

Course Information Document: Undergraduate

For students starting in Academic Year 2022/23

1. Course Summary

Names of programme and award title(s)	BSc (Hons) Natural Sciences BSc (Hons) Natural Sciences with International Year (see Annex for details) BSc (Hons) Natural Sciences with Work Placement Year (see Annex for details)
Award type	Single Honours
Mode of study	Full-time
Framework of Higher Education Qualification (FHEQ) level of final award	Level 6
Normal length of the programme	3 years; 4 years with either the International Year or Placement Year between years 2 and 3
Maximum period of registration	The normal length as specified above plus 3 years
Location of study	Keele Campus
Accreditation (if applicable)	n/a
Regulator	Office for Students (OfS)
Tuition Fees	<p>UK students: Fee for 2022/23 is £9,250*</p> <p>International students: Fee for 2022/23 is £17,900**</p> <p>The fee for the international year abroad is calculated at 15% of the standard year fee</p> <p>The fee for the work placement year is calculated at 20% of the standard year fee</p>

How this information might change: Please read the important information at <http://www.keele.ac.uk/student-agreement/>. This explains how and why we may need to make changes to the information provided in this document and to help you understand how we will communicate with you if this happens.

* These fees are regulated by Government. We reserve the right to increase fees in subsequent years of study in response to changes in government policy and/or changes to the law. If permitted by such change in policy or law, we may increase your fees by an inflationary amount or such other measure as required by government policy or the law. Please refer to the accompanying Student Terms & Conditions. Further information on fees can be found at <http://www.keele.ac.uk/studentfunding/tuitionfees/>

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2. What is a Single Honours programme?

The BSc Natural Sciences degree allows you to study a broad range of disciplines within a single honours programme.

The programme is highly interdisciplinary, drawing on the expertise of scientists in the fields of Biology, Mathematics, Psychology, Forensic Science, Chemistry, Physics, Computer Science, Environmental Science, Earth Science, and Geography. It is in keeping with Keele's commitment to offer a broad undergraduate degree programme, whilst providing opportunity for students to develop increased specialisation, or to maintain a broad science-based portfolio, within the structure of a Single Honours programme. Thus it enables students to gain, and be able to demonstrate, a distinctive range of graduate attributes.

Natural Sciences is available as a 3-year BSc or a 4-year MSci. The BSc is available for the following core disciplines: Astrophysics, Biology, Chemistry, Computer Science, Environmental Science, Forensic Science, Geology, Mathematics, Physical Geography, Physics and Psychology. The MSci is only available for Chemistry, Environmental Science, Forensic Science and Geology.

Students study the same module diets for the first two years on the BSc and MSci. Students may transfer between the BSc and MSci programmes up until the start of the third year of study. In third year, MSci students increase their specialism in their core discipline to prepare them for full specialism in fourth year. Progression to third year (Level 6) of the MSci Natural Sciences programme requires an average of at least 60% at Level 5 - students who do not attain this average are transferred automatically to the 3-year BSc Natural Sciences degree programme for Level 6.

These specifications refer solely to the BSc Natural Sciences programme. Students seeking further information on the 3-year BSc Honours Natural Sciences route are advised to consult the relevant programme specification.

3. Overview of the Programme

The BSc (Hons) degree programme in Natural Sciences provides you with the opportunity to combine your interests in one core discipline, multiple additional sciences, and interdisciplinary practice within the structure of a Single Honours degree programme. It aims to provide students with the scientific skills and expertise required to tackle many of the world's most pressing scientific and societal problems. The course at Keele draws on the expertise of scientists from within the Schools of Life Sciences; Chemical and Physical Sciences; Geography, Geology and the Environment; Psychology; and Computing and Mathematics, but also has close links with Keele's BA/MA Liberal Arts programme providing students with opportunity for cross-faculty, interdisciplinary debates about topical world issues. The degree structure is designed to cater for students who wish to continue to study multiple science subjects in an integrated manner at degree level and who are open minded, creative, inquiring and excited by the challenge of solving complex problems. It aims to produce graduates who have the interdisciplinary background, communication and problem-solving skills to address complex scientific problems in a changing world.

You will choose one core discipline as a named route, accounting for half of your learning, that ensures you have a solid grounding in an established discipline. The remaining half of your learning is through an even mix of programme-specific interdisciplinary modules that cover the full range of disciplines offered by the programme and your own choice of modules that allows you to mix and match different subjects. The programme-specific interdisciplinary sessions include shared learning with interdisciplinary Liberal Arts students to enable you to apply Natural Sciences effectively within the wider society in which we live and work.

At the end of your first year, there is flexibility to transfer between certain core discipline routes dependent on the modules you have taken. You are also able to move over to a Single Honours degree in your core discipline if you decide you want to fully focus on that one discipline. Depending on the modules you have taken as options or electives, you may also be able to transfer onto a Combined Honours programme. Similarly, any first year student on Combined or Single Honours programme at Keele that is available as a core Natural Sciences discipline is also welcome to transfer into the second year of Natural Sciences.

Similarly, any first year student on a Single or Combined Honours programme at Keele for one of the BSc Natural Sciences core disciplines is also welcome to transfer into the second year of the BSc Natural Sciences.

4. Aims of the programme

The broad aims of the programme are to:

- provide students with a sound scientific understanding of their selected 'core' science disciplines and the ability to apply this knowledge to help solve complex problems;
- gain a wide-range of laboratory and field-based skills, as appropriate to the student's chosen core science subjects, including the ability to carry out independent research;

- integrate scientific knowledge, and an awareness of social, economic and ethical issues, to address some of the World's most pressing societal concerns such as understanding the origins of the Universe, avoiding antibiotic drug resistance, mitigating climate change and providing long term food security;
- develop to a high professional standard, a broad range of employability skills including problem-solving, team work, independent research, communication and presentation skills.

5. What you will learn

The intended learning outcomes of the programme (what students should know, understand and be able to do at the end of the programme), can be described under the following headings:

- Subject knowledge and understanding
- Subject specific skills
- Key or transferable skills (including employability skills)

Subject knowledge and understanding

Successful students will be able to demonstrate knowledge and understanding of:

- the benefits of an interdisciplinary approach to science;
- the role Natural Scientists can play in the resolution of major challenges facing society;
- interdisciplinary perspectives on world/societal issues.

Subject specific skills

Successful students will be able to:

- effectively search and critically review the academic literature relating to a current interdisciplinary debate/discourse;
- recognise and make choices between the different methodological approaches to interdisciplinary research;
- frame research questions, aims and objectives, and design effective and achievable research/experimental projects;
- apply their knowledge, skills and experience to an aspect of current scientific research, through the use of established analytical scientific methods, literature review, data collection and interpretation;
- use a variety of evidence-based approaches to solve problems;
- apply reflection and critical skills to a wide range of issues;
- work with others to discover creative, innovative solutions to complex issues.

Key or transferable skills (including employability skills)

Successful students will be able to:

- locate, evaluate and make effective use of a wide range of university-level information sources;
- communicate clearly and effectively using appropriate scientific language and conventions in both written and oral forms;
- communicate complex ideas to lay audiences in a variety of forms;
- communicate reflective and critical ideas through advanced written and oral presentation skills.

The full range of intended learning outcomes that will be achieved by students taking the Natural Sciences degree programme will be highly dependent upon which combination of sciences* that they choose to study as 'core' and 'supporting'. Individual module specifications should be consulted for information on knowledge and understanding and skills obtained from optional modules within the degree programme, and for those modules taken as a supporting science. *The exact combination of subjects which can be taken as core and supporting is dependent upon timetabling restrictions (see 'What is the Structure of the Programme').

Keele Graduate attributes

Engagement with this programme will enable you to develop your intellectual, personal and professional capabilities. At Keele, we call these our ten Graduate Attributes and they include independent thinking, synthesizing information, creative problem solving, communicating clearly, and appreciating the social, environmental and global implications of your studies and activities. Our educational programme and learning environment is designed to help you to become a well-rounded graduate who is capable of making a positive and valued contribution in a complex and rapidly changing world, whichever spheres of life you engage in after your studies are completed.

Further information about the Keele Graduate Attributes can be found here: <http://www.keele.ac.uk/journey/>

6. How is the programme taught?

Learning and teaching methods used on the programme vary according to the subject matter and level of the module. They include the following:

- Lectures
- Tutorials
- Laboratory Classes
- Problem-solving classes and workshops
- Screencasts
- Pre-laboratory and post-laboratory exercises
- Research projects
- IT instruction (spreadsheets, word-processing, chemical structure drawing, databases, textbook resources, information retrieval and literature searching)
- Group work
- Seminars with pre- and post-seminar discussions
- Interdisciplinary debates (links with BA Liberal Arts students)
- Self and peer-assessment for learning
- Information literacy activities
- Computer-aided learning (simulations and animations, online activities and exercises)
- Case studies
- Use of e-learning/the Keele Learning Environment (KLE)

Apart from these formal activities, students are also provided with regular opportunities to talk through particular areas of difficulty, and any special learning needs they may have, with their Personal Tutors or module lecturers on a one-to-one basis.

These learning and teaching methods enable students to achieve the learning outcomes of the programme in a variety of ways.

7. Teaching Staff

As Natural Sciences is such an interdisciplinary subject, staff from across the Faculty of Natural Sciences make contributions to the degree programme. The teaching and research profiles of the staff that deliver and support the Natural Sciences programme can be found at:

School of Geography, Geology and the Environment: <http://www.keele.ac.uk/gge/people/>

School of Chemical and Physical Sciences: <http://www.keele.ac.uk/chemistry/staff/>

School of Life Sciences: <http://www.keele.ac.uk/lifesci/people/>

School of Computing and Mathematics: <https://www.keele.ac.uk/scm/staff/>

School of Psychology: <https://www.keele.ac.uk/psychology/people/academic-stafflist/>

The University will attempt to minimise changes to our core teaching teams, however, delivery of the programme depends on having a sufficient number of staff with the relevant expertise to ensure that the programme is taught to the appropriate academic standard.

Staff turnover, for example where key members of staff leave, fall ill or go on research leave, may result in changes to the programme's content. The University will endeavour to ensure that any impact on students is limited if such changes occur.

8. What is the structure of the Programme?

The academic year runs from September to June and is divided into two semesters. The number of weeks of teaching will vary from course to course, but you can generally expect to attend scheduled teaching sessions between the end of September and mid-December, and from mid-January to the end of May.

Our degree courses are organised into modules. Each module is usually a self-contained unit of study and each is usually assessed separately with the award of credits on the basis of 1 credit = 10 hours of student effort. An outline of the structure of the programme is provided in the tables below.

There are three types of module delivered as part of this programme. They are:

- Compulsory modules - a module that you are required to study on this course;
- Optional modules - these allow you some limited choice of what to study from a list of modules;

- Elective modules (Global Challenge Pathways at Level 4) - a choice of modules from different subject areas within the University that count towards the overall credit requirement but not the number of subject-related credits.

A summary of the credit requirements per year is as follows, with a minimum of 90 subject credits (compulsory plus optional) required for each year.

For further information on the content of modules currently offered, including the list of elective modules, please visit: <https://www.keele.ac.uk/recordsandexams/modulecatalogue/>

Core discipline routes through the BSc Natural Sciences

Students studying BSc Natural Sciences choose one core discipline from the following options as their named route through the programme:

- Astrophysics (route code NSC-ASTSH)
- Biology (route code NSC-BIOSH)
- Chemistry (route code NSC-CHESH)
- Computer Science (route code NSC-CSCSH)
- Environmental Science (route code NSC-EVSSH)
- Forensic Science (route code NSC-FSCSH)
- Geography* (route code NSC-GBSSH)
- Geology (route code NSC-GEOSH)
- Mathematics (route code NSC-MATSH)
- Physics (route code NSC-PHYSH)
- Psychology (route code NSC-PSYS)

* Geography as Combined Honours is available as BA or BSc routes - BSc Natural Sciences students follow the BSc module diet from Geography

The module diet at Level 4 (Year 1) and Level 5 (Year 2) follows the equivalent for the Combined Honours programme in that subject.

At Level 6, students continue to take 60 credits from their core discipline (students on equivalent Combined Honours programmes take 0-90 credits as they have another parallel subject from which they must take 90 overall subject-specific credits).

Overall structure of credits per year for the BSc Natural Sciences

	Year 1 (Level 4)	Year 2 (Level 5)	Year 3 (Level 6)
Core discipline (compulsory and/or options)	60 credits	60 credits	60 credits
Natural Sciences option modules or Global Challenge Pathways modules	30 credits	30 credits	30 credits
Interdisciplinary: BSc/MSc Natural Sciences	15 credits	15 credits	15 credits
Interdisciplinary: BSc/MSc Natural Sciences and BA/MA Liberal Arts	15 credits	15 credits	15 credits

Module Lists

Level 4

Compulsory modules	Module Code	Credits	Period
Science & Society	NAT-10001	15	Semester 1-2
Applied Interdisciplinary Science Case Studies	NAT-10005	15	Semester 1-2

Level 4 Module Rules

Summary of option modules and any applicable rules

Availability of option modules depends on timetabling and sometimes prerequisite study. All modules run in their normal timetable sessions as per the host discipline - with no requirement to adjust timetabling for availability to Natural Sciences students, which would not be feasible because core disciplines are spread across all 3 blocks of the block timetable.

School of Chemical and Physical Sciences

PHYSICS option modules

None available

CHEMISTRY option modules

All **require A-level chemistry or equivalent** and **not available to students taking Chemistry as core discipline**:

- CHE-10044 Introductory Environmental Chemistry (15) S2
- CHE-10063 Chemical structure and Reactivity (30) S1-2 **compulsory for students taking Chemistry as core discipline**
- CHE-10065 Environmental and Sustainable Chemistry (30) S1-2
- CHE-10051 Sustainable Chemistry (15) S1

FORENSIC SCIENCE option modules

All **require A-level chemistry or A-Level-biology** or equivalent

- FSC-10001 Forensic Science Skills and Practice (30) S2
- FSC-10005 Forensic Identification and Investigation (30) S1-2: FSC-10005 **compulsory for students taking Forensic Science as core discipline**

School of Computing and Mathematics

COMPUTER SCIENCE option modules

Available for all students

- CSC-10024 Programming I - Programming Fundamentals (15) S1
- CSC-10025 Cybercrime (15) S1
- CSC-10029 Fundamentals of Computing (15) S1
- CSC-10026 Computer Animation and Multimedia (15) S2
- CSC-10035 Natural Computation (15) S2
- CSC-10040 Introduction to Interaction Design (15) S2

Mathematics option modules

All **require A-level Mathematics** or equivalent

- MAT-10051 Applied Mathematics (15) S2
- MAT-10053 Statistics (15) S2

School of Geography, Geology and the Environment

ENVIRONMENTAL SCIENCE option modules

Available for all students

- ESC-10043 Greening Business: Employability and Sustainability (15) S2
- ESC-10061 Studying the Environment (15) S1-2 **compulsory for students taking Environmental Science as core discipline**
- ESC-10066 Climate Change: the Scientific Context (15) S2 **compulsory for students taking Environmental Science as core discipline**
- GEG-10015 Nature, Conservation and Society (15) S1

GEOGRAPHY option modules

Available for all students

- ESC-10039 Fundamentals of Physical Geography (15) S1
- ESC-10041 People and the Environment (15) S2
- GEG-10011 Geography and Geographers (15) S1

- GEG-10012 Practising Human Geography (15) S2
- GEG-10013 Human Geographies (15) S1

GEOLOGY option modules

Available for all students

- ESC-10074 Earth Structure (15) Sem1 **compulsory for students taking Geology as core discipline**
- ESC-10070 Minerals and Rocks (15) Sem1 **compulsory for students taking Geology as core discipline**
- ESC-10076 Stratigraphy and Palaeontology (15) Sem2 **compulsory for students taking Geology as core discipline**
- ESC-10047 Geology Data Visualisation, Analysis and Interpretation (15) Sem2
- ESC-10048 The Earth System (15) Sem2

School of Life Sciences

BIOLOGY option modules

Available for all students

- LSC-10081 Animal Biology (30) S1
- LSC-10083 Ecology & Plant Biology (30) S2

School of Psychology

PSYCHOLOGY option modules

Available for all students

- PSY-10021 Understanding Self and Others Better: An Introduction to Counselling Theories (15) S1
- CRI-10012 Psychology and Crime (15) S1
- PSY-10019 Applied Psychology (15) S2 **PSY-10019 cannot be taken by students who have previously taken Foundation Year modules PSY00002 or PSY00003**
- PSY-10026 Distress and Mental Health (15) S2

LIBERAL ARTS option modules

- LIB-10005 Introduction to the Liberal Arts (15) Semester 1-2
- PIR-10047 The politics of sustainability (15) Semester 1

Students take 60 credits of modules for their selected core discipline (mirroring the relevant subject Combined Honours diet). These may all be compulsory or there may be options.

School of Chemical and Physical Sciences

* Astrophysics students take compulsory PHY-10023 (Electricity and Stellar Structure), whilst Physics students take compulsory PHY-10021 (Electricity and Magnetism)

Core discipline	Code	Title	Period	Credits	Type
Astrophysics / Physics	PHY-10022	Mechanics, Gravity and Relativity	Semester 1	15	Compulsory
	PHY-10024	Nature of matter	Semester 1	15	Compulsory
	PHY-10020	Oscillations and Waves	Semester 2	15	Compulsory
	PHY-10021*	Electricity and Magnetism	Semester 2	15	Compulsory*
	PHY-10023*	Electricity and Stellar Structure	Semester 2	15	Compulsory*
Chemistry	CHE-10061	Practical and Professional Chemistry Skills	Semester 1-2	30	Compulsory
	CHE-10063	Chemical Structure and Reactivity	Semester 1-2	30	Compulsory
Forensic Science	FSC-10003	Forensic Chemistry and Analysis	Semester 1-2	30	Compulsory
	FSC-10005	Forensic Identification and Investigation	Semester 1-2	30	Compulsory

School of Computing and Mathematics

Core discipline	Code	Title	Period	Credits	Type
Computer Science	CSC-10024	Programming I - Programming Fundamentals	Semester 1	15	Compulsory
	CSC-10029	Fundamentals of Computing	Semester 1	15	Compulsory
	CSC-10056	Communication, Confidence and Competence	Semester 2	15	Compulsory
	CSC-10025	Cybercrime	Semester 1	15	Option
	CSC-10033	Systems and Architecture	Semester 1	15	Option
	CSC-10026	Computer Animation and Multimedia	Semester 2	15	Option
	CSC-10035	Natural Computation	Semester 2	15	Option
	CSC-10040	Introduction to Interaction Design	Semester 2	15	Option
Mathematics	MAT-10046	Calculus	Semester 1-2	30	Compulsory
	MAT-10047	Algebra	Semester 1-2	30	Compulsory

School of Geography, Geology and the Environment

Core discipline	Code	Title	Period	Credits	Type
Environmental Science	CHE-10044	Introductory Environmental Chemistry	Semester 1	15	Compulsory
	ESC-10061	Studying the Environment	Semester 1-2	15	Compulsory
	ESC-10068	Academic, Professional and Fieldwork Skills	Semester 1-2	15	Compulsory
	ESC-10066	Climate Change: The Scientific and Societal Context	Semester 2	15	Compulsory
Geography	ESC-10039	Fundamentals of Physical Geography	Semester 1	15	Compulsory
	ESC-10068	Academic, Professional and Fieldwork Skills	Semester 1-2	15	Compulsory
	ESC-10041	People and the Environment	Semester 2	15	Compulsory
	ESC-10066	Climate Change: The Scientific and Societal Context	Semester 2	15	Compulsory
Geology	ESC-10070	Minerals and Rocks	Semester 1	15	Compulsory
	ESC-10074	Earth Structure	Semester 1	15	Compulsory
	ESC-10068	Academic, Professional and Fieldwork Skills	Semester 1-2	15	Compulsory
	ESC-10076	Stratigraphy and Palaeontology	Semester 2	15	Compulsory

School of Life Sciences

* Biology core discipline students take LSC-10087 as a compulsory but zero-credit module. All Biology lab-work across this Level of study will be coordinated through this module and assessed within other credit-bearing modules across the year where appropriate. This module also provides helpful academic support and development material that provide added value to enhance your overall student experience.

Core discipline	Code	Title	Period	Credits	Type
Biology	LSC-10074	Physiology and Anatomy	Semester 1-2	30	Compulsory
	LSC-10085	Fundamentals of Biology	Semester 1-2	30	Compulsory
	LSC-10087*	Core Practical Skills	Semester 1-2	0*	Compulsory

School of Psychology

Core discipline	Code	Title	Period	Credits	Type
Psychology	PSY-10033	Introduction to developmental and social psychology	Semester 1	15	Compulsory
	PSY-10036	Introduction to Research Design for Psychology	Semester 1	15	Compulsory
	PSY-10031	Introduction to statistics for psychology	Semester 2	15	Compulsory
	PSY-10034	Introduction to biological and cognitive psychology	Semester 2	15	Compulsory

Global Challenge Pathways (GCPs) - Level 4 (year 1) students only

Students at Level 4 in 2022/23 have the option of taking a Global Challenge Pathway, which includes one 15-credit module in each year of the degree. Global Challenge Pathways offer students the chance to fulfil an exciting, engaging route of interdisciplinary study. Choosing a pathway, students will be presented with a global issue or 'challenge' which directly relates to societal issues, needs and debates. They will be invited to take part in academic and external facing projects which address these issues, within an interdisciplinary community of students and staff. Students completing a Global Challenge Pathway will receive recognition on their degree certificate.

Digital Futures	<p>The Digital Futures pathway offers you the opportunity to become an active contributor to current debates, cutting-edge research, and projects with external partners, addressing both the exciting potential and the challenges of disruptive digital transformation across all spheres of life.</p> <p>Part of a diverse and interdisciplinary pathway community, you will engage in exciting, impactful collaborative project work in innovative formats. Engaged in real-world scenarios, you will use digital technology and creativity to promote inclusive, empowering, and sustainable change at local and global levels.</p> <p>Module: A digital life: challenges and opportunities (GCP-10005)</p>
Climate Change & Sustainability	<p>Through the Climate Change & Sustainability pathway you will develop the skills, understanding and drive to become agents of change to tackle climate change and wider sustainability challenges.</p> <p>You will work with international partners to explore climate change and sustainability in different international contexts; lead your own projects to drive real change in your communities; and be part of educating others to help achieve a more sustainable future.</p> <p>Module: Climate Change & Sustainable Futures: Global Perspectives (GCP-10009)</p>
Social Justice	<p>Students on this pathway will embark on a reflective journey drawing upon decolonising, feminist, and ethical perspectives on social justice, forging transformative outputs as agents of change.</p> <p>You will enter a dialogue with local, national, and international partners from Universities, NGOs, International Human Rights Committees. You will engage with key societal challenges, for example Covid 19 as a social crisis with impact on gender and racial identities. The pathway will allow you to monitor and critically evaluate policies and human rights treaties, and produce and disseminate digitally fluent, international and sustainable project findings.</p> <p>Module: Reflections on Social Injustices, Past and Present (GCP-10003)</p>

<p>Enterprise & the Future of Work</p>	<p>If we are to achieve the promise of Sustainable Development Goals, solve the climate crisis and take advantage of the changes that the digital revolution provide, we need to understand the power of enterprise and prepare for future contexts of work, creativity and disruption.</p> <p>Supporting you to be part of future-facing solutions, this pathway will give you the ability to make judgements on the utilisation of resources, labour and capital. It will support you in developing creative, original thinking, allowing you to collaborate on projects that persuade and effect change, setting you up to thrive in future environments of work and innovation.</p> <p>Module: Enterprise and the Future of Work 1 (GCP-10007)</p>
<p>Global Health Challenges</p>	<p>By taking the global health challenge pathway you will develop solutions to improve the health and quality of life for particular people and communities, engaging with these groups to co-design interventions.</p> <p>This pathway will provide you with skills that go beyond a focus on health and will allow you to develop your ability to work in a team and lead change in society. The knowledge, skills and work experience will complement your core degree and enhance your career opportunities and graduate aspirations.</p> <p>Module: Key concepts and challenges in global health (GCP-10001)</p>
<p>Languages & Intercultural Awareness</p>	<p>By choosing modules from this pathway, will develop a practical knowledge of a specific language, allowing you to graduate with an enhanced degree title, or develop skills to teach English as a Foreign Language. You will meet and communicate with speakers different linguistic and cultural communities, ranging from students at partner universities in Japan and China, to refugees in Hanley, and develop an understanding of how languages and cultures interact.</p> <p>This pathway explores the power of language as a force both for breaking down and building cultural and political barriers - words can be weapons as well as bridges. You will examine how language is used, examine linguistic choices and how these impact on intercultural understanding. Throughout the pathway we also examine the practice of communication across cultural contexts, exploring cultural differences such as the language of ethnicity and gender.</p> <p>Modules: you will be able to select from either a Modern Language of your choice OR Certificate in TESOL Level 1.</p>

Level 5

Compulsory modules	Module Code	Credits	Period
Research Skills for Natural Scientists	NAT-20001	15	Semester 1-2
Interdisciplinary Perspectives on Wicked Problems	NAT-20007	15	Semester 1-2

Level 5 Module Rules

Summary of option modules and any applicable rules

Availability of option modules depends on timetabling and sometimes prerequisite study. All modules run in their normal timetable sessions as per the host discipline - with no requirement to adjust timetabling for availability to Natural Sciences students, which would not be feasible because core disciplines are spread across all 3 blocks of the block timetable.

PHYSICS option modules

None available

CHEMISTRY option modules

All **require A-level chemistry or equivalent** and **not available to students taking Chemistry as core discipline**:

- CHE-20032 Sustainable Chemistry (15) S2 **only available if have not done CHE-10051 or CHE-10065 at Level 4**

FORENSIC SCIENCE option modules

Available for all students

- FSC-20013 Digital Forensics (15) S2

School of Computing and Mathematics

COMPUTER SCIENCE option modules

All **require students to have successfully completed of Level 4 options CSC-10024 and/or CSC-10029**

- CSC-20002 Database Systems (15) S2 **requires successful completion of CSC-10029 and CSC-10024**
- CSC-20021 Web Technologies (15) S1 **requires successful completion of CSC-10024**
- CSC-20043 Computational and Artificial Intelligence I (15) S1 **requires successful completion of CSC-10029**

Mathematics option modules

None available

School of Geography, Geology and the Environment

ENVIRONMENTAL SCIENCE option modules

Available for all students

- ESC-20017 Human Impacts on the Environment: Scientific Perspectives (15) S1 **compulsory for students taking Environmental Science as core discipline**
- ESC-20108 Environmental Impact Assessment: practical geographical and environmental skills (15) S1 **compulsory for students taking Environmental Science as core discipline**

GEOGRAPHY option modules

Available for all students

- ESC-20110 Earth's Changing Landscapes (15) S1
- ESC-20096 Weather, Climate & Society (15) S2
- GEG-20015 Space & Society (15) S1
- GEG-20018 Concepts and Debates in Geography (15) S2

GEOLOGY option modules

Available for all students

- ESC-20036 Palaeoclimatology and Quaternary Studies (15) S1
- ESC-20002 Reconstructing Past Environments (15) S2 **compulsory for students taking Environmental Science as core discipline**
- ESC-20064 Geochemistry (15) S2
- ESC-20084 Geoscience and Society (15) S2

School of Life Sciences

BIOLOGY option modules

Available for all students

- LSC-20074 Current Topics in Biology (15) S1
- LSC-20093 Biodiversity Crisis (15) S2 **prerequisite completion of LSC-10083 Ecology & Plant Biology at Level 4**

School of Psychology

PSYCHOLOGY option modules

None available

LIBERAL ARTS option modules

- LIB-20008 Creative Arts and Humanities in Society (15) Semester 1
- PHI-20020 Philosophy of Science (15) Semester 2

Students take 60 credits of modules for their selected core discipline (mirroring the relevant subject Combined Honours diet). These may all be compulsory or there may be options.

School of Chemical and Physical Sciences

* Astrophysics students take compulsory PHY-20002 (Stellar Astrophysics, whilst Physics students take compulsory PHY-20009 (Nuclear and Particle Physics)

Core discipline	Code	Title	Period	Credits	Type
Astrophysics / Physics	PHY-20006	Quantum Mechanics	Semester 1	15	Compulsory
	PHY-20027	Optics and Thermodynamics	Semester 1	15	Compulsory
	PHY-20002*	Stellar Astrophysics	Semester 2	15	Compulsory*
	PHY-20009*	Nuclear and Particle Physics	Semester 2	15	Compulsory*
	PHY-20026	Statistical Mechanics and Solid State Physics	Semester 2	15	Compulsory
Chemistry	CHE-20055	Molecular Chemistry and Reactions	Semester 1-2	30	Compulsory
	CHE-20065	Physical and Structural Chemistry (Combined Honours)	Semester 1-2	15	Compulsory
	CHE-20083	Spectroscopy and Molecular Structure	Semester 1-2	15	Compulsory
Forensic Science	FSC-20003	Forensic Genetics	Semester 1	15	Compulsory
	FSC-20005	Spectroscopy and Advanced Analysis	Semester 1	15	Compulsory
	FSC-20001	Criminalistic Methods	Semester 2	15	Compulsory
	FSC-20009	Drugs of Abuse	Semester 2	15	Compulsory

School of Computing and Mathematics

Core discipline	Code	Title	Period	Credits	Type
Computer Science	CSC-20041	Software Engineering	Semester 2	15	Compulsory
	CSC-20021	Web Technologies	Semester 1	15	Option
	CSC-20037	Programming II - Data Structures and Algorithms	Semester 1	15	Option
	CSC-20038	Mobile Application Development	Semester 1	15	Option
	CSC-20043	Computational and Artificial Intelligence I	Semester 1	15	Option
	CHE-20042	Digital Forensics	Semester 2	15	Option
	CSC-20002	Database Systems	Semester 2	15	Option
	CSC-20004	Advanced Programming Practices	Semester 2	15	Option
	CSC-20047	Individual Study Topic in Computer Science	Semester 2	15	Option
Mathematics	MAT-20008	Differential Equations	Semester 1	15	Compulsory
	MAT-20023	Probability	Semester 1	15	Option
	MAT-20031	Computational Mathematics	Semester 1	15	Option
	MAT-20035	Exploring Algebra and Analysis	Semester 1	15	Option
	MAT-20004	Complex Variable I and Vector Calculus	Semester 2	15	Option
	MAT-20005	Dynamics	Semester 2	15	Option
	MAT-20025	Abstract Algebra	Semester 2	15	Option
	MAT-20027	Linear Statistical Models	Semester 2	15	Option
	MAT-20029	Analysis II	Semester 2	15	Option
	MAT-20037	Professional Mathematics and Data Science	Semester 2	15	Option

School of Geography, Geology and the Environment

Core discipline	Code	Title	Period	Credits	Type
Environmental Science	ESC-20017	Human Impact on the Environment, scientific perspectives	Semester 1	15	Compulsory
	ESC-20108	Environmental Impact Assessment: practical geographical and environmental skills	Semester 1	15	Compulsory
	ESC-20032	Environmental Analytical Methods	Semester 2	15	Compulsory
	ESC-20106	Geographical and Environmental Field Skills	Semester 2	15	Compulsory
Geography	ESC-20110	Earth's Changing Landscapes	Semester 1	15	Compulsory
	ESC-20102	Cartography and Geographic Information Science	Semester 1	15	Compulsory
	ESC-20106	Geographical and Environmental Field Skills	Semester 2	15	Option
	ESC-20096	Weather, Climate and Society	Semester 2	15	Option
	ESC-20100	Water in the Environment	Semester 2	15	Option
	GEG-20009	Geographical Research Training	Semester 2	15	Option
Geology	ESC-20001	Igneous and Metamorphic Petrology	Semester 1	15	Compulsory
	ESC-20092	Employability Training: Engaging with the Workplace	Semester 1-2	15	Compulsory
	ESC-20104	Field Skills	Semester 1-2	15	Compulsory
	ESC-20002	Reconstructing Past Environments	Semester 2	15	Compulsory

School of Life Sciences

* Biology core discipline students take LSC-20107 as a compulsory but zero-credit module. All Biology lab-work across this Level of study will be coordinated through this module and assessed within other credit-bearing modules across the year where appropriate. This module also provides helpful academic support and development material that provide added value to enhance your overall student experience.

Core discipline	Code	Title	Period	Credits	Type
Biology	LSC-20073	Microbes, Viruses and Parasites	Semester 1	15	Compulsory
	LSC-20097	Environmental Biology	Semester 1	15	Compulsory
	LSC-20107*	Practical Skills in Bioscience	Semester 1-2	0*	Compulsory
	LSC-20056	Research and Analytical Skills	Semester 2	15	Compulsory
	ESC-20017	Human Impact on the Environment, scientific perspectives	Semester 1	15	Option
	LSC-20074	Current Topics in Biology	Semester 1	15	Option
	LSC-20093	Biodiversity Crisis	Semester 2	15	Option
	PTY-20020	Health and the Environment	Semester 2	15	Option

School of Psychology

Core discipline	Code	Title	Period	Credits	Type
Psychology	PSY-20012	Developmental and Social Psychology	Semester 1	15	Compulsory
	PSY-20043	Qualitative and Survey Research Design	Semester 1	15	Compulsory
	PSY-20044	Statistics for Psychology	Semester 2	15	Compulsory
	PSY-20045	Biological and Cognitive Psychology	Semester 2	15	Compulsory

Level 6

Compulsory modules	Module Code	Credits	Period
Grand Challenges in Society	NAT-30001	15	Semester 1-2
Natural Sciences Interdisciplinary Research Project	NAT-30004	15	Semester 1-2

Level 6 Module Rules

Summary of option modules and any applicable rules

Availability of option modules depends on timetabling and sometimes prerequisite study. All modules run in their normal timetable sessions as per the host discipline - with no requirement to adjust timetabling for availability to Natural Sciences students, which would not be feasible because core disciplines are spread across all 3 blocks of the block timetable.

School of Chemical and Physical Sciences

PHYSICS option modules

None available

CHEMISTRY option modules

- CHE-30038 Chemical Kinetics, Photochemistry & Inorganic Reaction Mechanisms (15) S1
- CHE-30039 Advanced Organic Chemistry (15) S1
- CHE-30042 Inorganic, Physical & Solid State Chemistry (15) S1
- CHE-30050 Chemistry/Medicinal Chemistry Research Project (15) S1-2
- CHE-30051 Chemistry/Medicinal Chemistry Dissertation (15) S1-2
- CHE-30032 Advanced Chemical Analysis (15) S2

NB: Chemistry core discipline students must select one year-long project module (either CHE-30050 or CHE-30051)

FORENSIC SCIENCE option modules

None available

School of Computing and Mathematics

COMPUTER SCIENCE option modules

None available

Mathematics option modules

None available

School of Geography, Geology and the Environment

ENVIRONMENTAL SCIENCE option modules

Available for all students

- ESC-30040 Clean Technology (15) S1
- ESC-30060 Sustainability Consultancy (15) S1-2
- ESC-30058 The Science of Soil (15) S2

GEOGRAPHY option modules

Available for all students

- ESC-30006 Glaciers and Glacial Geomorphology (15) S1
- ESC-30018 Global Environmental Change (15) S1
- ESC-30027 Coastal Environments (15) S2
- ESC-30044 Applied GIS (15) S1
- GEG-30014 Inspirational Landscapes (15) S2
- GEG-30015 Postcolonialism in South Asia (15) S1
- GEG-30016 Economic Development & Environmental Transformation (15) S2
- GEG-30021 Animals and Society (15) S1
- GEG-30020 Rural Geographies (15) S2
- GEG-30029 Health Inequalities (15) S2

GEOLOGY option modules

Available for all students

- ESC-30009 Natural Hazards (15) S1
- ESC-30038 Geological Communication Skills (15) S1-2
- ESC-30022 Hydrological and Engineering Geology (15) S2

School of Life Sciences

BIOLOGY option modules

None available

School of Psychology

PSYCHOLOGY option modules

None available

LIBERAL ARTS option modules

None available

Students take 60 credits of modules for their selected core discipline (drawn from the relevant subject Combined Honours diet). These may all be compulsory or there may be options.

School of Chemical and Physical Sciences

* Astrophysics and Physics core discipline students have the same list of Option modules. Astrophysics students take compulsory PHY-30006 (Astrophysics Group Project and Science Communication - ISP), whilst Physics students take compulsory PHY-30007 (Physics Project - ISP)

Core discipline	Code	Title	Period	Credits	Type
Astrophysics / Physics	PHY-30012	Electromagnetism	Semester 1	15	Compulsory
	PHY-30006*	Astrophysics Group Project and Science Communication - ISP	Semester 1-2	15	Compulsory*
	PHY-30007*	Physics Project - ISP	Semester 1-2	15	Compulsory*
	PHY-30001	Cosmology	Semester 1	15	Option
	PHY-30010	Polymer Physics	Semester 1	15	Option
	PHY-30024	Binary Stars and Extrasolar Planets	Semester 1	15	Option
	PHY-30025	Life in the Universe	Semester 1	15	Option
	PHY-30026	Computational Methods in Physics and Astrophysics	Semester 1	15	Option
	PHY-30033	Particle Physics and Accelerators	Semester 1	15	Option
	PHY-30002	The Physics of Interstellar Medium	Semester 2	15	Option
	PHY-30003	The Physics of Compact Objects	Semester 2	15	Option
	PHY-30009	Quantum Physics of Atoms and Molecules	Semester 2	15	Option
	PHY-30027	Data Analysis and Model Testing	Semester 2	15	Option
	PHY-30029	Quantum Mechanics II	Semester 2	15	Option
	PHY-30030	Physics of Fluids	Semester 2	15	Option
	PHY-30031	Atmospheric Physics	Semester 2	15	Option
	PHY-30032	Plasma Physics	Semester 2	15	Option
	PHY-30035	General Relativity, Black Holes and Gravitational Waves	Semester 2	15	Option
	Chemistry	CHE-30037	Topics in Chemistry	Semester 2	15
Forensic	CHE-30033	Evaluation of evidence, explosives and arson	Semester 1	15	Compulsory
	CHE-30035	Advanced Topics in Forensic Analysis	Semester 1	15	Compulsory

Science	CHE-30011	Forensic Science Team Research Project - ISP	Semester 1-2	15	Compulsory
	CHE-30010	Forensic Toxicology	Semester 2	15	Compulsory
	CHE-30034	Forensic Geoscience	Semester 2	15	Compulsory

School of Computing and Mathematics

Core discipline	Code	Title	Period	Credits	Type
Computer Science	CSC-30014	Third Year Double Project - ISP	Semester 1-2	30	Compulsory
	CSC-30016	Software Engineering Project Management	Semester 1	15	Option
	CSC-30019	Games Computing	Semester 1	15	Option
	CSC-30022	Bioinformatics	Semester 1	15	Option
	CSY-30001	Advanced Information Systems	Semester 1	15	Option
	CSC-30002	Advanced Databases and Applications	Semester 2	15	Option
	CSC-30012	Communications and Networks	Semester 2	15	Option
	CSC-30025	Advanced Web Technologies	Semester 2	15	Option
	CSC-30027	Computational and Artificial Intelligence II	Semester 2	15	Option
Mathematics	MAT-30001	Graph Theory	Semester 1	15	Option
	MAT-30002	Non-linear Differential Equations	Semester 1	15	Option
	MAT-30003	Partial Differential Equations	Semester 1	15	Option
	MAT-30013	Group Theory	Semester 1	15	Option
	MAT-30038	Number Theory and Cryptography	Semester 1	15	Option
	MAT-30039	Financial Mathematics	Semester 1	15	Option
	MAT-30016	Project II - ISP	Semester 1-2	15	Option
	MAT-30043	Project (30 credits)	Semester 1-2	30	Option
	MAT-30004	Fluid Mechanics	Semester 2	15	Option
	MAT-30010	Complex Variable II	Semester 2	15	Option
	MAT-30011	Waves	Semester 2	15	Option

MAT-30014	Medical Statistics	Semester 2	15	Option
MAT-30023	Mathematical Biology	Semester 2	15	Option
MAT-30034	Introduction to Mathematics Teaching	Semester 2	15	Option
MAT-30045	Linear Algebra and Rings	Semester 2	15	Option
MAT-30047	Introduction to Linear Elasticity	Semester 2	15	Option
MAT-30051	Mathematical Modelling	Semester 2	15	Option

School of Geography, Geology and the Environment

* Geology core discipline MSci students must select a field course module, either ESC-30030 or ESC-30033

** Geology core discipline MSci students can take a maximum of two of these physical geography modules in total from Level 6 and Level 7

Core discipline	Code	Title	Period	Credits	Type
Environmental Science	ESC-30056	Ecotoxicology and Risk Assessment	Semester 1	15	Compulsory
	ESC-30050	Dissertation (15)	Semester 1-2	15	Compulsory
	ESC-30058	The Science of Soil	Semester 2	15	Compulsory
	ESC-30006	Glaciers and Glacial Geomorphology	Semester 1	15	Option
	ESC-30009	Natural Hazards	Semester 1	15	Option
	ESC-30018	Global Environmental Change	Semester 1	15	Option
	ESC-30040	Clean Technology	Semester 1	15	Option
	ESC-30044	Applied GIS	Semester 1	15	Option
	GEG-30016	Economic Development and Environmental Transformation	Semester 1	15	Option
	GEG-30021	Animals and Society	Semester 1	15	Option
	LSC-30043	Conservation Biology	Semester 1	15	Option
	LSC-30070	Insect Ecology and Pest Management	Semester 1	15	Option
	ESC-30060	Sustainability Consultancy	Semester 1-2	15	Option
	ESC-30022	Hydrological and Engineering Geology	Semester 2	15	Option
	ESC-30027	Coastal Environments	Semester 2	15	Option

	GEG-30020	Rural Geographies	Semester 2	15	Option
	LSC-30072	Animal Welfare	Semester 2	15	Option
	LSC-30076	Plant Science and Sustainability	Semester 2	15	Option
Geography	ESC-30006	Glaciers and Glacial Geomorphology	Semester 1	15	Option
	ESC-30009	Natural Hazards	Semester 1	15	Option
	ESC-30018	Global Environmental Change	Semester 1	15	Option
	ESC-30044	Applied GIS	Semester 1	15	Option
	ESC-30056	Ecotoxicology and Risk Assessment	Semester 1	15	Option
	ESC-30060	Sustainability Consultancy	Semester 1	15	Option
	GEG-30006	Geography Double Dissertation - ISP	Semester 1-2	30	Option
	GEG-30008	Geography (Single) Dissertation - ISP	Semester 1-2	15	Option
	GEG-30027	Advanced Fieldwork in Geography	Semester 1-2	15	Option
	ESC-30027	Coastal Environments	Semester 2	15	Option
	ESC-30058	The Science of Soil	Semester 2	15	Option
Geology	ESC-30039	Independent Fieldwork Project	Semester 1	15	Compulsory
	ESC-30030	Advanced Petrology and Structural Geology Field Course	Semester 2	15	Option*
	ESC-30033	Volcanic and Magmatic Processes	Semester 2	15	Option*
	ESC-30009	Natural Hazards	Semester 1	15	Option
	ESC-30028	Economic Geology	Semester 1	15	Option
	ESC-30082	Reservoir Geology and Geophysics	Semester 1	15	Option
	ESC-30008	Structure and Geodynamics	Semester 2	15	Option
	ESC-30022	Hydrological and Engineering Geology	Semester 2	15	Option
	ESC-30025	Micropalaeontology: Principles and Applications	Semester 2	15	Option
	ESC-30034	Advanced Topics in Sedimentology	Semester 2	15	Option
	ESC-30038	Geological Communication Skills	Semester 2	15	Option

	ESC-30006	Glaciers and Glacial Geomorphology	Semester 1	15	Option**
	ESC-30018	Global Environmental Change	Semester 1	15	Option**
	ESC-30027	Coastal Environments	Semester 2	15	Option**
	ESC-30058	The Science of Soil	Semester 2	15	Option**

School of Life Sciences

* Biology core discipline students must take ONE 15 credit Independent Study Project (ISP) module (LSC-30048 or LSC-30050)

Core discipline	Code	Title	Period	Credits	Type
Biology	ESC-30056	Ecotoxicology and Risk Assessment	Semester 1	15	Option
	LSC-30070	Insect Ecology and Pest Management	Semester 1	15	Option
	LSC-30043	Conservation Biology	Semester 1	15	Option
	LSC-30066	Tropical Biology Field Course	Semester 1	15	Option
	LSC-30048*	Life Sciences Single Experimental Project (with research skills assessment) - ISP	Semester 1-2	15	Option*
	LSC-30050*	Life Sciences Dissertation	Semester 1-2	15	Option*
	LSC-30030	Human Evolution	Semester 2	15	Option
	LSC-30076	Plant Science and Sustainability	Semester 2	15	Option

School of Psychology

Core discipline	Code	Title	Period	Credits	Type
Psychology	PSY-30061	Final Year Project (Double) - ISP	Semester 1-2	30	Compulsory
	PSY-30067	Individual Differences and Conceptual Issues	Semester 2	15	Compulsory
	PSY-30077	Health Psychology	Semester 1	15	Option
	PSY-30123	Faces, Forgetting and Forensic Psychology	Semester 1	15	Option
	PSY-30126	The psychology of deviance	Semester 1	15	Option
	PSY-30127	Psychology in Education	Semester 1	15	Option
	PSY-30134	Making a difference with psychology	Semester 1	15	Option

9. Final and intermediate awards

Credits required for each level of academic award are as follows:

Honours Degree	360 credits	You will require at least 120 credits at levels 4, 5 and 6
Diploma in Higher Education	240 credits	You will require at least 120 credits at level 4 or higher and at least 120 credits at level 5 or higher
Certificate in Higher Education	120 credits	You will require at least 120 credits at level 4 or higher

International Year option: in addition to the above students must pass a module covering the international year in order to graduate with a named degree including the 'international year' wording. Students who do not complete, or fail the international year, will be transferred to the three-year version of the programme.

Work Placement Year option: in addition to the above students must pass a non-credit bearing module covering the work placement year in order to graduate with a named degree including the 'with Work Placement Year' wording. Students who do not complete, or fail the work placement year, will be transferred to the three-year version of the programme.

10. How is the Programme Assessed?

The wide variety of assessment methods used on this programme at Keele reflects the broad range of knowledge and skills that are developed as you progress through the degree programme. Teaching staff pay particular attention to specifying clear assessment criteria and providing timely, regular and constructive feedback that helps to clarify things you did not understand and helps you to improve your performance. The following list is representative of the variety of assessment methods used on your programme:

- **Unseen closed and open book examinations** in different formats test students' knowledge and understanding of the subject. Examinations may consist of essay, short answer and/or multiple choice questions, and paper comprehension.
- **Assessed Problem Sheets** assess the student's skills in solving numerical and other problems within the discipline by drawing on their scientific understanding and knowledge, and experience of experimental techniques
- **Essays** allow you to demonstrate your ability to articulate ideas clearly using argument and reasoning skills and with close reference to the contexts and critical concepts covered in the modules. Essays also develop and demonstrate research and presentation skills (including appropriate scholarly referencing).
- **Laboratory reports** - structured proformas and full lab reports are formal summaries of work carried out in the laboratory and test students' understanding of the practical aspects of the programme and develop the skills necessary to enable students to present and analyse their results.

- **Class tests** taken either conventionally or online via the Keele Learning Environment (KLE) assess students' subject knowledge and their ability to apply it in a more structured and focused way.
- **Technical reports** are formal, structured summaries of work that test students' understanding of the practical aspects of the programme and develop the skills necessary to enable students to present and analyse their results.
- **Information retrieval exercises** require students to locate and analyse information of different types from the internet, various databases, scientific publications and textbooks. The information is then presented in a prescribed written format.
- **IT assignments and computer-based exercises** (e.g. spreadsheets exercises) - various activities designed to assess students ability to use software to retrieve, analyse and present scientific data in a variety of formats.
- **Dissertations** enable students to explore in depth an area of particular interest through a substantial piece of focused research and writing, and test their ability to formulate and answer research questions.
- **Field course notebook and portfolios** assess work that has been carried out in the field, and typically include field notebooks, research proposals, short quizzes and both oral and written presentations. The specific assessment portfolio will vary according to the field course destination and subject focus.
- **Short reports** for which students are required to write up their own account of small group studies and discussions on particular topics.
- **Research projects and reports** test student's knowledge of different research methodologies and the limits and provisional nature of knowledge. They also enable students to demonstrate their ability to formulate research questions and to answer them using appropriate methods.
- **Oral and poster presentations and reports** assess individual students' subject knowledge and understanding. They also test their ability to work effectively as members of a team, to communicate what they know orally and visually, and to reflect on these processes as part of their own personal development.
- **Portfolios** may consist of a range of different pieces of work but routinely include a requirement that students provide some evidence of critical reflection on the development of their own learning.
- **Peer assessment:** In some cases students will be involved in marking other students' work, usually with a prescriptive marking guide. This helps students to appreciate where marks are gained and lost and gives them the opportunity to see the common mistakes made by other students.
- **Reviews** of other scholars' work test students' ability to identify and summarise the key points of a text and to evaluate the quality of arguments and the evidence used to support them. In the case of work based on empirical research, reviews also assess students' knowledge of research methodologies and their ability to make critical judgements about the appropriateness of different strategies for collecting and analysing data.
- **Video/screencast presentations** require students to produce a short video or screencast on a given topic and assess students' knowledge and understanding, and ability to communicate what they know orally and visually, and to reflect on these processes as part of their own personal development.
- **Experimental projects** test students' knowledge of research methodologies and their ability to carry them out. They also enable students to demonstrate their ability to formulate research questions, design experiments, carry them out and analyse the results.

Marks are awarded for summative assessments designed to assess your achievement of learning outcomes. You will also be assessed formatively to enable you to monitor your own progress and to assist staff in identifying and addressing any specific learning needs. Feedback, including guidance on how you can improve the quality of your work, is also provided on all summative assessments within three working weeks of submission, unless there are compelling circumstances that make this impossible, and more informally in the course of tutorial and seminar discussions.

11. Contact Time and Expected Workload

This contact time measure is intended to provide you with an indication of the type of activity you are likely to undertake during this programme. The data is compiled based on module choices and learning patterns of students on similar programmes in previous years. Every effort is made to ensure this data is a realistic representation of what you are likely to experience, but changes to programmes, teaching methods and assessment methods mean this data is representative and not specific.

Undergraduate courses at Keele contain an element of module choice; therefore, individual students will experience a different mix of contact time and assessment types dependent upon their own individual choice of modules. The figures below are an example of activities that a student may expect on your chosen course by year stage of study. Contact time includes scheduled activities such as: lecture, seminar, tutorial, project supervision, demonstration, practical classes and labs, supervised time in labs/workshop, fieldwork and external visits. The figures are based on 1,200 hours of student effort each year for full-time students.

Activity

	Scheduled learning and teaching activities	Guided independent Study	Placements
Year 1 (Level 4)	32%	68%	0%
Year 2 (Level 5)	30%	70%	0%
Year 3 (Level 6)	11%	89%	0%

12. Accreditation

The BSc Natural Sciences with Psychology as a core discipline is accredited by the British Psychological Society.

13. University Regulations

The University Regulations form the framework for learning, teaching and assessment and other aspects of the student experience. Further information about the University Regulations can be found at: <http://www.keele.ac.uk/student-agreement/>

If this programme has any exemptions, variations or additions to the University Regulations these will be detailed in an Annex at the end of this document titled 'Programme-specific regulations'.

14. Other Learning Opportunities

Study Abroad (International Year)

A summary of the International Year, which is a potential option for students after completion of year 2 (Level 5), is provided in the Annex for the International Year.

Work Placement Year

A summary of the Work Placement Year, which is a potential option for students after completion of year 2 (Level 5), is provided in the Annex for the Work Placement Year.

Other opportunities

Fieldwork

Fieldwork is an essential part of a scientist's training in Biology, Earth Science, Physical Geography and Environmental Science, providing both the opportunity to acquire and practice field-based skills, to develop skills of observation and recording and to work as effective members of a team.

Keele is ideally located to be able to integrate a large component of field work into its environmental science programmes with a wide range of habitats in easy reach, including the Keele campus itself with its lake system and extensive woodlands, in addition to the mining and industrial heritage of the local area providing ideal opportunities for the study of the impact of these activities on the environment.

15. Additional Costs

Biology - Field Course Costs

Students taking Biology as a core or supporting science, who choose to take module LSC-20055, will do an 8-day compulsory field course accommodated at Bangor University during the summer vacation between the first and second years. The School of Life Sciences meets the cost of this, but the student will be expected to pay for their own travel to Bangor, and maintenance costs during the field course (for example food, appropriate clothing, etc.).

Environmental Science - Field Course Costs

Students taking Environmental Science as a core science will do a compulsory field course, chosen from the

range available, as part of module ESC-20079. The School of Geography, Geology and the Environment meets the travel and accommodation costs of this field course but students should note that field courses may be fully or only partly catered for, depending on the field course chosen. Others field courses are entirely self-catered and students are expected to purchase meals (e.g. lunch and/or evening meal).

All Natural Sciences students undertake an independent research project in their final year. For some students, this MAY include additional field work that is normally carried out during the summer vacation between years 2 and 3. Students are responsible for organising their own transport and accommodation as well as paying any costs incurred whilst carrying out fieldwork. These costs are extremely variable as they are dependent on the nature of a student's project and where the student chooses to carry out their project. Costs are minimal if the project work is undertaken in the students' local area.

IMPORTANT: Students are expected to have adequate clothing for field trips. We reserve the right to change the venues of field courses due to both cost and academic considerations.

Activity	Estimated Cost
Field courses - compulsory for students taking module LSC-20055 (8-day residential field course hosted at Bangor University and paid for by the School of Life Sciences).	£0
Travel - compulsory travel to Bangor University for students taking module LSC20055	Variable
Field courses - compulsory for students taking module ESC-20079 (week-long residential field course paid for by the School of Geography, Geology and the Environment)	£0
Field courses - compulsory for students taking module ESC-10061 (weekend residential field course semester 1 paid for by the School of Geography, Geology and the Environment)	£0
Field courses - compulsory for students taking module ESC-10061 (5 day Easter vacation residential field course semester 2 paid for by the School of Geography, Geology and the Environment); packed lunches to be bought by students	Variable - expect £15-25
Field courses - compulsory for students taking module ESC-20036 (one-day field course paid for by the School of Geography, Geology and the Environment)	£0
Field courses - compulsory for students taking module ESC-20037 (one-day field course paid for by the School of Geography, Geology and the Environment)	£0
Field courses - compulsory for students taking module ESC-20084 (one-day field course paid for by the School of Geography, Geology and the Environment).	£0
Equipment - waterproof clothing and suitable footwear for field courses if taking Biology, Environmental Science or Earth Sciences as a core science.	£150
Total estimated additional costs	Variable - depends on student's pathway through the Natural Sciences programme

These costs have been forecast by the University as accurately as possible but may be subject to change as a result of factors outside of our control (for example, increase in costs for external services). Forecast costs are reviewed on an annual basis to ensure they remain representative. Where additional costs are in direct control of the University we will ensure increases do not exceed 5%.

As to be expected there will be additional costs for inter-library loans and potential overdue library fines, print and graduation. We do not anticipate any further costs for this programme.

16. Annex - International Year

Natural Sciences with International Year

International Year Programme

Students registered for this Single Honours programme may either be admitted for or apply to transfer during their period of study at Level 5 to the International Year option. Students accepted onto this option will have an extra year of study (the International Year) at an international partner institution after they have completed Year 2 (Level 5) at Keele.

Students who successfully complete both the second year (Level 5) and the International Year will be permitted to progress to Level 6. Students who fail to satisfy the examiners in respect of the International Year will normally revert to the standard programme and progress to Level 6 on that basis. The failure will be recorded on the student's final transcript.

Study at Level 4, Level 5 and Level 6 will be as per the main body of this document. The additional detail contained in this annex will pertain solely to students registered for the International Year option.

International Year Programme Aims

In addition to the programme aims specified in the main body of this document, the international year programme of study aims to provide students with:

1. Personal development as a student and a researcher with an appreciation of the international dimension of their subject
2. Experience of a different culture, academically, professionally and socially

Entry Requirements for the International Year

Students may apply to the 4-year programme during Level 5. Admission to the International Year is subject to successful application, interview and references from appropriate staff.

The criteria to be applied are:

- Academic Performance (an average of 55% across all modules at Level 5 is required. Students with up to 15 credits of re-assessment who meet the 55% requirement may progress to the International Year. Where no Semester 1 marks have been awarded performance in 1st year marks and ongoing 2nd year assessments are taken into account)
- General Aptitude (to be demonstrated by application for study abroad, interview during the 2nd semester of year 2 (Level 5), and by recommendation of the student's personal tutor, 1st and 2nd year tutors and programme director)

Students may not register for both an International Year and a Placement Year.

Student Support

Students will be supported whilst on the International Year via the following methods:

- Phone or Skype conversations with Study Abroad tutor, in line with recommended Personal Tutoring meeting points.
- Support from the University's Global Education Team

Learning Outcomes

In addition to the learning outcomes specified in the main text of the Programme Specification, students who complete a Keele undergraduate programme with International Year will be able to:

1. Describe, discuss and reflect upon the cultural and international differences and similarities of different learning environments
2. Discuss the benefits and challenges of global citizenship and internationalisation
3. Explain how their perspective on their academic discipline has been influenced by locating it within an international setting.
4. Apply their experiences abroad to the specific Graduate Attributes associated with their Natural Sciences degree programme;
5. Integrate, apply and develop interdisciplinary principles and perspectives to solve global-scale problems.

In addition, students who complete the International Year will be able to:

These learning outcomes will all be assessed by the submission of a satisfactory individual learning agreement, the successful completion of assessments at the partner institution and the submission of the reflective portfolio element of the international year module.

Regulations

Students registered for the International Year are subject to the programme-specific regulations (if any) and the University regulations. In addition, during the International Year, the following regulations will apply:

Students undertaking the International Year must complete 120 credits, which must comprise *at least 40%* in the student's discipline area.

This may impact on your choice of modules to study, for example you will have to choose certain modules to ensure you have the discipline specific credits required.

Students are barred from studying any module with significant overlap to the Level 6 modules they will study on their return. Significant overlap with Level 5 modules previously studied should also be avoided.

Additional costs for the International Year

Tuition fees for students on the International Year will be charged at 15% of the annual tuition fees for that year of study, as set out in Section 1. The International Year can be included in your Student Finance allocation, to find out more about your personal eligibility see: www.gov.uk

Students will have to bear the costs of travelling to and from their destination university, accommodation, food and personal costs. Depending on the destination they are studying at additional costs may include visas, study permits, residence permits, and compulsory health checks. Students should expect the total costs of studying abroad be greater than if they study in the UK, information is made available from the Global Education Team throughout the process, as costs will vary depending on destination.

Students who meet external eligibility criteria may be eligible for grants as part of this programme. Students studying outside of this programme may be eligible income dependent bursaries at Keele.

Students travel on a comprehensive Keele University insurance plan, for which there are currently no additional charges. Some Governments and/or universities require additional compulsory health coverage plans; costs for this will be advised during the application process.

17. Annex - Work Placement Year

Natural Sciences with Work Placement Year

Work Placement Year summary

Students registered for this programme may either be admitted for or apply to transfer during their studies to the 'with Work Placement Year' option (NB: for Combined Honours students the rules relating to the work placement year in the subject where the placement is organised are to be followed). Students accepted onto this programme will have an extra year of study (the Work Placement Year) with a relevant placement provider after they have completed Year 2 (Level 5) at Keele.

Students who successfully complete both the second year (Level 5) and the Work Placement Year will be permitted to progress to Level 6. Students who fail to satisfactorily complete the Work Placement Year will normally revert to the 3-year programme and progress to Level 6 on that basis. The failure will be recorded on the student's final transcript.

Study at Level 4, Level 5 and Level 6 will be as per the main body of this document. The additional detail contained in this annex will pertain solely to students registered for the Work Placement Year option.

Work Placement Year Programme Aims

In addition to the programme aims specified in the main body of this document, the Work Placement Year aims to provide students with:

1. Substantial experience of work with a relevant placement provider, including familiarisation with the professional working environment;
2. The opportunity to apply academic theory to real situations in the work place and to expand employability skills.

Entry Requirements for the Work Placement Year

To proceed to the Work Placement Year, students must normally achieve an average of 55% across all Year-1 and Year-2 Semester 1 modules. If students do not meet these requirements, they will revert to the 3-year programme. Students have the opportunity to apply directly for the 4-year 'with work placement year' degree programme, or to transfer onto the 4-year programme at the end of Year-1 and in Year-2 at the end of Semester 1. Students who are initially registered for the 4-year degree programme may transfer onto the 3-year degree programme at any point in time, prior to undertaking the year-long work placement. Students who fail to pass the work placement year, and those who fail to meet the minimum requirements of the work placement year module (minimum 30 weeks full time (1,050 hours), or equivalent, work placement), will be automatically transferred onto the 3-year degree programme.

The criteria to be applied are:

- A good University attendance record and be in 'good academic standing'.
- Passed all Year-1 and Year-2 Semester 1 modules
- Students undertaking work placements will be expected to complete a Health and Safety checklist prior to commencing their work experience and will be required to satisfy the Health and Safety regulations of the company or organisation at which they are based.
- (*International students only*) Due to visa requirements, it is not possible for international students who require a Tier 4 Visa to apply for direct entry onto the 4-year with Work Placement Year degree programme. Students wishing to transfer onto this programme should discuss this with student support, the academic tutor for the work placement year, and the Programme Lead. Students should be aware that there are visa implications for this transfer, and it is the student's responsibility to complete any and all necessary processes to be eligible for this programme. There may be additional costs, including applying for a new Visa from outside of the UK for international students associated with a transfer to the work placement programme.

Students may not register for both an International Year and a Work Placement Year.

Student Support

Students will be supported whilst on the Work Placement Year via the following methods:

- Regular contact between the student and a named member of staff who will be assigned to the student as their University supervisor. The University supervisor will be in regular contact with the student throughout the year, and be on hand to provide advice (pastoral or academic) and liaise with the Placement supervisor on the student's behalf if required.
- Two formal contacts with the student during the placement year: the University supervisor will visit the student in their placement organization at around the 5 weeks after placement has commenced, and then visit again (or conduct a telephone/video call tutorial) at around 15 weeks into the placement.
- Weekly supervision sessions will take place with the placement supervisor (or his/her nominee) throughout the duration of the placement.

Learning Outcomes

In addition to the learning outcomes specified in the main text of the Programme Specification, students who complete the 'with Work Placement Year' option will be able to:

1. evaluate their own employability skills (via a SWOT analysis);
2. create Intended Learning Outcomes for their placement in order to develop the skills areas which they have identified as needing further enhancement;
3. develop, through practice in the work place, the work-related skills identified through their SWOT
4. analysis and Intended Learning Outcomes;
5. apply academic theory learned as part of their taught degree to real situations in the work place;
6. reflect on their work placement activities and evaluate the impact on their own employability skills;
7. explain how the sector of the placement operates and identify the skills required to pursue careers within the sector.

These learning outcomes will be assessed through the non-credit bearing Work Placement Year module (ESC-30042) which involves:

1. the submission of a mid-placement portfolio comprising a SWOT analysis, action plan and an evaluation of the student's performance based on the placement supervisor's initial report;
2. the submission of a final placement report comprising a reflective diary and an evaluation of the student's performance based on the placement supervisor's final report.

Regulations

Students registered for the 'with Work Placement Year' option are subject to programme-specific regulations (if any) and the University regulations. In addition, during the Work Placement Year, the following regulations will apply:

- Students undertaking the Work Placement Year must successfully complete the zero-credit rated module ESC-30042
- In order to ensure a high quality placement experience, each placement agency will sign up to a placement contract (analogous to a service level agreement).
- Once a student has been accepted by a placement organisation, the student will make a pre-placement visit and a member of staff identified within the placement contract will be assigned as the placement supervisor. The placement supervisor will be responsible for ensuring that the placement experience meets the agreed contract agreed with the University.
- The placement student will also sign up an agreement outlining his/her responsibilities in relation to the requirements of each organisation.

Students will be expected to behave professionally in terms of:

(i) conforming to the work practices of the organisation; and

(ii) remembering that they are representatives of the University and their actions will reflect on the School and have an impact on that organisation's willingness (or otherwise) to remain engaged with the placement.

Additional costs for the Work Placement Year

Tuition fees for students on the Work Placement Year will be charged at 20% of the annual tuition fees for that year of study, as set out in Section 1. The Work Placement Year can be included in your Student Finance allocation; to find out more about your personal eligibility see: www.gov.uk

Students will have to bear the costs of travelling to and from their placement provider, accommodation, food and personal costs. Depending on the placement provider additional costs may include parking permits, travel and transport, suitable clothing, DBS checks, and compulsory health checks.

A small stipend may be available to students from the placement provider during the placement but this will need to be explored on a placement-by-placement basis as some organisations, such as charities, may not have any extra money available. Students should budget with the assumption that their placement will be unpaid.

Eligibility for student finance will depend on the type of placement and whether it is paid or not. If it is paid, this is likely to affect student finance eligibility, however if it is voluntary and therefore unpaid, should not affect student finance eligibility. Students are required to confirm eligibility with their student finance provider.

International students who require a Tier 4 visa should check with the Immigration Compliance team prior to commencing any type of paid placement to ensure that they are not contravening their visa requirements.

Version History

This document

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Previous documents

Version No	Year	Owner	Date Approved	Summary of and rationale for changes
1	2021/22	ADAM MOOLNA	11 February 2021	
1	2020/21	ADAM MOOLNA	13 May 2020	