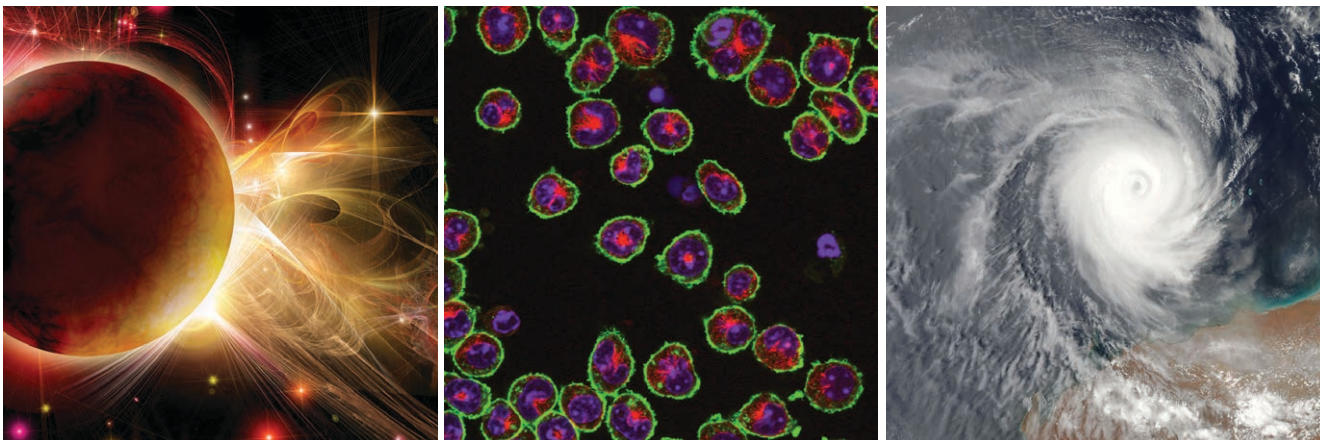
UNIVERSITY OF EXETER

THE SUNDAY TIMES UNIVERSITY OF THE YEAR 2012-13 UNIVERSITY OF EXETER

NATURAL SCIENCES

UNDERGRADUATE STUDY 2014 ENTRY




Key information

	UCAS CODE	TYPICAL OFFER
BSc Single Honours Natural Sciences	CGF0	A*AA-AAB; IB: 38-34
MSci Single Honours Natural Sciences	FGC0	A*AA-AAB; IB: 38-34

For further details on our entry requirements, please see our Natural Sciences pages at **www.exeter.ac.uk/naturalsciences**

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> The significant problems we face cannot be solved at the same level of thinking we were at when we created them.

ATTRIBUTED TO ALBERT EINSTEIN

Why study Natural Sciences at Exeter?

Finding solutions to the key challenges facing society, from an ageing population to climate change, requires a new scientific approach, inspired by a new generation of scientists.

Increasingly, the advances being made are taking place as the barriers between traditional subjects break down. This multidisciplinary approach relies on the application of core skills and knowledge from familiar scientific disciplines to new areas. For example, chemistry and mathematical thinking is meeting engineering concepts, and creating a whole new way of doing biology. Skills which have already solved big problems are now being harnessed in other contexts to tackle some of the grand challenges of the 21st century.

Our Natural Sciences degrees give you the opportunity to advance in the more traditional subjects, whilst also engaging with inspirational new areas of modern scientific innovation and research such as 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.

Contribute to our understanding of critical global issues and finding solutions to the challenges they present

Develop skills required to excel in multidisciplinary science careers

Study with a community of internationally respected scientists

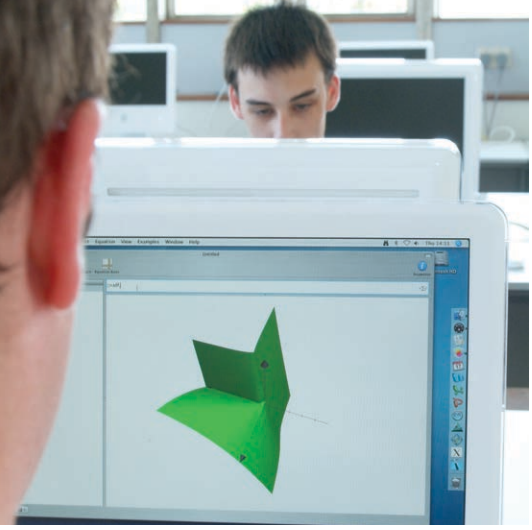
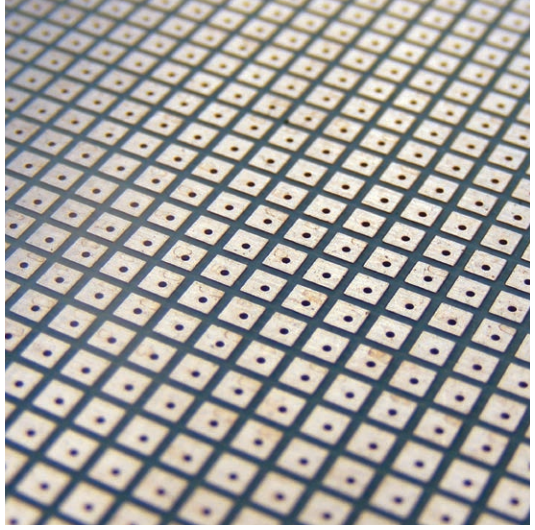
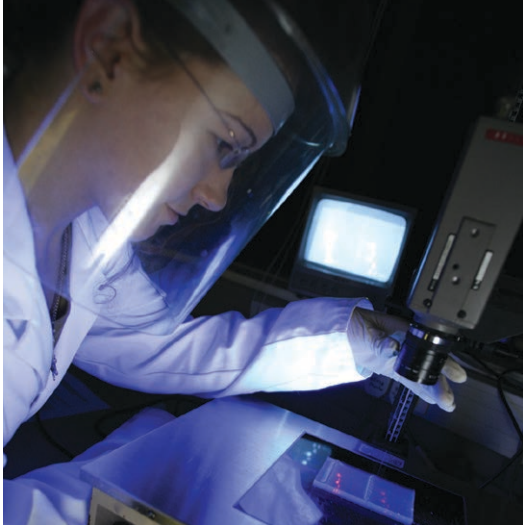
3-year BSc and 4-year research-focused MSci

World leading research undertaken in all of our science and engineering subjects▲

£230 million investment in science, engineering and medicine

Our challenging programmes demand that you think big. They have been developed for students who are not only bright and highly motivated, but who also have open and enquiring minds and are able to think without constraints; those who have the potential to question convention. An 'everything is possible' mindset is essential.

▲*Research Assessment Exercise 2008*

Degree programmes

Single Honours

BSc and MSci Natural Sciences

Our Natural Sciences programmes uniquely put scientific research at their core, with the first two years designed to equip you with the skills and knowledge required to undertake a real research project in one of the University's research groups. We will explore the scientific concepts required to explain the natural world; from the properties of novel nano-materials such as graphene, to the richness of the living world, and to complex dynamic systems such as the Earth's climate.

You will develop an appreciation of scientific methodology and how scientific advances are made in the 21st century. You will interact with leading researchers in student-led seminars and workshops, undertake multidisciplinary group projects and, if taking the MSci programme, have the opportunity to undertake a semester abroad at one of our world-class partner universities.

The degrees ensure that you build solid foundations in the fundamentals of physical, biological and mathematical sciences and provide you with the flexibility to specialise in areas of specific interest as the programmes progress. They offer you the opportunity to switch between the three-year BSc programme and the four-year Masters (MSci) programme as your interests and career aspirations develop.

The innovative design of the programmes, which expose you to contemporary science, is inspired and underpinned by some of the exciting and world leading interdisciplinary research being carried out at the University of Exeter. These include:

- climate change and sustainable futures
- systems biology
- functional materials
- extrasolar planets

In the third year of the programmes you will have the opportunity to join a research group associated with these themes to undertake a real research project and contribute to cutting-edge science. For students continuing on the MSci, this project will be extended into the fourth year when you have the option to spend the majority of your time working on the project with the aim of publishing the results.

Our Natural Sciences programmes allow you to take full advantage of the growing demand in research organisations, industry and business for graduates who are able to work in the multidisciplinary scientific environments of the future.

You can find out more about the University's interdisciplinary science research at **www.exeter.ac.uk/naturalsciences/research**

How your degree is structured

KEY ▲ = Core O = Optional

Our programme structure allows you to pursue your interests and shape your ambitions. The degrees are divided into core and optional modules, which gives you the flexibility to structure your degree according to your specific interests. Individual modules are worth 15, 30, 45 or 60 credits each and full-time undergraduates need to take 120 credits in each year.

Please note that modules may be subject to change. For up-to-date details of the programmes and modules, please check **www.exeter.ac.uk/naturalsciences**

BSc Natural Sciences

Year 1

In your first year you will be introduced to the significant scientific challenges that inspire and permeate this programme. You will develop core knowledge in biology, chemistry, physics, mathematical modelling, computation and data analysis and, importantly, explore the connections between these different areas. Such an approach is fundamental to understanding interdisciplinary scientific issues in areas such as energy, forces and field, matter and materials, complex dynamic systems and living systems.

At the heart of the programme is the *Frontiers in Science* module which runs through the first and second years. This is designed to enable you to bring together concepts from different disciplines, through a mixture of laboratory sessions, research seminars and workshops, with the aim of extending your understanding of fundamental scientific ideas. You will develop key skills such as scientific methodology and research report writing. In the seminars you will hear about current research from leading scientists and there will be opportunities to shape your activities in line with your interests.

The first year modules have been designed specifically, and solely, for students of our Natural Sciences degrees. The modules are not intended to reproduce the science which you will previously have studied. Instead, we aim to ensure you are challenged intellectually, can build on your existing knowledge as well as broaden your understanding in other areas of science, and are perfectly placed to study any of the more advanced and specialist modules in your second year.

Foundations in Natural Science	▲
Frontiers in Science	▲
Mathematics and Computing: Integrative Tools for Natural Sciences	▲

Year 2

During your second year you will enhance the skills you've developed in the first year and deepen your knowledge across the fundamental sciences, whilst also starting to shape your individual route through the programme. You will continue to develop mathematical skills that underpin 21st century science and shape the remaining focus of your studies in subjects spanning biosciences, mathematics, engineering, physics, psychology, geography and sport and health sciences.

The core modules are grouped into topic areas which reflect the interdisciplinary nature of much modern scientific research and which will lead naturally into the research you undertake in the third year. You will work closely with your tutor to tailor your studies to suit your developing interests, through careful choice of modules.

Frontiers in Science	▲

In addition to the *Frontiers in Science* core module, you must select at least four directed core modules, two chosen from one of the topic areas below and a further two chosen from a second topic area.

Energy, forces and fields

Differential Equations	▲
Electromagnetism	▲
Physical Chemistry	▲
Systems, Series and Transforms	▲
Thermal Physics	▲

Matters and materials

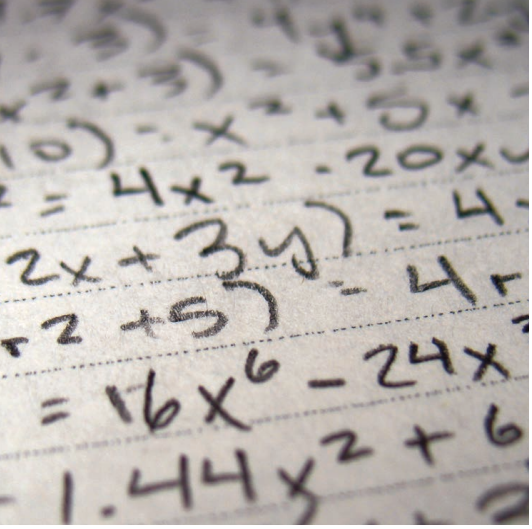
Chemical Structure and Reactivity of Organic Compounds	▲
Condensed Matter	▲
Differential Equations	▲
Quantum Mechanics	▲
Systems, Series and Transforms	▲

Complex dynamic systems

Ecology and the Environment	▲
Environmental Feedback to Climate Change	▲
Numerics and Optimisation	▲
Observing the Universe	▲
Systems, Series and Transforms	▲

Living systems

Advanced Cell Biology	▲
Analytical Techniques in Biochemistry	▲
Bioinorganic Chemistry	▲
Genomics and Introductory Bioinformatics	▲
Molecular Biology of the Gene	▲



You must also choose two or three optional modules from a wide selection, for example:

Analysis	O
Animal Ecophysiology	O
Biomechanics and Kinesiology	O
Electronics for Engineers/Scientists	O
Forensic Science	O
Frontiers of Computing	O
Introduction to Biological Psychology	O
Materials Engineering	O
Mathematics: History and Culture	O
Programming for Science	O
Statistical Modelling	O
The Physics of Living Systems	O

Year 3

Your third year studies will build on your developing knowledge and interests from the first and second years and extend your high-level training in modern scientific skills. You will have a fantastic opportunity to gain experience of undertaking an independent research project related to one of the University's key interdisciplinary science research areas such as: climate change and sustainable futures; functional materials; systems biology; and extrasolar planets. Within this framework, you will determine the specifics of the research to suit your developing interests.

To complement your project, you will also undertake a group project. Working in most modern environments requires highly developed team skills and being an effective and cooperative member of the group will make you a valued employee. The group project will provide you with experience of working as part of a project team of five to eight individuals in a situation similar to one that you may find in many workplace settings. Finally, you will be free to select two or three optional modules that enhance your core studies.

Group Project	▲
Research Project	▲

You must also choose two or three optional modules from a wide selection, for example:

Ecology of Environmental Change	O
Fluid Dynamics	O
Frontiers in Molecular Cell Biology	O
Mathematical Biology and Ecology	O
Mathematics of Climate Change	O
The Biophysics of Cells and Tissues	O

MSci Natural Sciences

KEY ▲ = Core O = Optional

Years 1–3

See above under BSc Natural Sciences. In the third year, instead of studying the Group Project, you will have the option to spend a semester abroad plus study two optional modules in Exeter. Your time spent abroad will be assessed and you'll gain credits towards your final degree while also gaining vital experience and employability skills.

Year 4

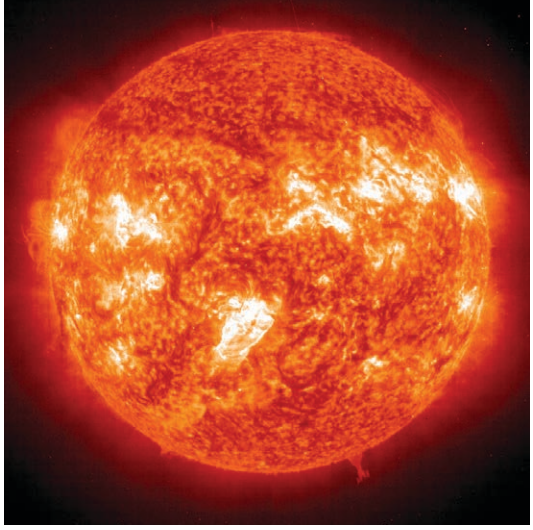
For students enrolled on the MSci, the final year provides an opportunity to continue the individual project started in the third year, working alongside leading scientists at the University. These mentors will provide the academic supervision to hone advanced technical laboratory research skills and analytical expertise. Research projects could, for example, be an exploration of the electronic properties of graphene, simulations of extrasolar planets, an investigation of the acoustic properties of lungs or the optical properties of cyano-bacteria. You will have the option to extend your project further with the aim of publishing your results in the scientific literature.

In your fourth year you will also select from a number of optional modules, through which you can explore other areas of interdisciplinary science and expand your ability to think at the frontiers of the scientific disciplines. Intensive two or three week problem-based learning modules will allow your scientific research, analysis and debating skills to be further developed.

Research Project	▲
Research Project Extension	O

You must choose three or four optional modules from a wide selection, for example:

Dynamical Systems and Chaos	O
Dynamics and Evolution of Biological Systems	O
Mathematical Biology and Ecology	O
New Developments in Materials Engineering	O
Pattern Recognition	O
Physical Methods in Biology and Medicine	O
Stars	O


Learning and teaching

Our Natural Sciences degrees will place you at the heart of a community of internationally respected scientists, who are exploring some of the most important developments of the future and whose success in research is matched by their passion for teaching. We believe that every student benefits from being part of a research-inspired, challenging culture and being taught by experts – you will discuss the very latest ideas in seminars and tutorials. Our relationship with students is one of partnership and facilitation. For example, we will work with you to ensure that you reach the required level across physics, chemistry, biology, mathematics and computing over the first year. Staff and student enthusiasm results in the best possible undergraduate experience.

We use a wide variety of techniques and approaches to help you learn and get the most from your degree. Our teaching methods make full use of both traditional and contemporary approaches, including lectures, tutorials, laboratory sessions, study groups, problem based project modules and web-based learning. Study groups will be an important aspect of enabling students from different backgrounds to gain a broad scientific background.

During core modules you will learn through practical work, problem-solving, project work, team work and research projects, all of which are designed to help you develop analytical skills and scientific acumen; key qualities for success for the rest of your degree – and your future career. Working through examples, solving problems and developing your mathematical and analytical skills are a vital part of being a scientist, so coursework forms a component of most modules. Modules will have a reading list that will consist of chapters from textbooks and research articles from journals.

As a student of the programmes you will benefit from excellent student:staff ratios, small group tutorials and accessible staff. In all years you will be offered personal tutoring in small groups with an academic member of staff who you will see every week. You'll have at least 15 hours of direct contact time with your lecturers and tutors per week in your first year and will be expected to undertake extensive independent and self-motivated study as part of your degree. You should expect your total workload to average about 40 hours per week during term time. During your studies you will learn to work independently and become a scientific thinker – these skills are not easy to acquire but we will be on-hand to guide you throughout the programme.

Alongside your academic studies you will develop personal skills, gaining expertise in communication, team working and project management, and the ability to debate and reflect on the effects of new scientific developments on society and individuals. Our aim is to teach a syllabus that you will find intellectually challenging, rewarding and stimulating. In addition, to help you develop as a scientist so that you can make a real contribution to the exciting research taking place at the University of Exeter and to important scientific developments long after your graduation.

Assessment

You will be assessed in all years through a variety of means; these will include coursework, exams, written reports or presentations amongst others. You must pass your first year assessment in order to progress to the second year, but the results will not count towards your degree classification and the assessment will not disadvantage students who did not study all science subjects at A level.

For full details of the assessment criteria for each module, check the relevant subject areas on our website at **www.exeter.ac.uk/naturalsciences**

Study abroad

If you study the MSci you will have the opportunity to study overseas for one semester at one of our world-class partner institutions. The semester abroad will be taken during your third year and will be assessed. Visit **www.exeter.ac.uk/naturalsciences** for further information.

Careers

Globally, research in universities and institutions is increasingly being undertaken in truly multidisciplinary settings. As a graduate of the University of Exeter Natural Sciences programmes you will have the skills and expertise to make a significant impact in such a setting and to further your academic career by pursuing doctoral training should you choose.

Alternatively, you may wish to follow an alternative career path. The issues and challenges facing society are also rarely confined to a single scientific discipline and government agencies draw upon expertise across different fields. Natural Sciences graduates will be ideally placed to not only pursue scientific careers within these organisations, usually starting in a graduate programme, but later to branch into project management, technical leadership and management.

In smaller companies, Research and Development (R&D) teams might only consist of a few people and scientists will often be expected to work across the traditional scientific disciplines, particularly with regards to the development of new products and services. Consultancy companies also work across traditional scientific careers and offer roles in project management, scientific software development and mathematical modelling. Larger companies use multidisciplinary teams in research, development, consultancy, and also in management activities such as strategy setting. Graduates from our Natural Sciences programmes will be well positioned to join large companies through their graduate recruitment programmes and to excel in these environments progressing to the top of their chosen career path.

Employers highly value skills and attributes such as flexibility, the capacity to work as an individual or a team, openness to new ideas, the ability to communicate complex ideas to different audiences, and passion, creativity and enthusiasm. Many employers look for graduates who can work across different disciplines to tackle some of the world's most challenging problems, whether in scientific research or industry and commerce.

Our Natural Sciences degree will not only provide you with a unique understanding of scientific global challenges facing our society, but will also help you to develop a wide range of key skills for employment and further study such as analytical problem solving, teamwork and organising and communicating information. Whether you choose to pursue a career in scientific research in academia or government, research and development in industry, or a career in law (particularly intellectual property), business, management, or teaching, a University of Exeter Natural Sciences degree will make you highly attractive and will open a wide range of career opportunities.

We have an excellent reputation with graduate recruiters and our students and graduates compete very successfully in the employment market. On campus we offer a careers advisory service which provides high quality careers information and guidance to all students as well as online facilities such as a CV creator and advice on application and interview techniques.

We also offer the Exeter Award and the Exeter Leaders Award. These schemes encourage you to participate in employability related workshops, skills events, volunteering and employment which will contribute to your career decision-making skills and success in the employment market. Whatever path you want to follow after graduating, we're here to help and support you with all your career and employability needs.

For further information about what the Employability Service offers at Exeter visit **www.exeter.ac.uk/undergraduate/employability**

Entry requirements and applying

You can find a summary of our typical entry requirements on the inside front cover of this brochure.

The full and most up-to-date information about Natural Sciences is on the undergraduate website at **www.exeter.ac.uk/undergraduate/degrees/natural-sciences** and we strongly advise that you check this before attending an Open Day or making your application. Some programmes require prior study of specific subjects and may also have minimum grade requirements at GCSE or equivalent, particularly in English Language and/or Mathematics.

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.

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/undergraduate/international**

For information on the application, decision, offer and confirmation process, please visit **www.exeter.ac.uk/undergraduate/applications**

Natural Sciences modules

Please note that availability of all modules is subject to timetabling constraints and that not all modules may be available every year. The optional modules below are just some of those open to Natural Sciences students; you may take any University science-based module providing you satisfy any necessary prerequisites and have not already taken the module or an equivalent.

For up-to-date details of all our programmes and modules, please check the undergraduate section of our website at **www.exeter.ac.uk/naturalsciences**

Year 1

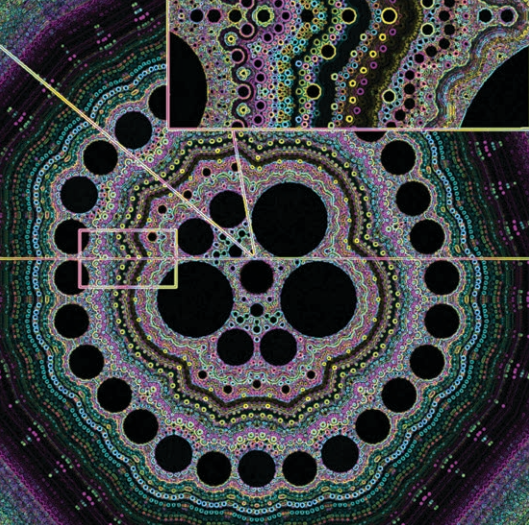
Core modules

Foundations in Natural Science	In this module you will gain excellent foundations in the fundamentals of biology, chemistry and physics and will apply this knowledge to solve problems in the study of energy, forces and fields, matter and materials, complex dynamic systems and living systems.
Frontiers in Science	This module is core to the Natural Sciences ethos and will include a mixture of experimental laboratories, seminars and workshops. Part of this will include student-led activities which will allow you to explore the science issues you find fascinating.
Mathematics and Computing: Integrative Tools for Natural Sciences	Provides you with the mathematical skills needed for a range of research areas. Computing is a fundamental part of modern science and you will be given an introduction to programming, together with an overview of developments in computer science.

Year 2

Core modules

Advanced Cell Biology	You'll study a range of important cellular processes in depth, including intracellular transport, cell polarity, cell cycle regulation and cell migration.
Analytical Techniques in Biochemistry	Introduces you to the state-of-the-art methods used to analyse and characterise biological macromolecules. Lectures are supplemented by practical sessions where you learn how to fractionate proteins from cells, purify proteins by chromatographic methods, assay enzymes and analyse results by gel electrophoresis.
Bioinorganic Chemistry	Provides a study of the processes of physical chemistry, redox reactions and bioinorganic chemistry. You then move on to study the role of metallochemistry in biology and medicine.
Chemical Structure and Reactivity of Organic Compounds	Introduces the modern spectroscopic methods (infrared, ultraviolet and nuclear magnetic resonance spectroscopies and mass spectrometry), which are used for determining the structures of organic molecules. Reactions of compounds containing carbonyl groups will be explained, with an emphasis on formation of carbon-carbon bonds, as the key to the construction of the carbon skeletons of complex, biologically active compounds.
Condensed Matter	Develops your understanding of how electrons, and other waves, propagate within crystalline materials. The first section involves learning about the crystal structures common in nature. The second section covers the vibrational excitations of the crystal lattice. The last section considers the transport of electrons in the free electron and nearly-free-electron approximations, which give a good description of the behaviour of electrons in metals and semiconductors.
Differential Equations	Introduces some representative types of ordinary and partial differential equations and a number of analytical techniques used to solve them exactly or approximately.
Ecology and the Environment	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.
Electromagnetism	The electromagnetic force holds atoms, molecules and materials together and plays a vital role in our understanding of almost all existing and potential technological developments. This module uses vector analysis to develop Maxwell's equations and investigate their application to quasistatic systems, including those involving matter. It builds a firm foundation for the study of advanced material in subsequent modules.
Environmental Feedback to Climate Change	Provides an introduction to the types of changes global warming may cause in terrestrial ecosystems, and how these will feedback to influence our climate.
Genomics and Introductory Bioinformatics	This module focuses on state-of-the-art technology for analysis of genomes and gene expression and critically discusses their use in biological research and biotechnology. Practical classes consolidate use of internet-based genomics tools and will provide a platform to critically discuss case studies.
Molecular Biology of the Gene	Covers a range of topics including cellular structure, genome organisation and replication, and genome expression, including protein modification and targeting.
Numerics and Optimisation	Explores the use of computers to solve mathematical problems by means of numerical approximation. The techniques discussed form the basis of the numerical simulation and computer modelling of problems in science and business.



Observing the Universe	Provides you with a basic understanding of the universe and its contents, and a good understanding of astrophysical measurement.
Physical Chemistry	This module extends thermodynamics of chemical reactions to electrochemical reactions and other key processes such as osmosis. The statistical basis of thermodynamics is also elaborated, helping to facilitate a microscopic model of elementary reaction rates. Reaction mechanisms are expanded to encompass complex reactions, such as chain reactions/explosions and enzyme-catalysed reactions beyond Michaelis-Menten. Quantum chemistry proceeds to semi-quantitative treatments of simple-harmonic motion and of the hydrogen atom. Transitions between electronic, vibrational and rotational levels are considered in the context of various spectroscopies, emphasising their role as key experimental tools in the Natural Sciences.
Quantum Mechanics	Quantum mechanics is one of the fundamental building-blocks of physics. It affects profoundly the way we think about the universe and is the basis for much of condensed-matter, nuclear and statistical physics. It also has a strong influence on technological developments, for instance in optical and electronic devices. This module introduces the basic principles of quantum mechanics and then applies these principles to atomic systems.
Systems, Series and Transforms	Looks at the mathematics of modern signal processing; the interplay between signals and series. It uncovers the mathematics which underpins the miniaturised digital revolution of the last couple of decades.
Thermal Physics	Develops the discussion of thermal properties into classical thermodynamics and shows how the laws of thermodynamics arise naturally from the statistical properties of an ensemble. Real-world examples of the key ideas are presented.
Optional modules	
Analysis	Covers the theory that underpins all continuous mathematics and introduces real and complex analysis, providing proofs of fundamental theorems.
Animal Ecophysiology	Explores the major physiological processes in animals and how these relate to ecological niche. You will cover metabolism, respiration, endocrinology, reproduction and osmoregulation.
Biomechanics and Kinesiology	Deepens your understanding of sport and exercise related biomechanics and introduces methods of movement assessment. You will develop an understanding of linear kinematics and linear kinetics and learn to apply these principles to the analysis of human movement and sports performance.
Electronics for Engineers/ Scientists	Introduces fundamental concepts of electronics, electronics terminology and devices and elementary circuits. You will explore the concept of logic systems and their implementation using electronic devices.
Forensic Science	Covers all aspects of forensic science from the physical principles of ballistics to DNA fingerprinting and the chemical analysis of drugs. A large part of the module is taught by visiting experts, who use these techniques daily, enabling you to really understand the practical aspects of forensic science.
Frontiers of Computing	This module provides you with an exciting and diverse overview of current research in computing. Computers are now able to learn for themselves, find solutions to difficult problems in science and provide ever-more human-like opponents in games.
Introduction to Biological Psychology	Promotes a sound knowledge of empirical data, both historic and recent, relevant to cognition in a variety of vertebrate species.
Materials Engineering	Develops your understanding of material properties, how they arise from internal microstructure and how they can be manipulated for specific applications. It will also introduce rapidly advancing topics in materials.
Mathematics: History and Culture	Provides an appreciation of the history and philosophy of mathematics and its place in human history and culture. It develops skills in research, essay-writing and presentation.
Programming for Science	Being able to program well is essential to computer science. This module introduces you to the procedural programming paradigm, and develops your problem-solving and analytical skills. It introduces you to the algorithmic formulation of solutions to problems, and will expose you to some of the scientific applications of programming.
Statistical Modelling	Learn how to use a range of simple statistical models for analysing data, including linear simple and multiple regression and one and two way ANOVA.
The Physics of Living Systems	Research at the interface between physics and biological science is developing rapidly. This module introduces the field through discussion of the physical properties of biomolecules, such as proteins and DNA that are key to their biological functions, and the remarkable physical processes that underlie cellular function. It provides a physicist's introduction to the functions of organs and tissues, reviewing, for example, the mechanics of bones and joints, the fluid mechanics of the circulation and the optics and acoustics of sensory perception.

Year 3

Core modules

Group Project	Requires you to work together in a group of between five and eight students and undertake a significant technical challenge. All projects are supervised by academic members of staff.
Research Project	Project work provides the opportunity to carry out research and detailed investigation into a specific area linked to the University's science strategy themes. It develops your analytical and problem-solving skills in a context where you won't be told the 'right' answer; rather you must discover and validate an answer yourself. This may involve devising explanations or solutions; use of the library computer, and other resources; working in small groups; and in the presentation and communication of your work, in both written and oral form.

Optional modules

Ecology of Environmental Change	Brings together science and politics to present a fact-based picture of human impacts on our changing world.
Fluid Dynamics	Provides further understanding of the basic concepts of fluid dynamics associated with flow of incompressible (constant density) fluids with both viscosity and inertia.
Frontiers in Molecular Cell Biology	Explores selected topics at the forefront of cell biology. You will be introduced to the range of experimental techniques that are used to investigate how cells function.
Mathematical Biology and Ecology	Provides an opportunity to learn how mathematics may be usefully employed in the biosciences to assess population and demographic phenomena. Some use of software will enable you to build and analyse models using real-world examples from nature. This sort of analysis has theoretical and practical applications in biological, biomedical and biotechnology research. For example, you may study the population dynamics of insects, animals or fish; or the competitive exclusion of species, and be able to draw conclusions about likely behaviours.
Mathematics of Climate Change	Provides a background in the mathematics underlying human-induced climate change. It will provide you with a good general understanding of the climate system, and human-induced climate change.
The Biophysics of Cells and Tissues	Introduces the remarkable physical properties of the cell membrane and the cytoskeleton and explains how these structures are involved in many essential cellular functions. It also describes how a complex network or proteins forming the extracellular matrix provides tissues such as cartilage and blood vessels with the unique physical properties that are essential to their function. Furthermore, it introduces cutting-edge research linking dysfunctions of these systems to diseases ranging from cancer to atherosclerosis.

Year 4

Core modules

Research Project	Based in one of our research groups, you will continue and develop the research project started in the third year.
Research Project Extension	For those whose research is progressing well, this module provides an opportunity to extend the research with the aim of publishing your results in the scientific literature.

Optional modules

Dynamical Systems and Chaos	Provides you with a good understanding of asymptotic behaviour of nonlinear dynamics. You will be exposed to qualitative and quantitative methods for dynamical systems, including nonlinear ordinary differential equations, maps and chaos.
Dynamics and Evolution of Biological Systems	Understanding life involves untangling complex interaction networks and coupled systems at the scale of molecules, cells, tissues and organisms. In this module we will develop mathematical techniques from dynamical systems and control to understand the stability and robustness of these networks and systems.
Mathematical Biology and Ecology	Provides an opportunity to learn how mathematics may be usefully employed in the biosciences to assess population and demographic phenomena. Some use of software will enable students to build and analyse models using real-world examples from nature.
New Developments in Materials Engineering	Provides an insight into the very latest developments in materials engineering; those that are likely to have an impact on your future career.
Pattern Recognition	Provides a thorough grounding in the theory and application of pattern recognition, classification, categorisation, and concept acquisition. Neural networks and graphical models are flexible tools for modelling data which can be employed, in a principled statistical way, in pattern recognition schemes.
Physical Methods in Biology and Medicine	From Robert Hooke's construction of the light microscope to the development of clinical MRI imaging the provision by physicists of new tools has provided a major stimulus for advances in biology and medicine. This module provides an introduction to many areas of physics such as nonlinear optics and nanophotonics that are being harnessed in biosensing and bioimaging to provide new windows on biological function and new approaches to disease detection.
Stars	The study of stellar systems encompasses a wide range of physics, including gravitation, quantum mechanics and thermodynamics. This module takes these fundamental physical concepts and uses them to derive the properties of stars. The basic internal structure of stars is described in the first lectures, while later lectures deal with the ageing and death of both high- and low-mass objects. The final lectures describe how stars and planetary systems form.

Academic excellence

- The University of Exeter has been named as *The Sunday Times* University of the Year and is also ranked 7th in the UK in its University Guide 2013
- We are also in the top one per cent of universities in the world, and a regular fixture in the top 10 league tables in *The Guardian* and *The Times*
- University of Exeter students are among the most satisfied in the UK: we are ranked 6th in the UK in the National Student Survey 2012 amongst traditional universities and 3rd for the quality of our teaching
- Our teaching is inspired by our research, nearly 90 per cent of which was ranked as internationally recognised by the 2008 Research Assessment Exercise
- We attract the best qualified students in the country; we're in the top 10 for the number of students graduating with a first or 2:1 and for entry standards (students achieving AAB at A level and above)

A vibrant community

- Our students are the most engaged in the country, smashing participation records in student elections for the last two years running
- The Students' Guild offers an unrivalled selection of societies, from sport to culture to community volunteering groups – 8,000 students take part in 165 societies
- We are a top 10 UK university for sport and provide excellent facilities and support whether you want to compete at the highest level or just for fun
- We work with our students to continually improve the education on offer, via initiatives which put students at the heart of our decision making process
- We're a truly international community, with students from over 130 countries and staff of 50 different nationalities

Ambition for the future

- We equip you with the skills employers need via business placements, study abroad schemes, volunteering opportunities, careers advice from successful alumni and much more
- Despite tough economic times, we've improved our employment record year-on-year: more than 90 per cent of students get a job or further study place within six months of graduating
- We've invested over £350 million in our three campuses, from new accommodation and research labs to state-of-the-art lecture theatres and library spaces

Explore the possibilities

Open Days
Come and visit our beautiful campuses. We hold Open Days twice a year in June and September.

Campus Tours
We run Campus Tours at the Streatham Campus each weekday during term time. You'll be shown round by a current student, who'll give you a first-hand account of what it's like to live and study at Exeter.

For full details and to book your place, contact us on:
Website: www.exeter.ac.uk/opendays
Phone: +44 (0)1392 724043
Email: visitus@exeter.ac.uk

Offer-Holder Visit Days
Once you receive confirmation of an offer we'll contact you with an invitation to visit us on an Offer-Holder Visit Day, which will give you the chance to find out more about your programme and department and decide whether to accept our offer. While this opportunity to visit includes a campus tour and formal introduction to the department, much emphasis is placed on a more informal period for questions and answers. A number of our current students also take part on these days, leading tours and giving you the opportunity to ask them what studying at Exeter is really like! Offer-Holder Visit Days take place during the period January to April.

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