



**CORPORATE AND ACADEMIC SERVICES**

**MODULE SPECIFICATION**

Part 1: Basic Data					
Module Title	Environmental and Field Techniques				
Module Code	USSK5G-30-2	Level	2	Version	1
Owning Faculty	Health & Life Sciences	Field	Department of Biological, Biomedical and Analytical Sciences		
Contributes towards	BSc Wildlife Ecology and Conservation Science BSc Environmental Science				
UWE Credit Rating	30	ECTS Credit Rating	15	Module Type	standard
Pre-requisites	USSK5B-30-1 Field Skills or equivalent	Co- requisites	none		
Excluded Combinations	none	Module Entry requirements	If offered as CPD or stand alone		
Valid From	September 2013	Valid to	September 2019		

<b>CAP Approval Date</b>	19 <sup>th</sup> June 2013
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Part 2: Learning and Teaching	
Learning Outcomes	<p>On successful completion of this module students will be able to:</p> <ul style="list-style-type: none"> <li>• discuss the sampling environmental systems and the critical selection of techniques in relation to specific objectives (assessed in Component A, B1);</li> <li>• design and undertake detailed environmental investigations drawing upon a diversity of environmental and field and techniques (assessed in Component A, B1);</li> <li>• undertake statistical analysis of environmental data and be able to critically interpret and present these data (assessed in Component B1, B2);</li> <li>• use resources that will support research, problem solving and study skills (assessed in Component A, B1,B2);</li> <li>• communicate their work to others by a variety of methods, including written, oral, new media (assessed in Component A1, B1, and B2).</li> </ul>
Syllabus Outline	This module allows students to develop practical skills in field research, field techniques and data analysis in addition to understanding the limitations of these approaches and being introduced to contemporary environmental technologies.

	<p><b>Experimental design, data analysis &amp; interpretation</b> Principles of scientific methodology. Principles of experimental design. Review and critical assessment of research methodologies including both quantitative and qualitative approaches. Principles of temporal and spatial data and long-term monitoring. Presentation of scientific data using Excel and Minitab. Graphical presentation. Data error bars. Examining and recognizing trends and patterns in complex data. Design and analysis of questionnaires and case studies.</p> <p><b>Field Techniques</b> Principles of ecological surveying techniques. Techniques in surveying terrestrial and aquatic fauna and flora, habitat and conservation management assessment techniques, habitat suitability and evaluation procedures. Biological monitoring - using organisms to monitor the environment, diversity indices, bioaccumulation, and indicator species. Principles of Environmental Impact Assessment (EIA). Techniques and approaches in undertaking EIA. Introduction to remote sensing: Geographical Information systems (GIS); LIDAR (Light Detection and Ranging); Ground penetrating radar.</p> <p><b>Statistics analysis of data</b> Analysis of environmental data from first principles. Data transformations, descriptive statistics, t-tests, Chi-square, ANOVA, ANCOVA, multiple regression, ordination and classification techniques. Use of Minitab and SPSS.</p> <p><b>International field course</b> Experience of field work in habitats and environments outside of the UK. Working as a team in the field. Logistics, planning and implementation of field work. The collection, recording and analysis of environmental data in the field. Data organisation and field report writing. The use of ecological surveying and environmental monitoring techniques in the field. Understanding of the limitations and experimental constraints of working within the field. Understanding of health and safety issues of working in the field. Working safely, responsibly and effectively in the field.</p> <p><b>Further development of Graduate &amp; Science Communication skills</b> Transition to level 2, expectations, requirements and support. Further development of study skills such as literature and information searching, scientific writing, referencing, use of word processing packages, using data bases, using feedback. Self evaluation of skills and planning personal development. Science communication, presentations, media platforms, web pages, use of social media, new communication technologies, Careers and current developments in their chosen discipline.</p> <p>IT skills sessions (described above) will cover topics comparable to the material covered in the European Computer Driving Licence - Level 2 (Extra) allowing students to gain this qualification. UWE is a test centre for ECDL and the Faculty TEL manager has confirmed that students on this programme will be accommodated Full details of the programme are available from: <a href="http://imp.uwe.ac.uk/imp_public/displayentry.asp?URN=5770&amp;rp=listEntry.asp&amp;pid=21">http://imp.uwe.ac.uk/imp_public/displayentry.asp?URN=5770&amp;rp=listEntry.asp&amp;pid=21</a></p>
Contact Hours	<p>The contact hours (120) are distributed as follows:</p> <ul style="list-style-type: none"> <li>2 interactive lectures @ 2 hours/lecture = 4 hours</li> <li>10 tutorials @ 1 hour/tutorial = 10 hours</li> <li>8 Workshops @ 2 hours/workshop = 16 hours</li> <li>8 Computer practicals @ 3 hours/practical = 24 hours</li> <li>6 lab/field practicals @ 3 hours/practical = 18 hours</li> <li>Residential field course @ 8 hours/day = 48 hours</li> </ul>
Teaching and Learning Methods	<p>This is a module about developing skills and so a variety of teaching and learning approaches will be employed that includes field work, laboratory work, computer practical tutorials and group research projects, Part of this module covers the further development data analysis skills initiated at level one. Technology enhanced learning</p>

	<p>is therefore essential to support the teaching of these skills. The module will be delivered using a mixture of whole group (lectorials), small tutorial group sessions, workshops, practical sessions and field visits. Students will be allocated to a Study Skills Tutor group where a member of staff will facilitate personal, group and peer assisted learning of key skills. This will encompass the university wide Personal Tutor scheme.</p> <p>The module includes an International residential fieldtrip of 6-7 days duration where emphasis will be placed on the understanding the theory behind fieldwork and developing practical hands on skills in field techniques. The field course will enable students to fully engage with the learning outcomes of the module, drawing upon their environmental skills to address specific environmental problems and undertake investigations independently. Team-working skills will be promoted through group work. Expert opinion will be accessed via site visits (e.g. to industrial sites, managed sites, information resources). Support material such as DVDs, relevant texts, internet and electronic resources, will be available for use both in formal and informal sessions.</p> <p>Support for student learning in data analysis will be given through regular lectorials/tutorials which will be integrated with the online self-assessment tests and online video support to ensure focussed help can be given to those students who need help in the particular areas. This re-enforces to students to the concept of using technology to enhance learning (TEL). Students will further develop IT and data analysis skills through the computer-based workshops. This will be re-enforced by the need of students to complete the European Computer Driving Licence (ECDL) Part 2. Resources for data analysis also include direct tutorial material, and references to published material, software, internet and intranet resources. Where possible, the statistical topics are presented and tested in the context of environmental issues.</p> <p>The module includes group research projects. Students will work in teams to undertake a practical investigation. When appropriate, students will use facilitated online collaborative working approach (such as a wiki) to support this group working. The project and findings will be presented as a poster which is assessed on an individual basis. This is ideal underpinning for the Research Project at final year.</p> <p>Student learning will be supported through the University's E-Learning Environment, Blackboard.</p> <p><b>Scheduled learning</b> includes lectorials, tutorials, workshops, laboratory practical classes, computer practical classes and a residential field course.  <b>Independent learning</b> includes hours engaged with essential reading, assignment preparation and completion. Students will be encouraged to use a facilitated online collaborative working approach (such as a wiki) to support the group project working. These sessions constitute an average time per level as indicated in the table below.</p>
Key Information Sets Information	Key Information Sets (KIS) are produced at programme level for all programmes that this module contributes to, which is a requirement set by HESA/HEFCE. KIS are comparable sets of standardised information about undergraduate courses allowing prospective students to compare and contrast between programmes they are

Key Information Set - Module data				
Number of credits for this module				30
Hours to be allocated	Scheduled learning and teaching study hours	Independent study hours	Placement study hours	Allocated Hours
300	120	180		300



The table below indicates as a percentage the total assessment of the module which constitutes a -

**Controlled:** Poster presentation with defence

**Coursework:** Field Report; Skills portfolio.

Total assessment of the module:	
Defended Poster	40%
Coursework assessment percentage	60%
	100%

### Reading Strategy

All students will be encouraged to make full use of the print and electronic resources available to them through membership of the University. These include a range of electronic journals and a wide variety of resources available through web sites and information gateways. The University Library's web pages provide access to subject relevant resources and services, and to the library catalogue. Many resources can be accessed remotely. Students will be presented with opportunities within the curriculum to develop their information retrieval and evaluation skills in order to identify such resources effectively.

Any **essential reading** will be indicated clearly, along with the method for accessing it, e.g. students may be expected to purchase a set text, be given or sold a print study pack or be referred to texts that are available electronically, etc. This guidance will be available either in the module handbook, via the module information on Blackboard or through any other vehicle deemed appropriate by the module/programme leaders.

If **further reading** is expected, this will be indicated clearly. If specific texts are listed, a clear indication will be given regarding how to access them and, if appropriate, students will be given guidance on how to identify relevant sources for themselves, e.g. through use of bibliographical databases.

A detailed reading list will be made available through relevant channels, e.g. module handbooks, Blackboard, etc.

### Indicative Reading List

The most recent edition of

Chapman, D. Water quality assessments: A guide to the use of biota, sediments and water in environmental monitoring. UNESCO/WHO/UNEP (freely available at [www.who.int/water\\_sanitation\\_health/resources/wqa/en/index.html](http://www.who.int/water_sanitation_health/resources/wqa/en/index.html))

Dytham, C. Choosing and using statistics: A biologist's guide. Blackwell, Oxford.

Girard, J.E. Principles of Environmental Chemistry. Jones and Bartlett Publishers.

	<p>Harrad, S., Batty, L., Diamond, M., &amp; Arhonditsis, G. Student projects in Environmental Science. Wiley, Chichester.</p> <p>Henderson, P. Practical Methods in Ecology. Blackwell Science, London.</p> <p>Jones, A. Duck, R., Reed, R &amp; Weyers, J. Practical Skills in Environmental Science. Prentice Hall, London</p> <p>Millican, P. &amp; Heritage, J. Studying Science: A guide to undergraduate success. Scion, Bloxham.</p> <p>Spellerberg, I. Evaluation and Assessment for Conservation. Chapman &amp; Hall, London.</p> <p>Sutherland, W. J. Ecological Census Techniques. Cambridge University Press, Cambridge.</p> <p>Waite, S. Statistical Ecology in Practice. Prentice Hall, London.</p>
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<b>Part 3: Assessment</b>	
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<b>Assessment Strategy</b>	<p>The Assessment Strategy has been designed to support and enhance the development of both subject-based and generic key skills, whilst ensuring that the modules Learning Outcomes are attained. The focus is on assessments that link directly to employability skills as described below.</p> <p>The coursework comprises 2 elements. The first is a Field Report which is based on the residential International field course. This report requires the detailed recording of a range of environmental variables whilst in the field, followed by analysis and interpretation of these data. This report includes critical review of the methodology used and discussion on how the environment is affected by natural and anthropogenic factors. The recording and analysis of field data a vital skill for environmental students. Furthermore, students need to know not just how to undertake a particular field survey but to be aware of the limitations and appropriateness of each method. Consequently this assessment addresses both these points and so can be described as an assessment for learning and employability.</p> <p>The second element is a Skills Portfolio. This will be generated using an appropriate online technology where possible or other system supported by UWE. Students will be given instruction on the content of this portfolio which will contain examples of both study skills and subject skills such as: data analysis case study; statistical analysis of field data; interpretation and discussion of field data; case study on biotic indicators; report on EIA; report on remote sensing; ECDL level 2 certificate; design of questionnaire; design of webpage; a skills evaluation and gap analysis; reflection and action plan.</p> <p>The controlled component is a Defended Poster. Students will work in groups to undertake a practical investigation but will then present their project individually as a poster that they defend. This assessment provides an opportunity for student to refine working in a group, time management, analysis of data and their presentation skills. The ability to present and discuss work is a highly sought after graduate skill.</p> <p>Formative feedback is available to students throughout the module through group discussions particularly in tutor group sessions, during the practical sessions and during the field course. Students are provided with formative feed-forward for their poster presentation through a poster preparation</p>
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	session prior to the presentation and through support materials supplied through Blackboard.
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Identify final assessment component and element		
% weighting between components A and B (Standard modules only)	<b>A:</b>	<b>B:</b>
	<b>40%</b>	<b>60%</b>
<b>First Sit</b>		
<b>Component A</b> (controlled conditions) <b>Description of each element</b>	<b>Element weighting</b> <b>(as % of component)</b>	
1. Poster presentation with defence	100%	
2.		
<b>Component B</b> <b>Description of each element</b>	<b>Element weighting</b> <b>(as % of component)</b>	
1. Field report	33.3%	
2. Skills portfolio	66.7%	

<b>Resit (further attendance at taught classes is not required)</b>		
<b>Component A</b> (controlled conditions) <b>Description of each element</b>	<b>Element weighting</b> <b>(as % of component)</b>	
1. Poster presentation with defence	100%	
2		
<b>Component B</b> <b>Description of each element</b>	<b>Element weighting</b> <b>(as % of component)</b>	
1. Field report	33.3%	
2. Skills portfolio	66.7%	
If a student is permitted an <b>EXCEPTIONAL RETAKE</b> of the module the assessment will be that indicated by the Module Description at the time that retake commences.		