Module Specification

Remote Sensing and Geographical Information Systems (GIS)

Version: 2023-24, v3.0, 30 May 2023

Contents

Part 1: Information

Module title: Remote Sensing and Geographical Information Systems (GIS)

Module code: USSK58-15-3

Level: Level 6

For implementation from: 2023-24

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Health & Applied Sciences

Department: HAS Dept of Applied Sciences

Partner institutions: None

Field: Applied Sciences

Module type: Module

Pre-requisites: Environmental and Field Techniques 2023-24

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: Not applicable

Features: Not applicable

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

Part 3: Teaching and learning methods

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

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

MO1 Understand the fundamental principles and advanced aspects of remote sensing systems

MO2 Describe the technologies used in remote sensing and critically discuss the types of data that can be obtained

MO3 Apply GIS to the presentation and analysis of remote sensing data

MO4 Interpret critically the images created from remote sensing data

MO5 Compare and critically appraise the technical possibilities and limitations of a range of remote sensing systems

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 117 hours

Face-to-face learning = 33 hours

Total = 150

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://uwe.rl.talis.com/modules/ussk58-15-3.html

Part 4: 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 Assessment task A and a written assignment, based on a case study, as Assessment task 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 (task 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.

Assessment task A (the Presentation) represents 60% of the module mark and Assessment task 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.

Assessment tasks:

Presentation (First Sit)
Description: Presentation
Weighting: 50 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

Case Study (First Sit)
Description: Case Study (2000 words)
Weighting: 50 %
Final assessment: No
Group work: No
Learning outcomes tested: MO2, MO3, MO4, MO5

Presentation (Resit)

Description: Presentation

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

Case Study (Resit)

Description: Case Study (2000 words)

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO3, MO4, MO5

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Integrated Wildlife Conservation {Top-Up} [Frenchay] BSc (Hons) 2023-24

Environmental Science [Sep][FT][Frenchay][3yrs] BSc (Hons) 2021-22

Wildlife Ecology and Conservation Science [Sep][FT][Frenchay][4yrs] MSci 2021-22

Environmental Science [Sep][FT][Frenchay][4yrs] MSci 2021-22

Wildlife Ecology and Conservation Science [Sep][FT][Zoo][3yrs] BSc (Hons) 2021-22

Wildlife Ecology and Conservation Science [Sep][SW][Frenchay][5yrs] MSci 2020-21

Environmental Science [Sep][SW][Frenchay][4yrs] BSc (Hons) 2020-21

Environmental Science {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2020-21

Wildlife Ecology and Conservation Science {Foundation} [Sep][FT][Frenchay][5yrs] MSci 2020-21

Environmental Science {Foundation} [Sep][FT][Frenchay][5yrs] MSci 2020-21

Environmental Science [Sep][SW][Frenchay][5yrs] MSci 2020-21

Wildlife Ecology and Conservation Science [Sep][SW][Zoo][4yrs] BSc (Hons) 2020-21

Wildlife Ecology and Conservation Science {Foundation} [Sep][FT][Zoo][4yrs] BSc (Hons) 2020-21

Wildlife Ecology and Conservation Science {Foundation} [Sep][SW][Frenchay][6yrs] MSci 2019-20

Environmental Science {Foundation} [Sep][SW][Frenchay][5yrs] BSc (Hons) 2019-20

Environmental Science {Foundation} [Sep][SW][Frenchay][6yrs] MSci 2019-20

Wildlife Ecology and Conservation Science {Foundation} [Sep][SW][Zoo][5yrs] BSc (Hons) 2019-20