

Programme Specification

Section 1: Basic Data

Awarding institution/body	University of the West of England
Teaching institution	University of the West of England
School responsible for programme	School of Life Sciences
Programme accredited by	Institution of Environmental Sciences
Highest award title	BSc (Hons) ENVIRONMENTAL SCIENCE
Default award title	BSc (Hons) Applied Sciences
Interim award title	Cert.HE Environmental Science Dip.HE Environmental Science
Modular Scheme title (if different)	
UCAS code (or other coding system if relevant)	<i>F900</i>
Relevant QAA subject benchmarking group(s)	Earth Sciences, Environmental Sciences and Environmental Studies
On-going/valid until* (*delete as appropriate/insert end date)	
Valid from (insert date if appropriate)	
Authorised by: SLS Quality and Standards Committee	Date: June 2010
Version Code: 4	

Section 2: Educational aims of the programme

The BSc (Hons) Environmental Science programme is a three year full-time or four-year sandwich degree designed to provide graduates with the knowledge and skills necessary to work effectively in the field of environmental science, for e.g. in environmental regulation, environmental consultancy or environmental biotechnology. It provides an opportunity for students to explore the theory and practice related to the subject of environmental science, and to develop both subject-specific and important generic graduate skills, particularly analytical and communication skills. It aims to develop, in students, an in-depth understanding of the natural world and the potential consequences to the natural environment of a wide range of human activities. Students will also develop a broad understanding of the social, political and economic context within which environmental decisions are made.

The design of the programme enables the student to:

- understand the principles that govern biological, physical and human systems in an environmental context.
- explore the impact of human activities on these systems, and appreciate the relationship between lifestyle choices (including their own) and the sustainable use of environmental resources at a local, regional and global scale.
- develop subject-specific and generic practical, analytical and communication skills which will equip them for the world of work.

The specific aims of the programme are to:

- Provide the educational and resource environment which will enable students with a background in science to develop:
 - a strong scientific understanding of the principles and processes that underpin contemporary environmental issues
 - an understanding of environmental issues from a multi-disciplinary and interdisciplinary perspective.
 - the field, laboratory and investigative skills necessary to undertake independent investigations and analyses of environmental problems, and the presentational skills necessary to communicate their findings to audiences with a variety of backgrounds.
 - the skills of a literate and numerate student capable of independent learning.
- Create a friendly and supportive atmosphere that will enable individual students to use the learning experience at UWE to create a graduate foundation, on which they can develop their future careers and on-going social and educational development.
- Provide a curriculum that is enhanced by a balance of experience from both research and consultancy.

Section 3: Learning outcomes of the programme

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

A Knowledge and understanding

Learning outcomes

Teaching, Learning and Assessment Strategies

A Knowledge and understanding of:

1. The need for both a multi-disciplinary and an interdisciplinary approach in knowledge and understanding of earth systems, drawing from the natural and social sciences.
2. The processes which shape the natural world at different temporal and spatial scales including the influence of human activities.
3. The terminology, nomenclature and classification systems relevant to Environmental Science.
4. Methods of acquiring, interpreting and analysing information and data with a critical understanding of the appropriate contexts for their use.
5. Issues concerning the availability and sustainable use of resources.
6. The contribution of the environmental sciences to debate on environmental issues and how knowledge forms the basis for informed concern about the Earth and its people.
7. The contribution of their subject to the development of knowledge of the world we live in.
8. The applicability of the environmental sciences to the world of work.

Teaching/learning methods and strategies:

Outcomes 1-8 are integrated across the programme, and are acquired through a variety of methods including lectures, laboratory and field-based (half- and whole-day visits, residential) practicals, case-studies, tutorials and workshops, supported by handouts, case-study materials, laboratory schedules, field notes, CD-Roms and other audio-visual material.

Acquisition of 1 is implicit in the structure of the degree programme, which included modules in both the natural and social sciences, but is addressed explicitly in several integrating modules such as Environment and Society, Environmental Skills and Renewable Energy.

The use of case studies to illustrate how knowledge and understanding have developed in the past underpins 7, whilst 8 is addressed particularly through the optional sandwich year as well as in final year modules, where greater specialism is achieved.

Additional support is provided through the general library facilities, specialist library facilities, reading packs and relevant software packages supplied via the Environmental Project Room and Field Studies Resource Room, and through e-learning systems including the Blackboard virtual learning environment.

Throughout, the student is encouraged to undertake independent reading both to supplement and consolidate what is being taught/learnt and to broaden their individual knowledge and understanding of the subject.

Assessment:

Knowledge and understanding is assessed using a variety of methods, including: formal (unseen, open-book, practical) and oral examinations, essays, fieldwork and laboratory reports, computer-based exercises, problem-solving exercises, data analysis and presentation, case studies and mini-projects, research project.

PROGRAMME SPECIFICATION

B Intellectual Skills

<p>B Intellectual Skills</p> <ol style="list-style-type: none">1. Recognising and using subject-specific theories, paradigms, concept and principles.2. Analysing, synthesising and summarising information critically, including prior research.3. Collecting and integrating several lines of evidence to formulate and test hypotheses.4. Applying knowledge and understanding to address familiar and unfamiliar problems.5. Recognising the moral and ethical issues of investigation and appreciating the need for professional codes of conduct.	<p>Teaching/learning methods and strategies</p> <p>Intellectual skills are developed through individual and team project work, student-centred learning, laboratory and fieldwork, data handling and interpretation exercises, and seminar work. The independent project further develops these intellectual skills on an individual basis.</p> <p>Assessment</p> <p>Assessment of intellectual skills is through the full range of methods identified in section A. In particular, the wide range of different types of coursework including various forms of reports/essays, group project work, problem-solving exercises and presentations, is important in assessing the student's ability to demonstrate generic intellectual skills. The independent project allows the assessment of the full range of intellectual skills at an advanced level.</p>
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C Subject, Professional and Practical Skills

<p>C Subject/Professional/Practical Skills</p> <p>A successful graduate will be able to:</p> <ol style="list-style-type: none">1. Plan, conduct, and report on investigations, including the use of secondary data.2. Collect, record and analyse data using appropriate techniques in the field and laboratory.3. Undertake field and laboratory investigations in a responsible and safe manner, paying due attention to risk assessment, rights of access, relevant health and safety regulations, and to display sensitivity to the impact of investigations on the environment and stakeholders.4. Reference work in an appropriate manner.	<p>Teaching/learning methods and strategies</p> <p>Skills 1-3 are introduced at level 1 through the Field Skills module and are further developed throughout the programme during laboratory and fieldwork practical sessions, especially during the independent project, but also through the interdisciplinary modules, where small project work forms an important element of the curriculum. Skill 4 is developed at the appropriate level across the programme.</p> <p>Assessment</p> <p>Skills 1-4 are primarily assessed through the independent project as well as smaller project, laboratory and field-based work, especially in the compulsory modules.</p> <p>Additionally, skill 4 is assessed in all written coursework, including essays, laboratory and fieldwork reports, across the programme.</p>
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D Transferable Skills and other attributes

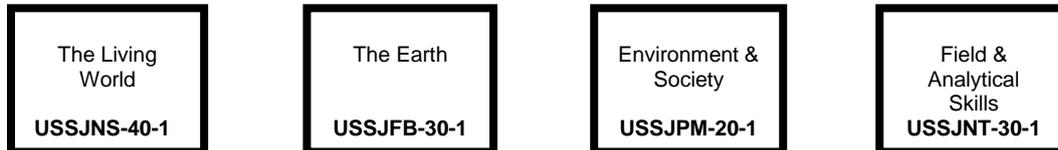
<p>D Transferable skills and other attributes</p> <p>A successful graduate will be able to:</p> <ol style="list-style-type: none"> 1. Receive and respond to a variety of sources of information (e.g. textual, numerical, verbal, and graphical). 2. Communicate appropriately to a variety of audiences using a range of formats and approaches. 3. Appreciate issues of sample selection, accuracy, calibration, precision, replicability and uncertainty during collection, recording and analysis of data in the field and laboratory. 4. Prepare, process, interpret and present data, using appropriate qualitative and quantitative techniques and packages 5. Solve numerical problems using computer and non-computer based techniques. 6. Use the internet and other electronic sources critically as a means of communication and a source of information. 7. Identify individual and collective goals and responsibilities and perform in a manner appropriate to these roles. 8. Recognise and respect the views and opinions of others. 9. Evaluate performance as an individual and a team member. 10. Develop the skills necessary for self-managed and life-long learning (e.g. working independently, time management and organisation skills). 11. Identify and work towards targets for personal, academic and career development. 12. Develop an adaptable, flexible and effective approach to study and work. 	<p>Teaching/learning methods and strategies</p> <p>Skills 1-12 are developed throughout all compulsory and core modules. Those skills dealing specifically with experimental design and analysis (skills 3, 4, 5) are introduced at level 1 and are further developed in compulsory modules at levels 2 and 3.</p> <p>Team-working skills (skills 7, 8 and 9) are developed in project work in the interdisciplinary and compulsory modules and are an integral part of field and laboratory work across the programme. Skills for independent and life-long learning (skills 10, 11 and 12) are developed through the structure of the assessment schedule, and through student support facilities including the Graduate Development Programme.</p> <p>Assessment</p> <p>All of these skills contribute to the student's general performance across the programme and, as such, achievement is evidenced by the overall classification of award. The wide range of different forms of assessment and coursework requires the student to demonstrate the full range of transferable skills.</p>
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Section 4: Programme Structure – 2010/11

BSc (Hons) ENVIRONMENTAL SCIENCE: STRUCTURE DIAGRAM

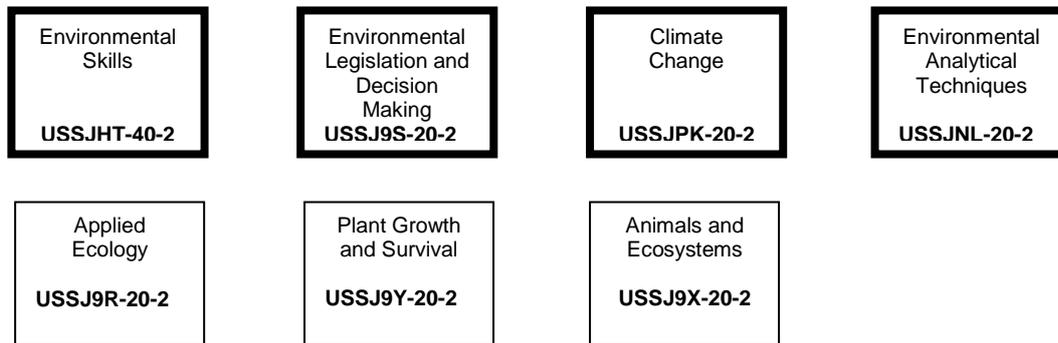
Level 1: one 40 credit, two 30 credit modules and one 20 credit module

Interim award: **Certificate of Higher Education** 120 credits



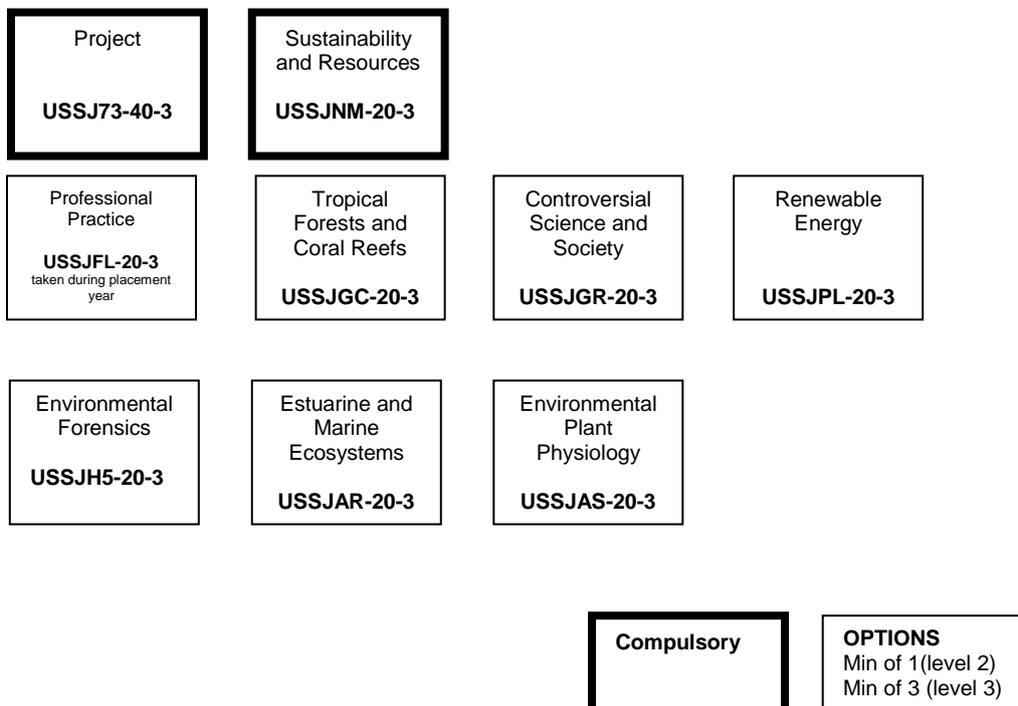
Level 2: one 40 credit module and four 20 credit modules

Interim award: **Diploma of Higher Education** 240 credits



Level 3: one 40 credit module and four 20 credit modules

Degree with Honours 360 Credits



PROGRAMME SPECIFICATION

level 1
Compulsory modules (all students MUST take these) <ul style="list-style-type: none">• USSJNS-40-1 (40 cr) The Living World• USSJFB-30-1 (30 cr) The Earth• USSJNT-30-1 (30 cr) Field and Analytical Skills• USSJPM-20-1 (20 cr) Environment and Society
Interim Awards: Certificate of Higher Education Credit requirements: 120 (of which 100 are level 1 or above)

level 2
Compulsory modules (all students MUST take these) <ul style="list-style-type: none">• USSJHT-40-2 (40 cr) Environmental Skills• USSJ9S-20-2 (20 cr) Environmental Legislation and Decision Making• USSJNL-20-2 (20 cr) Environmental Analytical Techniques• USSJPK-20-2 (20 cr) Climate Change
Core modules (strongly associated with the learning outcomes of the programme - students choose 2 from the modules listed below) <ul style="list-style-type: none">• USSJ9R-20-2 (20 cr) Applied Ecology• USSJ9X-20-2 (20 cr) Animals and Ecosystems• USSJ9Y-20-2 (20 cr) Plant Growth and Survival
Interim Awards: Diploma of Higher Education Credit requirements: 240 (of which not less than 100 are level 2 or above and 120 are at level 1 or above)

Year out
<p>Students may complete their degree programme full-time in a 3-year period, or may opt to spend their third year on Placement, before returning to complete their studies in year 4.</p> <p>In their year out, students may opt for a traditional Sandwich assessment, or for the newly introduced Professional Practice in Applied Science module (PPM). Both options require at least 40 weeks of vocational training with a suitable employer. On successful completion of either option, students are awarded 120 placement credits; these do not contribute towards their final year of study, but entitle them to graduate as a Sandwich student. In addition, successful completion of the PPM option contributes 20 credits towards the student's Level 3 credits, so that these students will study typically 1 less module in their final year.</p> <p>The Faculty has a Placement Support Team, headed by the Faculty Placement Tutor, and supported administratively by the Placements Co-ordinator. Typically 50% of students take up a placement each year in a wide range of employment areas including environmental impact assessment, environmental education, environmental consultancy and research.</p>

PROGRAMME SPECIFICATION

level 3

Compulsory modules (all students MUST take these)

- USSJ73-40-3 (40 cr) Project
- USSJNM-20-3 (20 cr) Sustainability and Resources

Core modules (strongly associated with the learning outcomes of the programme - students choose 4 from the modules listed below)

- USSJH5-20-3 (20 cr) Environmental Forensics
- USSJPL-20-3 (20 cr) Renewable Energy
- USSJGC-20-3 (20 cr) Tropical Forests and Coral Reefs
- USSJAR-20-3 (20 cr) Estuarine and Marine Ecosystems
- USSJFL-20-3 (20 cr) Professional Practice in Applied Sciences
- USSJAS-20-3 (20 cr) Environmental Plant Physiology
- USSJGR-20-3 (20 cr) Controversial Science and Society

Award/s:

Degree with Honours

Credit requirements:

360 (of which not less than 100 are level 3 or above, and 100 are at level 2 or above, and 140 are level 1 or above)

Degree

Credit requirements:

300 (of which not less than 60 are level 3 or above, and 100 are at level 2 or above, and 120 are level 1 or above)

Section 5: Entry requirements

Admissions into the BSc (Hons) Environmental Science award are overseen within the Undergraduate Programme in the Faculty of Applied Sciences. The standard UCAS entry for the programme is 200 - 260 tariff points. Successful application to the award must also meet one of the following minimum requirements:

- GCE A level at grade D or above in two subjects, and grade C or above in three GCSE subjects. GCSE subjects should include Mathematics and English Language. One A level should normally be a Science subject, which may include Geography.
- National Certificate or Diploma in an appropriate subject.
- Higher National Certificate or Diploma in an appropriate subject.
- Pass in a recognised Access or Foundation course.

Additionally applicants may be admitted to the award provided they meet one of the following requirements and can demonstrate to the faculty that the GCE A level and GCSE subject areas specified have been studied at an appropriate level:

- The Advanced General National Vocational Qualification (AGNVQ) or Advanced General Scottish Vocational Qualification (AGSVQ). A twelve unit or full AGNVQ award is equivalent to two GCE A levels, a six unit or single AGNVQ is equivalent to one GCE A level, and a three unit or part AGNVQ award is equivalent to one GCE AS level.
- The Irish Leaving Certificate with grade C or above in two subjects at Higher level, and three at ordinary level.
- The Scottish Leaving Certificate of education with grade C or above in three subjects at Higher and grade 3 or above in two subjects at Standard grade or Intermediate 2.
- National Vocation qualifications or Scottish Vocational qualifications at level III.
- The European Baccalaureate
- The International Baccalaureate
- Other European or International qualifications which the University considers to be of equivalence to the above.

Section 6: Assessment Regulations

Academic Regulations and Procedures 2010/11 (Academic Registry)

Section 7: Student learning: distinctive features and support

The BSc (Hons) Environmental Science programme is an interdisciplinary degree which combines a sound scientific understanding of environmental systems with the analysis of those socio-economic and political factors which determine the context within which environmental decisions are made. Hence its teaching is supported by tutors from not only a wide range of disciplines within the Faculty of Health & Life Sciences, but also by staff from other Faculties, including the Faculty of Environment and Technology. The sustainable use of natural resources is a theme which is integrated across the programme, as is the importance of interdisciplinarity, which is also developed explicitly through dedicated modules.

All students follow a core first year which is designed to provide a broad underpinning to the environmental sciences. Through optional modules at level 2 and 3, students may focus their degree studies around a number of themes, including: the quantification and diversity of the living environment; the analysis of the physical environment and sustainable exploitation of earth resources; the management of human: environment interactions in business and industry. Alternatively, students may choose to pick a broad range of modules to match their interests and career aspirations. A central, integrative theme which runs through the degree programme is the study of polluted systems, their management and remedy. In addition, students may opt to study a modern language in the second and final years, or to explore issues relating to science communication. Field work is of fundamental importance to the development of skills and understanding in environmental science, and occurs across a range of modules at all levels. In particular, residential field trips take place at levels 1 and 2 (compulsory) and level 3 (optional modules). The costs associated with half and full-day trips are generally met by the Faculty, and most residential field trips are subsidised, although the costs of the tropical field trip must be met in full by participating students. Group working is particularly encouraged to enable students to enhance the interpersonal skills they will need to take advantage of the wide choice of employment opportunities now available to environmental scientists.

The degree programme is managed as part of a suite of environmental awards. Year handbooks are provided at each level providing information on the Faculty, the University, its regulations and

PROGRAMME SPECIFICATION

procedures. Detailed information is distributed in guides for each module. Students are supported during their time at UWE by their tutors and the student advisor. Guidance on year issues is provided by the Year Tutors, and the programme is overseen by the Programme Leader, who is supported by the Teaching Team. Issues relating to groups of students are dealt with through the Programme Management Committee which includes student representatives, who also meet with year tutors on a regular basis. For those students who elect to undertake a placement year, the placement tutor makes regular, planned visits to provide support and to liaise with supervisors and assessors. For all students, access to academic staff and the student advisor is via e-mail or by personal access, with most staff offering an office-hours policy facilitating the booking of appointments.

The central University counselling and support services provide assistance and guidance for students with special needs. The Bolland library provides an extensive range of literature which supports the programme, and additional material is held in the Environmental Resource Room and Field Studies Resource Room. Students have 24-hour access to computers, and IT support services are available within the Faculty of Health & Life Sciences and from the University's Computing Helpdesk. The University's virtual learning environment, hosted by Blackboard, has been developed to provide supplementary material on a module-by-module basis. The Faculty has a well-equipped range of general laboratories, a dedicated field laboratory, and a wide range of specialist scientific equipment that is available for use by the students at appropriate stages in their study programme.

Section 8 Reference points/benchmarks

- **Qualification descriptors used in the QAA's Framework for Higher Education Qualifications**

The learning outcomes for the programme have been developed with reference to the qualification descriptors used in the QAA Framework for Higher Education Qualifications. In particular, the learning outcomes for modules at level one and level two have been considered to be consistent with the award of a Certificate of Higher Education and a Diploma in Higher Education respectively. Graduates of the award achieving an Honours classification will develop an understanding of a complex body of knowledge related to the environmental sciences. In addition, the graduate will develop analytical techniques, problem-solving skills and communication skills that can be applied to a range of employment opportunities.

- **Subject benchmark statements**

This programme maps to the benchmark statements for Earth Sciences, Environmental Sciences and Environmental Studies. The benchmarking statement identifies 4 key features which should characterise degree programmes in the Environmental/Earth Sciences:

- *'a holistic, multi-disciplinary and inter-disciplinary approach'*. This is evident in this programme from the breadth of the subject matter, the range of subject specialisms of the tutors involved (in both the analytical and social sciences) and the existence of integrating, 'issues' or case-study based modules and student work.
- *'the integration of fieldwork, experimental and theoretical investigations'*. At levels 1 and 2 of this programme, students spend typically around 60% of their time involved in practical work of all types (field or laboratory based work, library or internet investigations) and all year 3 projects involved a high degree of investigation, be they practical or more theoretical (desk-based) in nature.
- *'quantitative and qualitative approaches to acquiring and interpreting' data*. These approaches are integrated both in the practical work of the student as highlighted above, and through the lecture and assessment components of the programme, which encourage the students to develop skills in the objective analysis of all type of information and data, in order to recognise, understand and challenge current theories and paradigms. Examples include: the analysis of legal case material; the conducting of public opinion surveys; conducting literature searches and summarising bodies of evidence and opinion.
- *'the exploration for, and exploitation of, physical and biological resources in the context of sustainability'*. The diversity and extent of physical and biological resources are introduced at level 1 through the compulsory modules, which also begin the exploration of issues relating to unwise or over-exploitation of these resources. These themes are further explored at level 2 in all modules, which consider the social, economic, legal and political aspects of resource exploitation, as well as its physical consequences (loss of biodiversity, land degradation, pollution). At level 3 more emphasis is placed on precisely defining the impacts of over-exploitation and on investigating appropriate techniques for remediation.

The benchmarking statement also specifies the subject knowledge it expects to be covered to some degree of depth in an Environmental Science degree programme.

- *'The Earth as a system'* which is dealt with explicitly in compulsory modules at level 1 and at level 2 but more implicitly throughout the suite of modules taken.
- *'Human systems and their interactions with global systems'* which are explored in detail via the interdisciplinary and 'issues' based modules and a knowledge of which is underpinned by the compulsory modules at level 1 and 2. Human impacts on environmental systems forms an important theme in most level 3 modules, as well as underpinning most of the research topics investigated as part of the final year Independent Project.
- *'Inter-disciplinary/multi-disciplinary context'* which is implicit in the structure of the programme, as well as being dealt with explicitly in the Interdisciplinary and Issues-based modules, and integrated into most level 3 modules.
- *'Activities, patterns, processes, impacts and responses'* including environmental impact assessment, management and sustainable development. These themes are integrated throughout the programme, with knowledge and understanding of activities, patterns and processes typically being obtained at level 1, whilst impacts and responses are investigated in greater breadth and depth at levels 2 and 3.
- *'Temporal and spatial scales'* which are dealt with in all modules. It is a specific aim of the programme for students to gain an understanding of the interactions between local issues and actions, and regional and global consequences.

- ‘*Terminology, nomenclature and classification*’, the acquisition of which forms a central part of all the environmental modules and may form an explicit part of the assessment process, especially at level 1.
- ‘*Environmental Issues*’. These are investigated at all levels during the programme, with students acquiring an increasingly sophisticated understanding of certain issues as their academic career progresses. Key issues which are addressed include: atmospheric pollution including acid deposition, global climate change, and local air quality; exploitation of energy resources including fossil fuels, renewables, and nuclear power; the exploitation and conservation of biodiversity at a variety of scales; water quality including fresh, estuarine and marine water bodies; land contamination and reclamation; waste disposal, minimisation and recycling; sustainable use of natural resources including energy, forests, fisheries.

- **The University's mission statement**

The University's mission statement is ‘*to advance an inclusive, civilised and democratic society and its enrichment through education...*’. By studying the complexity of living and physical systems, and fostering in students an appreciation of the impact of human activity on these systems, this degree programme aims to produce graduates who are able to make a positive contribution to society, especially through the wise management of environmental resources. Team work projects encourage inclusivity and an appreciation of other's cultures and beliefs, whilst the university's committee structure including student representation at all levels, encourages an appreciation of democracy and a feeling of ownership and responsibility.

- **University teaching and learning policies**

In line with the University's teaching and learning policies, this programme takes a student-centred approach to learning by allowing students to take control of aspects of their learning and providing a learning environment that stimulates active participation and engagement with the learning process. The programme seeks to create an environment that will stimulate students to take responsibility for aspects of their learning, while tutors take responsibility for facilitating that learning. Module learning outcomes have been designed to ensure that students meet the overall programme learning outcomes on completion of the programme.

A variety of assessment methods are incorporated within the programme to cater for a diversity of student strengths and abilities. Although this document focuses on summative assessment, the course team recognises the importance of both summative and formative assessment activity, and feedback, as an integral part of the learning and teaching process. All assessments comply with the University Assessment Policy and MAR.

- **Research carried out by staff.**

Staff in the Faculty are research active and consequently programme development, formal teaching and project work is underpinned and informed by current research. Thus all staff contributing to the award have an established record in supervising undergraduate research-based projects, and students may have to opportunity to carry out their projects working alongside research staff at post-graduate and post-doctorate level. Furthermore, there is on-going and developing research in environmental science which is encouraged and maintained by Faculty Research Centres, notably the Centre for Research in Environmental Science (CRES), the Centre for Research in Plant Sciences (CRIPS), and the Centre for Research in Analytical, Materials and Sensors Science (CRAMS).

Conclusion

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 individual modules can be found in module specifications. These are available on the University Intranet.

Programme monitoring and review may lead to changes to approved programmes. There may be a time lag between approval of such changes/modifications and their incorporation into an authorised programme specification. Enquiries about any recent changes to the programme made since this specification was authorised should be made to the relevant Faculty Administrator.