



Undergraduate Study
Marine Sciences

Why study marine sciences?

Marine sciences is a research area of global importance in the twenty-first century, with issues such as climate change, biodiversity loss, ocean acidification and marine species invasion challenging society's expertise and capabilities.

The seas and oceans play an increasingly important role in our lives: they play a significant part in regulating our global climate and they influence weather patterns; we use them for tourism, leisure and transportation; and they are a vital source of food, minerals and materials. We also look increasingly to the oceans for new sources of energy, and for compounds with pharmaceutical or biotechnological applications.

Our use of the oceans is not without cost. Impacts include habitat and biodiversity loss, climate change, sea-level rise, pollution and over-exploitation of resources. Sustainable management of this precious ecosystem requires skill and sensitivity. There is therefore a great need for competent scientific and managerial professionals with expertise in this area.



Marine Sciences at Newcastle

Newcastle University enjoys a long-standing reputation for providing excellent degrees on the study of the animals and plants inhabiting our oceans, and their interaction with their physical and chemical environment.

The School of Marine Science and Technology is the UK's first marine school to provide a single base for all education, innovation and research related to the sea. Annually, more than 300 students from around 40 different countries register for accredited degrees in the School.

We offer the following three-year BSc degrees in marine science:

- Marine Biology
- Marine Biology and Oceanography
- Marine Zoology

Our degrees build on a basic foundation of biological knowledge and allow you to specialise in the area that interests you the most. While there are some modules common to all three degrees, the different range of topics covered in each will determine the specialist pathway you follow.

Each of these degrees will enable you to contribute to a greater understanding of the scientific issues related to marine sciences, and to follow careers that pioneer managerial and technological solutions to modern marine science challenges.

Top: A student diving during their overseas expedition.
Below: Undergraduate students sampling for crabs on a field trip.

Excellent teaching

We are committed to providing students with the highest levels of teaching and pastoral care. All of our academic staff are active at the forefront of marine research and this is reflected in their teaching, ensuring it is dynamic and relevant.

Accreditation

Our Marine Biology degree was the first undergraduate marine sciences programme in the UK to achieve professional accreditation from the Institute of Marine Engineering, Science and Technology (IMarEST). We are delighted that the high standard of this degree has been recognised and acknowledged. On graduating, in addition to your degree, you will have a professional qualification which, with further work experience, will enable you to achieve chartered status. For more information about IMarEST, visit www.imarest.org



Name: Victoria Dallas

Course: Marine Biology BSc Honours

What made you choose Newcastle University?

I chose Newcastle because it offers a great location for marine sciences students, being only 30 minutes away from the coast. There are great facilities within the School, including a research laboratory right on the beach and their own research vessel, to give you hands-on experience. As a red-brick university, it also has a really good reputation.

What has been the best part of your course?

During the summer vacation between Stages 2 and 3, everyone has to go on an overseas project to carry out research. I went to Trinidad and Tobago in the West Indies, volunteering in turtle conservation and a community education project. Others on my course went to the USA, the Antarctic, Thailand and Egypt.



The Dove Marine Laboratory at Cullercoats.

Facilities

Our undergraduates benefit from excellent facilities on campus including specialised laboratories and state-of-the-art recirculation aquaria within the School of Marine Science and Technology.

We have our own field station, the Dove Marine Laboratory, situated on Cullercoats Bay just nine miles from campus, from which students explore local habitats. Our aquaria, at Cullercoats and on the main campus, ensure that you are able to study live marine organisms at first hand.

The University also has its own state-of-the-art research vessel, which can be used by marine sciences students at each Stage of their chosen degree programme. We place great emphasis on seagoing experience for our students and this is reflected by the high number of training hours you will receive on our boat.

The degree programmes are also well resourced by the University's central services, such as our extensive computing facilities and the University Library Service, which has been awarded the government's Charter Mark for excellent customer services five times in a row.

Our current research vessel, which is used by undergraduate students.



Throughout the degree there is a strong emphasis on the use of the Dove Marine Laboratory, which is an excellent resource, especially when undertaking your research project in your final year. It has several labs, wireless computer access, lecture rooms and an aquarium, which undergraduate students routinely use.)

Christian Butler
Marine Biology BSc Honours

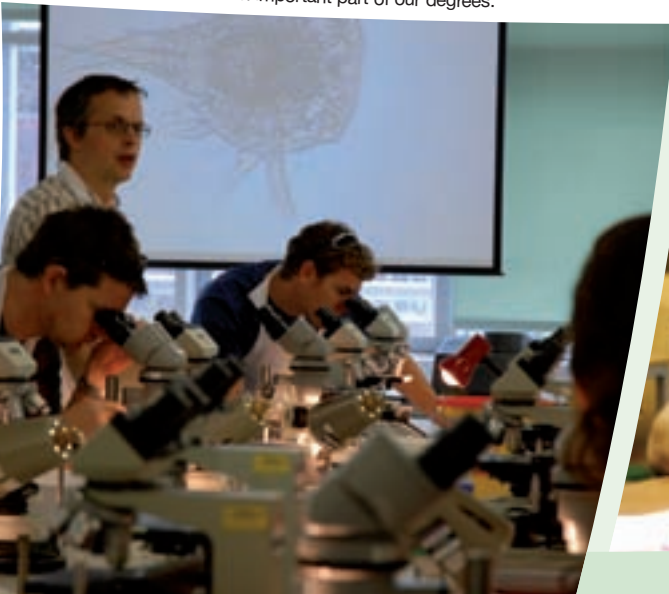
Overseas opportunities

As part of your final year you undertake an overseas field course expedition, the exact location and nature of which will depend on which degree you decide to follow. This is an exciting opportunity to experience new cultures, to network with scientists in other marine institutions, and to see at first hand the diversity of marine life in another country. The expedition will also broaden your appreciation of the spectrum of marine careers available to you around the world.

UK fieldwork

Students will have the opportunity to undertake diverse fieldwork in the UK, including an intensive residential field course, which proves to be a very popular part of the degree programme.

Laboratory work is an important part of our degrees.



Careers

The quality of marine sciences teaching at Newcastle is widely recognised by employers, and our graduates have high success rates in securing jobs in the UK as marine environmental consultants, working on monitoring and policy with organisations such as the Environment Agency and Natural England, or as fisheries scientists with organisations such as the Centre for Environment, Fisheries and Aquaculture.

Our graduates can also develop their careers internationally, for example, following marine professions related to coral reef conservation, researching the strategies for sustainable artisanal fisheries, or in aquaculture development projects in the tropics.

For those who decide not to follow a marine-related career there are excellent opportunities in a wide variety of career paths, as you will be equipped with an extensive set of transferable skills. Careers available to you may include: teaching; the armed forces; management in retail, health or industrial sectors; and many more.





Degree structure

Our degree programmes are based on three themes: marine organisms; marine ecology; and oceanography. You will be guided in the use of current literature, and use a small-group approach to technical and practical training.

At Stage 3 you will take an advanced study module covering the most exciting and cutting-edge research in marine sciences. Study modules centre on the research interests of academic staff and include opportunities for interaction with professional marine biologists from outside the University.

Core skills modules at Stage 3 will include topics of national and international importance, such as environmental impact assessment, modelling the marine ecosystem, and the application of molecular techniques in bio-fouling control.

Another major component of this Stage is the research project, which is an individual scientific investigation of your own choosing. Conducted under the supervision of a member of academic staff, your project forms one third of your final-year marks. Facilities at the University's Dove Marine Laboratory and on board our research vessel are well used by students during their projects.

Teaching and assessment

Modern marine scientists must be competent in a range of laboratory, coastal field survey and offshore techniques, and you will receive training in all aspects of these. Teaching is by a combination of lectures, tutorials, seminars and practical classes. Assignments and projects form part of the assessed work, promoting individual initiative and presentation skills, and contributing to your results at each Stage of your degree.

Graduates must be able to handle numerical data confidently and prepare written reports, so great importance is attached to the development of these skills. Modules in statistics and data management are introduced early to enable you to use these techniques with confidence in your final year.

Fieldwork is a very important element and during Stage 1 you will spend time gaining experience of diverse environments, as well as learning observational and experimental techniques. During Stage 2, you will spend a substantial component of time based at the Dove Marine Laboratory building on and developing these fieldwork skills. All of our students undertake an intensive residential field course within the UK to refine these techniques further. You will also undertake an intensive sea survival course.

Marine Biology BSc Honours

UCAS code C161

Marine biology is the study of life in the oceans and salt-water environments of earth. The majority of the world's organisms are found in the oceans and range from the smallest micro-organisms to the largest invertebrates (giant squid) and mammals (blue whales). These life forms occupy 95 per cent of the biosphere of our planet, living in conditions from the polar seas (below -2°C) to deep-sea hydrothermal vents (greater than 100°C).

This degree programme will equip you with an understanding of the biology and ecology of the full spectrum of organisms from bacteria to plants and animals. The programme also considers our relationship with the marine environment and how sustainable management of marine resources can be achieved.

Please note: In each Stage you complete modules to the value of 120 credits. The credit value of each module is given in brackets.

Stage 1

Biodiversity of marine animals (20) gives a basic grounding in the rich diversity of invertebrate and vertebrate animals that inhabit our oceans – their biology, function and taxonomy.

Oceanography and marine ecology (20) introduces you to a wide range of ecosystems and habitats from coral reefs to deep seas, and the physical and chemical processes that regulate them.

Field and laboratory techniques (20) equips you with the essential practical skills you will need to approach a study of marine biology, and in your subsequent professional career.

Marine microbiology and primary producers (20) covers the biology of the plants, algae and cyanobacteria which provide the foundation of almost all marine food webs.

Research skills (20) equips you with the information sourcing and analytical techniques necessary to study marine biology to degree level. Scientific writing, oral presentations and data handling skills are included.

Optional modules (20) chosen from: Introduction to marine environmental engineering (10); Introduction to animal behaviour (10); Marine zooplankton (10).

Stage 2

Tropical marine environments and ecology (10); Marine fouling and larval ecology (10); Marine pollution (10); Marine and coastal habitats (20); Marine practical skills (20); Fisheries biology and aquaculture (10); Experimental design and statistics (10).

Optional modules (30) chosen from: Animal physiology (10); Coastal management (10); Biological oceanography (10); Animal development (10); Life in extreme environments (10); Marine vertebrates (10); Biogeochemistry of estuaries and coastal seas (10).

Stage 3

Marine biology core activities (including overseas experience, UK residential field course and Environmental Impact Assessment training) (40); Research project (40); Advanced marine biology (20).

Optional modules (20) chosen from: Reproduction and life histories (10); Marine systems ecology (10); Marine biogeochemistry (10).

Marine Biology and Oceanography BSc Honours

UCAS code CF17

This degree will develop your knowledge of marine biology and ecology. It also focuses on the interaction of the marine biological system with the chemistry and physics of the oceans, as well as the ocean–atmosphere interactions that drive climate change regionally and globally.

By combining a study of oceanography with marine biology you will gain a deeper understanding of ocean currents, waves and the fluxes of various chemical substances and physical properties within the ocean and across its boundaries. You will also study the role biological organisms play in these important processes, and in energy and biomass transfer through the ocean system.

The broad range of skills and research approaches you will encounter are highly prized by many different employers outside marine science, as well as being increasingly important for subject-specific career paths.

Please note: In each Stage you complete modules to the value of 120 credits. The credit value of each module is given in brackets.

Stage 1

Biodiversity of marine animals (20) gives a basic grounding in the rich diversity of invertebrate and vertebrate animals that inhabit our oceans – their biology, function and taxonomy.

Oceanography and marine ecology (20) introduces you to a wide range of ecosystems and habitats from coral reefs to deep seas, and the physical and chemical processes that regulate them.

Field and laboratory techniques (20) equips you with the essential practical skills you will need to approach a study of marine science, and in your subsequent professional career.

Marine microbiology and primary producers (20) covers the biology of the plants, algae and cyanobacteria which provide the foundation of almost all marine food webs.

Research skills (20) equips you with the information sourcing and analytical techniques necessary to study marine biology to degree level. Scientific writing, oral presentations and data handling skills are included.

Introduction to marine environmental engineering (10) provides an appreciation of the complexities and problems associated with introducing man-made structures into the marine environment and how technological developments can lead to sustainable resource exploitation and scientific discovery.

Marine zooplankton (10) covers the range of taxonomic groups, life history strategies and feeding ecologies of zooplankton organisms, and highlights their important ecological role.

Stage 2

Biological oceanography (10); Biogeochemistry of estuaries and coastal seas (10); Marine pollution (10); Marine and coastal habitats (20); Marine practical skills (20); Fisheries biology and aquaculture (10); Experimental design and statistics (10).

Optional modules (30) chosen from: Life in extreme environments (10); Marine vertebrates (10); Tropical marine environments and ecology (10); Marine fouling and larval ecology (10).

Stage 3

Marine biology and oceanography core activities (including overseas experience, UK residential field course and Environmental Impact Assessment training) (40); Research project (40); Advanced marine biology and oceanography (20).

Optional modules (20) chosen from: Reproduction and life histories (10); Marine systems ecology (10); Marine biogeochemistry (10).

Marine Zoology BSc Honours

UCAS code C350

This course focuses on the biology and natural history of marine animals, from the function of single cells to the complex social interactions of populations.

Emphasis is placed on the evolution, classification, physiology and behaviour of key species and groups, as well as the biochemical and biophysical interactions and adaptations within a diverse range of marine environments.

Marine zoologists seek to discover the fundamental principles that underpin animal life in the oceans focusing on the diversity, function and evolution of animals. The discipline can thus provide the scientific basis for our knowledge both of the creatures with whom we share this planet and of ourselves. You will learn about biodiversity in marine animals including invertebrates, fish and mammals, and how marine organisms function internally (including respiratory and reproductive physiology). The skills and knowledge that you gain in this degree can be applied to the study of animals in any environment should you wish to diversify in your career after graduation.

Please note: In each Stage you complete modules to the value of 120 credits. The credit value of each module is given in brackets.

Stage 1

Biodiversity of marine animals (20) gives a basic grounding in the rich diversity of invertebrate and vertebrate animals that inhabit our oceans – their biology, function and taxonomy.

Oceanography and marine ecology (20) introduces you to a wide range of ecosystems and habitats from coral reefs to deep seas, and the physical and chemical processes that regulate them.

Field and laboratory techniques (20) equips you with the essential practical skills you will need to approach a study of marine science, and in your subsequent professional career.

Research skills (20) equips you with the information sourcing and analytical techniques necessary to study marine biology to degree level. Scientific writing, oral presentations and data handling skills are included.

Marine zooplankton (10) covers the range of taxonomic groups, life history strategies and feeding ecologies of zooplankton organisms, and highlights their important ecological role.

Plus: Introduction to animal behaviour (10); Introduction to genetics (10); Cell biology (10).

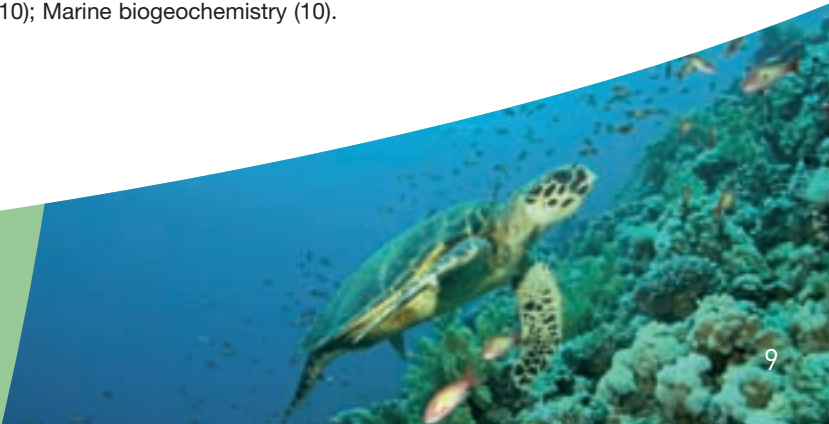
Stage 2

Molecular biology and genomics (10); Marine and coastal habitats (20); Marine practical skills (20); Experimental design and statistics (10); Animal development (10); Life in extreme environments (10); Marine vertebrates (10).

Optional modules (30) chosen from: Tropical marine environments and ecology (10); Marine fouling and larval ecology (10); Marine pollution (10); Fisheries biology and aquaculture (10).

Stage 3

Marine zoology core activities (including overseas experience, UK residential field course and cladistics modelling) (40); Research project (40); Advanced marine zoology (20). Optional modules (20) chosen from: Reproduction and life histories (10); Marine systems ecology (10); Marine biogeochemistry (10).





Entrance requirements

We recognise that students will apply to our degree programmes with a range of qualifications. We consider each applicant on an individual basis, taking into account the information on your UCAS application including past academic performance and potential. The following information gives an indication of the type and level of entrance requirements, but we encourage you to contact us if you require any further details or clarification. We are happy to accept deferred entry.

A levels: BBB including Biology and preferably another science subject but excluding General Studies. Chemistry is preferred at A/AS level but is not essential. GCSE Mathematics (minimum grade B) is required.

Scottish qualifications: AABB at Higher Grade including two science subjects. Advanced Higher Biology is preferred. Chemistry is desirable at Higher Grade but not essential.

International Baccalaureate: 32 points preferably including Higher Level Biology at grade 6. Chemistry is preferred at Higher Level but not essential. Mathematics or Mathematical Studies and Chemistry are required at Standard Level grade 5 if not offered at Higher Level.

We welcome applications from students with equivalent qualifications, including Access to HE Diplomas (a module in Biological Sciences is essential), and a full range of European and international qualifications. We are also pleased to advise anyone interested with regard to choosing an appropriate preparatory course of study. Applicants studying for the BTEC National Diploma and Higher National Diplomas are advised to contact the Admissions Tutor before applying, and are considered on an individual basis.

Please note: Entrance requirements can vary from year to year, so you should check the University's website for up-to-date details.

www.ncl.ac.uk/ug/marinesciences

‘The School provides a friendly and supportive atmosphere in which to do your degree and most of the staff know you by name, which makes you feel comfortable. The University also has a huge variety of student societies and clubs, which provide a great way to meet people and through which I’ve made some of my closest friends.’

Marie-Claire Reffell
Marine Biology BSc Honours



International students

Your choice of university is an important step towards your future. You are not only choosing a programme to study, you are also choosing a place to live. Newcastle has everything you need for successful studies and enjoyable experiences. We welcome students from all over the world and are already home to around 2,500 international students from more than 100 different nations. Find out more at: www.ncl.ac.uk/international

Student finance (UK and EU)

For information on tuition fees, bursaries and scholarships please contact the Enquiries Service for a copy of our *Guide to Student Finance* or see www.ncl.ac.uk/undergraduate/finance

“The University is extremely stimulating with a vast number of opportunities, exciting people and excellent support services.”

Susan Gebbels
Marine Biology BSc Honours

Disabled students

We welcome applications from students with disabilities and this brochure is available in alternative formats on request from the Enquiries Service. Disability Support provides help and advice whilst you are at the University, and make every effort to provide a suitable learning environment for you. If you would like to discuss the facilities on campus and any specific requirements you may have, contact:

Disability Support

Telephone: (UK) 0191 222 7623
(International) +44 191 222 7623
Textphone: (UK) 0191 222 5545
(International) +44 191 222 5545
Fax: (UK) 0191 222 5539
(International) +44 191 222 5539
E-mail: disability.support@ncl.ac.uk
www.ncl.ac.uk/disability-support

Newcastle and the region

Newcastle is a fantastic city with loads to do. The University is right in the city centre, only a short walk from the main shopping area. As a student here, you are right at the heart of everything that is going on.

The surrounding countryside of Northumberland is also easily accessible and is one of the UK's best-kept secrets. A short bus, rail or road journey takes you into one of the most beautiful and historically rich areas of the country.

www.ncl.ac.uk/undergraduate/newcastle



Further information

If you have any questions about our degrees or would like to visit us before you apply, please contact:

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www.ncl.ac.uk/ug/marinesciences

To find out more about the University and its facilities, including accommodation, sports and social activities, or the city and the surrounding area, take a look at the University's website or request an *Undergraduate Prospectus* from **www.ncl.ac.uk/undergraduate**

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United Kingdom

Telephone: (UK) 0191 222 5594
(International) +44 191 222 5594
Enquire online at: **www.ncl.ac.uk/enquiries**

www.ncl.ac.uk

Visiting the University

If you would like to visit the University before you apply, our Visit Days offer subject talks, information fairs and tours of the campus and accommodation. If we make you an offer, open days for your subject area give you the opportunity to talk to current students and members of staff. You can discuss the degree programmes as well as see the University and its facilities.

www.ncl.ac.uk/undergraduate/visit

Details are correct at the time of printing (May 2009) but should be checked against the current edition of the *Undergraduate Prospectus* or the University's website. This brochure is for information and guidance purposes only.

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