This usually takes the form of a design or research exercise and involves the production of a formal report. Projects are often linked with current research activities or topics suggested by our industrial partners.

### **Group Design Projects**

In Year 4, a Group Design Project (GDP) gives you the opportunity to address real design issues that are directly relevant to industry. Many GDPs are sponsored by local industrial partners, who maintain close links with the project team throughout.

The project portfolio encompasses many emerging research fields such as maritime energy.







### **Jules Verne kite**

The application of a kite to a hull for the purpose of a round the world yacht race was a concept that had not previously been explored in detail. Project students carried out a complete investigation into the implications and requirements. The design study drew on research from a broad spectrum of fields in order to bring together information and ideas that would lead to a successful design. The product of this work was a yacht which was not only theoretically capable of high speeds, but was also predicted to be able to sustain these speeds in the weather conditions expected.

### **Reducing environmental impact**

The aim of the project was to design an inland waterway vessel which could potentially be built for use across Europe with the focus on minimising environmental impact. Project students considered how the power required to propel the vessel and power the onboard appliances could be reduced, allowing the use of smaller scale alternative propulsion systems. They also investigated the potential to minimise the wash generated by the vessel, reduction in pollutant emissions along with the selection and use of appropriate materials, appliances and manufacturing methods.

### **Safety first**

Small high-speed vessels, such as Rigid Inflatable Boats (RIBs), are currently designed to meet performance criteria such as speed, payload, strength and other factors. Over the past few years, the design of new craft has become ever more sophisticated and these boats are now capable of very high speeds (around 60 knots). These speeds, combined with operation in rough water, can expose the crew to high levels of shock loading that can lead to injury. Long transits on these boats in waves can also result in crew fatigue and reduced performance.

Students from Southampton developed a method to enable small, high-speed boats to be designed with crew safety and performance as the criteria from the outset. The project involved experimental testing of different boats in a towing tank, comparison of the measured data with predictions from a computer simulation and testing of a real, full-scale RIB in rough conditions.

The data were combined with models of human performance to determine crew performance and safety limits and produce the new design method. The project directly ties in with research being funded by the Engineering and Physical Sciences Research Council. The results, which are already being used in this research, were presented at an international conference prior to completion of the project



“My reason for choosing Ship Science at University of Southampton is probably different from most other fellow students, who are into sailing sports. My hometown, Haugesund, on the south west coast of Norway, has strong shipping roots. I was fascinated by the enormous vessels sliding through the slipway, and decided that I wanted to learn everything needed to make such a vessel make such an entrance into the water.

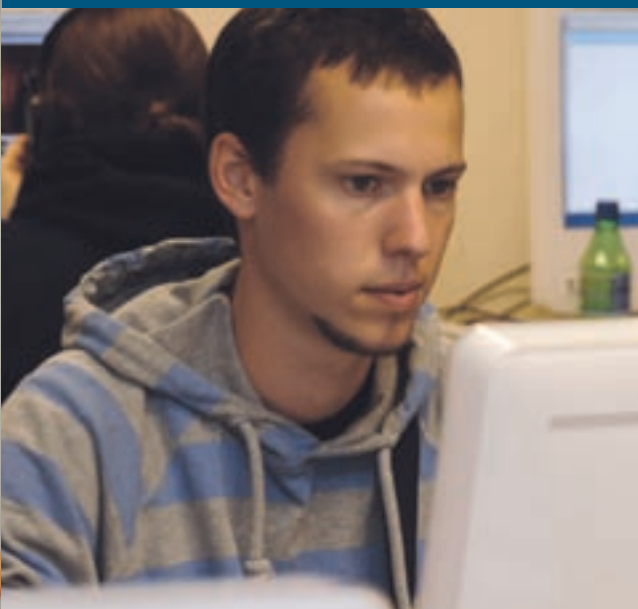
There is a good relationship between the students and lecturers in Ship Science, and staff are really helpful in answering any questions you may have about the course. I took up the opportunity to spend the summer at a ship design consultancy office and was pleased to discover that I could apply the knowledge I had gained from lectures. Although the course is quite tough, and requires a lot of dedication and strong will, it is very enjoyable and when I graduate it will be one of my greatest achievements!”

**Jorunn Seglem** | 4th year Ship Science Student



“I chose Southampton for its good reputation. The Ship Science degree has given me the skills and the confidence to follow any career in the marine industry. On graduation, I joined A P Moller-Maersk in Copenhagen.”

**Oscar Hellstrom** | MEng Ship Science/Yacht and Small Craft graduate | 2007



“The course was an ideal launch pad for a career in the marine industry. Its excellent worldwide reputation led me straight to a job with Seaspeed Marine Consulting, where I have had the chance to work on a wide range of international projects.”

**Daniel Hook** | MEng Ship Science graduate | 2002

“The quality of the teaching (both lectures and tutoring) ultimately enabled me to build an enjoyable career. I also thoroughly enjoyed my final-year group project, which provided a good base for moving into industry.”

**Rhys Bowen** | MEng Ship Science graduate | 2005 – Engineering Consultant | White Young Green Specialist Structures







# International students

**The School of Engineering Sciences welcomes international students and boasts a warm, friendly and multicultural community. We have a dedicated International Tutor, who will be happy to answer any questions you may have about studying and living in Southampton.**

We run an induction programme for international students, which takes place in September before the beginning of the academic term. This provides an excellent opportunity for students to meet and socialise and to find out more about the University and their degree programme.

The University and Southampton city have many vibrant communities from all over the world. Celebrations such as Chinese New Year and Diwali bring together students, staff and residents from across the city.

The University's International Office can assist you with any queries before you apply and during your studies. Staff from the International Office can also provide you with details of forthcoming exhibitions that they will be attending in your country. For further details, please go to: [www.southampton.ac.uk/international](http://www.southampton.ac.uk/international)

If you have any questions about our programmes, or studying or living in Southampton, please get in touch:

#### **Before you apply**

International Enquiries:  
Email: [global@soton.ac.uk](mailto:global@soton.ac.uk)  
Tel: +44 (0)23 8059 9699

EU Enquiries:  
Email: [ugship@soton.ac.uk](mailto:ugship@soton.ac.uk)  
Tel: +44 (0)23 8059 2840

#### **After you apply**

All enquiries:  
Email: [ugship@soton.ac.uk](mailto:ugship@soton.ac.uk)  
Tel: +44 (0)23 8059 2840

# Applications & offers

A-Levels	AAB, including mathematics and physics (general studies not accepted), plus GCSE English Language Grade C
International Baccalaureate	36 points overall (18 at Higher Level to include Mathematics and Physics, Standard Level 5 English)
European Baccalaureate	85% overall 85% in Mathematics (Level 5) and Physics 70% English
French Baccalaureate	15/20 overall 15/20 Mathematics 15/20 Physics 14/20 English

## How to apply

All applications should be made through UCAS. We welcome candidates from diverse backgrounds and accept a range of different qualifications from the UK/European Union and overseas. For further details, please go to: [www.ucas.com](http://www.ucas.com)

While the average entry level onto our degree programmes is among the highest in the UK, we always look carefully at each individual application. In addition to your examination grades, we also take into account your personal statement and references. These give us an indication of your personal attributes and your enthusiasm for your chosen area of study.

## Entry requirements

Typical entrance requirements for A level students are: AAB.

Our key aim is to ensure that you have the potential to meet the challenges of our degree programmes. You should have A levels in Mathematics and Physics plus a further subject (General Studies is excluded). GCSE English Language at grade C or above is also required.

We are always happy to receive applications from candidates with equivalent qualifications. If you are unsure about our entry criteria, please contact our admissions staff who would be happy to provide advice in advance of your application.

## English Language requirements

If your first language is not English, we need to ensure that your listening, written and spoken English skills would enable you to enjoy the full benefit of your studies. For entry onto our programmes, you will need an International English Language Testing System (IELTS) score of 6.5 or an equivalent qualification.

## Deferred entry

You may choose to defer entry to obtain industrial work experience, work overseas, travel or simply earn some money and we can accommodate these requests. You should still apply for a place at University during your final year in school or college and indicate that you wish to defer entry on your application form. It is often possible to defer at a later stage, but please let us know as early as possible. We recommend that you plan your year out positively to make the most of the opportunity and broaden your experience.

# Southampton at a glance

## – World-class reputation

The University of Southampton is one of the UK's top 10 research universities with a global reputation for leading-edge research and innovation. We are ranked in the top 80 universities in the world – one of only 19 UK universities to make the top 100 in the World University Rankings (The Times Higher Education Supplement 2007).

## – Engineering excellence

Southampton is the UK's leading university for engineering with a world-renowned reputation for the quality of research and teaching. The School scored highly on the 2008 Research Assessment Exercise for its range and quality of research.

## – First-class teaching

Southampton has a long-standing reputation for excellent teaching and the School of Engineering Sciences has achieved consistently high marks in national assessment exercises. Our degrees provide a vast breadth of study, enabling graduates to pursue a wide variety of careers in engineering and other professions.

The School of Engineering Sciences has been awarded an ExxonMobil Award in recognition of 'excellence' in engineering teaching by the Royal Academy of Engineering. We were also awarded the Royal Academy of Engineering's first ever prize for 'Innovation in Education'.

Ship Science at Southampton is ranked in third place nationally in The Guardian University Guide 2009\*.

\*Mechanical Engineering, subject group category includes ship Science.

## Excellent career prospects

Southampton graduates are highly sought after by leading employers in the engineering sectors. Many work in high-profile roles in organisations such as BAE Systems, British Maritime Technology, the Defence Science and Technology Laboratory (Dstl)/MOD, Carnival Corporate Shipbuilding, Lloyd's Register and QinetiQ. Others embark on postgraduate courses at Southampton and other Universities, to further enhance their knowledge and skills.

In a survey of Ship Science graduates from 2007, 100 per cent of respondents who were available to work had secured employment or were undertaking further study within six months of graduation.

## – Outstanding facilities

Continued investment (£200 million over four years) in development ensures that our students benefit from world-class facilities that make Southampton one of the best learning environments in the UK. In the latest National Student Survey, we were ranked fifth overall for the provision of learning resources – including libraries, IT and specialised equipment and facilities.







#### – **Fantastic location**

Situated on England's south coast in the heart of Hampshire, the University of Southampton enjoys an outstanding location, just over one hour from central London and Heathrow Airport, and within easy reach of open countryside.

Southampton is one of the leading cultural and leisure destinations in the south of England. The city is also close to many places of interest, including the New Forest National Park, coastal resorts such as Bournemouth and Poole, and the ancient cities of Winchester and Salisbury. Southampton has excellent transport links across the UK and to mainland Europe (via the city's international airport).

#### – **Excellent accommodation**

The University of Southampton is one of the largest providers of accommodation in the university sector, with more than 5000 places in 20 halls of residence. We offer high-quality accommodation at competitive prices and a range of options tailored to students' needs.

All first-year students are guaranteed a room in halls provided that certain conditions are met\*. For international students, this guarantee applies to the full duration of your degree programme.

\*please go to the accommodation section of our website for further details:  
[www.southampton.ac.uk/accommodation](http://www.southampton.ac.uk/accommodation)

#### – **Superb sports facilities**

Southampton boasts some of the best sporting facilities of any UK university, including an £8.5 million indoor sports complex, with an Olympic-sized swimming pool, 160 fitness stations and an eight-court badminton sports hall. The University has a 76-acre outdoor site with pitches for hockey and football, and floodlit tennis courts.

The university offers a sports bursary scheme, please go to [www.sportrec.soton.ac.uk](http://www.sportrec.soton.ac.uk) for further information.

#### – **A great social life**

Our Students' Union ([www.SUSU.org](http://www.SUSU.org)) features bars, restaurants, a travel centre, a hair and beauty salon, banks, a nightclub, a 330-seat cinema and a regular campus market. SUSU runs a varied programme of events – from live music and karaoke through to club nights and comedy. Our campuses also have internationally acclaimed arts venues, including a concert hall, two art galleries and one of the south of England's leading theatres.

The city of Southampton has a vibrant mix of funky bars, nightclubs, restaurants, cafés, cinemas, arts and sporting venues. Southampton is also home to one of the UK's top 10 shopping outlets.

#### – **A cosmopolitan university**

The University has more than 3000 European Union and international students from 130 countries. We provide a range of support for international students, including a one-week welcome programme and a 'Meet and Greet' service from London Heathrow Airport at the start of the academic year. We are one of the few UK universities to offer accommodation to international students for the full duration of their studies.

# Visit us

If we decide to offer you a place on one of our programmes, you will be invited to visit the University and the School. During this visit, you will meet with a member of our academic staff to discuss the offer in an informal setting and explore how your interests and aspirations fit with the course. This meeting also gives us the opportunity to get to know you.

You will also have the opportunity to meet some of our current students who will show you around our facilities and the main campus. This provides an excellent chance to ask questions about the University, the School, our programmes and student life at Southampton.

If you are an overseas student, you are very welcome to visit us but we realise that this may be difficult for practical reasons. A formal written offer will therefore be sent to you.

## By road to Southampton

M3 – exit the M3 at junction 14, following signs for Southampton (A33). Follow the A33 into Basset Avenue and follow the map/signs to University campuses.

The M27 (west or East) – leave the M27 at junction 5 (Southampton airport) and follow the map/signs to University campuses.

## By rail

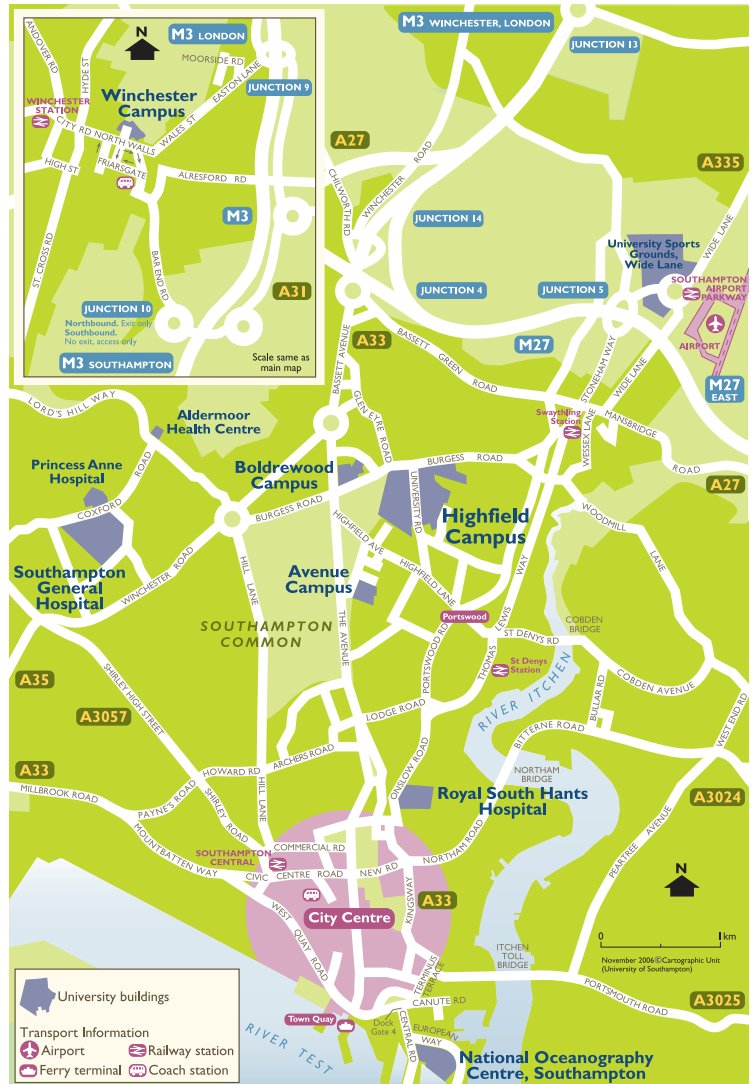
Fast trains from London and Bournemouth/Weymouth stop at Winchester, Southampton Central and Southampton Airport Parkway. Trains from Portsmouth and Bristol/South Wales stop at Southampton Central. Slow trains from London and Bournemouth/Weymouth also stop at Swaythling station (five minutes' walk from Connaught, South Stoneham and Montefiore halls of residence).

## By coach

Southampton coach station is at Western Esplanade in the city centre. Uni-link buses connect the University's Southampton campuses and the city centre.

## By air

Southampton International Airport is a short journey from the Southampton campuses by bus or taxi. The airport runs domestic flights in and around the UK and flights to mainland Europe and the Channel Islands.



## Contact us

For further details about our programmes, staff, facilities and research, please take a look at the School of Engineering Sciences website at: [www.southampton.ac.uk/ses](http://www.southampton.ac.uk/ses)

To find out more about the University of Southampton, please go to: [www.southampton.ac.uk](http://www.southampton.ac.uk)

If you have any queries, please contact our Undergraduate Admissions Office by email, phone, fax or post:

Ship Science Undergraduate Admissions  
School of Engineering Sciences  
University of Southampton  
Highfield  
Southampton  
SO17 1BJ

Telephone: +44 (0)23 8059 2840

Fax: +44 (0)23 8059 5167

Email: [ugship@soton.ac.uk](mailto:ugship@soton.ac.uk)

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We have the best staff-student ratio of all leading UK engineering universities in this field, with over 90 academic staff and 670 full-time undergraduate students.

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This brochure is prepared well in advance of the academic year to which it relates and the University offers the information contained in it as a guide only. While the University makes every effort to check the accuracy of the factual content at the time of drafting, some changes will inevitably have occurred in the interval between publication and commencement of the relevant academic year. You should not therefore rely solely on this brochure and go to: [www.southampton.ac.uk/ses](http://www.southampton.ac.uk/ses) for up-to-date information on fees, programme content and entry requirements for the current academic year.

You should also consult the University's prospectus or go to: [www.southampton.ac.uk/inf/termsandconditions.html](http://www.southampton.ac.uk/inf/termsandconditions.html) for more specific details of the limits of the University's liability in the event of changes to advertised courses/programmes and related information.

### Alternative formats

This information is available, on request, in alternative formats, such as electronic, large print, Braille or audio tape and, in some cases, other languages. To request a copy, please contact the School on +44 (0)23 8059 2840



[www.southampton.ac.uk/ses](http://www.southampton.ac.uk/ses)

UK and EU enquiries:

[ugship@soton.ac.uk](mailto:ugship@soton.ac.uk)

+44 (0)23 8059 2840

International enquiries:

[global@soton.ac.uk](mailto:global@soton.ac.uk)

+44 (0)23 8059 9699