

Programme Specification: Undergraduate

For students starting in Academic Year 2023/24

1. Course Summary

Names of programme and award title(s)	Master in Natural Sciences (MSci) Master in Natural Sciences (MSci) with International Year (see annex for details) Master in Natural Sciences (MSci) with Work Placement Year (see annex for details)
Award type	Single Honours (Masters)
Mode of study	Full-time
Framework of Higher Education Qualification (FHEQ) level of final award	Level 7
Normal length of the programme	4 years; 5 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:</p> <p>Fee for 2023/24 is £9,250*</p> <p>International students:</p> <p>Fee for 2023/24 is £18,800**</p> <p>The fee for the international year abroad is calculated at 15% 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/>

** We reserve the right to increase fees in subsequent years of study by an inflationary amount. Please refer to the accompanying Student Terms & Conditions for full details. Further information on fees can be found at <http://www.keele.ac.uk/studentfunding/tuitionfees/>

2. What is an Integrated Master's programme?

Integrated master's awards - which are common in science, mathematics and engineering - are delivered through a programme that combines study at the level of a bachelor's degree with honours with study at

master's level. As such, a student graduates with a master's degree after a single four-year programme of study.

Natural Sciences is available as a 3-year BSc or a 4-year MSci. The MSci is only available for the following core disciplines: **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, 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 50% at Level 5. If you do not attain this average, you will be transferred automatically to the 3-year BSc Natural Sciences degree programme for Level 6.

These specifications refer solely to the MSci 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 MSci degree programme in Natural Sciences provides you with the opportunity to pursue interdisciplinary study around your core discipline for 3 years and then to specialise fully in your core discipline at Master's level.

MSci students follow the BSc Natural Sciences programme identically in Years 1-2, and then in Year 3 differ only in taking an additional 15 credits in their core discipline to begin to specialise. In Years 1-3 one-quarter of your study is of interdisciplinary modules bespoke to the Natural Sciences programme. You have 30 credits of option modules across the range of Natural Sciences disciplines and including some Liberal Arts modules in Years 1-2, with 15 credits of option modules in Year 3.

In Year 4, you specialise fully in your core discipline. The MSci programme is designed to enable you to enhance your employability through the development of subject specialism on top of your interdisciplinary Bachelor's level study. You will develop advanced level problem-solving, presentational and communication skills, as well as developing your research skills and your capacity to learn independently.

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, you may also be able to transfer onto a Combined Honours programme.

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

4. Aims of the programme

The broad aims of the programme are to:

- develop a systematic understanding of knowledge, and a critical awareness of current issues and debates, much of which is at the forefront of their academic disciplines;
- develop, to an advanced level, skills in laboratory and/or field work, evaluate new methods of investigation or analysis and appropriate and place these within the context of current research debates in that field of science;
- show originality in the application of knowledge via undertaking cutting-edge 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
- their chosen science to an advanced level, including the knowledge base of their advanced-level research project, and be able to place this within the context of current research debates in their field of study

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
- deal with complex data both systematically and creatively, make sound judgments in the absence of complete data, and communicate conclusions clearly to a specialist audience
- critically evaluate current research and methodologies in their chosen field of study

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
- deal with complex data both systematically and creatively, make sound judgments in the absence of complete data, and communicate conclusions clearly to a specialist audience
- work in a self-directed fashion in tackling and solving problems, and act autonomously in planning and implementing tasks associated with the project

The full range of intended learning outcomes that will be achieved by students taking the MSci Natural Sciences degree programme will be highly dependent upon which combination of sciences that they choose to study as core and supporting' during Years 1-3, alongside the choice of subject in Year-4. 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.

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
- 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 Academic Mentors 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 MSci 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/>

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;
- Global Challenge Pathways (students studying at Level 6 in 2023/24 may take electives instead) - 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 please visit:
<https://www.keele.ac.uk/recordsandexams/modulecatalogue/>

Core discipline routes through the MSci Natural Sciences

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

- Chemistry (route code NSC-CHESHM)
- Environmental Science (route code NSC-EVSSH)
- Forensic Science (route code NSC-FSCSHM)
- Geology (route code NSC-GEOSHM)

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 (Year 3) students begin to specialise in their core discipline, taking 75 credits of compulsory and/or option modules, to prepare for subject specialism at Level 7 (Year 4).

At Level 7 (Year 4) students specialise fully in their core discipline, taking 120 credits of compulsory and/or option modules from that discipline with no whole cohort Natural Sciences modules.

Overall structure of credits per year for the MSci Natural Sciences

	Year 1 (Level 4)	Year 2 (Level 5)	Year 3 (Level 6)	Year 4 (Level 7)
Core interdisciplinary BSc/MSc Natural Sciences and BA/MA Liberal Arts	15 credits	15 credits	15 credits	none
Core discipline (compulsory and/or options)	60 credits	60 credits	90 credits	120 credits
Natural Sciences option modules or Global Challenge Pathways modules	45 credits	45 credits	0 credits	none
Natural Sciences dissertation	none	none	15 credits	none

Global Challenge Pathways (GCPs)

Students at Level 4 and Level 5 in 2023/24 have the option of taking a Global Challenge Pathway, which includes one 15-credit module in each year of the degree. Information about Global Challenge Pathways can be found after the module lists for Level 5. 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.

Module Lists

Level 4

Compulsory modules	Module Code	Credits	Period
Science & Society	NAT-10001	15	Semester 1-2

Level 4 option modules

Option group A = option modules from the core discipline (when applicable)

Option group B = programme level science module options available to all students

Option group C = programme level non-science module options available to all students (maximum 15 credits at each Level of study)

Level 4. Option group A is included at the end of this section as part of the core discipline structure

Level 4. Option group B = programme level science module options available to all students

School of Chemical and Physical Sciences

CHE-10044 Introductory Environmental Chemistry (15) S2 = require A-level chemistry or equivalent and not available to students taking Chemistry as core discipline

CHE-10063 Chemical structure and Reactivity (30) S1-2 compulsory for Chemistry as core discipline = require A-level chemistry or equivalent and not available to students taking Chemistry as core discipline

CHE-10065 Environmental and Sustainable Chemistry (30) S1-2 = require A-level chemistry or equivalent and not available to students taking Chemistry as core discipline

FSC-10001 Forensic Science Skills and Practice (30) S2 = requires A-level chemistry or A-Level-biology or equivalent

FSC-10005 Forensic Identification and Investigation (30) S1-2 = requires A-level chemistry or A-Level-biology or equivalent; compulsory for Forensic Science as core discipline

School of Computing and Mathematics

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-10040 Introduction to Interaction Design (15) S2

MAT-10061 Introduction to Mathematical Modelling (15) S2. Requires A-level Mathematics or equivalent

MAT-10059 Fundamentals of Statistics with Applications in R (15) S2. Requires A-level Mathematics or equivalent

School of Geography, Geology and the Environment

ESC-10043 Greening Business: Employability and Sustainability (15) S2

ESC-10061 Studying the Environment (15) S1-2 = compulsory for Environmental Science as core discipline

ESC-10066 Climate Change: the Scientific Context (15) S2 = compulsory for Environmental Science and Geography as core disciplines

GEG-10015 Nature, Conservation and Society (15) S1

ESC-10039 Fundamentals of Physical Geography (15) S1 compulsory for Geography as core discipline

ESC-10041 People and the Environment (15) S2 compulsory for Geography as core discipline

ESC-10074 Earth Structure (15) Sem1 = compulsory for Geology as core discipline

ESC-10070 Minerals and Rocks (15) Sem1 = compulsory for 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

LSC-10081 Animal Biology (30) S1

LSC-10083 Ecology & Plant Biology (30) S2

School of Psychology

PSY-10038 Science communication (15) S1

CRI-10012 Psychology and Crime (15) S1

PSY-10026 Distress and Mental Health (15) S2

Level 4. Option group C

LIB-10005 Introduction to the Liberal Arts (15) Semester 1-2

NB: Global Challenge Pathways (GCPs) - students at Level 4 and Level 5 in 2023/24 have the option of taking a Global Challenge Pathway, which includes one 15-credit module in each year of the degree. Information on GCPs is shown under the Level 5 modules below.

Language modules

Students on this programme will also be able to study language modules offered by the Language Centre, as part of a Global Challenge Pathway. You can enrol on either a Modern Language module [more information available at this [link](#)] (Semester 1 only) or Teaching English to Speakers of Other Languages (TESOL) (Semesters 1 and 2) module (ENL-10053).

If you choose a Modern Language, you can add a Semester 2 module as a continuation of your language of choice as a faculty funded 'additional' module. Undertaking a Modern Languages module in Semester 2 is compulsory if you wish to continue to the language GCP the following academic year.

Level 5

Compulsory modules	Module Code	Credits	Period
Interdisciplinary Perspectives on Wicked Problems	NAT-20007	15	Semester 1-2

Level 5 option modules

Option group A = option modules from the core discipline (when applicable)

Option group B = programme level science module options available to all students

Option group C = programme level non-science module options available to all students (maximum 15 credits at each Level of study)

Level 5. Option group A is included at the end of this section as part of the core discipline structure

Level 5. Option group B

School of Chemical and Physical Sciences

FSC-20013 Digital Forensics (15) S2

School of Computing and Mathematics

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

School of Geography, Geology and the Environment

ESC-20017 Human Impacts on the Environment: Scientific Perspectives (15) S1 = compulsory for Environmental Science as core discipline

ESC-20108 Environmental Impact Assessment: practical geographical and environmental skills (15) S1 = compulsory for Environmental Science as core discipline

ESC-20110 Earth's Changing Landscapes (15) S1

ESC-20036 Palaeoclimatology and Quaternary Studies (15) S1

ESC-20100 Water in the Environment (15) S2

ESC-20002 Reconstructing Past Environments (15) S2

ESC-20064 Geochemistry (15) S2

ESC-20084 Geoscience and Society (15) S2

School of Life Sciences

LSC-20074 Current Topics in Biology (15) S1

LSC-20093 Biodiversity Crisis (15) S2 = requires successful completion of LSC-10083

School of Psychology

No options

Level 5. Option group C

LIB-20008 Creative Arts and Humanities in Society (15) Semester 1

PHI-20020 Philosophy of Science (15) Semester 2

Plus Global Challenge Pathway options (if selected in level 4)

Global Challenge Pathways (GCPs)

Students at Level 4 and Level 5 in 2023/24 have the option of taking a Global Challenge Pathway, which includes one 15-credit module in each year of the degree. Students at Level 5 will continue the Global Challenge Pathway they started at Level 4.

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>Level 4 Module: A digital life: challenges and opportunities (GCP-10005)</p> <p>Level 5 Module: Digital World - People, Spaces, and Data (GCP-20005)</p>
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<p>Climate Change & Sustainability</p>	<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>Level 4 Module: Climate Change and Sustainable Futures: Global Perspectives (GCP-10009)</p> <p>Level 5 Module: Climate Change and Sustainability: Action and Activism (GCP-20009)</p>
<p>Social Justice</p>	<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>Level 4 Module: Reflections on Social Injustices, Past and Present (GCP-10003)</p> <p>Level 5 Module: Strategic Interventions for Social Justice (GCP-20003)</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>Level 4 Module: Enterprise and the Future of Work (GCP-10007)</p> <p>Level 5 Module: Enterprise and the Future of Work: Collaborate to Innovate (GCP-20007)</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>Level 4 Module: Key concepts and challenges in global health (GCP-10001)</p> <p>Level 5 Module: Using Evidence to Improve Global Health (GCP-20001)</p>

Languages & Intercultural Awareness

An understanding of language and culture opens the doorway to understanding what happens, why it happens and how you can make a difference. Why learn Russian now? How will an understanding of intercultural values impact on global development? How can you use English to work your way around the world? Importantly - how do language and culture impact on the UN Sustainability Goals?

The Languages and Intercultural Awareness pathway offers you four distinct strands.

The Language Specialist: Become a specialist in one of our languages and graduate with a degree title that includes '... with competency in (Language)'.
The Language Taster: Explore a new language every year

The Certificate in TESOL (Teaching English to Speakers of Other Languages): Train to teach English as a Foreign Language, gain a globally recognised teaching qualification and work with asylum seekers and refugees.

The Intercultural Explorer: Explore cultural practices around the world and discover how the power of language and culture can be forces for breaking down barriers and achieving intercultural understanding, but how they can also be used to create political and social barricades.

Modules available:

The Language Specialist:

Any Semester 1 Language Module (the level at which you enter will be determined by your previous language learning experiences).

The Language Taster:

Any Semester 1 Language Module (the level at which you enter will be determined by your previous language learning experiences)

The Certificate in TESOL:

ENL-10053 TESOL 1

ENL-20007 TESOL 2

The Intercultural Explorer:

ENL-10057 The stories we live by

ENL-20009 Who do you think you are?

Information on Global Challenge Pathways can be found here:
<https://www.keele.ac.uk/study/undergraduate/globalchallengepathways/>

Language modules

You can enrol on the continuing Modern Language module [more information available at this [link](#)] (Semester 1 only) or the continuing TESOL (Semesters 1 and 2) module (ENL-20007).

If you choose a Modern Language, you can add a Semester 2 module as a continuation of your language of choice as a faculty funded 'additional' module. Undertaking a Modern Languages module in Semester 2 is compulsory if you wish to continue to the language GCP the following academic year.

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 option modules

All options at Level 6 are taken from the core discipline

Level 7

Level 7 modules are all taken from the core discipline as set out in in Section B4 as part of the core discipline structure

Structure of each core discipline through the programme:

Option modules from the core discipline (when applicable) are listed in modules diets as Option Group A
(Information shown: Module title, module code, credits, semester)

ASTROPHYSICS

Level 4 BSc Natural Sciences, Astrophysics core discipline

60 credits: 60 credits core (no options)

Compulsory modules

Mechanics, Gravity and Relativity PHY-10022 15 Semester 1

Nature of matter PHY-10024 15 Semester 1

Oscillations and Waves PHY-10020 15 Semester 2

Electricity and Stellar Structure PHY-10023 15 Semester 2

Level 5 BSc Natural Sciences, Astrophysics core discipline

60 credits: 60 credits core (no options)

Compulsory modules

Quantum Mechanics PHY-20006 15 Semester 1

Optics and Thermodynamics PHY-20027 15 Semester 1

Stellar Astrophysics PHY-20002 15 Semester 2

Statistical Mechanics and Solid State Physics PHY-20026 15 Semester 2

Level 6 BSc Natural Sciences, Astrophysics core discipline

60 credits: 30 credits core + 30 credits options

Compulsory modules

Electromagnetism PHY-30012 15 Semester 1

Optional modules

Cosmology PHY-30001 15 Semester 1

Polymer Physics PHY-30010 15 Semester 1

Binary Stars and Extrasolar Planets PHY-30024 15 Semester 1

Life in the Universe PHY-30025 15 Semester 1

Computational Methods in Physics and Astrophysics PHY-30026 15 Semester 1

Particle Physics and Accelerators PHY-30033 15 Semester 1

Two-Dimensional (2D) Materials PHY-30037 15 Semester 1

The Physics of Interstellar Medium PHY-30002 15 Semester 2

The Physics of Compact Objects PHY-30003 15 Semester 2

Quantum Physics of Atoms and Molecules PHY-30009 15 Semester 2

Data Analysis and Model Testing PHY-30027 15 Semester 2

Quantum Mechanics II PHY-30029 15 Semester 2

Physics of Fluids PHY-30030 15 Semester 2

Atmospheric Physics PHY-30031 15 Semester 2

Plasma Physics PHY-30032 15 Semester 2

General Relativity, Black Holes and Gravitational Waves PHY-30035 15 Semester 2

Level 6 BSc Natural Sciences, Astrophysics core discipline - Module rules

The following modules may be delivered in either Semester 1 or 2: PHY-30001, PHY-30010, PHY-30024, PHY-30025, PHY-30026 and PHY-30028.

BIOLOGY

Level 4 BSc Natural Sciences, Biology core discipline

60 credits: 60 credits core (no options)

Compulsory modules

Physiology and Anatomy LSC-10074 30 Semester 1-2

Fundamentals of Biology LSC-10085 30 Semester 1-2

Core Practical Skills LSC-10087 0 Semester 1-2

Level 5 BSc Natural Sciences, Biology core discipline

60 credits: 45 credits core + 15 credits options

Compulsory modules

Microbes, Viruses and Parasites LSC-20073 15 Semester 1

Environmental Biology LSC-20097 15 Semester 1

Practical Skills in Bioscience LSC-20107 0 Semester 1-2

Research and Analytical Skills LSC-20056 15 Semester 2

Optional modules

Human Impact on the Environment, scientific perspectives ESC-20017 15 Semester 1

Current Topics in Biology LSC-20074 15 Semester 1

Biodiversity Crisis LSC-20093 15 Semester 2

Health and the Environment PTY-20020 15 Semester 2

Level 5 BSc Natural Sciences, Biology core discipline - Module Rules

LSC-20097: please note, this module includes a field course during the summer vacation between Levels 4 and ESC-20017 is a prerequisite module for the final year module ESC-30056

Level 6 BSc Natural Sciences, Biology core discipline

60 credits: 60 credits options (no compulsory)

Optional modules

Ecotoxicology and Risk Assessment ESC-30056 15 Semester 1

Insect Ecology and Pest Management LSC-30070 15 Semester 1

Conservation Biology LSC-30043 15 Semester 1

Tropical Biology Field Course LSC-30066 15 Semester 1

Life Sciences Single Experimental Project (with research skills assessment) - ISP LSC-30048 15 Semester 1-2

Life Sciences Dissertation LSC-30050 15 Semester 1-2

Human Evolution LSC-30030 15 Semester 2

Plant Science and Sustainability LSC-30076 15 Semester 2

Level 6 BSc Natural Sciences, Biology core discipline - Module rules

Students must take ONE 15 credit ISP module (LSC-30048 or LSC-30050)

CHEMISTRY

Level 4 BSc/MSci Natural Sciences, Chemistry core discipline

60 credits: 60 credits core (no options)

Compulsory modules

Practical and Professional Chemistry Skills CHE-10061 30 Semester 1-2

Chemical Structure and Reactivity CHE-10063 30 Semester 1-2

Level 5 BSc/MSci Natural Sciences, Chemistry core discipline

60 credits: 60 credits core (no options)

Compulsory modules

Molecular Chemistry and Reactions CHE-20055 30 Semester 1-2

Physical and Structural Chemistry (Combined Honours) CHE-20065 15 Semester 1-2

Spectroscopy and Molecular Structure CHE-20083 15 Semester 1-2

Level 6 BSc Natural Sciences, Chemistry core discipline

60 credits: 15 credits core + 45 credits options

Compulsory modules

Topics in Chemistry CHE-30037 15 Semester 2

Optional modules

Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms CHE-30038 15 Semester 1

Advanced Organic Chemistry CHE-30039 15 Semester 1

Materials Chemistry and Catalysis CHE-30043 15 Semester 1

Advanced Physical and Inorganic Chemistry CHE-30056 15 Semester 1

Chemistry/Medicinal Chemistry Research Project CHE-30050 15 Semester 1-2

Chemistry/Medicinal Chemistry Dissertation CHE-30051 15 Semester 1-2

Level 6 BSc Natural Sciences, Chemistry core discipline - Module rules

Students must select one year-long project module (either CHE-30050 or CHE-30051)

Level 6 MSci Natural Sciences, Chemistry core discipline

75 credits: 75 credits core (no options)

Compulsory modules

Chemical Kinetics, Photochemistry & Inorganic Reaction Mechanisms CHE-30038 15 Semester 1

Advanced Organic Chemistry CHE-30039 15 Semester 1

Advanced Physical and Inorganic Chemistry CHE-30056 15 Semester 1

Chemistry/Medicinal Chemistry Research Project CHE-30050 15 Semester 1-2

Synoptic Topics in Chemistry CHE-30046 15 Semester 1-2

Level 7 MSci Natural Sciences, Chemistry core discipline

120 credits: 120 credits core (no options)

Compulsory modules

MChem Research Project CHE-40021 60 Semester 1-2

Advanced Topics in Chemistry and Medicinal Chemistry CHE-40048 30 Semester 1-2

MChem Research Training CHE-40050 30 Semester 1-2

COMPUTER SCIENCE

Level 4 BSc Natural Sciences, Computer Science core discipline

60 credits: 45 credits core + 15 credits options

Compulsory modules

Programming I - Programming Fundamentals CSC-10024 15 Semester 1

Fundamentals of Computing CSC-10029 15 Semester 1

Communication, Confidence and Competence CSC-10056 15 Semester 2

Optional modules

Cybercrime CSC-10025 15 Semester 1

Systems and Architecture CSC-10033 15 Semester 1

Computer Animation and Multimedia CSC-10026 15 Semester 2

Natural Computation CSC-10035 15 Semester 2

Introduction to Interaction Design CSC-10040 15 Semester 2

Level 5 BSc Natural Sciences, Computer Science core discipline

60 credits: 60 credits options (no compulsory)

Optional modules

Web Technologies CSC-20021 15 Semester 1

Programming II - Data Structures and Algorithms CSC-20037 15 Semester 1

Mobile Application Development CSC-20038 15 Semester 1

Computational and Artificial Intelligence I CSC-20043 15 Semester 1

Digital Forensics CHE-20042 15 Semester 2

Database Systems CSC-20002 15 Semester 2

Advanced Programming Practices CSC-20004 15 Semester 2

Software Engineering CSC-20041 15 Semester 2

Individual Study Topic in Computer Science CSC-20047 15 Semester 2

Level 6 BSc Natural Sciences, Computer Science core discipline

60 credits: 30 credits core + 30 credits options

Compulsory modules

Third Year Double Project - ISP CSC-30014 30 Semester 1-2

Optional modules

Software Engineering Project Management CSC-30016 15 Semester 1

Games Computing CSC-30019 15 Semester 1

Bioinformatics CSC-30022 15 Semester 1

Advanced Information Systems CSY-30001 15 Semester 1

Advanced Databases and Applications CSC-30002 15 Semester 2

Communications and Networks CSC-30012 15 Semester 2

Advanced Web Technologies CSC-30025 15 Semester 2

Computational and Artificial Intelligence II CSC-30027 15 Semester 2

ENVIRONMENTAL SCIENCE

Level 4 BSc/MSci Natural Sciences, Environmental Science core discipline

60 credits: 60 credits core (no options)

Compulsory modules

Introductory Environmental Chemistry CHE-10044 15 Semester 1

Studying the Environment ESC-10061 15 Semester 1-2

Academic, Professional and Fieldwork Skills ESC-10068 15 Semester 1-2

Climate Change: The Scientific and Societal Context ESC-10066 15 Semester 2

Level 5 BSc/MSci Natural Sciences, Environmental Science core discipline

60 credits: 60 credits core (no options)

Compulsory modules

Human Impact on the Environment, scientific perspectives ESC-20017 15 Semester 1

Environmental Impact Assessment: practical geographical and environmental skills ESC-20108 15 Semester 1

Environmental Analytical Methods ESC-20032 15 Semester 2

Geographical and Environmental Field Skills ESC-20106 15 Semester 2

Level 6 BSc Natural Sciences, Environmental Science core discipline

60 credits: 45 credits core + 15 credits options

Compulsory modules

Ecotoxicology and Risk Assessment ESC-30056 15 Semester 1

Dissertation ESC-30050 15 Semester 1-2

The Science of Soil ESC-30058 15 Semester 2

Optional modules

Environmental crimes CRI-30051 15 Semester 1

Glaciers and Glacial Geomorphology ESC-30006 15 Semester 1

Natural Hazards ESC-30009 15 Semester 1

Global Environmental Change ESC-30018 15 Semester 1

Clean Technology ESC-30040 15 Semester 1

Applied GIS ESC-30044 15 Semester 1

Animals and Society GEG-30021 15 Semester 1

Conservation Biology LSC-30043 15 Semester 1

Insect Ecology and Pest Management LSC-30070 15 Semester 1

Sustainability Consultancy ESC-30060 15 Semester 1-2

Water Resources ESC-30020 15 Semester 2

Hydrological and Engineering Geology ESC-30022 15 Semester 2

Coastal Environments ESC-30027 15 Semester 2

Economic Development and Environmental Transformation GEG-30016 15 Semester 2

Rural Geographies GEG-30020 15 Semester 2

Animal Welfare LSC-30072 15 Semester 2

Plant Science and Sustainability LSC-30076 15 Semester 2

Level 6 MSci Natural Sciences, Environmental Science core discipline

75 credits: 45 credits core + 30 credits options

Compulsory modules

Ecotoxicology and Risk Assessment ESC-30056 15 Semester 1

Dissertation ESC-30050 15 Semester 1-2

The Science of Soil ESC-30058 15 Semester 2

Optional modules

Environmental crimes CRI-30051 15 Semester 1
Glaciers and Glacial Geomorphology ESC-30006 15 Semester 1
Natural Hazards ESC-30009 15 Semester 1
Global Environmental Change ESC-30018 15 Semester 1
Clean Technology ESC-30040 15 Semester 1
Applied GIS ESC-30044 15 Semester 1
Animals and Society GEG-30021 15 Semester 1
Conservation Biology LSC-30043 15 Semester 1
Insect Ecology and Pest Management LSC-30070 15 Semester 1
Sustainability Consultancy ESC-30060 15 Semester 1-2
Water Resources ESC-30020 15 Semester 2
Hydrological and Engineering Geology ESC-30022 15 Semester 2
Coastal Environments ESC-30027 15 Semester 2
Economic Development and Environmental Transformation GEG-30016 15 Semester 2
Rural Geographies GEG-30020 15 Semester 2
Animal Welfare LSC-30072 15 Semester 2
Plant Science and Sustainability LSC-30076 15 Semester 2

Level 7 MSci Natural Sciences, Environmental Science core discipline

120 credits: 120 credits core (no options)

Compulsory modules

Clean & Green Technologies I: Power from above the Earth ESC-40031 15 Semester 1
An Introduction to Sustainable Technologies ESC-40034 15 Semester 1
Dimensions of Environmental Politics PIR-40106 15 Semester 1
Research Project & Dissertation ESC-40029 60 Semester 2
Research & Business Skills, Project & Portfolio Management ESC-40048 15 Semester 2

FORENSIC SCIENCE

Level 4 BSc/MSci Natural Sciences, Forensic Science core discipline

60 credits: 60 credits core (no options)

Compulsory modules

Forensic Chemistry and Analysis FSC-10003 30 Semester 1-2
Forensic Identification and Investigation FSC-10005 30 Semester 1-2

Level 5 BSc/MSci Natural Sciences, Forensic Science core discipline

60 credits: 60 credits core (no options)

Compulsory modules

Forensic Genetics FSC-20003 15 Semester 1

Spectroscopy and Advanced Analysis FSC-20005 15 Semester 1

Criminalistic Methods FSC-20001 15 Semester 2

Drugs of Abuse FSC-20009 15 Semester 2

Level 6 BSc Natural Sciences, Forensic Science core discipline

60 credits: 45 credits core + 15 credits options

Compulsory modules

Evaluation of evidence, explosives and arson FSC-30007 15 Semester 1

Forensic Science Team Research Project - ISP FSC-30015 15 Semester 1-2

Forensic Toxicology FSC-30017 15 Semester 2

Optional modules

Advanced Topics in Forensic Analysis FSC-30019 15 Semester 1

Forensic Geoscience FSC-30013 15 Semester 2

Level 6 MSci Natural Sciences, Forensic Science core discipline

75 credits: 75 credits core (no options)

Compulsory modules

Evaluation of evidence, explosives and arson CHE-30033 15 Semester 1

Advanced Topics in Forensic Analysis CHE-30035 15 Semester 1

Forensic Science Team Research Project - ISP CHE-30011 15 Semester 1-2

Forensic Toxicology CHE-30010 15 Semester 2

Forensic Geoscience CHE-30034 15 Semester 2

Level 7 MSci Natural Sciences, Forensic Science core discipline

120 credits: 120 credits core (no options)

Compulsory modules

Analytical Science: Principles and Practice CHE-40030 30 Semester 1

Research Skills for Analytical Science CHE-40032 15 Semester 1

MSci Independent Project CHE-40026 60 Semester 1-2

Forensic Evidence: At the crime scene and in the court CHE-40025 15 Semester 2

GEOGRAPHY

Level 4 BSc Natural Sciences, Geography core discipline

60 credits: 60 credits core (no options)

Compulsory modules

Academic, Professional and Fieldwork Skills ESC-10068 15 Semester 1-2

Fundamentals of Physical Geography ESC-10039 15 Semester 1

People and the Environment ESC-10041 15 Semester 2

Climate Change: The Scientific and Societal Context ESC-10066 15 Semester 2

Level 5 BSc Natural Sciences, Geography core discipline, NSC-PHGSH

60 credits: 30 credits core + 30credits options

Compulsory modules

Environmental Impact Assessment: Practical Geographical and Environmental Skills ESC-20108 15 Semester 1

Earth's Changing Landscapes ESC-20110 15

Optional modules

Option group A = core discipline options (Geography)

Cartography and Geographic Information Science ESC-20102 15 Semester 1

Weather, Climate and Society ESC-20096 15 Semester 2

Water in the Environment ESC-20100 15 Semester 2

Geographical and Environmental Field Skills ESC-20106 15 Semester 2

Making Better Worlds GEG-20046 15 Semester 2

Level 6 BSc Natural Sciences, Geography core discipline

60 credits: 60 credits options (no compulsory)

Optional modules

Glaciers and Glacial Geomorphology ESC-30006 15 Semester 1

Natural Hazards ESC-30009 15 Semester 1

Global Environmental Change ESC-30018 15 Semester 1

Applied GIS ESC-30044 15 Semester 1

Ecotoxicology and Risk Assessment ESC-30056 15 Semester 1

Sustainability Consultancy ESC-30060 15 Semester 1

Postcolonialism in South Asia GEG-30015 15 Semester 1

Economic Development and

Environmental Transformation GEG-30016 15 Semester 1

Animals and Society GEG-30021 15 Semester 1

Geography Double Dissertation - ISP GEG-30006 30 Semester 1-2

Geography (Single) Dissertation - ISP GEG-30008 15 Semester 1-2

Advanced Fieldwork in Geography GEG-30027 15 Semester 1-2

Coastal Environments ESC-30027 15 Semester 2

The Science of Soil ESC-30058 15 Semester 2

Inspirational Landscapes GEG-30014 15 Semester 2

Rural Geographies GEG-30020 15 Semester 2

Health Inequalities GEG-30029 15 Semester 2

GEOLOGY

Level 4 BSc/MSci Natural Sciences, Geology core discipline

60 credits: 60 credits core (no options)

Compulsory modules

Minerals and Rocks ESC-10070 15 Semester 1

Earth Structure ESC-10074 15 Semester 1

Academic, Professional and Fieldwork Skills ESC-10068 15 Semester 1-2

Stratigraphy and Palaeontology ESC-10076 15 Semester 2

Level 5 BSc/MSci Natural Sciences, Geology core discipline

60 credits: 60 credits core (no options)

Compulsory modules

Igneous and Metamorphic Petrology ESC-20001 15 Semester 1

Employability Training: Engaging with the Workplace ESC-20092 15 Semester 1-2

Field Skills ESC-20104 15 Semester 1-2

Reconstructing Past Environments ESC-20002 15 Semester 2

Level 6 BSc Natural Sciences, Geology core discipline

60 credits: 15 credits core + 45 credits options

Compulsory modules

Independent Fieldwork Project - ISP ESC-30039 15 Semester 1

Optional modules

Natural Hazards ESC-30009 15 Semester 1

Economic Geology ESC-30028 15 Semester 1

Reservoir Geology and Geophysics ESC-30082 15 Semester 1

Structure and Geodynamics ESC-30008 15 Semester 2

Hydrological and Engineering Geology ESC-30022 15 Semester 2

Micropalaeontology: Principles and Applications ESC-30025 15 Semester 2

Advanced Topics in Sedimentology ESC-30034 15 Semester 2

Geological Communication Skills ESC-30038 15 Semester 2

Level 6 MSci Natural Sciences, Geology core discipline

75 credits: 15 credits core + 60 credits options

Compulsory modules

ESC-30039 Independent Fieldwork Project Semester 1 15 Compulsory

Optional modules (group 1)

Geology core discipline MSci students must select a field course module, either:

Advanced Petrology and Structural Geology Field Course ESC-30030 15 Semester 2

Volcanic and Magmatic Processes ESC-30033 15 Semester 2

Optional modules (group 2)

Natural Hazards ESC-30009 15 Semester 1

Economic Geology ESC-30028 15 Semester 1

Reservoir Geology and Geophysics ESC-30082 15 Semester 1

Structure and Geodynamics ESC-30008 15 Semester 2

Hydrological and Engineering Geology ESC-30022 15 Semester 2

Micropalaeontology: Principles and Applications ESC-30025 15 Semester 2

Advanced Topics in Sedimentology ESC-30034 15 Semester 2

Geological Communication Skills ESC-30038 15 Semester 2

Optional modules (group 3)

Students can take a maximum of two of these physical geography modules in total from Level 6 and Level 7:

Glaciers and Glacial Geomorphology ESC-30006 15 Semester 1

Global Environmental Change ESC-30018 15 Semester 1

Coastal Environments ESC-30027 15 Semester 2

The Science of Soil ESC-30058 15 Semester 2

Level 7 MSci Natural Sciences, Geology core discipline

120 credits: 75 credits core + 45 credits options

Compulsory modules

Literature Synthesis ESC-40003 15 Semester 1 15

Research Project ESC-40004 15 Semester 1-2

Research in Context ESC-40005 15 Semester 1-2

Research Report ESC-40006 15 Semester 1-2

Spatial Geoscience Data Analysis ESC-40007 15 Semester 1-2

Optional modules (group 1)

Each of these modules can only be taken at Level 7 if the L6 equivalents has not been taken

ESC-40015 MGeoscience: Natural Hazards Semester 1 15 Option*

ESC-40026 MGeoscience: Economic Geology Semester 1 15 Option*

ESC-40073 Reservoir Geology and Geophysics (Masters) Semester 1 15

ESC-40020 MGeoscience: Hydrological and Engineering Geology Semester 2 15

ESC-40023 MGeoscience: Micropalaeontology: Principles and Applications Semester 2 15

ESC-40024 MGeoscience: Structure and Geodynamics Semester 2 15

Optional modules (group 2)

Students can take a maximum of two of these physical geography modules in total from Level 6 and Level 7

ESC-40017 MGeoscience: Glaciers and Glacial Geomorphology Semester 1 15

ESC-40018 MGeoscience: Global Environmental Change Semester 1 15

ESC-40019 MGeoscience: Water Resources Semester 2 15

ESC-40040 MGeoscience: Coastal Environments Semester 2 15

Level 4 BSc Natural Sciences, Mathematics core discipline

60 credits: 60 credits core (no options)

Compulsory modules

Calculus MAT-10046 30 Semester 1-2

Algebra MAT-10047 30 Semester 1-2

Level 5 BSc Natural Sciences, Mathematics core discipline

60 credits: 15 credits core + 45 credits options

Compulsory modules

Differential Equations MAT-20008 15 Semester 1

Optional modules

Probability MAT-20023 15 Semester 1

Computational Mathematics MAT-20031 15 Semester 1

Exploring Algebra and Analysis MAT-20035 15 Semester 1

Complex Variable I and Vector Calculus MAT-20004 15 Semester 2

Dynamics MAT-20005 15 Semester 2

Abstract Algebra MAT-20025 15 Semester 2

Linear Statistical Models MAT-20027 15 Semester 2

Analysis II MAT-20029 15 Semester 2

Professional Mathematics and Data Science MAT-20037 15 Semester 2

Operational Research MAT-20039 15 Semester 2

Module Rules

In each semester students take two 15-credit modules. The choice will depend on any timetabling restrictions and will be subject to the student having met the necessary prerequisites.

Level 6 BSc Natural Sciences, Mathematics core discipline

60 credits: 60 credits options (no compulsory)

Optional modules

Graph Theory MAT-30001 15 Semester 1

Non-linear Differential Equations MAT-30002 15 Semester 1

Partial Differential Equations MAT-30003 15 Semester 1

Group Theory MAT-30013 15 Semester 1

Number Theory and Cryptography MAT-30038 15 Semester 1

Financial Mathematics MAT-30039 15 Semester 1

Project II - ISP MAT-30016 15 Semester 1-2

Project (30 credits) MAT-30043 30 Semester 1-2

Fluid Mechanics MAT-30004 15 Semester 2

Complex Variable II MAT-30010 15 Semester 2

Waves MAT-30011 15 Semester 2

Medical Statistics MAT-30014 15 Semester 2

Mathematical Biology MAT-30023 15 Semester 2

Introduction to Mathematics Teaching MAT-30034 15 Semester 2

Linear Algebra and Rings MAT-30045 15 Semester 2

Introduction to Linear Elasticity MAT-30047 15 Semester 2

Mathematical Modelling MAT-30051 15 Semester 2

Mathematics core discipline Level 6 (BSc Natural Sciences) Module Rules

Students normally choose two 15-credit modules in each semester. The choice will depend on any timetabling restrictions and will be subject to the student having met the necessary prerequisites.

PHYSICS

Level 4 BSc Natural Sciences, Physics core discipline

60 credits: 60 credits core (no options)

Compulsory modules

Mechanics, Gravity and Relativity PHY-10022 15 Semester 1

Nature of matter PHY-10024 15 Semester 1

Oscillations and Waves PHY-10020 15 Semester 2

Electricity and Magnetism PHY-10021 15 Semester 2

Level 5 BSc Natural Sciences, Physics core discipline

60 credits: 60 credits core (no options)

Compulsory modules

Quantum Mechanics PHY-20006 15 Semester 1

Optics and Thermodynamics PHY-20027 15 Semester 1

Nuclear and Particle Physics PHY-20009 15 Semester 2

Statistical Mechanics and Solid State Physics PHY-20026 15 Semester 2

Level 6 BSc Natural Sciences, Physics core discipline

60 credits: 30 credits core + 30 credits options

Compulsory modules

Electromagnetism PHY-30012 15 Semester 1

Physics Project - ISP PHY-30007 15 Semester 1-2

Optional modules

Cosmology PHY-30001 15 Semester 1

Polymer Physics PHY-30010 15 Semester 1

Binary Stars and Extrasolar Planets PHY-30024 15 Semester 1

Life in the Universe PHY-30025 15 Semester 1

Computational Methods in Physics and Astrophysics PHY-30026 15 Semester 1

Physics of Galaxies PHY-30028 15 Semester 1

Particle Physics and Accelerators PHY-30033 15 Semester 1

Two-Dimensional (2D) Materials PHY-30037 15 Semester 1
The Physics of Interstellar Medium PHY-30002 15 Semester 2
The Physics of Compact Objects PHY-30003 15 Semester 2
Quantum Physics of Atoms and Molecules PHY-30009 15 Semester 2
Data Analysis and Model Testing PHY-30027 15 Semester 2
Quantum Mechanics II PHY-30029 15 Semester 2
Physics of Fluids PHY-30030 15 Semester 2
Atmospheric Physics PHY-30031 15 Semester 2
Plasma Physics PHY-30032 15 Semester 2
General Relativity, Black Holes and Gravitational Waves PHY-30035 15 Semester 2

Physics core discipline Level 6 (BSc Natural Sciences) Module Rules

The following modules may be delivered in either Semester 1 or 2: PHY-30001, PHY-30010, PHY-30024, PHY-30025, PHY-30026 and PHY-30028

PSYCHOLOGY

Level 4 BSc Natural Sciences, Psychology core discipline

60 credits: 60 credits core (no options)

Compulsory modules

Introduction to developmental and social psychology PSY-10033 15 Semester 1
Introduction to Research Design for Psychology PSY-10036 15 Semester 1
Introduction to statistics for psychology PSY-10031 15 Semester 2
Introduction to biological and cognitive psychology PSY-10034 15 Semester 2

Level 5 BSc Natural Sciences, Psychology core discipline

60 credits: 60 credits core (no options)

Compulsory modules

Developmental and Social Psychology PSY-20012 15 Semester 1
Qualitative Research Methods PSY-20050 15 Semester 1
Statistics for Psychology PSY-20044 15 Semester 2
Biological and Cognitive Psychology PSY-20045 15 Semester 2

Level 6 BSc Natural Sciences, Psychology core discipline

60 credits: 45 credits core + 15 credits options

Compulsory modules

Final Year Project (Double) - ISP PSY-30061 30 Semester 1-2
Individual Differences and Conceptual Issues PSY-30067 15 Semester 2

Optional modules

Health Psychology PSY-30077 15 Semester 1
Faces, Forgetting and Forensic Psychology PSY-30123 15 Semester 1

The psychology of deviance PSY-30126 15 Semester 1

Psychology in Education PSY-30127 15 Semester 1

Making a difference with psychology PSY-30134 15 Semester 1

Learning Outcomes

The table below sets out what students learn in the programme and the modules in which that learning takes place. Details of how learning outcomes are assessed through these modules can be found in module specifications.

Subject Knowledge and Understanding	
Learning Outcome	Module in which this is delivered
the benefits of an interdisciplinary approach to science;	Interdisciplinary Perspectives on Wicked Problems - NAT-20007 Grand Challenges in Society - NAT-30001 Science & Society - NAT-10001
the role Natural Scientists can play in the resolution of major challenges facing society;	Science & Society - NAT-10001 Grand Challenges in Society - NAT-30001 Interdisciplinary Perspectives on Wicked Problems - NAT-20007
interdisciplinary perspectives on world/societal issues.	Grand Challenges in Society - NAT-30001 Science & Society - NAT-10001 Interdisciplinary Perspectives on Wicked Problems - NAT-20007
their chosen science to an advanced level, including the knowledge base of their advanced-level research project, and be able to place this within the context of current research debates in their field of study.	Natural Sciences Interdisciplinary Research Project - NAT-30004 All Level 7 modules

Key or Transferable Skills (graduate attributes)	
Learning Outcome	Module in which this is delivered
locate, evaluate and make effective use of a wide range of university-level information sources;	Interdisciplinary Perspectives on Wicked Problems - NAT-20007 Science & Society - NAT-10001 Grand Challenges in Society - NAT-30001
communicate clearly and effectively using appropriate scientific language and conventions in both written and oral forms;	Interdisciplinary Perspectives on Wicked Problems - NAT-20007 Science & Society - NAT-10001 Grand Challenges in Society - NAT-30001
communicate complex ideas to lay audiences in a variety of forms;	Grand Challenges in Society - NAT-30001 Interdisciplinary Perspectives on Wicked Problems - NAT-20007 Science & Society - NAT-10001
communicate reflective and critical ideas through advanced written and oral presentation skills;	Grand Challenges in Society - NAT-30001 Interdisciplinary Perspectives on Wicked Problems - NAT-20007 Science & Society - NAT-10001
deal with complex data both systematically and creatively, make sound judgments in the absence of complete data, and communicate conclusions clearly to a specialist audience;	Natural Sciences Interdisciplinary Research Project - NAT-30004
work in a self-directed fashion in tackling and solving problems, and act autonomously in planning and implementing tasks associated with the project.	Natural Sciences Interdisciplinary Research Project - NAT-30004

Subject Specific Skills	
Learning Outcome	Module in which this is delivered
effectively search and critically review the academic literature relating to a current interdisciplinary debate/discourse;	Grand Challenges in Society - NAT-30001 Interdisciplinary Perspectives on Wicked Problems - NAT-20007 Science & Society - NAT-10001
recognise and make choices between the different methodological approaches to interdisciplinary research;	Natural Sciences Interdisciplinary Research Project - NAT-30004
frame research questions, aims and objectives, and design effective and achievable research/experimental projects	Natural Sciences Interdisciplinary Research Project - NAT-30004
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;	Natural Sciences Interdisciplinary Research Project - NAT-30004
use a variety of evidence-based approaches to solve problems;	Natural Sciences Interdisciplinary Research Project - NAT-30004
apply reflection and critical skills to a wide range of issues;	Science & Society - NAT-10001 Interdisciplinary Perspectives on Wicked Problems - NAT-20007 Grand Challenges in Society - NAT-30001
work with others to discover creative, innovative solutions to complex issues.	Grand Challenges in Society - NAT-30001 Interdisciplinary Perspectives on Wicked Problems - NAT-20007 Science & Society - NAT-10001
deal with complex data both systematically and creatively, make sound judgments in the absence of complete data, and communicate conclusions clearly to a specialist audience;	Natural Sciences Interdisciplinary Research Project - NAT-30004
critically evaluate current research and methodologies in their chosen field of study.	Natural Sciences Interdisciplinary Research Project - NAT-30004

9. Final and intermediate awards

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

Master's Degree	480 credits	You will require at least 120 credits at levels 4, 5, 6 and 7
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)	28%	72%	0%
Year 2 (Level 5)	26%	74%	0%
Year 3 (Level 6)	12%	88%	0%
Year 4 (Level 7)	15%	85%	0%

12. Accreditation

This programme does not have accreditation from an external body.

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/>

(International students only) Due to UK Home Office Visa (UKVI) restrictions, students who enrol on an integrated master's programme are not able to transfer to an alternative programme without the change meeting UKVI requirements. Where students wish to take an exit award of a Bachelor's Degree at the level 6 boards they are able to do so, but it is recommended to speak with Immigration Compliance and Support (visa@keele.ac.uk) before taking this option as this affects current and future Visa options.

All other students who are considering a course change or find themselves in circumstances where they need to change will need to speak to Immigration Compliance and Support (Student Services Centre) (visa@keele.ac.uk) first to check eligibility and review the consequences of the transfer and the timings of a new Visa application from outside the UK.

14. What are the typical admission requirements for the Programme?

See the relevant course page on the website for the admission requirements relevant to this programme:

<https://www.keele.ac.uk/study/>

Applicants who are not currently undertaking any formal study or who have been out of formal education for more than 3 years and are not qualified to A-level or BTEC standard may be offered entry to the University's Foundation Year Programme.

Applicants for whom English is not a first language must provide evidence of a recognised qualification in English language. The minimum score for entry to the Programme is Academic IELTS 6.0 or equivalent.

English for Academic Purposes

Please note: All new international students entering the university will sit a diagnostic language assessment. Using this assessment, the Language Centre may allocate you to an English language module which will become compulsory. This will replace any GCP modules. *NB:* students can take an EAP module only with the approval of the English Language Programme Director and are not able to take any other Language modules in the same academic year.

English Language Modules at Level 4:

- Business - ENL-90003 Academic English for Business Students (Part 1); ENL-90004 Academic English for Business Students (2)
- Science - ENL-90013 Academic English for Science Students
- General - ENL-90006 English for Academic Purposes 2; ENL-90001 English for Academic Purposes 3; ENL-90002 English for Academic Purposes 4

Recognition of Prior Learning (APL) is considered on a case-by-case basis and those interested should contact the Programme Director. The University's guidelines on this can be found here: <http://www.keele.ac.uk/qa/accreditationofpriorlearning/>

15. How are students supported on the programme?

Academic Mentors: All students are allocated an Academic Mentor for the duration of their studies as part of the University's Academic Mentor system. The role of the Academic Mentor is to meet formally with their mentees at least once per semester to discuss progress and performance, and to offer support and advice. In addition, to an Academic Mentor allocated to the student, students are encouraged to seek support from any of the Natural Sciences teaching and administrative staff. Students can make arrangements to see their Academic Mentor or other staff at any time.

Use of e-learning/the Keele Learning Environment (KLE): All modules are supported by learning materials that are accessible to students via the KLE. The School supports the University's policy on module support on the KLE.

Health and Safety: All students admitted to the programme receive detailed training on health and safety in the laboratory, as appropriate for the Science subjects they are studying. Students studying Earth Sciences, Environmental Science or Physical Geography are expected to abide by the rules and regulations governing the efficient working, safety and welfare of all members both within the University and in the field.

Students with disabilities: Students with disabilities or medical problems, who are admitted onto the Natural Science degree programme, will meet with a member of the University's Disability Services at the very start of the course in order to discuss any special requirements. Procedures will then be implemented according to the nature of the student's disability or medical problem. These procedures can range, for example, from allowing extra examination time for students diagnosed as dyslexic, to allocating additional staff or demonstrators to field classes to help students with mobility problems.

16. Learning Resources

Chemistry at Keele is based in the Lennard-Jones building, which houses excellent, well-equipped teaching and research laboratory facilities. Each module has a site within the university's virtual learning environment (the Keele Learning Environment or KLE), which hosts teaching materials (lecture notes/slides, laboratory scripts, assessments, past examination papers, on-line quizzes, videos, screencasts and audio clips) and useful links. The KLE is accessible on or off campus and is also used for online submission and return of assessments. Each module has a module guide or specification which contains details of the specific intended learning outcomes, Graduate Attributes and assessments.

The School of **Geography, Geology and Environment** has its own building (the William Smith Building) that contains well-equipped laboratories and lecture theatres. The foyer provides pleasant surroundings for students to meet and socialise with their peers. The Office is currently open during the week from 8.45am to 5.00pm to answer student queries and deal with administrative tasks.

Biology is taught in modern teaching rooms across the University, almost all of which are equipped with computers, internet access and electronic whiteboards or projection equipment. The School of Life Sciences has recently benefited from £10 million of investment to expand its teaching and research areas. Rooms may

be arranged either in traditional lecture format or more informally to allow students to work together in small groups. Practical sessions are held in dedicated teaching laboratories within the School of Life Sciences, which have places for a total of 210 students. The learning resources available to students on the Programme include:

- The extensive collection of books and journals relevant to undergraduate study held in the University Library. Much of this material is also accessible online to Keele students from anywhere in the world with a University username and password.
- A smaller collection of biological publications and materials held in the Undergraduate Resource Room in the School of Life Sciences. The Resource Room is open at regular times during teaching periods and the resources are specifically related to the needs of students on Bioscience programmes.
- The Keele Learning Environment (KLE) which provides easy access to a wide range of learning resources including lecture notes, electronic materials available in a repository maintained by the University Library and other resources - video, audio and text-based - accessible from external providers via the internet.

Mathematics is taught in lecture theatres equipped with whiteboards and projection equipment. There is also a large computer laboratory containing state-of-the-art computers and monitors. There is also a room within the Division which exclusively for use by students for private study. The learning resources available to students on the Programme include:

- The extensive collection of books and journals relevant to undergraduate study held in the University Library. Much of this material is also accessible online to Keele students from anywhere in the world with a University username and password.
- Detailed printed notes and other paper resources supplied in certain modules.
- A smaller collection of Mathematics texts available to students held in the Division's Reading Room.
- The Keele Learning Environment (KLE) which provides easy access to a range of learning resources including some lecture notes and past examination papers, and other resources accessible from external providers via the internet.

17. 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 at the end of this document.

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.

18. 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 LSC-20055	Variable
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-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-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.

19. Quality management and enhancement

The quality and standards of learning in this programme are subject to a continuous process of monitoring, review and enhancement.

- The School Education Committee is responsible for reviewing and monitoring quality management and enhancement procedures and activities across the School.
- Individual modules and the programme as a whole are reviewed and enhanced every year in the annual programme review which takes place at the end of the academic year.
- The programmes are run in accordance with the University's Quality Assurance procedures and are subject to periodic reviews under the Revalidation process.

Student evaluation of, and feedback on, the quality of learning on every module takes place every year using a variety of different methods:

- The results of student evaluations of all modules are reported to module leaders and reviewed by the Programme Committee as part of annual programme review.
- Findings related to the programme from the annual National Student Survey (NSS), and from regular surveys of the student experience conducted by the University, are subjected to careful analysis and a planned response at programme and School level.
- Feedback received from representatives of students on the programme is considered and acted on at regular meetings of the Student Staff Voice Committee.

The University appoints senior members of academic staff from other universities to act as external examiners on all programmes. They are responsible for:

- Approving examination questions
- Confirming all marks which contribute to a student's degree
- Reviewing and giving advice on the structure and content of the programme and assessment procedures

Information about current external examiner(s) can be found here:

<http://www.keele.ac.uk/qa/externalexaminers/currentexternalexaminers/>

20. The principles of programme design

The programme described in this document has been drawn up with reference to, and in accordance with the guidance set out in, the following documents:

a. UK Quality Code for Higher Education, Quality Assurance Agency for Higher Education:

<http://www.qaa.ac.uk/quality-code>

b. QAA Subject Benchmark Statements:

Biosciences (2015): <https://www.qaa.ac.uk/quality-code/subject-benchmark-statements?indexCatalogue=document-search&searchQuery=biosciences&wordsMode=AllWords>

Chemistry (2014): <https://www.qaa.ac.uk/quality-code/subject-benchmark-statements?indexCatalogue=document-search&searchQuery=chemistry&wordsMode=AllWords>

Computing (2016): <https://www.qaa.ac.uk/quality-code/subject-benchmark-statements?indexCatalogue=document-search&searchQuery=computing&wordsMode=AllWords>

Earth Sciences, Environmental Sciences and Environmental Studies (2014): <https://www.qaa.ac.uk/quality-code/subject-benchmark-statements?indexCatalogue=document-search&searchQuery=earth%20sciences&wordsMode=AllWords>

Geography (2014): <https://www.qaa.ac.uk/quality-code/subject-benchmark-statements?indexCatalogue=document-search&searchQuery=geography&wordsMode=AllWords>

Mathematics, Statistics and Operational Research (2015): <https://www.qaa.ac.uk/quality-code/subject-benchmark-statements?indexCatalogue=document-search&searchQuery=mathematics&wordsMode=AllWords>

Physics, Astronomy and Astrophysics (2016): <https://www.qaa.ac.uk/quality-code/subject-benchmark-statements?indexCatalogue=document-search&searchQuery=physics&wordsMode=AllWords>

c. Keele University Regulations and Guidance for Students and Staff: <http://www.keele.ac.uk/regulations>

21. Annex - International Year

Master in Natural Sciences (MSci) 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, Level 6 and Level 7 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 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 in Semester 1 at Level 5 is normally required. Places on the International Year are then conditional on achieving an average mark of 55% across all Level 5 modules. 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 Academic Mentor, 1st and 2nd year tutors and programme director)

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 Academic Mentoring 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.

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.

22. 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 your employability skills.

Entry Requirements for the Work Placement Year

To proceed to the 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 Single Honours 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 analysis and Intended Learning Outcomes;
4. apply academic theory learned as part of their taught degree to real situations in the work place;
5. reflect on their work placement activities and evaluate the impact on their own employability skills;
6. 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 'Work Placement Year' 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

Date Approved: 08 February 2023

Previous documents

Version No	Year	Owner	Date Approved	Summary of and rationale for changes
1.1	2022/23	ADAM MOOLNA	22 December 2022	Change to progression threshold from Level 5 to Level 6: reduced to 50% (agreed by Senate in December 2022)
1	2022/23	ADAM MOOLNA	07 February 2022	
1	2021/22	ADAM MOOLNA	11 February 2021	
1	2020/21	ADAM MOOLNA	13 May 2020	
2	2019/20	SARAH ROBERTS		Updated following major modification (April 2020)
1	2019/20	ADAM MOOLNA	15 November 2019	