# MODULE SPECIFICATION

| Part 1: Information | | | |
|---|---|---|---|
| Module Title | Remote Sensing and Geographical Information Systems (GIS) | | |
| Module Code | USSK58-15-3 | Level | Level 6 |
| For implementation from | 2020-21 | | |
| UWE Credit Rating | 15 | ECTS Credit Rating | 7.5 |
| Faculty | Faculty of Health & Applied Sciences | Field | Applied Sciences |
| Department | HAS Dept of Applied Sciences | | |
| Module type: | Standard | | |
| Pre-requisites | Environmental and Field Techniques 2020-21 | | |
| Excluded Combinations | None | | |
| Co- requisites | None | | |
| Module Entry requirements | None | | |

## Part 2: Description

**Educational Aims:** See Learning Outcomes

**Outline Syllabus:** 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)

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

**Teaching and Learning Methods:** 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.

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

Lectorials will discuss: contemporary technologies of remote sensing; acquisition, processing and interpretation of data obtained from remote sensing

Tutorials will supplement the lectorials and give support to students in their case study and presentation

Scheduled learning (33 hours) includes lectorials, tutorials and workshops.

Independent learning (117 hours) includes hours engaged with essential reading, case study preparation and completion. These constitute an average time as indicated below:

Contact Hours: The delivery of the module will include workshops, lectorials, tutorials and with the following contact hours

Workshops - 21 hours
Lectorials - 6 hours
Tutorials - 6 hours

**Part 3: Assessment**

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.

| First Sit Components | **Final Assessment** | **Element weighting** | **Description** |
|---|---|---|---|
| Presentation - Component A | ✓ | 50 % | Presentation |
| Case Study - Component B | | 50 % | Case Study (2000 words) |
| Resit Components | **Final Assessment** | **Element weighting** | **Description** |
| Presentation - Component A | ✓ | 50 % | Presentation |
| Case Study - Component B | | 50 % | Case Study (2000 words) |

**Part 4: Teaching and Learning Methods**

Learning Outcomes

On successful completion of this module students will achieve the following learning outcomes:

| **Module Learning Outcomes** | **Reference** |
|---|---|
| Understand the fundamental principles and advanced aspects of remote sensing systems | MO1 |
| Describe the technologies used in remote sensing and critically discuss the types of data that can be obtained | MO2 |
| Apply GIS to the presentation and analysis of remote sensing data | MO3 |
| Interpret critically the images created from remote sensing data | MO4 |
| Compare and critically appraise the technical possibilities and limitations of a range of remote sensing systems | MO5 |

Contact Hours

| **Independent Study Hours:** | |
|---|---|
| Independent study/self-guided study | 117 |
| **Total Independent Study Hours:** | 117 |
| **Scheduled Learning and Teaching Hours:** | |
| Face-to-face learning | 33 |
| **Total Scheduled Learning and Teaching Hours:** | 33 |

| | | |
|---|---|---|
| | **Hours to be allocated** | 150 |
| | **Allocated Hours** | 150 |
| Reading List | *The reading list for this module can be accessed via the following link:*<br><br>https://uwe.rl.talis.com/modules/ussk58-15-3.html | |

| **Part 5: Contributes Towards** |
|---|
| This module contributes towards the following programmes of study:<br><br>Integrated Wildlife Conservation {Top-Up} [Sep][FT][Frenchay][1yr] BSc (Hons) 2020-21<br>Environmental Science [Sep][FT][Frenchay][4yrs] MSci 2018-19<br>Wildlife Ecology and Conservation Science [Sep][FT][Zoo][3yrs] BSc (Hons) 2018-19<br>Wildlife Ecology and Conservation Science [Sep][FT][Frenchay][4yrs] MSci 2018-19<br>Environmental Science [Sep][FT][Frenchay][3yrs] BSc (Hons) 2018-19 |