BSc Environmental Geology with Professional Experience

UCAS code: F631

Awarding Institution:	The University of Reading
Teaching Institution:	The University of Reading
Relevant QAA subject benchmarking group(s):	Earth Sciences, Environmental Sciences and Environmental Studies
Faculty of Science	Programme length: 4 years
For students entering Part 1 in 2002	Date of specification: Apr 2004
Programme Director: Dr T R Astin (SHES)	
Programme Adviser: Dr T R Astin (SHES)	
Board of Studies: Environmental Sciences	
Accreditation: None	

Summary of programme aims

The course is designed to provide a sound education in geology and geological processes and their relationship with the environment, an understanding of the evolution of environments, an appreciation of the impact of human activity on the environment and a substantial period of professional experience. (For a full statement of the programme aims and learning outcomes see below)

Transferable skills

The University's Strategy for Teaching and Learning has identified a number of generic transferable skills which all students are expected to have developed by the end of their degree programme. In following this programme, students will have had the opportunity to enhance their skills relating to career management, communication (both written and oral), information handling, numeracy, problem-solving, team working and use of information technology.

As part of this programme students are expected to have gained experience and show competence in the following transferable skills: IT (word-processing, using standard software packages), scientific writing, oral presentation, team-working, problem-solving, use of library resources, time-management and career planning and management. They will have developed skills in observing and recording data, teamworking and leadership, and be confident and self-reliant, particularly as a result of experience during field courses, independent fieldwork and professional experience. They will also have a sound knowledge of fieldwork safety procedures.

Programme content

The programme which follows states which modules must be taken (the compulsory part), together with one or more lists of modules from which the student must make a selection (the 'selected' modules). Students must choose such additional modules as they wish, 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)		*Credits*	*Level*	*Term*
Compulsory modules (40 credits)				
GO1A1	*Earth Structure & Processes*	10	C	1
GO1B1	*Earth Materials*	10	C	1
GO1C2	*Earth History & Evolution*	10	C	2
GO1X2	*Introduction to Geological Fieldwork*	10	C	E.Vac

Optional modules (80 credits)		*Credits*	*Level*	*Term*
Recommended:				
GO1S1	*Essential Maths for Earth & Environmental Scientists*	10	C	1
ES1A2	*Essential Chemistry & Physics for Environmental Science*	10	C	2
SS1A1	*Introduction to Soil Science*	10	C	1
SS1A2	*Soils, Land and Environment*	10	C	2
Others Including:		*Credits*	*Level*	*Term*
AM1C12	*Animal Physiology*	10	C	1
AM1Z11	*Environmental Biology*	10	C	1
BI1M10	*Biodiversity*	10	C	1
BI1Z10	*Ecology*	20	C	2
CH1I1	*Introduction to Inorganic Chemistry*	20	C	1,2,3
CH1O1	*Introduction to Organic Chemistry*	20	C	1,2,3
CH1P1	*Introduction to Physical Chemistry*	20	C	1,2,3
ES1A1	*Maths for Environmental Scientists*	10	C	1
MT11A	*Introduction to Atmospheric Science*	20	C	1,2
SS1B1	*Biological Processes in Soil*	10	C	1
SS1B2	*Soil Processes and Applications*	10	C	2
SS1A3	*Soil Science Field Studies*	10	C	3

Part 2 (three terms : 2003-2004)

Compulsory modules (100 credits)		*Credits*	*Level*	*Term*
ES2A5	*Environmental Systems*	10	I	5
GO2A4	*Introductory Environmental Geochemistry*	10	I	4
GO2B4	*Crust and Mantle Processes*	10	I	4
GO2C4	*Sedimentology*	10	I	4
GO2D5	*Global Change Through Geological Time*	10	I	5
GO2F5	*Geophysics*	10	I	5
GO2G4	*Structural and Engineering Geology*	10	I	4
GO2J5	*Skills for Earth & Environmental Scientists*	10	I	5
GO2X5	*Environmental Geology Field Class*	10	I	6
GO2Y3	*Geological Field Techniques Field Class*	10	I	3
Optional Modules (20 credits)				
Including:				
AM24F	*Evolution*	10	I	4
AM2Z36	*Development*	10	I	5
AM2Z34	*Invertebrate Zoology*	10	I	5
AM2Z32	*Vertebrate Zoology*	10	I	4
BI2B31	*Macro Evolution*	10	I	4
CH2A2	*Introduction to Analytical Geochemistry*	10	I	4
CH2P2	*Intermediate Physical Chemistry*	10	I	4
CH2I2	*Inorganic Geochemistry*	10	I	5
GO2I5	*Analytical Geochemistry*	10	I	5
MT24A	*Atmosphere & Ocean Dynamics*	20	I	4,5
MT24B	*Atmospheric Physics*	20	I	4,5
MT24C	*Numerical Methods for Environmental Science*	10	I	4
SS2A4	*Soil Physical Properties and their Measurement*	10	I	4
SS2B4	*Chemistry of Soil Constituents*	10	I	4

SS2A5	*Transport Processes in Soils*	10	I	5
SS2C5	*Soils and Environmental Pollution*	10	I	5
SS2D5	*Sustainable Land Management*	10	I	5
SS2A6	*Soil Survey and Experimentation*	10	I	6

Part 3 (three terms : 2004-2005)

Compulsory module (120 credits)		*Credits*	*Level*	*Term*
GO3PE78	*Professional Experience*	*120*	*I/H*	*7,8,9*

Part 4 (three terms : 2005-2006)

Compulsory modules (100 credits)		*Credits*	*Level*	*Term*
GO4MP9	*Independent Geological Mapping Project*	30	H	S.Vac,10,11
GO4LP10	*Library Project*	10	H	10,11
GO4X11	*Earth Systems Field Class*	10	H	E.Vac
ES4A11	*Environmental Issues*	10	H	11
GO4S10	*Palaeoclimatology*	10	H	10
GO4F10	*Geological Hazards and Risk Analysis*	10	H	10
GO4T10	*Palaeobiology*	10	H	10
GO4B10	*Environmental and Global Geochemistry*	10	H	10

Optional Modules (20 credits)		*Credits*	*Level*	*Term*
Including:				
SS3A7	*Soil Contaminants*	10	H	10
SS3B7	*Soils, Vegetation and the Atmosphere*	10	H	10
SS3C8	*Soils and the Global Environment*	10	H	11
AR3S1	*Environmental Archaeology and the Cultural Landscape of Prehistory*	20	H	10
AR3S2	*Environment and Landscape in Historic Periods*	20	H	11
GG330	*Dryland Environments*	20	H	10
GG332	*Estuaries and Coastal Processes*	20	H	11
GG335	*Ice Sheets and Climate Change*	20	H	11

Progression requirements

Students must obtain at least 40% overall in Part 1, in addition to obtaining at least 40% in modules GO1A1, GO1B1, GO1C2, and GO1X2 averaged together, and gaining at least 30% in every module. Students must obtain at least 40% overall in Part 2, in addition to obtaining at least 40% in modules ES2A5, GO2A4, GO2B4, GO2C4, GO2G4, GO2D5, GO2F5, GO2J5, GO2X5 and GO2Y3 averaged together, and gaining at least 30% in every module. Marks of less than 30% in a total of 20 credits, in Part 1 and in Part 2 excluding compulsory modules, will be condoned provided that the candidate has pursued the course for the module with reasonable diligence and has not been absent from the examination without reasonable cause. Students must also maintain appropriate standards in coursework throughout Part 2, gaining an average of at least 50% in coursework for each compulsory module in order to progress to Part 3. Students unable to progress after their first attempt at Part 2, or for whom it is not possible to find an appropriate placement, may qualify for progression to the 3-year BSc in Environmental Geology.

Summary of teaching and assessment

Teaching is organised in modules that typically involve both lectures and practicals. Modules are assessed by a mixture of coursework and formal examinations. The professional placement (Part 3) is assessed by in-service assessment, a written report and oral presentation. Part 4 project work is monitored by means of tutorials with an individual advisor, and is assessed as coursework. Independent mapping is conducted independently in the field and is assessed, in part by means of a report, as coursework.

Degree Assessment: Part 2 will contribute 30% of the marks for the Final Degree classification.
Part 3 will contribute 10% of the marks for the Final Degree classification.
Part 4 will contribute 60% of the marks for the Final Degree classification.

Admission requirements
Entrants to this programme are normally required to have obtained:
Grade C or better in English GCSE; and achieved
UCAS Tariff: 260 points from 3 A Levels or 300 points from 4 A Levels. Must include at least two subjects from Maths, Physics, Chemistry, Biology, Geography, Geology or Environmental Science.

Admissions Tutor: Dr Hazel McGoff

Support for students and their learning
University support for students and their learning falls into two categories. Learning support includes IT Services, which has several hundred computers and the University Library, which across its three sites holds over a million volumes, subscribes to around 4,000 current periodicals, has a range of electronic sources of information and houses 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, the Careers Advisory Service, the University's Special Needs Advisor, Study Advisors, Hall Wardens and the Students' Union.

The providing Department has well-equipped teaching laboratories and analytical laboratories. It has long-standing well-established links with the oil and water industry and other geological industries. Substantial collections of earth materials and geological maps are available for hands-on access by students. Within the providing Department additional support for students is given through practical and field classes and in the course of independent project work. There is a Course Adviser to offer advice on the choice of modules throughout the programme. The period of professional placement will be monitored by an on-site mentor and by regular (at least one per term) visits by the student's tutor.

Career prospects
Environmental Geology provides access to a wide range of careers in geology and environmental sciences, waste disposal and pollution monitoring, management of water resources, and to more specialised degrees in these and other fields. Employers require environmental science graduates with an 'in-depth' understanding of a core science discipline. The professional placement will be an invaluable asset in the student's future career development. Many graduates who wish to pursue a career in environmental science take an advanced postgraduate course in a specialised field before employment.

Opportunities for study abroad
Students following this degree programme may complete their placement with an appropriate company overseas. This is only permitted if the student displays the appropriate ability to benefit from such a secondment, has the requisite degree of fluency in the foreign language required, and, if suitable industrial experience can be found for the student.

Educational aims of the programme
The course is designed to provide a sound education in geology and geological processes and their relationship with the environment, an understanding of the evolution of environments, and an appreciation of the impact of human activity on the environment.

Part 1 is designed to provide a solid foundation in geology, with particular reference to materials, structures and processes, an introduction to field work, and the opportunity to select introductory modules from a range of disciplines. Part 2 devotes special attention to the development of skills and technical experience, with further importance placed on fieldwork and emphasis on environmental systems and the surface and near-surface environment. Part 3 consists of a substantial period of placement (3 terms) in an appropriate industrial or other relevant professional environment. Part 4 is integrative and focuses on environmental issues and physical resources, and professional geological skills. The field mapping project develops the student's ability to work independently using all their geological knowledge to investigate and interpret the three dimensional geology of an area, it also tests initiative, self-confidence and time management skills. It is an essential element of professional accreditation. The project provides the student with the opportunity to demonstrate their expertise in conducting and reporting on a detailed research investigation.

Programme Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas:

Knowledge and Understanding

A. Knowledge and understanding of:	**Teaching/learning methods and strategies**
1. Earth and planetary materials and how they are formed 2. The history of the Earth and the evolution of environment through geological time, and how that understanding is arrived at 3. The internal structure and composition of the Earth and internal processes 4. Processes in the surface and near-surface environment, including interactions between the solid Earth, hydrosphere, atmosphere and biological agents, including man. 5. Geological hazards 6. Relevant experience in a professional placement 7. Earth's physical resources, their occurrence, location by man and the environmental issues associated with their exploitation 8. A selected range of optional topics 9. Environmental issues with an interdisciplinary and integrative perspective. 10. Fieldwork safety issues and procedures	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, Part 2 and Part 4. Students conduct an independent project in the form of practical investigation in Part 4, with support and advice from academic and technical staff, and an independent field mapping project. Assessment Most knowledge is tested through a combination of coursework and unseen formal examinations. The professional placement in Part 3 is assessed by in-service assessment, a report and oral presentation. The mapping report, project report and oral presentations also contribute in Part 4.

Skills and other attributes

B. Intellectual skills – able to:

1. think logically and critically in a scientific manner
2. analyse and interpret geological and environmental observations and data and recognise and identify issues and problems
3. organise tasks into a structured form
4. understand the current state of knowledge of the environment
5. integrate and apply concepts and principles from one area of earth science to another and to the work place environment
6. plan, conduct and report on an independent field mapping programme, construct a geological map of an area and interpret its structure
7. plan, conduct and write a report and give an oral presentation on an independent project.

Teaching/learning methods and strategies

Logical and critical thinking is an essential part of interpreting earth science data and materials, it is embedded throughout the programme and emphasised by the field mapping project in Part 4. 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, it is critical in the Part 3 placement.

Assessment

1 and 2 are assessed indirectly in most parts of the programme, 3 in the course of laboratory and fieldwork and during the placement. 4 is focused on by courses in Parts 2 and 4, while 5 contributes to more successful work in all parts of the programme and is important during the placement. 6 and 7 are assessed by independent project work in Part 3.

C. Practical skills – able to:

1. accurately observe, record and interpret earth materials and data
2. conduct a practical earth science project
3. construct a geological map of an area from field observations and interpret its geological history and structure
4. carry out a risk assessment for fieldwork in a given area.
5. Conduct relevant tasks in a working environment.

Teaching/learning methods and strategies

Observing, recording and interpreting is taught in laboratory and field classes throughout the course. Direct practical experience is gained through the placement in Part 3. Investigative independent practical project and field mapping projects are conducted by the student in Part 4, with advice from academic staff. Risk assessment forms an essential part of each field course and any field based project work.

Assessment

1 is tested both formatively in coursework and summatively in examinations. 2 is assessed by means of the project report, 3 by means of the field mapping report. 4 is assessed practically through coursework and the independent projects. 5 by in-service assessment.

D. Transferable skills – able to:

1. use IT (word-processing, using standard software and the Internet)
2. communicate scientific ideas
3. give oral presentations
4. work as part of a team
5. use library resources
6. manage time
7. plan their career.

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 4 practical project. Career management is taught in the Part 2 Skills module and through the placement. Teamworking is particularly emphasised in field courses. Time management is essential for the timely and effective completion of the programme. Library resources are required for the literature review in Part 4, and contribute to the best performances throughout.

Assessment

1, 2 and 3 are assessed through coursework and particularly in the Part 3 projects. 4 in field courses, 5 in the project and 7 in the skills module in Part 2 and through the placement. 6 is not directly assessed but contributes to successful performance throughout the programme, it is particularly critical during the placement and in the independent mapping project.

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 expect 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 module and programme handbooks.