

Programme Specification

Marine Biology with Oceanography (2020-21)

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided.

Awarding Institution	University of Southampton
Teaching Institution	University of Southampton
Mode of Study	Full-time
Duration in years	4
Accreditation details	N/A
Final award	Master in Science (MSci)
Name of award	Marine Biology with Oceanography
Interim Exit awards	Bachelor of Science with Honours (BSc (Hons)) Certificate of Higher Education (CertHE) Diploma of Higher Education (DipHE)
FHEQ level of final award	Level 7
UCAS code	F7C2
Programme code	8166
QAA Subject Benchmark or other external reference	Not Applicable
Programme Lead	Thomas Ezard (te1e12)

Programme Overview

Brief outline of the programme

Our Master of Biology and Marine Biology programme combines modules from the Centre for Biological Sciences (CfBS) and from the School of Ocean and Earth Science (SOES) (based at the National Oceanography Centre Southampton (NOCS)). In Southampton you will undertake a balanced (50:50 terrestrial and marine) programme where you will gain the relevant skills and knowledge for a career requiring a blend of terrestrial and marine biological expertise.

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

To assist your learning, you will be provided with an extensive programme of lectures, tutorials, problem workshops, and laboratory classes. You will also be provided with support material and also informal assistance to guide your private study.

You will be assisted to acquire transferrable and generic skills through the formal teaching programme

Practical skills are developed through the learning and teaching programme. Experimental and fieldwork skills are developed through laboratory experiments, fieldwork and project work.

Throughout the programme you are encouraged to use additional recommended reading material for private study to consolidate the formal learning process, and to broaden and deepen your understanding.

There are written examinations at the end of each semester to test your knowledge and understanding of material presented in lectures, tutorials and workshops.

Practical and transferrable work/skills are continuously assessed primarily through written reports, laboratory reports, coursework exercises, project reports and presentations

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Learning and teaching

You will develop core knowledge and understanding of subject specific and transferable key skills via compulsory modules and specialised option module lectures. Teaching and learning through the degree programmes will be supported by tutor- and student-led tutorials, seminars and presentations, essays and report writing. You will be trained to make use of peer-reviewed internet sources to support guided independent study, group study and your own research.

Experimental, research, experimental design, data processing and interpretive/analytical skills are further developed through laboratory and practical classes and fieldwork (including boatwork).

Assessment

To test your knowledge and understanding of material presented in the lectures and associated practicals, you will be assessed via a combination of written examinations, essays, group and individual oral presentations, poster presentations and short coursework assignments. Experimental, analytical and research skills are assessed through laboratory experiment write-ups, library based project work, research project reports, field notebooks, fieldwork/boatwork exercises and/or reports.

Special Features of the programme

The blend of terrestrial and marine science within this programme provides a unique series of Fieldwork/boatwork opportunities. In Part 1 you will attend a 5-day field course in Andalusia (BIOL1001) looking at both terrestrial and marine biology. In Part 2 a 7-day intertidal marine biology field course, currently held at Dale Fort in South Wales (timetabled in SOES2030), will provide for a more in-depth treatment of marine invertebrate fauna and the ecology of marine shoreline environments. You will be required to attend a 7 day residential shallow water survey techniques field course at the end of Part 2 currently in Plymouth (timetabled in SOES3051). In Part 4, you have the option to take a 10-day tropical marine biology field course, currently at the Bermuda Institute of Ocean Sciences (BIOS) in June with a possible alternative destination at the Charles Darwin Research Station, Galapagos in September.

Further information is available in the Student Handbooks and on the Academic Unit web pages: <http://www.southampton.ac.uk/oes/>. Details of the individual modules taken in each part are provided in the pathway guides.

Please note: As a research-led University, we undertake a continuous review of our programmes to ensure quality enhancement and to manage our resources. As a result, this programme may be revised during a student's period of registration; however, any revision will be balanced against the requirement that the student should receive the educational service expected. Please read our Disclaimer to see why, when and how changes may be made to a student's programme.

Programmes and major changes to programmes are approved through the University's programme validation process which is described in the University's Quality handbook.

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Educational Aims of the Programme

You will undertake a balanced programme where you will gain the relevant skills and knowledge for a career using skills developed whilst studying Biology and Marine Biology.

The aims of this programme are to provide:

- A stimulating, informed learning environment through a wide range of interesting and contemporary courses, with flexibility of choice, but allowing you to increasingly focus as you progress from level to level.
- The opportunity to develop a knowledge and understanding of living organisms at several levels of biological organisation from the molecular, through cells and whole organisms, to ecosystems; and from an evolutionary perspective.
- An understanding of terrestrial and marine biological systems and processes in theory and practice.
- Exposure to a range of terrestrial and marine biological concepts.
- The opportunity to construct individual programmes of study within a coherent framework, including advanced concepts and techniques in biological topics of your choice.
- Training in relevant laboratory and field work skills.
- An opportunity to develop a range of transferable skills (information and communication technology, team working, written and oral communication, time management, planning, data collection, analysis and presentation), and the capacity to give a clear and accurate account of the subject.
- An opportunity for you to develop the ability to think critically and to show that you can pursue independent study.
- Independent research projects on marine and terrestrial biological topics.
- An education and training suitable for a wide variety of careers and to prepare you for higher degrees and careers in marine and or terrestrial biological research.
- The capability for life-long learning, study and enquiry

Programme Learning Outcomes

Knowledge and Understanding

On successful completion of this programme you will have knowledge and understanding of:

- A1. Fundamental knowledge & understanding of biology and marine biology
- A2. Core concepts, principles, themes, terminology, and classification systems in the disciplines covered.
- A3. A more detailed knowledge and advanced understanding within subject specific options
- A4. How the chemistry and structure of the major biological macromolecules, including proteins and nucleic acids, determines their biological properties. Theory and practice of acquisition, analysis and interpretation of biological data across a range of biological applications.
- A5. Understand how the principles of genetics underlie much of the basis of modern molecular biology
- A6. How the diversity of organisms on earth evolved, and how they are identified and classified.

- A7. Use and interpretation of the outcome of a variety of statistical methods
- A8. An ability to recognise the principal coastal and oceanic marine ecosystems at global, regional and local scales.
- A9. Key biological, physical and chemical processes operating in marine ecosystems.
- A10. The types of plants and animals inhabiting marine environments and their ecological adaptations to particular physico-chemical conditions
- A11. The major attributes of the Earth environment, now and in the past.
- A12. To describe the basic physiological and other functional characteristics of marine organisms
- A13. How to relate the form and function of a marine organism to its habitat
- A14. An appreciation of the main evolutionary trends that can be found in marine species
- A15. Basic laboratory measurements.
- A16. An appreciation of the fundamental processes of phytoplankton photosynthesis and primary production in the ocean.
- A17. The main factors influencing phytoplankton production and carbon recycling in the surface ocean.
- A18. The acquisition of a basic introduction to practical methods for observing phytoplankton, quantifying their biomass and determining photosynthesis and respiration rates.
- A19. The key molecules involved in the fundamental biochemical processes occurring in living cells, including nucleic acid & protein function; gene structure and regulation.
- A20. Aspects of the cellular and sub-cellular processes of marine organisms, including cell apoptosis; damage and decay of cell components; oxidative & anaerobic metabolism.
- A21. Appreciation of these processes at a population and ecosystem-wide level, including the molecular basis of material cycles and primary production such as photosynthesis or chemosynthesis.
- A22. The principles and application of a range of molecular biological experimental research techniques to biological oceanographic studies.
- A23. Conduct a range of basic molecular biological and biochemical assays on nucleic acids and proteins and appropriately analyse laboratory data.
- A24. The distinction between and use of a range of library information and bioinformatic database services;
- A25. Basic ecological principles relating to shore ecology.
- A26. The use of keys to identify fauna and macroalgae.
- A27. How to design, plan and implement a research project based on intertidal community ecology.
- A28. An appreciation of water column sampling strategies in marine biology.
- A29. An ability to design and carry out a practical, pragmatic and effective field survey that collects quantified data suitable for statistical analysis to test a hypothesis.

Subject Specific Intellectual and Research Skills

On successful completion of this programme you will be able to:

- B1. Formulate and test hypotheses by planning, conducting and reporting a significant programme of (marine) biological research.
- B2. Use a range of (marine) biological skills to conduct experiments and/or collect observational data.
- B3. Use computer software and statistics to record and analyse data and determine their importance and validity.
- B4. Analyse critically and solve complex biological problems.
- B5. Integrate your biological knowledge base with broader biological disciplines such as development,

behaviour and evolution.

- B6. Independently integrate and critically evaluate (marine) biological data from a wide range of sources, including primary source material in ecological journals and experimentation.
- B7. Demonstrate a systematic understanding of how the boundaries of (marine) biological knowledge are advanced through research.
- B8. Conduct risk assessments concerning the use of equipment, and laboratory and field procedures.
- B9. Demonstrate broad expertise in defined areas of (marine) biology at the level of current research in the field.
- B10. Critically evaluate the data and methodology of current published research in (marine) biological sciences and present your conclusions.
- B11. Carry out literature searches and synthesis of material for written assignments.
- B12. Production of a thorough but concise scientific report describing the background, hypothesis being tested, aims/objectives of study, methodology, results, discussion of results and conclusions made from the data provided.
- B13. Plan, cost and/or produce a proposal for an advanced research project to be carried out in Part 4.

Transferable and Generic Skills

On successful completion of this programme you will be able to:

- C1. Recognise and use marine/biological/oceanographic specific theories, paradigms, concepts and principles.
- C2. Critically analyse, synthesise and summarise information, including prior research.
- C3. Collect and integrate several lines of evidence to formulate and test hypotheses.
- C4. Apply knowledge and understanding to address familiar and unfamiliar problems, including collection and documentation of marine biological/oceanographic information in the field, experimental design of field surveys and sampling programmes.
- C5. Recognise the moral and ethical issues of investigations and appreciating the need for professional codes of conduct.
- C6. Communicate effectively to a variety of audiences in written, verbal and graphical forms.
- C7. Select and use the appropriate method and means of communication for a range of different situation
- C8. Absorb and respond to a variety of information sources (e.g., textual, numerical, verbal, graphical).
- C9. Write a research proposal [MSci students only].
- C10. Appreciate issues of sample selection, accuracy, precision and uncertainty during collection, recording and analysis of data in the field and in the laboratory.
- C11. Prepare, process, interpret and present data, using appropriate qualitative and quantitative techniques, univariate and multivariate statistical analyses and computer software packages, including geographic information systems.
- C12. Develop computing and data analysis skills in a wide range of techniques
- C13. Solve numerical problems.
- C14. Critically use the Internet as a means of communication and as a source of information.
- C15. Identify individual and collective goals and responsibilities and perform in an appropriate manner
- C16. Appreciate the concepts of experimental learning in groups and team performance.
- C17. Recognise and respect the views and opinions of other team members
- C18. Evaluate performance as an individual and as a team member

- C19. Develop the skills necessary for self-managed and life-long learning (e.g. working independently, time management and organisation skills).
- C20. Identify and work toward targets for personal, academic and career development
- C21. Develop an adaptable and flexible approach to study and work

Programme Structure

The programme structure table is below:

Information about pre and co-requisites is included in individual module profiles.

Where optional modules have been specified, the following is an indicative list of available optional modules, which are subject to change each academic year. Please note in some instances modules have limited spaces available.

Part 1 (Year 1)

The following Modules are compulsory and must be taken:

Code	Module Title	ECTS	Type
SOES1008	Earth and Ocean System	7.5	Compulsory
SOES1011	Introduction to Functional Marine Biology	7.5	Compulsory
SOES1006	Introduction to Marine Ecology and Evolution	7.5	Compulsory
SOES1005	Introduction to Ocean Biogeochemistry	7.5	Compulsory
SOES1013	Key Skills for Marine Scientists	7.5	Compulsory
SOES1007	Marine Invertebrates	7.5	Compulsory
SOES1004	Physical Oceanography I	7.5	Compulsory
SOES1015	Quantitative Methods in Marine Sciences	7.5	Compulsory

Part II (Year 2)

Compulsory modules

Code	Module Title	ECTS	Type
SOES2024	Coastal and Estuarine Oceanography I	7.5	Compulsory
SOES2027	Coastal and Estuarine Oceanography II	7.5	Compulsory
SOES2030	Dale Field Marine Biology Fieldwork Skills	7.5	Compulsory
SOES2006	Phytoplankton and Primary Production	7.5	Compulsory

Part II (Year 2)

Optional modules. Choose two modules from the following list

Code	Module Title	ECTS	Type
SOES2011	Marine Vertebrates	7.5	Optional
SOES2010	Physical Oceanography	7.5	Optional
SOES2017	Marine Benthic Ecology	7.5	Optional
SOES2026	Molecular Tools for Advancing Marine Biology Research	7.5	Optional
SOES2032	Palaeobiology	7.5	Optional
GEOG2010	Introduction to Geographic Information Systems	7.5	Optional

Part III (Year 3)

The following modules are compulsory and must be taken:

Code	Module Title	ECTS	Type
SOES3013	Zooplankton Ecology and Processes	7.5	Compulsory
SOES3018	Applied Oceanography and Fieldwork	7.5	Compulsory
SOES3035	Oceanography and Marine Biology Research Training	15	Compulsory

Part III (Year 3) Optional Modules

Two Modules from the following list

Code	Module Title	ECTS	Type
SOES3009	Shelf Seas and Shelf Edge Dynamics	7.5	Optional
SOES3010	Large Scale Ocean Processes and Climate	7.5	Optional
SOES3015	Palaeoclimate Change	7.5	Optional
SOES3017	Marine Fisheries Ecology	7.5	Optional
SOES3031	Marine Molecular Biology	7.5	Optional
SOES3041	Communicating and Teaching in the Undergraduate Ambassadors Scheme	7.5	Optional
SOES3054	Marine Conservation and Policy	7.5	Optional
SOES3053	Understanding Coral Reefs	7.5	Optional
BIOL3056	Global Change Biology	7.5	Optional
GEOG3068	Biogeography	7.5	Optional

Part IV

Compulsory Modules

Code	Module Title	ECTS	Type
SOES6071	MSci Advanced Independent Research Project	30	Compulsory
SOES6074	Contemporary Topics in Oceanography and Marine Biology	7.5	Compulsory

Part IV Optional Modules

Code	Module Title	ECTS	Type
SOES6008	Deep Sea Ecology	7.5	Optional
SOES6021	Ecological Modelling	7.5	Optional
SOES6024	Seafloor Exploration and Surveying 2	7.5	Optional
SOES6051	Reproduction in Marine Invertebrates	7.5	Optional
SOES6052	Tropical Marine Biology Field Course	7.5	Optional
SOES6062	Pathogens and Disease in Marine Systems	7.5	Optional
SOES6070	Advanced Oceanography Fieldwork	7.5	Optional
BIOL6052	Advanced Quantitative Methods	7.5	Optional
ENVS6032	Geographical Information Systems for Environmental Consultants	7.5	Optional

Progression Requirements

The programme will follow the University's regulations for [Progression, Determination and Classification of Results: Undergraduate and Integrated Masters Programmes](#) or the University's regulations for [Progression, Determination and Classification of Results: Standalone Masters Programmes](#) as set out in the General Academic Regulations in the University Calendar: <http://www.calendar.soton.ac.uk/sectionIV/sectIV-index.html>

Support for student learning

There are facilities and services to support your learning some of which are accessible to students across the University and some of which will be geared more particularly to students in your particular Faculty or discipline area.

The University provides:

- library resources, including e-books, on-line journals and databases, which are comprehensive and up-to-date; together with assistance from Library staff to enable you to make the best use of these resources
- high speed access to online electronic learning resources on the Internet from dedicated PC Workstations onsite and from your own devices; laptops, smartphones and tablet PCs via the Eduroam wireless network. There is a wide range of application software available from the Student Public Workstations.
- computer accounts which will connect you to a number of learning technologies for example, the Blackboard virtual learning environment (which facilitates online learning and access to specific learning resources)
- standard ICT tools such as Email, secure filestore and calendars.
- access to key information through the MySouthampton Student Mobile Portal which delivers timetables, Module information, Locations, Tutor details, Library account, bus timetables etc. while you are on the move.
- IT support through a comprehensive website, telephone and online ticketed support and a dedicated helpdesk in the Hartley Library.

- Enabling Services offering support services and resources via a triage model to access crisis management, mental health support and counselling. Support includes daily Drop In at Highfield campus at 13.00 – 15.00 (Monday, Wednesday and Friday out of term-time) or via on-line chat on weekdays from 14.00 – 16.00. Arrangements can also be made for meetings via Skype.
- assessment and support (including specialist IT support) facilities if you have a disability, long term health problem or Specific Learning Difficulty (e.g. dyslexia).
- the Student Services Centre (SSC) to assist you with a range of general enquiries including financial matters, accommodation, exams, graduation, student visas, ID cards
- Career and Employability services, advising on job search, applications, interviews, paid work, volunteering and internship opportunities and getting the most out of your extra-curricular activities alongside your degree programme when writing your CV
- Other support that includes health services (GPs), chaplaincy (for all faiths) and 'out of hours' support for students in Halls and in the local community, (18.00-08.00)
- A Centre for Language Study, providing assistance in the development of English language and study skills for non-native speakers.

The Students' Union provides

- an academic student representation system, consisting of Course Representatives, Academic Presidents, Faculty Officers and the Vice-President Education; SUSU provides training and support for all these representatives, whose role is to represent students' views to the University.
- opportunities for extracurricular activities and volunteering
- an Advice Centre offering free and confidential advice including support if you need to make an academic appeal
- Support for student peer-to-peer groups, such as Nightline.

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:

Further details on the University's quality assurance processes are given in the [Quality Handbook](#).

Career Opportunities

- Postgraduate degrees
- Teaching
- Government agencies, e.g. British Antarctic Survey; the Environment Agency
- Global corporations, e.g. British Petroleum
- Nature Conservation Groups
- Research laboratories
- Commercial consultancies

External Examiner(s) for the programme

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 Academic Tutor in the first instance.

Please note: This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided. More detailed information can be found in the programme handbook.

Appendix 1:

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 also have to pay for:

Additional Costs

Type	Details
Clothing	<p>Description: Lab coats and safety spectacles: Marine Biology students will receive a lab coat, dissection kit and waterproof notebook during Induction. If these are lost the student must replace them at their own expense.</p> <p>Field course clothing: You will need to wear suitable clothing when attending field courses, e.g. waterproofs, walking boots. You can purchase these from any source.</p> <p>Wet Suits: You will need to purchase a suitable wet suit and associated snorkelling equipment if participating on SOES6052.</p> <p>Value Type: Approximate</p>
Field Trips	<p>SOES6052: Tropical Field Course</p> <p>This field trip is optional and open only to MSci Marine Biology and MSci Biology with Marine Biology students. Students are expected to fund their travel and to provide their own snorkelling equipment, including 3mm-thick wetsuit. The total cost is currently expected to be no more than £800-900. The department provides full board, IT and lab facilities and course-related travel whilst on Bermuda.</p> <p>Notes:</p> <p>Where a student contribution is made, invoices will be issued approximately 2 weeks prior to the start of a field course and payment will be due within 7 days.</p> <p>Dates and costs are correct at the time of going to press.</p> <p>Marine Biology and Oceanography</p> <ul style="list-style-type: none"> Marine Biology students will receive a lab coat, dissection kit and waterproof notebook during Induction. Oceanography students will receive a lab coat and waterproof notebook during Induction. <p>Insurance (travel, medical, personal property and baggage)</p> <p>Students are automatically insured whilst on University organised field courses undertaken as part of their official studies, including field.</p>
IT	<p>Data Storage: Students are expected to provide their own data storage device</p> <p>Software Licenses: Will be provided by the University where appropriate.</p> <p>Hardware: It is advisable that students provide their own laptop or personal computer, although shared facilities are available across the University campus.</p>
Stationery	<p>You will be expected to provide your own day-to-day stationery items, e.g. pens, pencils, notebooks, etc. Any specialist stationery items will be specified under the Additional Costs tab of the relevant module profile.</p>
Textbooks	<p>Where a module specifies core texts these should generally be available on the reserve list in the library. However, students may prefer to buy their own copies. These can be purchased from any source.</p>

	Some modules suggest reading texts as optional background reading. The library may hold copies of such texts, or alternatively you may wish to purchase your own copies. Although not essential reading, you may benefit from the additional reading materials for the module.
Equipment and Materials	<p>Field Equipment and Materials: For compulsory residential field courses, accommodation and travel are provided (for Independent Geology Mapping a fixed amount is provided to cover these costs for the least expensive area). You are usually expected to cover the costs of food and drink, although some courses may include meals. For optional field courses, students are asked to make a contribution to the travel and/or accommodation costs. Details are provided in the table below.</p> <p>Please note that if a field course is compulsory for your degree programme and you later move from that degree programme to one where that field course is optional, you will be charged for the cost of that field course. To provide an example: students on the MSci Marine Biology programme undertaking the field course to Bermuda will be charged the full cost of the field course if they later choose to transfer to the BSc Marine Biology degree programme.</p> <p>In addition to the field courses mentioned in this booklet, there are also one-day field courses associated with specific modules; students are expected to cover food and drink costs for these days, but transport is arranged and paid for by the department. As the department arranges transport, should students wish to make their own way to or from field courses, then they must meet these costs themselves.</p> <p>Laboratory Equipment and Materials: Laboratory equipment and consumables will be provided where appropriate. Value Type: Approximate</p>
Printing and Photocopying Costs	<p>Coursework such as essays, projects and dissertations may be submitted online. However, some items will require submission as a printed copy, including some items where it is not possible to submit online. The University printing costs for taught students are currently:</p> <p>A4 - 4p per side (black and white) or 18p per side (colour) A4 - 7p double sided (black and white) or 35p double sided (colour) A3 - 8p per side (black and white) or 35p per side (colour) A3 - 14p double sided (black and white) or 50p double sided (colour)</p> <p>Please remember that we are unable to refund any credit that has not been used by the end of your course, so please consider this when topping up your printing/copy account.</p> <p>You will be given a printing allowance towards the costs of printing lecture handouts or you may choose to use digital versions only during lectures.</p> <p>The University Print Centre also offer a printing and copying service as well as a dissertation/binding service. They also provide a large format printing service, e.g. Academic posters.</p>

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.