University of the West of England
BRISTOL

CORPORATE AND ACADEMIC SERVICES

MODULE SPECIFICATION

Part 1: Basic Data						
Module Title	Remote Sensing and Geographical Information Systems (GIS)					
Module Code	USSK58-15-3		Level	3	Version	1
Owning Faculty	Health and Applied Sciences		Field	Biological, Biomedical and Analytical Sciences		
Contributes towards	BSc(Hons) Wildlife Ecology and Conservation Science BSc(Hons) Environmental Science					
UWE Credit Rating	15	ECTS Credit Rating	7.5	Module Type	Standard	
Pre-requisites	USSK5G-30-2 Environmental and Field Techniques		Co- requisites	None		
Excluded Combinations	None		Module Entry requirements	None		
Valid From	Sept 2013		Valid to	September 2019		

CAP Approval Date	19 June 2013

Part 2: Learning and Teaching	
Learning Outcomes	On successful completion of this module students will be able to: • Understand the fundamental principles and advanced aspects of remote sensing systems (assessed in Component A) • Describe the technologies used in remote sensing and critically discuss the types of data that can be obtained (assessed in component A and B) • Apply GIS to the presentation and analysis of remote sensing data (assessed in Components A and B) • Interpret critically the images created from remote sensing data (assessed in Components A and B) • Compare and critically appraise the technical possibilities and limitations of a range of remote sensing systems (assessed in Components A and B)
Syllabus Outline	This module will build on the introduction to GIS delivered at level 2 and will address the following subjects. • Remote sensing: history, electromagnetic spectrum, detection (including: visible, infrared, microwave, ultraviolet) • Image acquisition (mapping cameras, digital imagery).Land observation satellites (eg Landsat), data sources and recovery. Aerial photography (aircraft and remotely controlled drones).Oblique and planar aerial photography. LIDAR (Light Detection and Ranging) and the use of lasers for terrain mapping. Environmental geophysics (including: resitivity, magnetometry and ground penetrating radar)

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Google Earth and other public domain sources of aerial/remote sensing data. Data acquisition and processing using Geographical Information Systems (GIS). GIS and available packages (eg ESRI's ArcGIS, Bentley's MicroStation, Autodesk's AutoCAD Map 3D).
Data import into GIS packages. Data presentation and analysis in GIS. Interpretation of data/images. Analysis of resolution restraints and artefacts
Application areas including:

Environmental conservation, Land use, Vegetation stress, Climate change: Earth's surface warming
Climate change: sea temperature, Ground topology, Archaeology, Pollution (ground, air and water), Forensics, Flood plains, Land drainage, Forestation, Global light and heat emissions.

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<tr><td>Contact Hours</td><td>The delivery of the module will include workshops, lectorials, tutorials and with the following contact hours:
1. Workshops - 24 hours
2. Lectorials - 6 hours
3. Tutorials - 6 hours</td></tr>
<tr><td>Teaching and Learning Methods</td><td>A variety of teaching and learning methods will be adopted in the presentation of this module. Remote sensing software is available in a number of computer teaching room in the Faculty of Health and Life Sciences, library and across the university, to support students during their contact time and independent learning.

1. Workshops will provide students with: hands-on, practical experience of the acquisition of remote sensing data, the use of GIS in data presentation and analysis; image interpretation
2. Lectorials will discuss: contemporary technologies of remote sensing; acquisition, processing and interpretation of data obtained from remote sensing
3. Tutorials will supplement the lectorials and give support to students in their case study and presentation

Scheduled learning (36 hours) includes lectorials, tutorials and workshops.

Independent learning (114 hours) includes hours engaged with essential reading, case study preparation and completion. These constitute an average time as indicated below:</td></tr>
<tr><td>Key Information Sets Information</td><td>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 interested in applying for.

<table>
<tr><td colspan="3"><u>Key Information Set - Module data</u></td><td></td><td></td><td></td></tr>
<tr><td colspan="4">Number of credits for this module</td><td>15</td><td></td></tr>
<tr><td>Hours to be allocated</td><td>Scheduled learning and teaching study hours</td><td>Independent study hours</td><td>Placement study hours</td><td>Allocated Hours</td><td></td></tr>
<tr><td>150</td><td>36</td><td>114</td><td>0</td><td>150</td><td></td></tr>
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The table below indicates as a percentage the total assessment of the module which</td></tr>
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	constitutes a - **Component A**: Presentation. **Coursework**: Written assignment. Please note that this is the total of various types of assessment and will not necessarily reflect the component and module weightings in the Assessment section of this module description: Total assessment of the module: Presentation 60% Coursework assessment percentage 40% 100%
Reading Strategy	All texts in the indicative reading list (below) are available as hardcopies or e-books from the UWE library together with many related titles. Students will also be expected to access additional information sources from both primary and secondary literature. The UWE library has access to a large number of electronic journals. Students will be given guidance on accessing primary and secondary literature sources on-line through search engines such as 'Springer-link' and 'ScienceDirect' as well as abstracting services. UWE also has extensive mapping and related information on-line that students will be able to access to facilitate completion of their case study. Furthermore, several of the texts in the indicative reading list have related websites that students can access for additional information, tutorial exercises and data sources. Additionally, several governmental and non-governmental organizations have websites containing relevant information and data. Such organizations include: English Heritage, DEFRA, NASA and Department for Energy & Climate Change (DECC). Detailed reading lists will be made available through relevant channels, e.g. the module handbook and Blackboard.
Indicative Reading List	The most recent edition of • Campbell, J.B. & Wynne, R.H. Introduction to Remote Sensing. New York & London. The Guildford Press. • Horning, N., Robinson, J.A., Sterling, E.J. & Turner, W. Remote sensing for Ecology and conservation. A Handbook of Techniques. Oxford University Press. • Heywood, I., Cornelius, S. & Carver, S. An Introduction to Geographical Information Systems. Harlow. Prentice Hall. • Longley, P.A., Goodchild, M.F., Maguire, D.J. & Rhind, D.W. Geographic Information Systems & Science. Hoboken. Wiley. • Reynolds, J.M. An Introduction to Applied and Environmental Geophysics 2nd. Chichester. Wiley-Blackwell.

Part 3: Assessment

Assessment Strategy	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. The assessment strategy includes a presentation as component A and a written assignment, based on a case study, as component B. The latter will have a word length of 2000 words (consistent with other level 3 modules). The Presentation is designed to assess the student's knowledge of remote sensing systems, and their practical applications of such techniques and their ability to *appraise critically* the technologies involved. This assessment links directly to requests from employers as they require graduates experienced in remote sensing techniques. The written assignment (component B) is a case study that will assess the student's ability to acquire remote sensing data available in the public domain, download it, process it, present it in an appropriate form and analyze the final outcome. This assessment will also assess the student's ability to *appraise critically* the technologies involved. This assessment links directly to requests from employers as they require graduates proficient at GIS. Component A (the Presentation) represents 60% of the module mark and component B (the case study) represents the remaining 40% of the module mark. This is consistent with the Department's assessment strategy for Level 3 modules. Thus the allocation of marks is as follows: Presentation: 60% Case study (2000 words): 40% Formative feedback will occur during the workshops and tutorials and these provide an opportunity to give feedback to individual students on their understanding of the subject matter and to discuss their progress in their processing and application of remote sensing techniques.

Identify final assessment component and element	**Component A**	
% weighting between components A and B (Standard modules only)	**A:** **60%**	**B**: **40%**

First Sit	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Presentation	100%
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. CW1 Case Study (2000 words)	100%

Resit (further attendance at taught classes is not required)	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**

1. Presentation	100%
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. CW1 Case Study (2000 words)	100%
If a student is permitted an **EXCEPTIONAL RETAKE** of the module the assessment will be that indicated by the Module Description at the time that retake commences.	