

BSc Environmental Science
For students entering Part 1 in 2011/2

UCAS code: F851

Awarding Institution:	University of Reading
Teaching Institution:	University of Reading
Relevant QAA subject Benchmarking group(s):	Earth Sciences, Environmental Sciences and Environmental Studies
Faculty:	Science Faculty
Programme length:	3 years
Date of specification:	04/Nov/2013
Programme Director:	Dr Hazel McGoff
Programme Advisor:	Dr Hazel McGoff
Board of Studies:	Geography and Environmental Science
Accreditation:	Institution of Environmental Science

Summary of programme aims

The programme aims to provide students with a sound scientific understanding of the processes operating in the Earth system, and to apply this science to the understanding of current and future environmental issues. It also aims to provide students with the scientific and transferable skills that are relevant to the application of environmental science in research, industry and other areas such as government policy.

The programme aims to provide a thorough degree-level education in Environmental Science, with pathways such as Climate Change, Water Resources and Quality and Habitat Management being determined by the choice of optional modules.

Part 1 is designed to provide a sound foundation in Environmental Science, and supporting knowledge of relevant Chemistry, Physics and Mathematics. A wide range of subject options are available and shape the particular pathway chosen. Part 2 has a core of compulsory modules to develop further technical skills with particular emphasis on understanding key environmental processes and their interactions. Options are designed to give depth to knowledge and methodology in selected subject areas. Placement learning and career management are also a key component of Part 2. Part 3 has an emphasis on environmental management whilst providing scope for specialisation through the selection of options and through project work. The latter provides the student with the opportunity to demonstrate their ability to conduct and report on a detailed research investigation.

Transferable skills

During the course of their studies at Reading, all students will be expected to enhance their academic and personal transferable skills. In following this programme, students will have had the opportunity to develop such skills, in particular relating to career management, communication (both written and oral), information handling, numeracy, problem-solving, team working, field work and use of information technology and will have been encouraged to further develop and enhance the full set of skills through a variety of opportunities available outside their curriculum.

As part of this programme students are expected to have gained experience and show competence in the following transferable skills: IT (word-processing, using spreadsheet and graphical applications programs, scientific programming, internet), scientific writing, oral presentation, experimental methods (laboratory and field), team-working, use of library resources, career planning and management. They will have developed skills in team-working and leadership, and be confident and self-reliant, particularly as a result of experience during field courses and independent fieldwork. They will also have a sound knowledge of fieldwork safety procedure.

Programme content

The profile which follows states which modules must be taken (the compulsory part), together with lists of modules from which the student must make a selection (the 'optional' modules). Students must choose additional modules, in consultation with their programme adviser, to make 120 credits in each Part. The number of credits for each module is listed.

Part 1 (three terms)

Compulsory modules

<i>Mod Code</i>	<i>Module Title</i>	<i>Credits</i>	<i>Level</i>
GV1A3	Chemistry of the Earth and Environment	10	4
GV1A4	Introduction to Physics of the Environment	10	4

GV1B1	Introduction to Environmental Science	10	4
GV1B2	Environmental Science Field Class	10	4
GV1D1	Earth Structure and Processes	10	4
GV1E1	Soils in the Environment	10	4

Optional modules (60 credits)

Students select a minimum of three contributory subjects to Environmental Science, including: Earth Science, Meteorology, Geography, Chemistry, Biology, Rural Environmental Science. They may also chose a language as part of the Institution-Wide Language Programme. Choice is subject to timetable constraints and students having appropriate pre-requisites.

Recommended:

GV1D2	Earth Materials	10	4
GV1F2	Biogeography and Soils	10	4

Others including:

Biology

BI1BA1	The Living Cell	10	4
BI1ED2	Mammals: Diversity, Behaviour and Conservation	10	4
BI1EF2	Ecology: Species and their Interactions	10	4
BI1EF3	Practical Field Ecology	10	4

Archaeology

AR1TS2	Bones, Bodies and Burials: the Archaeology of Death	20	4
AR1TS3	Practising Archaeology: methods and approaches	20	4

Rural Science and Agriculture

AP1A10	Countryside & Environment	10	4
AP1A02	Introduction to Agriculture and Food Systems	10	4
AP1EE3	Economics 1	10	4
AP1EF1	The UK Food Chain	10	4

Chemistry

CH1FC1	Fundamental Chemistry 1	10	4
CH1PH2	Physical Processes for Biologists	10	4
CH1IN2	Descriptive Inorganic Chemistry	10	4

Geography

GV1C	Climatology	10	4
GV1D	Hydrology	10	4
GV1GS	Geomorphology	10	4

Meteorology

MT11C	Introduction to Meteorology	20	4
MT11D	Weather and Climate Fundamentals	20	4

Languages

LA1XX1	IWLP- Various Languages	20	4
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Plus up to 20 other credits subject to approval by the Programme Adviser

Part 2 (three terms)

Compulsory modules

<i>Mod Code</i>	<i>Module Title</i>	<i>Credits</i>	<i>Level</i>
GV2B4	Chemistry of Natural and Contaminated Environments	10	5
GV2F4	Soil Ecology and Functions	10	5
GV2H4	Transport Processes in the Environment	10	5
GV2P4	Career and Placement Learning for Environmental Science	10	5
GV2P5	Excel Data Management and Analysis	10	5

And one field class from:

GV2Z6	Environmental Science Field Class 2	10	5
AP2A58*	Environmental Science and Management Field Course	10	5

*Taken at the end of Term 3

Optional modules (60 credits)

Students develop depth in a minimum of two contributory subjects to Environmental Science, including: Earth Science, Meteorology, Geography, Chemistry, Biosciences, Rural Environmental Science, Archaeology. They may also chose a language as part of the Institution-Wide Language Programme.

Recommended:

Earth Sciences

GV2C5	Crime Scene Analysis	10	5
GV2D5	Sustainable Resource Management	10	5
GV2M5	Quaternary Global Climate Change	10	5
GV2N5	Laboratory Methods	10	5

Others including:

Archaeology (20 credits)

AR2S1	Archaeological Science	20	5
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Rural Science and Agriculture (20 to 40 credits)

AP2A26	Forestry and Woodlands	10	5
AP2A39**	Environment and the Farm Business	10	5
AP2A56	Grassland Management and Ecology	10	5
AP2A57	Methods in Ecology and Environmental Management	20	5
AP2A59	Nature Conservation	10	5

**Students must have taken AP1A02 in order to take AP2A39

Bioscience (20 to 40 credits)

BI2BN4	Vertebrate Zoology: Structure, Form and Function	10	5
BI2EE4	Evolutionary Biology	10	5
BI2EI4	Invertebrate Zoology	10	5
BI2EN5	Animal Behaviour	10	5
BI2EX5	Introduction to Entomology	10	5
BI2EY5	Birds: Diversity, Behaviour and Conservation	10	5

Meteorology (20 or 40 credits)

MT24A	Atmosphere and Ocean Dynamics	20	5
MT24B	Atmospheric Physics	20	5

Physical Geography (20 to 40 credits)

GV2ER	Energy Resources	10	5
GV2P1	Geomorphological Hazards	10	5
GV2P3	Human Activity and Environmental Change	10	5
GV2P5	Hydrological Processes	10	5
GV2BC	Biogeography and Conservation	10	5

Others

LA1XX1	Institution Wide Language Programme	20	4
MM270	Practice of Entrepreneurship	20	5

Plus up to 20 other credits subject to approval by the Programme Adviser

Part 3 (three terms)

Compulsory modules

Code	Module title	Credits	Level
GV3IP	Independent Project	40	6

And Either				
	GV3I7	Carbon and Global Change	10	6
	GV3G8	Contaminated Land Management	10	6

Plus 60 credits of optional modules as listed below to make a total of 120 credits

Or one from				
	GV3SA	Study Abroad (60 credits)	60	6
	GV3SA2	Study Abroad (50 credits)	50	6
	GVSA1	Study Abroad (40 credits)	40	6

Plus 20, 30 or 40 credits of optional modules as listed below to make a total of 120 credits

Optional Modules (60 credits)

Recommended:

	GV3F8	Applied and Environmental Soil Microbiology	10	6
	GV3LP	Environmental Science Literature Project	10	6
	GV3Z8	Earth Systems Field Class	10	6
	GV3J8	Soil, Atmosphere and Vegetation Modelling	10	6

Others including:

Archaeology

	AR3S15	People, Plants and Environmental Change	20	6
	AR3S16	Climate Change and Human Society	20	6

Rural Science and Agriculture

	AP3EP3	Rural Policy and Countryside Planning	10	6
	AP3A68	Wildlife in the Farming Environment	10	6
	AP3A87	Environment Management	10	6
	AP3A89	Water, Agriculture and Irrigation	10	6
	AP3A90	Climate Change and Food Systems	10	6
	AP3A99	Plants, Greenspace and Urban Sustainability	10	6

Biological Sciences

	BI3EA7	Insect Ecology and its Applications	10	6
	BI3EB7	Forensic Zoology	10	6
	BI3EE7	Urban Ecology	10	6
	BI3EJ8	Conservation Biology	10	6
	BI3EM7	Plants, Animals and Climate Change	10	6
	BI3EN7	Conservation and Biodiversity: Global and Local Scales	10	6

Physical Geography

	GV3CC	Climate Change	20	6
	GV342	Environmental Modelling	20	6
	GV361	Aquatic Environments: Problems and Management	20	6
	GV332	Water Resources	20	6

Others

	LA1XX1	Institute Wide Language Programme*	20	6
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*Not available if Study Abroad modules are taken

Plus up to 20 other optional credits subject to approval by the Programme Adviser.

Physical Geography (20 or 40 credits)

	GV3CC	Climate Change	20	6
	GV342	Environmental Modelling	20	6
	GV361	Aquatic Environments: Problems and Management	20	6
	GV362	Water Resources	20	6

Progression requirements

To gain a threshold performance at Part 1 a student shall normally be required to achieve an overall average of 40% over 120 credits taken in Part 1, and a mark of at least 30% in individual modules amounting to not less than 100 credits. In order to progress from Part 1 to Part 2, a student shall normally be required to achieve a threshold performance at Part 1. In addition, students shall normally obtain at least 40% in the compulsory modules ES1A3, ES1A4, ES1B1, ES1B2, ES1D1 and SS1A1 averaged together.

To gain a threshold performance at Part 2 a student should normally be required to achieve an overall average of 40% over 120 credits taken in Part 2, and a mark of at least 30% in individual modules amounting to not less than 100 credits. In order to progress from Part 2 to Part 3, a student shall normally be required to achieve a threshold performance at Part 2.

To be eligible for Honours, students must normally pass Level 6 modules with a total credit of at least 100.

Assessment and classification

The University's honours classification scheme is:

<i>Mark</i>	<i>Interpretation</i>
70% - 100%	First class
60% - 69%	Upper Second class
50% - 59%	Lower Second class
40% - 49%	Third class
35% - 39%	Below Honours Standard
0% - 34%	Fail

For the University-wide framework for classification, which includes details of the classification method, please see: www.reading.ac.uk/internal/exams/Policies/exa-class.aspx

The weighting of the Parts/Years in the calculation of the degree classification is

Three-year programmes

Part 2 one-third

Part 3 two-thirds

Teaching is organized in modules that typically involve lectures, problem solving classes, and practical classes. The assessment is carried out within the University's degree classification scheme, details of which are in the programme handbooks. The pass mark in each module is 40%. Parts 1 and 2 are assessed by a mixture of coursework and formal examination. In Part 3 there are some modules which are assessed wholly by coursework and others wholly by examination: the details are given in the module descriptions. The Part 3 project involves a substantial component of independent learning, under the supervision and guidance of Project Supervisors. The projects are assessed on the basis of formal reports, oral presentations and development of independent learning skills.

Admission requirements

Entrants to this programme are normally required to have obtained:

Grade C or better in English, Science and Mathematics in GCSE, and a minimum UCAS Tariff of 300 points including two full 'A' levels. One subject from Maths, Physics, Chemistry, Biology, Geography, Geology or Environmental Science preferred;

Or International Baccalaureat: minimum pass plus minimum 6,5,5 in Higher Level Subjects including at least one science or maths.

Or Irish Highers: four grade Bs and one grade C including two sciences.

Admissions Tutor: Prof ME Hodson

Support for students and their learning

University support for students and their learning falls into two categories. Learning support is provided by a wide array of services across the University, including: the University Library, the Careers, Placement and

Experience Centre (CPEC), In-sessional English Support Programme, the Study Advice and Mathematics Support Centre teams, IT Services and the Student Access to Independent Learning (S@il) computer-based teaching and learning facilities. There are language laboratory facilities both for those students studying on a language degree and for those taking modules offered by the Institution-wide Language Programme. Student guidance and welfare support is provided by Personal Tutors, School Senior Tutors, the Students' Union, the Medical Practice and advisers in the Student Services Centre. The Student Services Centre is housed in the Carrington Building and offers advice on accommodation, careers, disability, finance, and wellbeing, academic issues (eg problems with module selection) and exam related queries. Students can get key information and guidance from the team of Helpdesk Advisers, or make an appointment with a specialist adviser; Student Services also offer drop-in sessions and runs workshops and seminars on a range of topics. For more information see www.reading.ac.uk/student

The providing Departments have well-equipped teaching laboratories, analytical laboratories and dedicated computer laboratories. Substantial collections of earth materials and maps are available for hands-on access by students. Within the providing Departments additional support for students is given through practical and field classes and in the course of the independent project. There is a Course Adviser to offer advice on the choice of modules throughout the programme.

Career prospects

The requirement for environmental scientists with a sound scientific training continues to grow and opportunities for graduates from this course include employment by environmental consultants, water companies and the many offices of national and local government concerned with environmental issues as well as post-graduate study. Private industry is increasingly concerned to employ scientists to help minimise the adverse environmental impact of its activities.

Opportunities for study abroad or for placements

Students following this degree programme may transfer to the parallel degree BSc Environmental Science with Professional Experience (F852). It may be possible to undertake the period of Professional Experience with a company overseas. Such transfers are only permitted if the student displays the appropriate ability to benefit from such a secondment, has taken appropriate options in Part 2, has the requisite degree of fluency in the foreign language required, and, if suitable industrial experience can be found for the student. Students may also participate in the ERASMUS exchange scheme where one or two terms are spent studying in a European university. Study Abroad is also available in institutions in north America and Australia. Further details are available from the Course Director and the Study Abroad Office.

Programme Outcomes

Knowledge and Understanding

A. Knowledge and understanding of:

1. Earth Systems including the lithosphere, hydrosphere, atmosphere and biosphere
2. Interactions between the processes operating in the different components of the Earth System.
3. The evolution of the Earth and the environment through different time scales, and the evidence for that change
4. Monitoring and management of natural and human-induced environmental change.
5. Scientific examination of the implications of sustainability and sustainable development.
6. A selected range of optional topics
7. Environmental issues and management with an interdisciplinary and integrative perspective.
8. Fieldwork safety issues and procedures.

Teaching/learning methods and strategies

Underlying knowledge in the essential areas is set out in lectures, in most cases directly supported by illustrative practicals. The essential field experience required for proper understanding is provided by compulsory field courses in Part 1 and Part 2, with additional optional field courses in Part 3. Students conduct an independent project in the form of practical investigation into an environmental topic in Part 3, with support and advice from academic and technical staff.

Assessment

Most knowledge is tested through a combination of coursework and unseen formal examinations. Dissertations and oral presentations also contribute in Part 3.

Skills and other attributes

B. Intellectual skills - able to:

1. Think logically and critically in a scientific manner
2. Analyse and interpret environmental observations and data and recognise and identify issues and problems with that data
3. Organise tasks into a structured form
4. Understand the current state of knowledge of the environment - a rapidly developing area
5. Integrate and apply concepts and principles from one area of environmental science to another
6. Recognise the need for professional codes of conduct.

C. Practical skills - able to:

1. Plan, conduct and report on investigations, including the use of secondary data
2. Collect, record and analyse data using appropriate field and laboratory techniques
3. Reference work in an appropriate manner
4. Carry out a risk assessment for field and laboratory investigations
5. Consider the impact of field investigations on the environment as well as other interested parties.

D. Transferable skills - able to:

1. Use IT (word-processing, using standard software and the Internet)
2. Understand issues of sample selection, accuracy, precision and uncertainty in field and laboratory work
3. Prepare, process, interpret and present data in an appropriate manner, using both quantitative and qualitative techniques
4. Communicate scientific ideas in verbal, written and graphic form to a variety of audiences.
5. Work as part of a team, identifying individual and collective goals, respecting the views and opinions of others and evaluating both individual and team performances.
6. Use library resources
7. Manage their time
8. Plan their career, developing skills for self-managed and lifelong learning.

Teaching/learning methods and strategies

Logical and critical thinking is an essential part of interpreting environmental science data and materials, it is embedded throughout the programme. The ability to integrate and apply concepts and principles from one area of the subject to another are intrinsic to high-level performance in the programme. Current developments in environmental science are highlighted by contact with visiting experts in the field in Part 3.

Assessment

1 and 2 are assessed indirectly in most parts of the programme, 3 in the course of laboratory and fieldwork. 4 is focused on by courses in Parts 2 and 3, while 5 contributes to more successful work. 6 not directly assessed.

Teaching/learning methods and strategies

Observing, recording and interpreting is taught in laboratory and field classes throughout the course. An investigative independent practical project is conducted by the student in Part 3, with advice from academic and technical staff. Risk assessment forms an essential part of each field course and any field based project work.

Assessment

1 and 2 are tested both formatively in coursework and particularly during the final year projects. summatively in examinations. 2 is assessed by means of coursework and project work, 4 and 5 during field classes and project work.

Teaching/learning methods and strategies

The use of IT is embedded throughout the programme with special sessions in Part 1 and in the Skills Module in Part 2. Oral presentation and communication skills are developed in various modules, culminating in the Part 3 practical project. Career management is taught in the Part 2 Skills module. Teamworking is particularly emphasised in field courses. Time management is essential for the timely and effective completion of the programme. Library and internet resources are required for the literature review in Part 3, and contribute to the best performances throughout.

Assessment

1, 2, 3 and 4 are assessed through coursework and particularly in the Part 3 project. 5 in field courses, 6 in the Library Project and most other modules, and 8 in the skills module in Part 2. 7 is not directly assessed but contributes to successful performance throughout the programme.

Please note - This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the module description and in the programme handbook. The University reserves the right to modify this specification in unforeseen circumstances, or where the process of academic development and feedback from students, quality assurance process or external sources, such as professional bodies, requires a change to be made. In such circumstances, a revised specification will be issued.