

UNIVERSITY OF  
**EXETER**

# BIOSCIENCES

UNDERGRADUATE SUBJECT BROCHURE 2016  
CORNWALL AND EXETER CAMPUSES



# KEY INFORMATION AND ENTRY REQUIREMENTS

PENRYN CAMPUS, CORNWALL	UCAS CODE	TYPICAL OFFER		STREATHAM CAMPUS, EXETER	UCAS CODE	TYPICAL OFFER	REQUIRED SUBJECTS
<b>Biosciences in Cornwall</b> With the exception of Environmental Science and Human Sciences, all programmes require GCE AL science at grade B or IB HL5 in Biology/Human Biology, Chemistry, Physics or Maths/Pure Maths/Further Maths. GCE AL science at grade B or IB HL5 is also required for the Environmental Science degrees, and GCE AS grade B or IB SL5 in a science subject is required for Human Sciences; eligible science subjects are outlined below the table.				<b>Biosciences in Exeter</b> All programmes require GCE AL Biology grade B or IB Biology HL5, GCSE Maths at grade B and either GCSE Double Award Science or GCSE Chemistry at grade C, in addition to any requirements listed below.			
<b>BSc Single Honours</b> Animal Behaviour D391 AAB-ABB; IB: 34-32 				<b>BSc Single Honours</b> Biological Sciences C100 AAB-ABB; IB: 34-32 plus another AL science subject at grade B; IB second science HL5 			
Animal Behaviour with Study Abroad D392 AAA-AAB; IB: 36-34 				Biological Sciences with Study Abroad C000 AAA-AAB; IB: 36-34 plus another AL science subject at grade B; IB second science HL5 			
Conservation Biology and Ecology C190 AAB-ABB; IB: 34-32 				Biological Sciences with Professional Placement C101 AAA-AAB; IB: 36-34 plus another AL science subject at grade B; IB second science HL5 			
Conservation Biology and Ecology with Study Abroad C150 AAA-AAB; IB: 36-34 				Biochemistry C724 AAB-ABB; IB: 34-32 plus GCE AL Chemistry at grade B; IB Chemistry HL5 			
Environmental Science F750 AAB-ABB; IB: 34-32 				Biochemistry with Study Abroad C732 AAA-AAB; IB: 36-34 plus GCE AL Chemistry at grade B; IB Chemistry HL5 			
Environmental Science with Study Abroad F752 AAA-AAB; IB: 36-34 				Biochemistry with Industrial Experience C737 AAA-AAB; IB: 36-34 plus GCE AL Chemistry at grade B; IB Chemistry HL5 			
Evolutionary Biology C182 AAB-ABB; IB: 34-32 				Biological and Medicinal Chemistry CF71 AAB-ABB; IB: 34-32 plus GCE AL Chemistry at grade B; IB Chemistry HL5 			
Evolutionary Biology with Study Abroad C183 AAA-AAB; IB: 36-34 				Biological and Medicinal Chemistry with Study Abroad CF7C AAA-AAB; IB: 36-34 plus GCE AL Chemistry at grade B; IB Chemistry HL5 			
Marine Biology CF17 AAB-ABB; IB: 34-32 				Biological and Medicinal Chemistry with Industrial Experience FC17 AAA-AAB; IB: 36-34 plus GCE AL Chemistry at grade B; IB Chemistry HL5 			
Marine Biology with Study Abroad CF19 AAA-AAB; IB: 36-34 				Human Biosciences C900 AAB-ABB; IB: 34-32 plus another science at grade B or two GCE AS science subjects at grade B; IB Biology and second science HL5 or two science subjects at SL5 			
Zoology C300 AAB-ABB; IB: 34-32 							
Zoology with Study Abroad C301 AAA-AAB; IB: 36-34 							
<b>BA/BSc Single Honours</b> Human Sciences BCL0 AAA-AAB; IB: 36-32 							
Human Sciences with Study Abroad BCL1 AAA-AAB; IB: 36-34 							
<b>MSci Single Honours</b> Animal Behaviour D393 AAA-AAB; IB: 36-34 							
Conservation Biology and Ecology C151 AAA-AAB; IB: 36-34 							
Environmental Science F751 AAA-AAB; IB: 36-34 							
Evolutionary Biology C184 AAA-AAB; IB: 36-34 							
Marine Biology CF16 AAA-AAB; IB: 36-34 							
Zoology C302 AAA-AAB; IB: 36-34 							

You may also be interested in:

## BSc/MSci Natural Sciences

Please see [www.exeter.ac.uk/ug/natural-sciences](http://www.exeter.ac.uk/ug/natural-sciences)

## BSc Medical Sciences

Please see [www.exeter.ac.uk/ug/medical-sciences](http://www.exeter.ac.uk/ug/medical-sciences)

GCE AL/AS science includes: Biology/Human Biology<sup>+</sup>; Chemistry; Computing; Design and Technology; Electronics; Environmental Studies; Geography; Geology; Maths/Pure Maths/Further Maths<sup>+</sup>; Physical Education; Physics; Psychology; Science (applied); Statistics.

The full and most up-to-date information about Biosciences and our entry requirements is at [www.exeter.ac.uk/ug/biosciences](http://www.exeter.ac.uk/ug/biosciences)

We make every effort to ensure that the entry requirements are as up-to-date as possible in our printed literature. However, since this is printed well in advance of

the start of the admissions cycle, in some cases our entry requirements and offers will change.

<sup>+</sup> if more than one of these is taken they would only count as one 'science' but could count as two A levels towards our general requirements

## International students

If you are an international student you should consult our general and subject-specific entry requirements information for A levels and the International Baccalaureate, but the University also recognises a wide range of international qualifications. You can find further information about academic and English language entry requirements

at [www.exeter.ac.uk/ug/international](http://www.exeter.ac.uk/ug/international)

All of our Biosciences programmes are available for part-time study; for further information, see [www.exeter.ac.uk/ug/biosciences](http://www.exeter.ac.uk/ug/biosciences)

## Award winning students

Some of our Biosciences students were part of a multidisciplinary team of University of Exeter students that won gold at the latest international Genetically Engineered Machines (iGEM) event. Find out how they attained gold standard at this prestigious global synthetic biology competition at [www.exeter.ac.uk/news/igem](http://www.exeter.ac.uk/news/igem)

# BIOSCIENCES

3rd in the Russell Group for Biosciences students progressing into employment or further study within six months of graduation<sup>1</sup>

5th in the UK in the National Student Survey 2014<sup>2</sup>

6th in the UK for Biosciences in *The Guardian University Guide 2015*

Top 10 in the UK for world-leading and internationally excellent research<sup>3</sup>

State-of-the-art learning facilities

Learn with world-leading researchers and carry out challenging independent research

All final year modules are based on the research expertise of our academics

Inspiring field courses in the UK and overseas

Study Abroad partners in North America, Australia, Europe, Singapore and Hong Kong

Biosciences at the University of Exeter is a world class centre for the teaching and research of biological sciences. From your first year, you will be taught by world-leading experts in subjects at the frontiers of science and throughout the spectrum of biology: evolution, conservation, ecology, whole organism biology, microbiology, molecular and cellular biology, computational biology and biological chemistry.

We have attracted internationally renowned professors to join our staff and we also host a number of research fellows who received independent funding from the Royal Society, BBSRC, NERC, Leverhulme Trust, United States NSF, and EU Marie Curie Programmes. All of our programmes are recognised by The Society of Biology.

We pride ourselves on providing the highest standard of care and support to our students and use the very latest research information and teaching techniques. We offer a wide range of modules, built around a core curriculum that provides the skills needed to become a free-thinking, critical scientist. Our teaching introduces new concepts in systems biology and describes how fundamental research is both commercialised in the biotechnology industry and applied practically in the fields of ecology and conservation.

We provide state-of-the-art teaching laboratory facilities for all our students in Cornwall and Exeter, integrating these with our activities in lecture theatres, classrooms and the field. Our facilities are supported by expert teams of laboratory, research and computing technicians.

Above all, we are a friendly and supportive community of scientists and professional support staff, who place research-led teaching at the heart of our undergraduate programmes to provide you with the skill set to excel in your future.



## **STREATHAM CAMPUS, EXETER**

Undergraduate Admissions

Website: [www.exeter.ac.uk/ug/biosciences](http://www.exeter.ac.uk/ug/biosciences)

Email: [cles-externalrelations@exeter.ac.uk](mailto:cles-externalrelations@exeter.ac.uk)

Phone: +44 (0)1392 725818



## **PENRYN CAMPUS, CORNWALL**

Undergraduate Admissions

Website: [www.exeter.ac.uk/ug/biosciences](http://www.exeter.ac.uk/ug/biosciences)

Email: [cornwall@exeter.ac.uk](mailto:cornwall@exeter.ac.uk)

Phone: +44 (0)1326 371801



The Athena SWAN Charter recognises and celebrates good employment practice for women working in Science, Technology, Engineering, Mathematics and Medicine (STEMM) in higher education and research. Find out more about Athena SWAN in Biosciences at [www.exeter.ac.uk/biosciences/athenaswan](http://www.exeter.ac.uk/biosciences/athenaswan)

<sup>1</sup> respondents to the Destination of Leavers from Higher Education Survey (DLHE) of 2012/13 graduates  
<sup>2</sup> based on the average percentage of positive responses, from Biology and Zoology students, across all survey categories for full service universities  
<sup>3</sup> Research Excellence Framework 2014 based on the percentage of research categorised as 4\* and 3\*



# BIOSCIENCES IN CORNWALL

As a student of Biosciences at our Penryn Campus, you will be taught by some of the world's foremost biologists working in evolution, behaviour, ecology and conservation. All of our staff are based in our Centre for Ecology and Conservation and are active researchers who specialise in a range of fields and topics, including conservation biology, behavioural, population and community ecology, zoology, and evolutionary biology and genetics. You will benefit from expert teaching and world class research designed to address the very latest factors influencing biodiversity and complexity in the natural world.

Cornwall is an exceptional place in which to study Biosciences. The county is a perfect living laboratory that offers a diverse range of marine and terrestrial habitats and a wealth of natural resources. You will be welcomed into an interactive, dynamic and intimate environment in which to study. The campus features state-of-the-art equipment for teaching and research in Biosciences, including the recently extended and refurbished teaching laboratory, significant investment in iPad technology for teaching in the lab, classroom and field, as well as the University's Environment and Sustainability Institute (ESI), which leads cutting-edge research into solutions to problems of environmental change.

Field work is an essential aspect of our programmes and is included in all years of study. Field work includes: Year 1 field courses in Cornwall; residential field courses in Year 2 in Cornwall, Scotland, Cyprus, Iceland or the Isles of Scilly; and a two-week international field course in Year 3 to the Canary Islands, Costa Rica, South Africa, Bahamas or Borneo\*. We believe that the number of field-based learning opportunities at the University of Exeter far exceeds that offered at any other comparable university in the UK. To see our field course films visit [www.exeter.ac.uk/ug/biosciences/fieldwork](http://www.exeter.ac.uk/ug/biosciences/fieldwork)

As part of our research-led department, you will discuss the very latest ideas in our interactive seminars and tutorials and, by your final year, will become an active member of the research team. We have very close links with a wide range of conservation and environmental organisations in the UK and overseas with whom there may be the opportunity to collaborate for your final year research project. Many of our students also work with these organisations during their vacations and during their work placement module in the second year.

Short films about our degrees can be seen on the programme pages at [www.exeter.ac.uk/ug/biosciences](http://www.exeter.ac.uk/ug/biosciences)

## MSci/BSc Animal Behaviour

The Penryn Campus hosts a large and thriving group of scientists who work at the cutting-edge of research on animal behaviour in the wild. These programmes encompass all aspects of behaviour in wild, domestic and captive animals. Animal behaviour research aims to identify natural behaviour patterns, understand how behaviour varies among individuals and species, and explore how current and past environments and ecology influence not only behaviour, but also the underlying gene-environment interactions that shape it. The programmes highlight the value of studying animals in their natural habitats, utilising the expertise of staff members who run long-term studies of iconic species in the wild. This approach is underpinned by field courses in the second and third years. An interdisciplinary approach is encouraged throughout the programmes, and you will be exposed to a wide range of theoretical and practical techniques used to study animal behaviour.

**Year 1** You will gain broad experience of behaviour, zoology, ecology and evolutionary biology and will be introduced to the main concepts underlying the scientific study

of animal behaviour. You will learn about the major milestones in behaviour research and explore current topics of outstanding interest. In practical classes, you will learn how to collect data on behaviour and to analyse and interpret results in a rigorous scientific manner.

**Year 2** You will learn how behaviour is influenced by genes and the environment in which an animal develops, and how behaviour is regulated by hormones and neuronal mechanisms. You will also learn evolutionary approaches to the study of behaviour, with a focus on how natural selection shapes the behaviour and life histories of animals in their natural environment. You will experience a residential field course to gain an understanding of habitats and biodiversity.

**Year 3** This year will build on previous insights and develop some key themes in more detail – particularly issues at the forefront of current knowledge. You will interact closely with an expert member of the academic staff who is research-active and will carry out a detailed independent research project on animal behaviour in the wild or a laboratory. You may also take a residential field course in the Canary Islands, Costa Rica, Africa, Borneo or the Bahamas\* to gain practical experience of research in the wild.

**Year 4 (MSci only)** For students enrolled on the MSci programme, the fourth year provides an opportunity to work on two projects, each focused on a specialised area aligned with one of our leading research groups. It is expected that one of these projects will be carried out in partnership with an external organisation. The remainder of your time will be spent on a two-week intensive field course in which your scientific field research, debating and presentation skills will be further developed.

## MSci/BSc Conservation Biology and Ecology

These programmes offer you more direct field experience than any other Ecology degree in the UK, with destinations ranging from Cornwall to Africa\*. You will gain knowledge and skills that are essential for working conservationists and ecologists, including wildlife identification and data handling. In the first year, we take full advantage of Cornwall's rich landscapes with many one-day field trips around the South West Peninsula. In the second year, wider experience comes as a result of a variety of field courses in the UK and Europe, while in your third year there are opportunities to go overseas. In all these locations, we teach vital identification skills and census techniques, while at the same time studying local ecology and conservation issues.

**Year 1** You will gain experience in a broad spectrum of topics in biology, ecology and conservation. Field trip modules, led by wildlife specialists, are an exciting aspect of the programme. You will survey a wide range of organisms, from marine mammals to heathland flowers, in their natural environments, recording how they interact with their surroundings and humans.

**Year 2** You will continue to explore conservation and ecology, develop your analytical skills and have the chance to begin to specialise in habitats or groups of species, if you so wish. During the Easter vacation, we offer field courses in behaviour and biodiversity to either the Isles of Scilly or Cyprus; in the summer term you will choose from the field courses in Scotland, Scillies, Cyprus or Iceland\*.

**Year 3** During this year, the emphasis on field-based experience becomes even greater and gives you the opportunity to use the skills built up over the previous two years. You may take a residential field course in the Canary Islands, Costa Rica, Africa, Borneo or the Bahamas\* to gain practical experience of research in the wild. You will also carry out a piece of research under the supervision of a member of Biosciences staff.

**Year 4 (MSci only)** For students enrolled on the MSci programme, the fourth year provides an opportunity to work on two

projects, each focused on a specialised area aligned with one of our leading research groups. It is expected that one of these projects will be carried out in partnership with an external organisation. The remainder of your time will be spent on a two-week intensive field course in which your scientific field research, debating and presentation skills will be further developed.

## MSci/BSc Environmental Science

These programmes are the University's flagship environmental degrees, enabling you to learn the science behind the Earth's amazing complexity and its environmental processes. The programmes are at the cutting edge of current thinking in the environmental field. You will gain practical and theoretical insights from internationally renowned research experts in a range of environmental disciplines.

Full details of the programmes are available in the Geography, Environmental Science and Human Sciences subject brochure and online at [www.exeter.ac.uk/environmentalscience](http://www.exeter.ac.uk/environmentalscience)

## MSci/BSc Evolutionary Biology

Evolutionary Biology is a fast-growing area of study, utilising ever more sophisticated technology to unravel the history of life on Earth. You will have access to state-of-the-art facilities to develop a deep understanding of this rapidly developing field, which encompasses genetics, animal behaviour and psychology, and examine evolution from many perspectives – from the smallest building blocks of life to entire ecosystems.

**Year 1** You will develop both knowledge and practical skills in evolutionary ecology. This year will include lectures and laboratory work, introducing you to modern approaches to understanding evolution. You will also develop important communication and analytical skills.

**Year 2** In your second year you will continue to examine the basis for evolutionary change, including consideration of both the ecological and genetic mechanisms driving adaptive evolution. You will further develop

essential analytical and communication skills. You will also take a field course to gain an understanding of evolution in the wild.

**Year 3** In this year you will undertake a research project with a member of academic staff. Outside of the research project you will have complete freedom to choose among our final year modules, tailoring your degree to your specific interests. You may also take a residential field course in the Canary Islands, Costa Rica, Africa, Borneo or the Bahamas\* to gain practical experience of research in the wild.

**Year 4 (MSci only)** For students enrolled on the MSci programme, the fourth year provides an opportunity to work on two projects, each focused on a specialised area aligned with one of our leading research groups. It is expected that one of these projects will be carried out in partnership with an external organisation. The remainder of your time will be spent on a two-week intensive field course in which your scientific field research, debating and presentation skills will be further developed.

## BA/BSc Human Sciences

Our Human Sciences degree is an interdisciplinary programme that combines aspects of social and biological sciences to cover a broad range of topics, from human evolution and genetics, to sustainability and social organisation. It is designed to enable you to examine the past and present of humans from the contrasting perspectives of the social and biological sciences to answer questions such as: who and what are human beings; why are individuals and society the way they are; how does behaviour evolve; and what problems do human societies face now and in the future, and how can we address them?

The programme, delivered jointly by Geography and Biosciences, allows you to combine these exciting disciplines to make connections between biological processes, political and environmental issues and social patterns. It will enable you to understand relationships between science and policy and show how you can facilitate decision-making in this context.

The degree will encourage your curiosity about the human environment and how it

functions. Throughout, you will engage in field work and laboratory research exploring the social and natural science behind the complexity of human evolution, behaviour and social organisation.

**Year 1** You will develop both knowledge and practical skills in a range of core disciplines in the human sciences. This year will include lectures and laboratory work, introducing you to modern approaches to understanding the biology of organisms including humans, through ecology, genetics and evolution, to the comparative study of social and cultural patterns of world populations. You will also develop important communication and analytical skills.

**Year 2** In your second year, you will perform a more in-depth examination of the subject areas to which you were introduced in your first year. For example, you will consider the evolutionary origins of human behaviour by exploring the relationship between human cultural processes and human genetic processes. In particular, you will be encouraged to investigate the ways in which human beings both shape their environments and are shaped by them.

**Year 3** In your final year, you will undertake a research project with a member of academic staff. Outside of the research project, you will have freedom to choose from our final year modules, tailoring your degree to your specific interests. You may also take a residential field course in the USA or Africa\* to gain practical experience of how humans develop interpretative frameworks of explanations to make sense of the world around them.

## MSci/BSc Marine Biology

These programmes focus on understanding the biology of marine organisms and their ecosystems, with special emphasis on whole animal biology, biodiversity, ecology and behaviour. The programmes are delivered by internationally-recognised experts who work at the cutting-edge of applied and pure research on whole-organism biology, with particular focus on large marine vertebrates, including fish (bony fish and sharks), marine turtles, seabirds and cetaceans (eg, whales, dolphins and porpoises). The programmes

provide the skills, concepts and experience to understand all aspects of marine ecosystems and the pressures they face, ranging from over-exploitation to climate change. Our interdisciplinary approach to the study of marine ecosystems, from rocky shores to open oceans and from shallow surface seas to deep water habitats, allows you to learn about a wide range of theoretical and practical techniques.

**Year 1** During your first year you will develop a broad knowledge of the biology of the marine environment. Emphasis will be placed on theory underpinned by field work and development of a suite of techniques appropriate to studying life in the sea.

**Year 2** You will make use of the skills and concepts learned in your first year to study marine life in more detail, with a particular emphasis on the interaction between organisms and their environments. Concepts will be explained in detail in the classroom and brought to life in the field – both via the living laboratory of the Cornish coastline and during a residential field course.

**Year 3** This year will build on previous insights and develop some key themes in more detail – particularly issues at the forefront of current knowledge. You will interact closely with an expert member of the academic staff who is research-active and will carry out a detailed independent research project on animal behaviour in the wild or a laboratory. You may also take a bespoke marine biology residential field course in the Canary Islands or Bahamas\* to gain practical experience of research in the wild.

**Year 4 (MSci only)** For students enrolled on the MSci programme, the fourth year provides an opportunity to work on two projects, each focused on a specialised area aligned with one of our leading research groups. It is expected that one of these projects will be carried out in partnership with an external organisation. The remainder of your time will be spent on a two-week intensive field course in which your scientific field research, debating and presentation skills will be further developed.

## MSci/BSc Zoology

At our Penryn Campus we have one of the largest groups of scientists in the UK specialising in animal behaviour, ecology and conservation and these degrees build on our internationally recognised expertise in this field. They focus on an understanding of animal biology, with an emphasis on whole animal biology, ecology and behaviour, and the evolution of animal life histories. The programmes will be of interest to students seeking graduate careers in both human and veterinary sciences, as well as in animal ecology and behaviour.

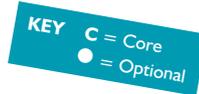
**Year 1** In your first year you will explore animals in the context of the environments in which they live. You will examine zoology from molecules to ecosystems and get experience with the modern techniques used to generate knowledge about animal systems.

**Year 2** You will explore how animal development relates to the diversity of animal forms and examine animal behaviour as it relates to life history and adaptive evolution. You will be able to go on either one of the behaviour and biodiversity field courses that run over the Easter break, or a field course during the summer.

**Year 3** In this year you will have the opportunity to put your analytical and experimental skills to use through your research project with a member of academic staff. Our students work side-by-side with researchers, developing an independent research project. You will also have the opportunity to go on one of our final year field courses to the Canary Islands, Costa Rica, Africa, Borneo or the Bahamas\*.

**Year 4 (MSci only)** For students enrolled on the MSci programme, the fourth year provides an opportunity to work on two projects, each focused on a specialised area aligned with one of our leading research groups. It is expected that one of these projects will be carried out in partnership with an external organisation. The remainder of your time will be spent on a two-week intensive field course in which your scientific field-research, debating and presentation skills will be further developed.

# MODULES IN CORNWALL



## How your degree is structured

The degrees are divided into core and optional modules, giving you the flexibility to structure your degree according to your specific interests. Individual modules are worth 5, 15, 30 or 40 credits. Full-time undergraduates need to take 120 credits in each year. In addition to the core modules, you can choose from an extensive range of options in all years. Each year you may take up to 30 credits from another discipline outside of Biosciences.

Please note that availability of all modules is subject to timetabling constraints and that not all modules are available every year.

Third year modules will be taken in the fourth year of degrees taken with Study Abroad.

For up-to-date details of all our programmes and modules, please check [www.exeter.ac.uk/ug/biosciences](http://www.exeter.ac.uk/ug/biosciences)

### Year 1 Modules

Module Name	MSci/BSc Animal Behaviour	MSci/BSc Conservation Biology and Ecology	MSci/BSc Evolutionary Biology	BA/BSc Human Sciences	MSci/BSc Marine Biology	MSci/BSc Zoology
A Legal Foundation for Environmental Protection				●		
Analysis of Environmental Data				C		
Biosciences Research Internship	●	●	●		●	●
Environment and Society				C		
Field and Laboratory Techniques	C	C	C		C	C
Genetics	C	C	C		C	C
Global Issues in Environmental Science				●		
Introduction to Ecology and Conservation		C	●		C	●
Introduction to Evolution and Behavioural Ecology	C	C	C	C		C
Introduction to Human Sciences			●	C		●
Introduction to Invertebrate Zoology	C	C	C		C	C
Introduction to Marine Biology					C	●
Introduction to Vertebrate Zoology	C	C	C		C	C
Investigating Social and Spatial Environments				C		
Key Skills in Biological Sciences	C	C	C		C	C
Physiology	C	C	C	●	C	C
Power, Conflict, Inequality: Issues in Global Politics				C		
Tutorials				C		
West Penwith Field Trip				●		

Module Name	MSci/BSc Animal Behaviour	MSci/BSc Conservation Biology and Ecology	MSci/BSc Evolutionary Biology	BA/BSc Human Sciences	MSci/BSc Marine Biology	MSci/BSc Zoology
Biology of Aquatic Vertebrates	●	●	●		C	●
Biology of Birds	●	●	●		●	●
Biosciences Research Internship	●	●	●		●	●
Critical Thinking and Scientific Reasoning	C	C	C		C	C
Development of Behaviour	C		●	●		●
Evolution of Human Societies	●		●	C		●
Evolutionary Ecology	●		C			●
Evolutionary Conservation Genetics	●	●	C			●
Exploitation of the Sea		●			C	●
Field Course (Scillies, Scotland, Cyprus, Iceland, Pembrokeshire, Grand Challenges*)	C	C	C	C	C	C
Introduction to Ecological Consultancy		●				
Key Skills for Human Scientists				C		
Marine Ecology					C	
Mathematics of the Environment II	●	●	●	●	●	●
Nature and Culture				C		
NGOs: Responding to Global Challenges				●		
Political Psychology of Elites				●		
Political Psychology of Masses				●		
Population and Community Ecology	C	C			●	●
Rural Social Issues				●		
The Biology of Mammals	●	●	●			C
The Ethics and Politics of Humanitarian Intervention				●		
The Politics of Climate Change and Energy				●		
Time and Place				C		
Wildlife Disease	●	●	C		●	●
Workplace Learning	●	●	●	●	●	●

### Year 2 Modules

Module Name	MSci/BSc Animal Behaviour	MSci/BSc Conservation Biology and Ecology	MSci/BSc Evolutionary Biology	BA/BSc Human Sciences	MSci/BSc Marine Biology	MSci/BSc Zoology
Analysis of Biological Data	C	C	C		C	C
Animal Ecophysiology	C		●	●	●	C
Applied Insect Ecology	●	C				●
Behavioural Ecology	C	●	●	C		●
Biodiversity and Conservation		C			●	

## Year 3 Modules

Module Name	MSci/BSc Animal Behaviour	MSci/BSc Conservation Biology and Ecology	MSci/BSc Evolutionary Biology	BA/BSc Human Sciences	MSci/BSc Marine Biology	MSci/BSc Zoology
Animal Life History Evolution and Conservation	●	●	●		●	●
Biosciences Research Internship	●	●	●		●	●
Climate Change and Society				●		
Coevolutionary Interactions	●	●	●		●	●
Dissertation				C		
Ecological Responses to Climate Change	●	●	●		●	●
Energy Policies for a Low Carbon Economy				●		
Environment and Empire				●		
Evolution and Ecology of Disease	●	●	●		●	●
Field Course (Canary Islands, Costa Rica, Bahamas, Borneo, South Africa*)	C	C	C		C	C
Human Behavioural Ecology	●	●	●	●	●	●
International Field Course*				C		
Issues in Climate Change				●		
Legal Response to Environmental Destruction				●		
Living in Groups	●	●	●		●	●
Marine Ornithology	●	●	●		●	●

Module Name	MSci/BSc Animal Behaviour	MSci/BSc Conservation Biology and Ecology	MSci/BSc Evolutionary Biology	BA/BSc Human Sciences	MSci/BSc Marine Biology	MSci/BSc Zoology
Marine Vertebrate Conservation	●	●	●		●	●
Mating Systems Biology	●	●	●		●	●
Nature via Nurture	●	●	●	●	●	●
Political Psychology of Elites				●		
Political Psychology of Masses				●		
Preparing to Graduate	C	C	C	C	C	C
Reproductive Biology	●	●	●		●	●
Research Project	C	C	C		C	C
Science in Society	●	●	●		●	●
Sustainability				●		
Symbiosis in Marine Systems	●	●	●		●	●
The Behavioural Ecology of Information Use	●	●	●	●	●	●
The Complexity of Human Societies				C		
The Ethics and Politics of Humanitarian Intervention				●		
Trends in Ecology and Evolution	●	●	●		●	●
Waste and Society				●		



# MODULES IN CORNWALL CONTINUED

## Year 1

<b>Analysis of Environmental Data</b>	Introduces quantitative approaches to data analysis in geographical science. You will learn about using satellite imagery and digital mapping technology. Data handling techniques will also be introduced in practical classes.
<b>Environment and Society</b>	Explores the relationships between environmental and social processes in different geographical contexts and at different spatial scales. Explains the contested nature of these interactions at the global, national, regional, urban and local levels, and the role of different stakeholder groups in shaping them.
<b>Field and Laboratory Techniques</b>	There is an extraordinary wealth of wildlife everywhere you look. This module introduces you to the diverse ways that we as scientists can gather information from the world around us, from collection and identification of specimens to laboratory analysis. The combination of field and laboratory techniques covered in this module will leave you with a wealth of skills and methodologies for exploring fully the world around you.
<b>Genetics</b>	You will gain a basic understanding of how information is stored and expressed in cells, the differential role of genes and the environment on expression of a phenotype, and of the behaviour of genes in populations.
<b>Introduction to Ecology and Conservation</b>	This module introduces the fundamentals of each topic and will provide you with core knowledge of ecology and conservation.
<b>Introduction to Evolution and Behavioural Ecology</b>	This module provides grounding in the basic principles and significance of Darwinian evolution in an ecological and behavioural context. It introduces the mechanisms of evolution and explores how this process links to behaviour and biodiversity.
<b>Introduction to Human Sciences</b>	Introduces a range of core disciplines within the Human Sciences degree, from the biology of organisms including humans, through ecology, genetics and evolution, to the comparative study of social and cultural patterns of world populations. We will explore the impact of humans on the natural environment, through examining why some populations decline and others grow, and ask the question how many people can the planet support?
<b>Introduction to Invertebrate Zoology</b>	This module develops your core knowledge of biodiversity and macroevolutionary patterns, forming a grounding for future studies. You will attend lectures covering a wide range of topics from the origin of life to the most complex invertebrates. In practical classes, you will learn about invertebrate diversity, concentrating on function and adaptation to environments and ecosystems.
<b>Introduction to Marine Biology</b>	This module will provide the fundamental building blocks for the study of marine biology. You will attend lectures covering a wide variety of topics including oceanography, marine ecosystem function, and marine conservation. During laboratory and field practicals, you will learn about identification and diversity of marine life, as well as methods for studying biology in the seas.

<b>Introduction to Vertebrate Zoology</b>	This module builds on the first-term module Introduction to Invertebrate Zoology, exploring similar themes in vertebrates. You will attend lectures covering a wide range of topics from the first chordates through to the evolution of humans. In practical classes, you will learn about vertebrate diversity, concentrating on function and adaptation to environments and ecosystems.
<b>Investigating Social and Spatial Environments</b>	Introduces how geographers investigate human societies and their qualitative relations to different environments. It uses a variety of techniques, including group practical projects, to examine the various research questions, methods and sources used by geographers to investigate the dynamic and complex interaction of social groups and spatial environments.
<b>Key Skills in Biological Sciences</b>	This module develops a variety of practical and transferable skills in areas such as teamwork, scientific report writing, oral presentations, study skills, basic laboratory skills, experimental design, data handling, display and interpretation, and basic statistical analysis.
<b>Physiology</b>	We explore the essential features of anatomy and how this relates to physiological function throughout a range of animals and some plants. We place an emphasis on how structure, function and physiology link to lifestyle, habitat and evolutionary history.

## Year 2

<b>Analysis of Biological Data</b>	This module provides basic training in the collection and analysis of ecological datasets, recognising that statistics is a tool for understanding biological data. You will gain experience with the modern scientific method as applied in ecology and evolution, including hypothesis formulation, experimental design and modern techniques for collecting and analysing data.
<b>Applied Insect Ecology</b>	You will gain an understanding of the systematics and biology of a range of pest species, disease vectors and species providing ecosystem services (eg, pollinators). We will also investigate methods of pest control and monitoring rare species.
<b>Behavioural Ecology</b>	This module explores how natural selection shapes the behavioural strategies of animals in the wild. The emphasis will be on discussing key concepts that can be applied to explain behaviour across very different animals in different habitats, exploring the problems faced by animals as they survive and reproduce, and the behavioural and social adaptations that have evolved in response to environmental pressures.

<b>Biology of Aquatic Vertebrates</b>	Aquatic vertebrates (including turtles, sharks, rays, cetaceans, penguins and other aquatic birds) are generally considered very charismatic animals and attract much public and research attention. As a group they also represent a diverse range of adaptations to the challenges of life in water. This module provides you with an in-depth insight into the range of adaptations for life in the water and the ways in which organisms have adapted to cope with the challenges of low oxygen, high pressure and unpredictability in resources.
<b>Critical Thinking and Scientific Reasoning</b>	This module explores how knowledge is created and validated, and explores key skills for critical thinking and evaluating evidence applicable to all disciplines.
<b>Development of Behaviour</b>	Explore how genes, environment and physiological mechanisms interact to shape the behaviour of animals, from insects to humans. You will focus on how behaviour develops over the lifespan of the animal, how experience affects social and cognitive development, and how an evolutionary perspective can shed light on the causes of variation in behaviour within and among species.
<b>Evolutionary Conservation Genetics</b>	This module develops and expands your understanding of the principles introduced in <i>Introduction to Evolution and Behavioural Ecology</i> by considering the genetic mechanisms underlying evolutionary change. It focuses on the concepts of genetic variation and the forces underlying the changes in allele frequency over time.
<b>Evolution of Human Societies</b>	How can we explain the great diversity of human cultures around the world? How have human societies changed over time? This module focuses on the evolutionary origins of human behaviour, and shows how cultural change and human societies can be studied within an evolutionary framework. Topics covered include subsistence strategies and the development of agriculture, population expansions, language, religion, social and political organisation, and the ways culture can affect the evolution of genes and vice versa.
<b>Key Skills for Human Scientists</b>	Enables you to develop the conceptual, analytical and research skills necessary to carry out independent research work throughout your degree as well as in future workplaces. You will be introduced to a range of methodologies used in study and sampling design, data analysis, interpretation of information, and presentation.
<b>Nature and Culture</b>	Explores the relationship between nature and culture and how our different conceptualisations and representations of nature have shaped the way we engage with and manage the natural environment. Working through both historical and contemporary ideas about nature and landscape, we explore the changing theorisations of nature as 'out there' to something that is very much a part of our (more than) human existence.

## The Biology of Mammals

In this module, we first build a foundation understanding of mammalian evolution and classification. We then move rapidly to draw inspiration from case studies and controversies in mammalian biology and use these to explore the evolution, adaptation, ecology and management of modern mammals. Wherever possible, we will use examples from the British Isles, as well as further afield. In the lab, we will explore evolution and morphology, while in the field we will develop skills in catching and handling small mammals.

## Workplace Learning

This module will provide you with an opportunity to get ahead of the crowd by gaining practical experience in a real life working environment. You will apply for a placement position with a relevant organisation, and spend 70 hours in the workplace (either full-time or part-time, depending on when the placement is conducted). This module provides a valuable opportunity for you to build confidence, develop transferable skills, and enhance your CV, all of which will improve your career prospects after graduation.

## Year 3

### Animal Life History Evolution and Conservation

This module is designed to develop and expand your understanding of the principles introduced in earlier modules by exploring animal life, history, diversity and evolution in the context of conservation and wildlife biology.

### Climate Change and Society

Climate change is not only a scientific issue but one which affects many areas of our everyday lives. This module goes beyond the science of climate change to ask how it is understood in fields as diverse as – for example – economics, policy and art, as humanity faces one of the greatest challenges to its future.

### Coevolutionary Interactions

The evolution of one species in response to another, and reciprocal adaptation of the other species to the first, plays a central role in shaping the great diversity we see in nature. The module will use a range of approaches to investigate how species interactions might: generate and maintain diversity, drive speciation, help or hinder the spread of invasive species, and affect the stability of communities.

### Dissertation

This module aims to provide you with an opportunity to prepare a dissertation on a research topic of modern interest and relevance to your specialism. You will develop your skills in reviewing the literature relevant to your chosen topic, and in writing a scientific report. You will choose your topic through discussions with the academic staff.

### Energy Policies for a Low Carbon Economy

Introduces the idea that any given desired energy system requires a tailored energy policy and examines the building blocks of an energy policy: economic, social, security and environmental goals.

<b>Environment and Empire</b>	Focusing on the British Empire in the 19th and 20th centuries, this module explores how global environments have been transformed by the rise and fall of colonial empires. Involves the critical examination of how Western colonial ideologies shaped new ideas and forms of nature, industry, urbanisation, technology, science, environment and society.	<b>Nature via Nurture</b>	Understanding the chief generators of phenotypic variation lies at the heart of attempts to understand the process of evolution by natural selection. It is becoming increasingly clear that phenotypes are governed by direct and indirect 'environmental' effects on patterns of gene expression as well as the underlying genotype. Such epigenetic effects can be heritable, influencing the phenotype of offspring and grand-offspring. This module will introduce you to epigenetic processes – in particular highlighting how they influence phenotypes – and examine the role of epigenetics in adaptation.
<b>Human Behavioural Ecology</b>	In this module we will use evolutionary theory to try and understand why humans behave the way they do. We will examine both the differences and similarities in the behaviour of human populations across the world to understand how natural selection has shaped our anatomy, mating and marriage systems, patterns of reproduction, lifespans, social systems and culture. We will build on the theoretical material covered during the lectures with practical exercises and guest lectures from experts.	<b>Preparing to Graduate</b>	This module will ensure that in your final year you are aware of the different career paths available to Biosciences graduates and will allow you to gain the skills and experience necessary to maximise your chance of securing graduate-level employment. You will be provided with an opportunity to attend career-focused seminars which will give advice on self-promotion (through CVs, application forms, covering letters and web resources) as well as advice on obtaining CV enhancing skills and experience (eg, web design, scientific communication, grant writing, postgraduate study).
<b>Issues in Climate Change</b>	Develops your understanding of current issues concerning present and future climatic change through an investigation of past change over a range of timescales, from the interglacial/glacial cycle, through millennial and centennial cycles to change over the observational record.	<b>Science in Society</b>	This module develops and expands the principles of ecology and evolution introduced in your second year, leading to an understanding of their implications for public policy issues and the public understanding of science.
<b>Living in Groups</b>	When animals live in groups we see some of the most remarkable behaviours in the animal kingdom. From the highly coordinated movements of shoaling fish, to the extreme morphological adaptations seen in some social insects, animal societies are truly spectacular. This module will explore the different social systems that exist in the animal kingdom and consider how these societies may have evolved.	<b>The Behavioural Ecology of Information Use</b>	This module focuses on ecology at the interface of evolutionary, physiological and behavioural aspects of the subject, concentrating on information use by organisms in their natural habitats. It will help you develop a fuller understanding of the way natural and sexual selection can and do act to mould much of what we see in the natural world.
<b>Marine Ornithology</b>	Seabirds are top predators and are therefore sentinels of change in marine ecosystems. However, the fact that seabirds are among the most threatened group of birds on earth indicates that not all is well in our seas. At the interface between theory and applied ecology, this module will explore state-of-the-art approaches to unravelling the individual behaviour, population ecology and community dynamics of this diverse assemblage, and will therefore reveal how marine birds are responding to environmental change.	<b>The Complexity of Human Societies</b>	In this module you will learn more about the processes of cooperation and conflict involved in the origin, maintenance, and collapse of complex societies. Using evolutionary and ecological theory you will examine a number of topics including structural inequalities, division of labour, warfare, and population cycles. You will explore how this perspective can address important issues facing the world today including failed states, environmental sustainability, and global disparities in economic development.
<b>Mating Systems Biology</b>	The evolution of animal mating systems and alternative mating strategies lies at the heart of studies of sexual selection. In this module we will discuss how factors such as population density, operational sex ratio, and habitat quality can directly influence animal mating patterns. You will examine the concept of the opportunity for sexual selection, why it can be restricted to one sex while opposed in the other, and why it is a powerful evolutionary force. The focus will be on how ecological and historical processes that directly influence the spatial and temporal distribution of receptive females determine the evolution of animal reproductive strategies.		





# BIOSCIENCES IN EXETER

Choosing a Biosciences degree at our Streatham Campus in Exeter will lead you into a community of scientists whose world-class research is matched by their passion for teaching. Our expertise spans the fields of ecotoxicology, plant pathology, whole-organism biology, biochemistry and molecular biology.

You will be welcomed into a warm, friendly, vibrant and supportive scientific environment, where the enthusiasm and engagement from both staff and students produces one of the very best undergraduate experiences. From your first day, you will interact with exceptional researchers in your academic tutorials and group lectures. Over the course of your degree, your learning will be driven towards small, focused sessions in the final year, based around the very latest research topics. You will also be able to undertake a challenging independent research project dealing with questions and issues at the cutting-edge of life science research.

You will be located in the refurbished Geoffrey Pope Building, where our teaching laboratory is equipped with state-of-the-art instruments for observational, experimental and numerical aspects of biosciences including biochemical, molecular, physiological and electronic apparatus. We also have an excellent Bioinformatics Computer Centre to facilitate the rapid growth in biological computer use.

In addition, we have next-generation DNA sequencing facilities and have recently invested £5 million in new equipment and a bio-imaging facility. This includes both scanning and transmission electron microscopes, laser confocal and fluorescence microscopes, and real-time polymerase chain reaction and array scanning machines. A

further £17.6 million has been spent to provide world class research facilities across all the biosciences laboratories in the Geoffrey Pope Building.

Our academics have close links with a wide range of industrial, medical and conservation organisations that you may be able to collaborate with for your final year research project. Many of our students work with these organisations during their vacations and others build their experience through one of our four year programmes with Professional Placement/Industrial Experience.

## BSc Biological Sciences

### BSc Biological Sciences (Animal Biology)

### BSc Biological Sciences (Microbiology and Infectious Disease)

### BSc Biological Sciences (Molecular and Cellular Biology)

This is our most popular and flexible degree programme, giving you the option to design either a broad-based biology degree or a more focused degree specialising in areas of biology that interest you. For specialisms in animal biology, microbiology and infectious disease or molecular and cellular biology you can graduate with your chosen specialism named as part of the degree title, eg, BSc Biological Sciences (Microbiology and Infectious Disease). The Biological Sciences degree leads to a variety of employment and further study opportunities in a wide spectrum of bioscience-related areas and can also act as a sound foundation for non-science-related career paths.

After a first year which covers the range of biology from molecules to ecosystems, you have complete freedom of module choice. Options range from genomics to the ecology of environmental change; from mammalian biology to medical cell biology; from the molecular basis of infection to a coral reef field course. You can mould your degree as you wish, specialising in the pathways mentioned above, or in other areas, or keeping your biological choices broad. If you want a degree with one of the named specialisms you simply need to take sufficient second and final year options in those subject areas; you will receive advice about this once you are at Exeter and you do not need to make any decisions in advance.

**Year 1** You will be introduced to modern techniques associated with biology research and their application within a range of fields from biotechnology industries to biodiversity and conservation. Modules include topics in biochemistry, genetics, microbiology, animals, plants and ecology.

**Year 2** There is only one compulsory module in the second year (*Research Skills and Bioethics*) and this forms a foundation for the work of the final year research project. Optional modules will help your understanding of key concepts in biological sciences and also offer you the opportunity to specialise within particular areas.

**Final Year** In the final year, you will take modules that will provide you with the opportunity to focus on an area of biology that particularly interests you. You will also take either an independent research project or dissertation, centred on the cutting-edge research of leading scientists in Biosciences.

## BSc Biological Sciences with Professional Placement

This four-year version of the Biological Sciences degree includes a professional placement year between the second and final years. This year will be spent working in an appropriate business or industry with services in biological research, analysis or consultancy. We have established collaborations with local, national and multinational organisations.

We find that our students gain valuable experience from work placements. As well as increasing first-hand knowledge, students also improve personal and transferable skills, make new contacts and enhance their employability. Our placement degrees develop experienced graduates and the placement companies often offer employment after graduation.

## BSc Biochemistry

Our degree programme in Biochemistry focuses on understanding the biochemical control of biological processes, particularly in the cell, and the tools for investigating these mechanisms. After a broad first year, this degree focuses on cellular biochemistry providing specialist modules aimed at understanding key topics at the frontiers of cell biology. As you progress through the second and third years, a wide choice of biochemistry module options is available, including metabolism, molecular biology of the gene, cell and biology of disease, and horizons in biochemical research. The Biochemistry degree leads to career opportunities in biotechnological, pharmaceutical and other industries, as well as many further study options, including PhD/MSc /MRes programmes.

**Year 1** The first year provides a firm foundation for your degree with modules in biochemistry, cell biology, genetics, microbiology, and organic and inorganic chemistry. This forms the core of your programme, with options available in physical chemistry and plant biology.

**Year 2** In addition to core biochemistry, organic chemistry and cell biology, you will choose three optional modules in subjects ranging from biological chemistry to medical and general microbiology and evolutionary biology.

**Final Year** Around the core topics of *Horizons of Biochemical Research* and *Energy Metabolism*, you can choose a research project or dissertation, plus a flexible choice of modules from a wide range within biochemistry, molecular cell biology and biological chemistry.

## BSc Biochemistry with Industrial Experience

This four-year version of the Biochemistry degree includes a paid year in industry between the second and final years. In your third year you spend a salaried year working on a research project in the biotechnology or pharmaceutical sectors. We have established collaborations with local, national and multinational companies, and have successfully placed students with companies including AstraZeneca, GSK, the Environment Agency, Axiom Veterinary Laboratories, and Shell.

We find that our students gain valuable experience from working in industry. As well as increasing their first-hand knowledge, they also improve personal and transferable skills, make new contacts and enhance their employability. Our industrial placement degrees develop experienced graduates and the placement companies often offer employment after graduation.

During your year in industry you are paid by the company and take two modules: *Learning from Industrial Experience* and *Industrial Placement and Report*. You will have regular contact with an academic supervisor in addition to an industrial supervisor at the company.

## BSc Biological and Medicinal Chemistry

This interdisciplinary degree provides core training in chemistry supplemented with options in biochemistry and biology, and shows how these areas relate to aspects of medicine and drug design. Emphasis is placed on understanding the chemistry and synthesis of small molecules, particularly in medicine and disease. Module choices in your second and final year allow further specialisation in chemistry, pharmacology, cell biology, molecular biology and genomics, and biotechnology. This degree leads to many career opportunities in pharmaceutical, chemical, biotechnological and other

industries as well as medically-related employment and further study.

**Year 1** You will develop an understanding of the fundamentals of chemistry and biochemistry, cell structure and physiology, genetics and microbiology. Practical work is designed to complement the lectures.

**Year 2** In addition to core chemistry and biochemistry, you can also take options in molecular biology of the gene, cell biology, microbiology, genomics and bioinformatics, pharmacology, or forensic science.

**Final Year** You will study, amongst other things, pharmacology, medicinal chemistry and drug design, and you can choose an independent research project or dissertation centred on the research work of members of staff. You will be able to choose from projects in the areas of biological science, chemistry, biochemistry or clinical research.

## BSc Biological and Medicinal Chemistry with Industrial Experience

This four-year version of the Biological and Medicinal Chemistry degree includes a paid year in industry between the second and final years where you will work on a research project in either the chemical, pharmaceutical or biotechnology sectors. We have established collaborations with local, national and multinational companies, and have successfully placed students with companies including AstraZeneca, GSK, the Environment Agency, Axiom Veterinary Laboratories, and Shell.

We find that our students gain valuable experience from working in industry; not only first-hand knowledge, but improving personal and transferable skills, making new contacts and enhancing employability. Our industrial placement degrees develop experienced graduates and the placement companies often offer employment after graduation.

During your year in industry you are paid by the company and take two modules: *Learning from Industrial Experience* and *Industrial Placement and Report*. You will have regular contact with an academic supervisor in addition to an industrial supervisor at the company.

## BSc Human Biosciences

Our BSc Human Biosciences is taught jointly by Biosciences and Sport and Health Sciences across both the Streatham and St Luke's campuses in Exeter, and represents an innovative collaborative teaching response to a broadening demand for graduates with skills in biological and sport sciences. It allows you to study scientific aspects of health, physical activity and cell biology and recognises the importance that exercise can play in the prevention and treatment of disease. You will receive a thorough grounding in the study of cell and molecular biology together with the various sub-disciplines of exercise and sport sciences, including biomechanics, kinesiology, human and applied physiology, molecular biology, genetics and microbiology. This unique degree can lead to a variety of biological and sport-related employment opportunities as well as in other fields. There is also the prospect of further study opportunities.

**Year 1** Your first year will provide you with a foundation in exercise science and biology. Practical work is designed to complement the lectures. You will receive training in key scientific skills as part of the *Fundamental*

*Principles for Bioscientists* module, which includes small group academic tutorials.

**Year 2** In your second year, the modules build on knowledge and skills obtained in the first year. You can now begin to tailor your degree to suit your personal interests in biology and exercise and sports sciences.

**Final Year** You have the opportunity to focus on areas of biology and exercise and sport sciences that particularly interest you, and you can undertake a project/dissertation centred on the research work of a member of staff. Under their academic supervision, you will develop the skill set needed to move forward as a science graduate.

## BSc Medical Sciences

Our Medical Sciences degree provides a firm foundation in the core biomedical and biomolecular sciences, alongside an insight into medical practice and the technologies used to diagnose disorders and treat patients. You will develop an integrated, scientific knowledge that you can put into practice in a clinical setting, plus robust research skills, and creative and inquisitive communication, leadership, critical appraisal and problem-

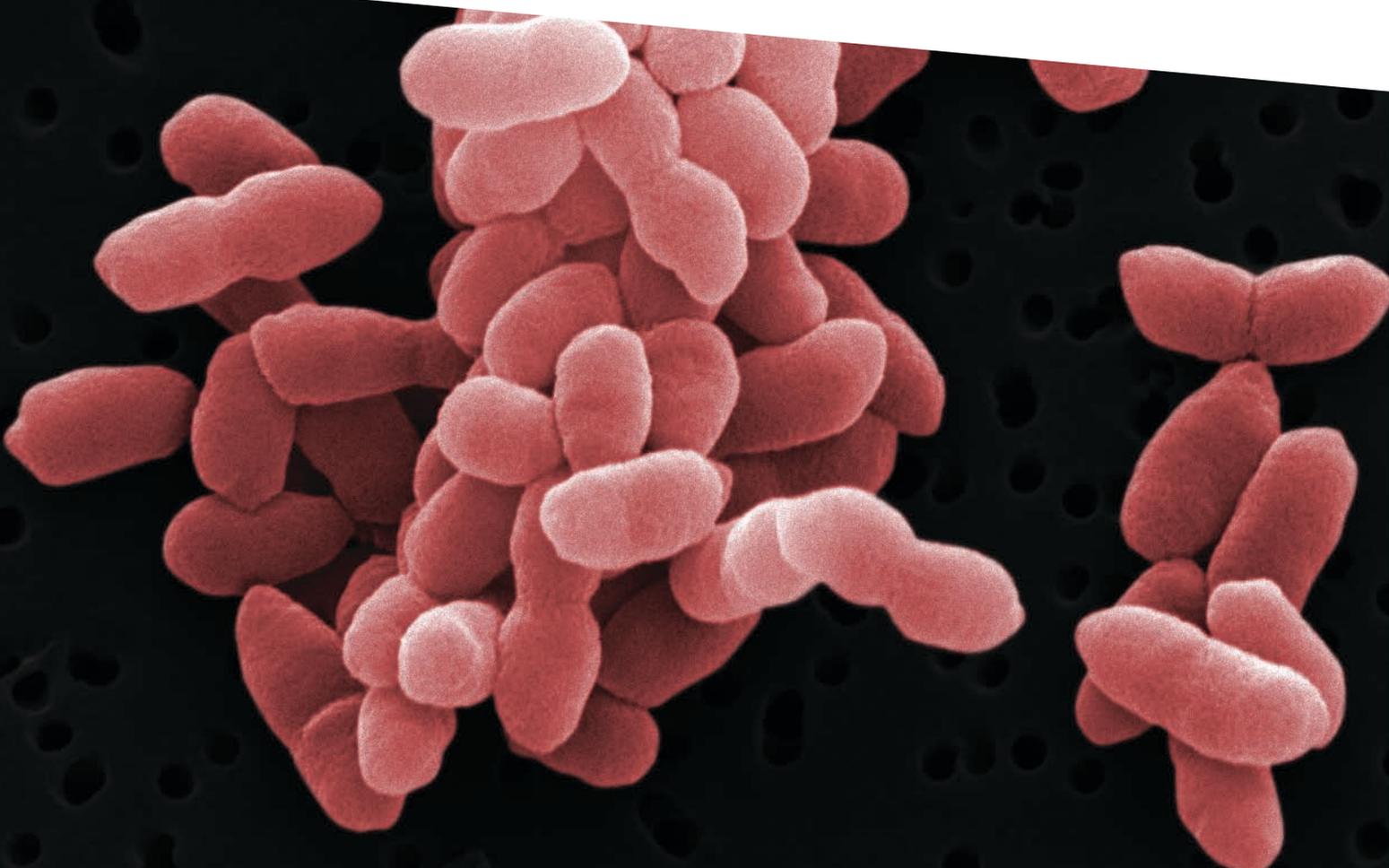
solving skills. You will have the option to study pathways in genetics/genomics, neuroscience, pharmacology, health research: clinical trials management or environment and public health should you wish.

Full details of the programmes are available in the Medical Sciences subject brochure and online at [www.exeter.ac.uk/ug/medical-sciences](http://www.exeter.ac.uk/ug/medical-sciences)

## MSci/BSc Natural Sciences

Our interdisciplinary Natural Sciences degrees at the University of Exeter give you the opportunity to advance in the more traditional science subjects, whilst also engaging with inspirational new areas of scientific innovation and research which traverse familiar subjects. For example, mathematical and computational biology; biophysical, biochemical and biomedical science; materials science and materials chemistry; the science of oceans, atmospheres and climate; astrophysics; and energy research.

Full details of the programmes are available in the Natural Sciences subject brochure and online at [www.exeter.ac.uk/natural-sciences](http://www.exeter.ac.uk/natural-sciences)





# MODULES IN EXETER



## How your degree is structured

The degrees are divided into core and optional modules, giving you the flexibility to structure your degree according to your specific interests. Individual modules are worth 15, 30 or 45 credits. Full-time undergraduates need to take 120 credits in each year. In addition to the core modules, you can choose from an extensive range of options. In the second and final years you may take up to 30 credits from another discipline outside of Biosciences.

Please note that availability of all modules is subject to timetabling constraints and that not all modules are available every year.

Year three modules will be taken in the fourth year of degrees taken with Study Abroad, Professional Placement or Industrial Experience.

For up-to-date details of all our programmes and modules, please check [www.exeter.ac.uk/ug/biosciences](http://www.exeter.ac.uk/ug/biosciences)

For details of the Sport and Health Sciences modules taught on BSc Human Biosciences please see [www.exeter.ac.uk/ug/sport](http://www.exeter.ac.uk/ug/sport)

### Year 1 Modules

Module Name	BSc Biological Sciences	BSc Biochemistry	BSc Biological and Medicinal Chemistry	BSc Human Biosciences
Animals	C			
Biochemistry	C	C	C	
Bioenergetics				C
Cells	C	C	C	C
Ecology	C			
Foundations of Biomechanics				C
Fundamental Inorganic and Physical Chemistry		●	C	
Fundamental Principles for Bioscientists	C	C	C	C
Genetics	C	C	C	C
Human Physiology				C
Human Anatomy and Kinanthropometry				C
Integrated Practical Chemistry		C	C	
Microbiology	C	C	C	C
Plants	C	●		
Structure and Reactivity of Organic Compounds I		C	C	

### Year 2 Modules

Module Name	BSc Biological Sciences	BSc Biochemistry	BSc Biological and Medicinal Chemistry	BSc Human Biosciences
Advanced Cell Biology	●	C	●	●
Analytical Techniques in Biochemistry	●	C	C	
Animal Ecophysiology	●			
Bioinorganic Chemistry		●	C	
Biomechanics and Kinesiology				C
Coral Reef Field Course	●			
Ecology and Environment	●			
Exercise Physiology				C
Forensic Science	●	●	●	●
Foundations of Sports Nutrition				●
Genomics and Introductory Bioinformatics	●	●	●	●
Introduction to Pharmacology			●	
Marine Biology	●			
Medical and General Microbiology	●	●	●	●
Metabolism	●	C	C	
Modelling for Biosciences	●			
Modern Theories of Evolution	●	●		●
Molecular Biology of the Gene	●	●	●	●
Molecular Microbiology	●	●	●	●
Observations and Experiments in Animal Behaviour	●			
Physical Chemistry		●	●	
Plants and People	●	●		
Practical Skills in Field Ecology	●			
Quantitative Research Methods				C
Research Skills and Bioethics	C	C	C	C
Strength, Conditioning and Athletic Training				●
Structure and Reactivity of Organic Compounds II		C	C	
Wild Behaviour	●			

# MODULES IN EXETER CONTINUED

## Year 3 Modules

Module Name	BSc Biological Sciences	BSc Biochemistry	BSc Biological and Medicinal Chemistry	BSc Human Biosciences	Module Name	BSc Biological Sciences	BSc Biochemistry	BSc Biological and Medicinal Chemistry	BSc Human Biosciences
Animal Developmental Biology	●				Food Security: Plants, Disease and the Environment	●	●		
Bioinformatics	●	●	●	●	Frontiers in Molecular Cell Biology	●	●	●	●
Biomechanical Analysis of Human Movement				●	Horizons of Biochemical Research	●	C	●	
Cell Biology of Disease	●	●	●	●	Mammalian Biology	●			
Cellular Basis of Immunity	●	●	●	●	Microbial Effectors of Disease	●	●	●	●
Clinical Exercise Prescription				●	Molecular Basis of Infection	●	●	●	●
Current Issues in Marine Biology	●				Organic Synthesis and Drug Design		●	C	
Dissertation or Independent Research Project	C	C	C	C	Paediatric Exercise Physiology				●
Ecology of Environmental Change	●				Parasitology	●	●	●	●
Ecotoxicology	●				Pharmacology and Medicinal Chemistry	●	●	C	
Employability and Career Development				●	Rational Drug Design			●	
Energy Metabolism	●	C			Science Communication	●	●	●	●
Environmental Microbiology	●				Secondary Metabolites		●	C	
Factors Affecting Performance				●	Specialist Topics in Chemical Sciences		●	●	
					Sports Nutrition				●



## Year 1

<b>Animals</b>	You will explore the essential features of vertebrates and invertebrates and how their anatomy relates to physiological function. Particular emphasis is placed on structure and how this relates to function, especially physiology, lifestyle and habitat.
<b>Biochemistry</b>	Biochemistry is an introductory module providing the essential biochemical knowledge for understanding all living processes. You will study protein structure, enzyme kinetics and basic metabolism; understanding how each of these processes function and shape the living cell. Practical sessions offer you vital hands-on experience, learning key biochemical techniques and how to apply them.
<b>Bioenergetics</b>	How do they manage it? Asking this question of people participating in sport and exercise involves a consideration of the very basis of human life. Considering the biological and chemical mechanisms which sustain and support life, this module builds an understanding which forms the foundation of exercise physiology.
<b>Cells</b>	This module takes you on a trip around the fundamental unit of life – the cell. With particular emphasis on its dynamic nature, and using examples from bacteria to plants to animals, you will learn how cells use membranes and proteins to organise themselves, and how they communicate both within and without their confines. It also considers the guiding principles that govern formation of a multicellular organism such as cell division and tissue development.
<b>Ecology</b>	In this module you study the key concepts, knowledge and unanswered questions in the ecology of populations, communities and ecosystems. We look at some important historical figures and their legacy, and consider the various approaches to ecological science, including description, experiments and theoretical models. Wherever feasible, we will look at how a general predictive theory can emerge. In laboratory practicals, you will undertake experiments and also undergo some circuit training in the 'ecology gym'.
<b>Fundamental Inorganic and Physical Chemistry</b>	Introduces the fundamental concepts of inorganic and physical chemistry, with particular emphasis on their application to biological and biochemical processes, including atomic and molecular orbitals theory with emphasis on molecular bonding, main group, and transition metal chemistry. In addition, you will be shown how to apply the laws of thermodynamics to predict the position of chemical equilibrium and how theories of reaction kinetics are used to interpret experimental data for reaction rates, including those catalysed by enzymes. You will also learn the basic principles of spectroscopy (for example UV-vis and infra-red) in terms of molecular analysis.
<b>Fundamental Principles for Bioscientists</b>	Introduces the underlying concepts required for scientific investigation, including modern laboratory techniques, experimental design and presenting scientific data. Particular emphasis is given to learning the quantitative skills required to analyse experimental results. Team development training and small-group tutorial work are features of this module.

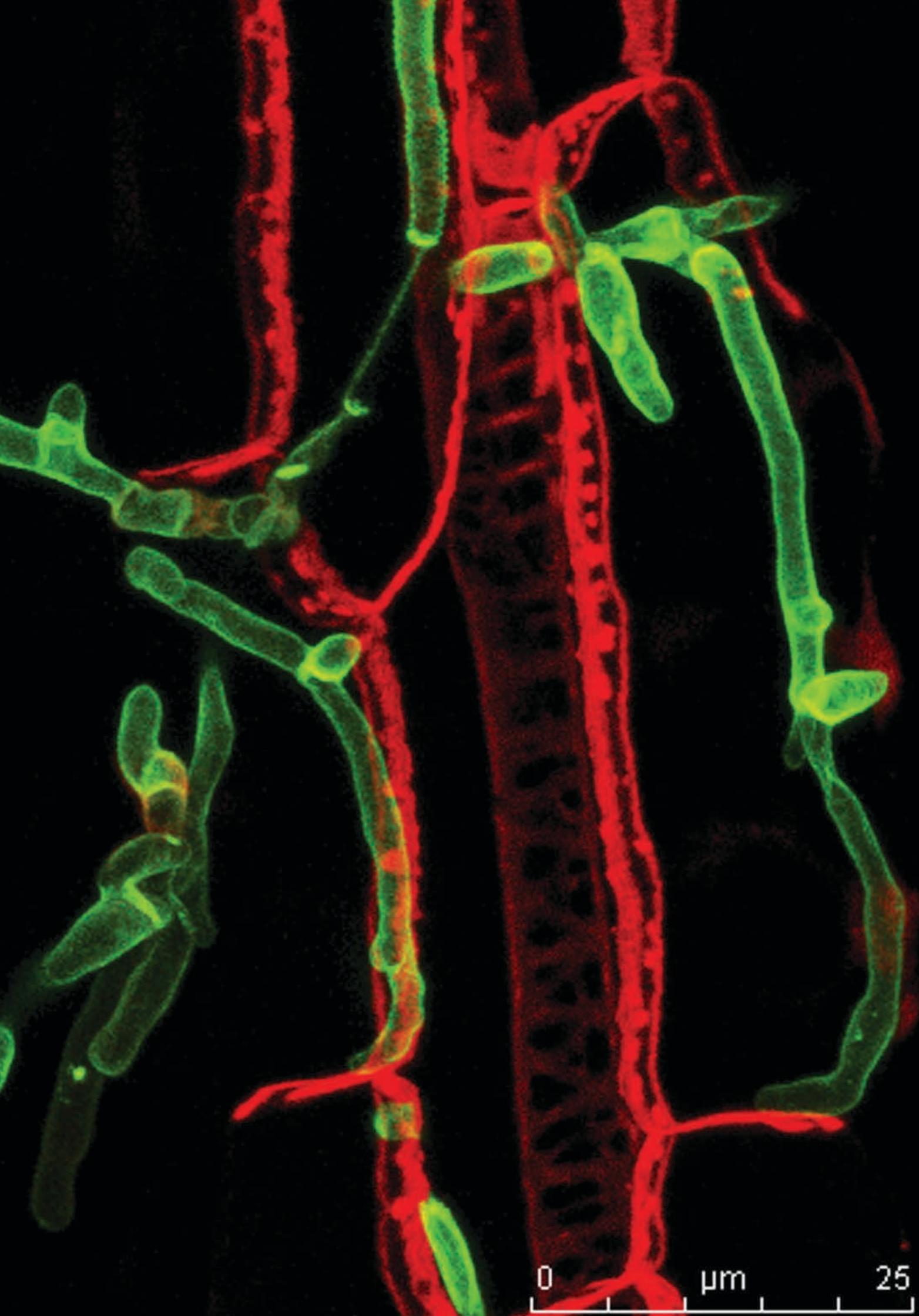
<b>Genetics</b>	Life is controlled by genetic information. In this module you will gain an understanding of how information is stored and inherited in living organisms. Modern techniques in DNA sequencing and the exploration of gene diversity will be introduced, with examples from humans and other organisms.
<b>Integrated Practical Chemistry</b>	Develops your practical chemistry skills and improves your knowledge and understanding of aspects of organic, inorganic and physical chemistry. You will use synthetic chemistry techniques such as distillation, chromatography and crystallisation. You will carry out qualitative and quantitative characterisation, including the use of NMR, IR, UV/visible spectroscopies and quantitative techniques such as titration. You will also learn to follow the course of a reaction using standard kinetics experiments.
<b>Microbiology</b>	This module focuses on the microbiological world, covering bacteria, fungi and protists. Topics including evolution, structure and function and the impact of microorganisms are covered, with an emphasis on their practical applications. You will continue to build on your practical techniques, developing microscopy and microbiological skills.
<b>Plants</b>	Life as we know it is dependent on plants. This module will equip you with a basic understanding of plant science, from the evolution and function of their unique structures, biochemistries and life strategies, through their responses to the environment and other organisms, to their exploitation by humankind as a source of food, materials and energy.
<b>Structure and Reactivity of Organic Compounds I</b>	This module begins to explore the structure and reactivity of organic compounds, starting with an examination of bonding before using a mechanistic approach to study the reactivity of the common functional groups. This module provides fundamental information on aspects of 3D molecular structure (stereochemistry) and the basics of addition, substitution and elimination reactions and illustrates these topics with laboratory experiments.

## Year 2

<b>Advanced Cell Biology</b>	This module builds on the first year <i>Cells</i> module focusing on processes such as maintenance of cell shape, cell division, cell motility and autophagy, and the regulation of these processes, to provide you with an understanding of the complex spatio-temporal organisation required for cell function.
<b>Animal Ecophysiology</b>	This module explores the major physiological processes in animals and how these relate to ecological niche. You will cover metabolism, respiration, endocrinology, reproduction and osmoregulation.
<b>Coral Reef Field Course</b>	This entirely field-based module, held at a research centre in the Bahamas, introduces you to the field of coral reef ecology and that of the associated ecosystems (seagrass and mangroves). You will explore fieldwork techniques in tropical marine ecology and will carry out a series of individual research projects in a range of marine habitats.

# MODULES IN EXETER CONTINUED

<b>Ecology and Environment</b>	Develops your understanding of some of the fundamental concepts, methods and results in the scientific study of ecology, biodiversity and the environment. The module uses examples from both terrestrial and aquatic systems and is a valuable complement to some of our ecology field courses.	<b>Dissertation or Independent Research Project</b>	Both the <i>Dissertation</i> and <i>Research Project</i> give you the opportunity to undertake your own independent and original piece of research, under the supervision of a member of staff. They may be based in the field or laboratory and will deal with questions and issues at the cutting-edge of the discipline.
<b>Exercise Physiology</b>	In this module you explore the body's physiological response to exercise. The module deals with the assessment and interpretation of aerobic and anaerobic fitness and performance, blood lactate, lactate and ventilatory thresholds and cardiovascular control during exercise.	<b>Environmental Microbiology</b>	This module covers bacterial survival in the environment, including extreme environments, and the impact of climate change on pathogen dispersal and survival.
<b>Genomics and Introductory Bioinformatics</b>	We focus on state-of-the-art technology for analysis of genomes and gene expression and critically discuss their use in biological research and biotechnology. Practical classes consolidate use of internet-based genomics tools and provide a platform to critically discuss case studies.	<b>Food Security: Plants, Disease and the Environment</b>	The increasing world population and changing environmental conditions challenge global food security. Our major food crops face numerous yield-lowering perils, including attack by fungi, oomycetes, nematodes, bacteria and viruses. Amongst these living foes, fungi present the greatest challenge. Indeed, fungal diseases of crops have been increasing in both severity and scale since the mid 20th Century and are now moving pole-wards in concert with climate change. In this specialist module you will study plant disease biology, host-pathogen interactions, epidemiology, consider current disease control practices and future mitigation strategies and look at the effects of abiotic stresses on plants.
<b>Medical and General Microbiology</b>	Considers modern approaches to pathogen detection and the challenges posed by the spread of antibiotic resistance.	<b>Frontiers in Molecular Cell Biology</b>	In this module we will explore selected topics at the forefront of cell biology and you will be introduced to the range of experimental techniques that are used to investigate how cells function.
<b>Metabolism</b>	Life is dependent on energy generation and controlled synthesis of building blocks (proteins, lipid, polysaccharides and nucleic acids) needed to make cells: this is metabolism. This module will explore the critical principles that underpin metabolism in all organisms: these include the action and control of enzymes and the co-ordination of enzymes into controlled metabolic pathways.	<b>Horizons of Biochemical Research</b>	Biochemistry, the study of chemical processes in biological systems, is a broad discipline, encompassing biological aspects of chemistry, study of biological macromolecules, and the many ways in which chemicals are synthesised and degraded in organisms. In this module you will engage with recent research in diverse areas of biochemistry, giving an insight into the progress that has been made, the range of areas being explored, and the challenges for the next generation of scientists.
<b>Molecular Biology of the Gene</b>	This module covers a range of topics including cellular structure, genome organisation and replication, and genome expression, including protein modification and targeting.	<b>Mammalian Biology</b>	Examines key characteristics of mammals including reproductive biology, parental care, endothermy, concepts of behaviour and ecology. Topics will be illustrated by case studies of wild mammals.
<b>Structure and Reactivity of Organic Compounds II</b>	Starting with an extension of the chemistry of carbonyl compounds studied in the first year, this module will add key reactions that are used in constructing complex molecular frameworks. The reactions of aromatic compounds are used to explain the chemistry of aromatic heterocycles, the most abundant compounds in nature and pharmaceuticals. Modern spectroscopic methods will be applied to determine the structure of compounds that you will prepare in the laboratory.	<b>Organic Synthesis and Drug Design</b>	In this module we show how the basic reactions covered in the first and second years can be applied to the synthesis of biologically important molecules such as pharmaceuticals. Methods for designing synthetic routes to these compounds will also be explained using case studies.
<b>Year 3</b>		<b>Science Communication</b>	In this module you'll gain an understanding of how science is disseminated to the public via journalists and documentary makers and also how science is communicated to governments, politicians and policy makers. You'll examine good and bad strategies for communicating science to various audiences and how science information and misinformation can be used to change public perception.
<b>Bioinformatics</b>	Research in the biological sciences is increasingly dependent on large datasets such as those generated by DNA sequencing and microarrays. This is also true for diagnostics and medicine. Analysis of these datasets requires a range of skills and knowledge drawn from computer science, physical sciences and mathematics and statistics as well as biological sciences. Bioinformatics is the discipline that integrates algorithms and methods from these disciplines to model biological systems and infer patterns hidden in complex data.		





# LEARNING AND TEACHING

Learning and teaching is through lectures, seminars, tutorials, field work, laboratory sessions and independent study with internationally recognised, research-active staff. You will undertake challenging, independent research projects dealing with questions and issues at the cutting-edge of life science research. Regular research seminars, by our staff and visiting lecturers, bring you the latest issues on a wide range of research topics.

Our staff have close links with a wide range of industrial, medical and conservation organisations, who you may be able to collaborate with for your final year research project. Many of our students also work with these organisations during their vacations.

You will have more than 15 hours of direct contact time per week with your tutors in your first year and will be expected to supplement your lectures with independent study. You should expect your total workload to average about 40 hours per week during term time.

We frequently introduce new methods of learning and teaching, including increasing use of interactive computer-based approaches to learning through our virtual learning environment, where the details of all modules are stored in an easily navigable website. You can access detailed information about modules and learning outcomes and interact through activities such as the discussion forums.

## Research-inspired teaching

We believe that every student benefits from being part of a culture that is inspired by research and being taught by experts. You will discuss the very latest ideas in seminars and tutorials and, in appropriate degree programmes, become an active member of a research team.

The complementary expertise of our staff ensures a vibrant, collaborative research culture within our research groups: Behaviour; Cellular and Chemical Biology; Ecology and Conservation; Environmental Biology; Evolution; and Microbes and Disease.

## Assessment

Your first year does not count towards your final degree classification, but you do have to pass it in order to progress. If you study a three-year programme, assessments in the final two years both count towards your classification, and if you study a four-year programme then the final three years all contribute.

## Academic support

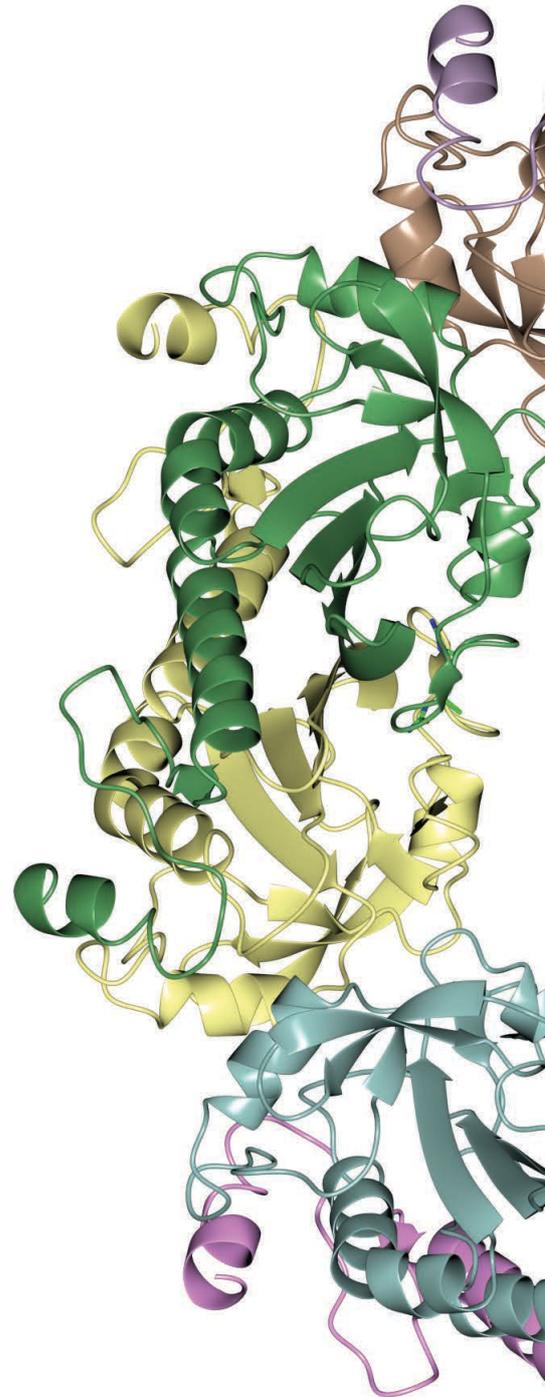
All students have a personal tutor who is available for advice and support throughout your studies. There are also a number of services on campus where you can get advice and information, including the Students' Guild Advice Unit. You can find further information about all the services in the University's undergraduate prospectus or online at [www.exeter.ac.uk/undergraduate](http://www.exeter.ac.uk/undergraduate)

## Study abroad

Research indicates that 64 per cent of employers consider an international experience important for recruitment and report that graduates with an international background are given greater responsibility more frequently. 92 per cent of employers involved in a study conducted in 2014\* indicated that they look for skills such as openness to and curiosity about new challenges, problem-solving and decision-making skills, confidence, and tolerance towards other personal values and behaviours. The research revealed that studying abroad had a positive impact on the development of these skills and concluded that the employability and competences of students greatly benefit from mobility.

Our four-year 'with Study Abroad' degrees give you the opportunity to spend your third year studying at a partner university overseas. We have a number of partners in Europe, North America, and the Pacific Rim. For further information see [www.exeter.ac.uk/ug/biosciences](http://www.exeter.ac.uk/ug/biosciences)

You must apply directly through UCAS for the four-year 'with Study Abroad' degree programmes and there are higher entry requirements compared with our three-year degrees. There are also strict progression criteria through each year: you must attain an overall Upper Second Class result in both your first year and second year to meet the progression criteria in Exeter and the entrance criteria of the host institution.



# CAREERS

Key skills are integrated into all our undergraduate programmes to ensure students gain not just subject knowledge, but the transferable skills valued by employers such as analytical problem solving, teamwork, and organising and communicating information. Group learning, peer level assessment and key vocational skills, such as advanced laboratory training within molecular biology, also enhance the employability of our students.

Your degree will equip you with a comprehensive understanding of the very latest developments within the consistently evolving field of biosciences, and how they form a central part of global thinking on a wide range of topics. All of our Biosciences undergraduate programmes are recognised by the Society of Biology. We also have an excellent reputation with graduate recruiters and our students and graduates compete very successfully in the employment market.

In today's competitive job market, employers look much more favourably on graduates with relevant work experience. We provide all of our students with opportunities to gain high quality work experience during their degrees and work closely with careers staff and alumni to support students on both our Streatham and Penryn campuses. You will be encouraged to take the opportunity to develop your work-based skills through placements during the course of your degree.

Our BSc Biological Sciences, Biochemistry, and Biological and Medicinal Chemistry programmes all have a four-year option to spend a year-long placement in business or industry. In the past students have worked with host organisations such as Shell, Cefas, and GSK. Biosciences students in Cornwall have undertaken work placements at a variety of organisations including the RSPCA, RSPB, Environment Agency, and National Trust.

For further information about what the careers service offers at the University of Exeter, please visit [www.exeter.ac.uk/ug/biosciences/careers](http://www.exeter.ac.uk/ug/biosciences/careers)

## Examples of the destinations of our recent graduates:

### Occupations

Genetic Analyst // Research Analyst // Wildlife Health Research Officer // Turtle Husbandry Assistant // Clinical Research Scientist // Healthcare Technical Officer // Conservation Worker // Fertility Technician // Microbiologist // Assistant Marine Specialist // Environmental Consultant // Medical Sales Representative // Medical Research Technician // Bioinformatics Officer // Biomedical Support Officer // Field Ecologist // Computational Ecologist // Cardiac Scientist

### Employers

Astra Zeneca // Medical Research Council // Plasticell Ltd // Phillips // NHS // Food and Environment Research Agency // Shell Global Solutions // Quotient Bio Research // Wildfowl and Wetlands Trust // Eli Lilly & Co // KPMG // First Data Bank Europe // University of Oxford // Munroe and Forster // Environment Agency Abu Dhabi // The Carbon Trust // Environment Agency // Rothamsted Research // National Biodiversity Data Centre // Biotrack Ltd

## Examples of further study followed by our graduates:

- Environmental Management
- Behavioural and Evolutionary Ecology
- Food Security and Sustainable Agriculture
- Biological Science
- Nanopores
- Renewable Energy Development
- Managing the Environment
- Toxicology
- Medicine
- PGCE Biology
- Animal Behaviour
- Conservation and Diversity
- Medicinal Chemistry
- Immunogenetics



Studying a Biosciences degree at the Penryn Campus in Cornwall is like being in a living laboratory and learning through practical experiences is the best way to engage with biology. The enthusiasm of our lecturers in their own research and teaching means that course content is always new and offers opportunities to pursue your individual interests within the course itself.

Miranda Walter, BSc Conservation Biology and Ecology, Penryn Campus

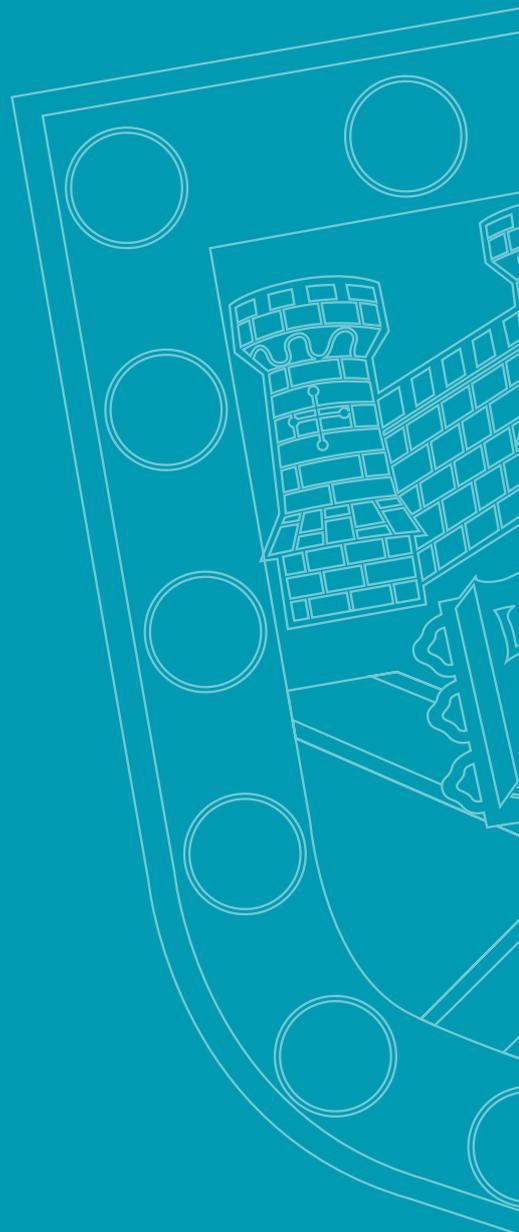
# ABOUT THE UNIVERSITY OF EXETER

1st in the Russell Group for student satisfaction according to the National Student Survey 2014

7th in *The Times and The Sunday Times Good University Guide 2015*

Our teaching is inspired by our research, 82% of which was ranked as world-leading or internationally excellent in the 2014 Research Excellence Framework

Six months after graduation, 93% of our first degree graduates were in employment or further study (HESA 2012/13)



## VISIT US TO FIND OUT MORE

### Open Days

You can register your interest now for our Open Days and receive priority access to book your place\*; visit [www.exeter.ac.uk/opendays](http://www.exeter.ac.uk/opendays)

\* Pre-registration guarantees priority access to the booking system and is not an absolute guarantee of a place at any of our Open Days. Booking is essential and is on a first-come, first-served basis.

Exeter campuses:

Friday 5 June 2015

Saturday 6 June 2015

Saturday 5 September 2015

Penryn Campus, Cornwall:

Saturday 13 June 2015

Saturday 26 September 2015

### Campus Tours

We run campus tours at the Streatham Campus each weekday during term time and at the Penryn Campus on Wednesday and Friday afternoons.

You'll be shown around by a current student, who'll give you a first-hand account of what it's like to live and study at the University.

**Exeter** phone: +44 (0)1392 724043  
email: [visitus@exeter.ac.uk](mailto:visitus@exeter.ac.uk)

**Cornwall** phone: +44 (0)1326 371801  
email: [cornwall@exeter.ac.uk](mailto:cornwall@exeter.ac.uk)

[www.exeter.ac.uk/ug/biosciences](http://www.exeter.ac.uk/ug/biosciences)



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