Programme Specification

Ocean and Earth Science (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               None
Final award                          Integrated Doctor of Philosophy (iPhD)
Name of award                        Ocean and Earth Science
Interim Exit awards                 Master of Philosophy (MPhil)
                                      Postgraduate Certificate
                                      Postgraduate Diploma
FHEQ level of final award           Level 8
UCAS code                           N/A
Programme code                      4916
QAA Subject Benchmark or other      
external reference
Programme Lead                      Damon Teagle

Programme Overview

Brief outline of the programme

The Integrated PhD offers a structured PhD pathway that includes a wide choice of formal instruction, coupled with an extensive range of specialist research topics across the breadth of the subject. There is a progression from an initial emphasis on instructional modules towards full time research, supported by high quality supervision.

The integrated PhD programme is highly flexible and student-centred, allowing exit at both masters and MPhil levels according to needs and performance.

Our postgraduate research programmes are conducted under expert individual or joint supervision. Supervisors are research-active members of staff with expertise in your area of interest.

The course is particularly suitable for overseas students seeking to convert from other scientific disciplines and also those who are awarded four-year scholarships through their government or other sources. Please note that there is no funding available for this programme for UK students through the University of Southampton or NERC.
Your contact hours will vary depending on your module/option choices. Full information about contact hours is provided in individual module profiles.

**Learning and teaching**

An integrated programme with formal subject knowledge and research skills teaching, leading to an advanced research project.

**Assessment**

You will need to demonstrate satisfactory progress at the end of each year. Your supervisor will complete an annual report that takes into account how you have progressed against your agreed targets, which include training and development activities.

**Special Features of the programme**

N/A

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

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

**Educational Aims of the Programme**

The aims of the programme are to: Ocean and Earth Science (OES) is strongly committed to providing the very best learning experience to all our students in a friendly and stimulating environment. We are known nationally and internationally for our excellence in teaching and are continually improving the scope and delivery of our activities.

OES is housed in the prestigious National Oceanography Centre Southampton (NOCS). A joint venture between the University of Southampton and the Natural Environment Research Council (NERC), the Centre is one of the world’s largest institutions devoted to research, teaching and technology development in Ocean and Earth science.

Research carried out by academic staff provides direct and enthusiastic input into a challenging and stimulating teaching programme. There are also unique opportunities for you to undertake research projects with other NOC NERC scientists.

This programme is a conversion course for students with a pure science first degree and gives the appropriate background material for research or a career in Ocean and Earth science. It is designed to provide you with the knowledge and skills required for an academic career as a researcher and teacher in the Ocean and Earth sciences, or for a career as a professional scientist within the private and public sector.

The specific aims of our teaching programme are to provide you with:

- A broad knowledge of the main branches of marine science, stressing their interactions;
- In-depth training through advanced coursework and an individual research project, which may be multidisciplinary or directed towards a specific disciplinary branch;
- A broad theoretical knowledge and understanding of ocean processes in all four main disciplines of
oceanography (e.g. biological, chemical, geological and physical oceanography processes);
- A training in practical marine and Earth science research methods and application of advanced techniques both through fieldwork and laboratory work;
- A high quality and intellectually stimulating experience of learning in a supportive environment;
- Vocational training for a professional career in industries related to marine and Earth science by undertaking a number of specialist applied options and by gaining practical experience through project work;
- Communication and presentation skills through group fieldwork, seminar presentations and production of a literature review;
- The ability to interpret and critically evaluate research and scholarship in areas of Ocean and Earth science;
- The ability to conceptualise, design, implement and manage research for the generation of new knowledge, applications or understanding at the forefront of Ocean and Earth science;
- The ability to create and interpret new knowledge through original research of a quality to satisfy peer review and to merit publication;
- The capacity to present ideas, arguments and research findings effectively to a variety of specialist and non-specialist audiences.

Programme Learning Outcomes

Knowledge and Understanding

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

A1. The fundamentals of major science disciplines (chemistry, physics, biology and geology) applied to the marine and earth sciences
A2. The physics of the ocean and an understanding of the processes that control the movement of water, heat and other properties
A3. The biological processes in the water and how these are affected by the ambient physicochemical conditions
A4. The basic concepts used in chemical oceanography
A5. The geological evolution of the ocean basins, and the methods currently employed to investigate the superficial and deep structural features of the sea bed and subsurface
A6. The processes that shape the natural world at different temporal and spatial scales
A7. The terminology, nomenclature and classification systems used in Ocean and Earth science
A8. Theory, practice, acquisition, analysis and interpretation of data across a range of oceanographic and geological applications
A9. The core concepts in biological, chemical and physical processes operating in the marine environment
A10. The value and need for multi-disciplinary approaches in advancing knowledge
A11. The applicability of Ocean and Earth science to postgraduate employment
A12. More detailed knowledge and advanced understanding within subject-specific options selected from the range available
A13. Theoretical and empirical developments at the research frontiers in a number of specialised areas of Ocean and Earth science
A14. The principles of research design and research strategy
**Subject Specific Intellectual and Research Skills**

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

B1. An extensive knowledge in recognising and using marine and Earth science theories, paradigms, concepts and principles in the context of ocean and Earth science research

B2. The ability to make informed judgements on the design and effective implementation of policies, to address a broad range of ocean and Earth science problems

B3. The ability to critically analyse, synthesise, interpret and summarise complex scientific information

B4. A mastery of a range of software for the organisation, presentation and analysis of data, using state-of-the-art techniques and equipment

B5. The ability to read, use and reference the work of others in an appropriate manner

B6. The ability to undertake field and laboratory investigations in a responsible and safe manner, paying due attention to risk assessment, rights of access, relevant health and safety regulations, and sensitivity to the impact of investigations on the environment and stakeholders

B7. The ability to evaluate the applicability of a range of research methods to the conduct of ocean and Earth science research

B8. The ability to formulate research questions in ocean and Earth science and translate these into appropriate research designs

**Transferable and Generic Skills**

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

C1. Synthesise, apply and further develop the computing, statistical and mathematical skills that you brought to the programme from your undergraduate work

C2. Appreciate statistical issues of sample selection, accuracy, precision and uncertainty during collection, recording and analysis of data in the field and in the laboratory

C3. Prepare, process and present data, using appropriate qualitative and quantitative techniques and computer software packages and solving numerical problems using computer and non-computer-based techniques

C4. Develop, where appropriate, specialist skills in numerical computer programming

C5. Collect and integrate several lines of evidence to formulate and test hypotheses

C6. Design, implement and report on scientific research projects, including a major research project at the forefront of ocean and Earth science knowledge

C7. Access and utilise a range of library-based and electronic resources in an effective manner

C8. Demonstrate a high level of competence in the use of ICT, including the Internet, word-processing, databases and spreadsheets

C9. Identify individual and collective goals and responsibilities and perform in a manner appropriate to these roles

C10. Recognise and respect the views of other team members

C11. Evaluate performance as an individual and as a team member

C12. Understand the roles of individuals in teams and how individuals learn in team groups

C13. Continue to develop the skills necessary for self-managed and life-long learning (such as working independently and within groups, time management and organisation)

C14. Identify and work towards targets for personal, academic and career development
C15. Develop an adaptable and flexible approach to study and work
C16. Demonstrate awareness and understanding of the ethical and legal issues associated with the conduct of research in the ocean and Earth science
C17. Design, implement and manage a substantial piece of original research
C18. Communicate complex theoretical and methodological arguments and research findings in both written and oral form for a variety of audiences
C19. Engage in critical discourse with colleagues, reflect on and constructively evaluate one’s own research and that of others

Programme Structure

The programme structure table is below:
Information about pre and co-requisites is included in individual module profiles.

Part I
The Integrated PhD is a four-year programme consisting of three strands: advanced courses in Ocean and Earth science (year 1), professional skill development through workshops and seminars and research project planning (year 2) and supervised research (years 3 and 4).

Year 1: [60 ECTS at FHEQ Level 7]
Year 1 comprises a multi-disciplinary programme of instruction taught exclusively in the National Oceanography Centre Southampton (NOCS). The instructional programme offered within the Graduate School of the Southampton Oceanography Centre is fully modular, allowing you to choose pathways through the programme that provide academic or more vocational training, depending on your needs.

Year 1 is composed of 30 weeks of taught modules (at FHEQ Level 7), divided into two semesters. Each study module is normally worth between 7.5 and 15 credit points, which equates to 75 - 150 hours of study, of which normally up to 60 hours comprises contact teaching (lectures, practicals, etc.) and the remainder of the time is for your own independent study.

You will be encouraged to attend research seminars, which at the NOCS are run at a variety of different levels. In particular, you will be encouraged to attend key seminars from leading visiting scientists.

Year 2: [30 ECTS at FHEQ Level 8]
During year 2 of the programme, you will combine supervised research with further advanced training in your specific pathway, designed to extend your knowledge and understanding of developments at the frontiers of the subject, and give you training in appropriate methods. The programme includes:
- Key skills provision provided through a range of options available through the GSNOCS training programme, including web- and classroom-based tutorial and workshop-style modules, such as communication, critical reading, teaching, computing, data analysis and statistics and teamwork.
- Project-based skills via interaction with research teams and intensive short courses, including basic modelling and systems analysis, and analytical techniques.
- Parallel work on a major research topic, leading to completion of a transfer report and presentation. This may be accomplished through preparation of a scientific paper for publication.

Having decided upon an area of research, you are assigned an Advisory Group consisting of a thesis supervisor and two other members of staff with related research interests. The thesis supervisor is responsible for routine supervision of your research and meets with you on a regular basis. The Advisory Group provides additional support and guidance where required and is responsible for monitoring and reviewing your progress at regular intervals throughout the programme.
Years 3 and 4: [180 ECTS at FHEQ Level 8]

The third and fourth years of study are devoted to full-time research and preparation of your doctoral thesis. Research students in their final year are expected to participate fully in the School’s programme of research workshops and seminars. This includes a formal presentation of a completed research paper in the School’s programme of research seminars. The programme includes:

- Full-time research on a chosen research topic, which could include land-based or marine-based fieldwork, follow-up laboratory work, and computer modelling as appropriate.
- Access to participation in an extensive series of research seminars throughout the year provided by NOCS-based and visiting scientists and students.
- Participation in further specialist short courses, conferences, work with industry, research cruises and postgraduate demonstrating. These are always available to those who wish to take advantage of such opportunities.
- Regular supervisory meetings and formal progress reviews.
- Thesis completion and defence.

Part I Compulsory

The following modules are compulsory and must be taken.

<table>
<thead>
<tr>
<th>Code</th>
<th>Module Title</th>
<th>ECTS</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOES6013</td>
<td>Introduction to Biological Oceanography 2020-21</td>
<td>3.75</td>
<td>Compulsory</td>
</tr>
<tr>
<td>SOES6015</td>
<td>Introduction to Chemical Oceanography 2020-21</td>
<td>3.75</td>
<td>Compulsory</td>
</tr>
<tr>
<td>SOES6016</td>
<td>Introduction to Marine Geology 2020-21</td>
<td>3.75</td>
<td>Compulsory</td>
</tr>
<tr>
<td>SOES6014</td>
<td>Introduction to Physical Oceanography 2020-21</td>
<td>3.75</td>
<td>Compulsory</td>
</tr>
<tr>
<td>SOES6018</td>
<td>MSc Key Skills and Literature Review 2020-21</td>
<td>7.5</td>
<td>Compulsory</td>
</tr>
</tbody>
</table>

Part I Optional

Part I Optional Route 1

Select 2 modules from the following.

<table>
<thead>
<tr>
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<th>ECTS</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOES6004</td>
<td>Applied and Marine Geophysics 2020-21</td>
<td>7.5</td>
<td>Optional</td>
</tr>
<tr>
<td>SOES6007</td>
<td>Biogeochemical Cycles in the Earth System 2020-21</td>
<td>7.5</td>
<td>Optional</td>
</tr>
<tr>
<td>SOES3014</td>
<td>Coastal Sediment Dynamics 2020-21</td>
<td>7.5</td>
<td>Optional</td>
</tr>
<tr>
<td>SOES6025</td>
<td>Computational Data Analysis for Geophysicists and Ocean Scientists 2020-21</td>
<td>7.5</td>
<td>Optional</td>
</tr>
<tr>
<td>Code</td>
<td>Module Title</td>
<td>ECTS</td>
<td>Type</td>
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<tr>
<td>SOES6008</td>
<td>Deep Sea Ecology 2020-21</td>
<td>7.5</td>
<td>Optional</td>
</tr>
<tr>
<td>SOES6037</td>
<td>Geodynamics and Solid Earth Geophysics 2020-21</td>
<td>7.5</td>
<td>Optional</td>
</tr>
<tr>
<td>SOES6005</td>
<td>Large Scale Ocean Processes and Climate 2020-21</td>
<td>7.5</td>
<td>Optional</td>
</tr>
<tr>
<td>SOES6022</td>
<td>Microfossil Evolution, Environments, and Time 2020-21</td>
<td>7.5</td>
<td>Optional</td>
</tr>
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</table>

**Part I Optional Route 2**

Select 3 modules from the following.

<table>
<thead>
<tr>
<th>Code</th>
<th>Module Title</th>
<th>ECTS</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOES6006</td>
<td>Climate Dynamics 2020-21</td>
<td>7.5</td>
<td>Optional</td>
</tr>
<tr>
<td>SOES6021</td>
<td>Ecological Modelling 2020-21</td>
<td>7.5</td>
<td>Optional</td>
</tr>
<tr>
<td>SOES6023</td>
<td>Environmental Radioactivity and Radiochemistry 2020-21</td>
<td>7.5</td>
<td>Optional</td>
</tr>
<tr>
<td>SOES6047</td>
<td>Global Climate Change: Past and Future 2020-21</td>
<td>7.5</td>
<td>Optional</td>
</tr>
<tr>
<td>SOES6073</td>
<td>Global Ocean Carbon Cycle, Ocean Acidification and Climate 2020-21</td>
<td>7.5</td>
<td>Optional</td>
</tr>
<tr>
<td>SOES6011</td>
<td>Sea level rise and coastal management 2020-21</td>
<td>7.5</td>
<td>Optional</td>
</tr>
<tr>
<td>SOES6024</td>
<td>Seafloor Exploration and Surveying 2 2020-21</td>
<td>7.5</td>
<td>Optional</td>
</tr>
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</table>

**Part II Compulsory**

The following modules are compulsory and must be taken.

<table>
<thead>
<tr>
<th>Code</th>
<th>Module Title</th>
<th>ECTS</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOES7001</td>
<td>Advanced Training and Research Skills</td>
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</table>

**Progression Requirements**

The programme follows the University's regulations for *Progression, Determination and Classification of Results: Postgraduate Master's Programmes* Any exemptions or variations to the University regulations, approved by AQSC are located in *section VI of the University Calendar.*
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.

OES provides:

- A member of the academic staff who will be assigned as your personal tutor on arrival at University, who will monitor your performance and offer academic advice and guidance during the instructional part of the programme in year 1.
- A thesis supervisor who is actively engaged in research closely related to your thesis topic.
- An Advisory Group consisting of your thesis supervisor and two other members of the School with research interests related to your own.
- Programme and module guides/information. Hard copies are available but are mainly published on the web: http://www.southampton.ac.uk/oes/postgraduate/research_degrees/courses.page.
- Study skills support in the form of sessions/workshops on computing, library and information skills, research design and management, presentation of research findings.
- A base room and access to the computing facilities in the NOCS.
- Additional computer clusters are available for your use on the other University campuses, as well as links from the Halls of Residence.
- A number of well-resourced lecture/meeting rooms and a suite of chemical and biological laboratories and geological/geophysical analysis facilities.
- The use of separate practical project laboratories and additional specialised laboratory facilities available within the NERC Divisions in association with NERC personnel at the NOCS.
- Training on Ocean and Earth Science’s research launch RV Callista, which is fully equipped for boatwork practicals and project work in the local estuary and coastal waters and in our shore-side laboratory and aquarium facilities.
- Equipment to support your field work, including laptop computers, GPS, specialised shipboard data acquisition systems deployed from the 19m research catamaran RV Callista.
- Email which is freely available at all times and personal contact with all teaching staff.
- Administrative staff of the Graduate Student Office who are readily available during the normal working day.
- A research-led environment at the NOCS that provides a high-quality learning environment for students.
- Close collaboration between Ocean and Earth Science staff and staff from the NOCS Strategic Research Divisions, provides additional support for student learning, particularly with regard to research projects.

**Methods for evaluating the quality of teaching and learning**

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

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

Further details on the University's quality assurance processes are given in the *Quality Handbook*.

**Career Opportunities**

Students from the National Oceanography Centre Southampton enter a broad range of careers, ranging from industrial, commercial and governmental positions, to academic and research posts.

**External Examiner(s) for the programme**

Name:  
Dr James Hammond – University of London
Dr Matthew Witt – University of Exeter

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 they take 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

<table>
<thead>
<tr>
<th>Type</th>
<th>Details</th>
</tr>
</thead>
</table>

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.