

*This document provides detailed information on the module named below. It will be updated as necessary when modifications to the module are approved. Modules are allocated to a Subject Network not a programme, and may be accessed by students studying on different programmes.*

## **1 SUMMARY MODULE INFORMATION**

### **a Module title**

Geographical Information Systems.

### **b SITS module code**

UL711934

### **c UHI Subject Network**

Sustainable Science, Heritage and Development.

### **d Exam board**

MSc Managing Sustainable Rural/Mountain Development Course Committee.

### **e SCQF level**

11

### **f SCOTCAT credit points**

15

### **g Module leader and contact details (email, phone)**

Donna Clark.

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Tel: 01343 576272 – I am in college on Mondays & Tuesdays only but can arrange to phone students outwith these days if necessary.

### **h Brief description of module**

This module will provide an introduction to the capabilities of GIS and outline the requirements for their successful design and implementation. The module will provide an understanding of the nature and use of GIS rather than seek to develop technical expertise in any specific GIS platform. The module will encourage students to consider how GIS might be used to address issues raised in other parts of their course or professional life.

This module will enable students to develop their knowledge and understanding of geographic information systems and therefore may also be applicable as a stand-alone module in the UHI Post Graduate prospectus.

### **i Pre-requisites or co-requisites**

An undergraduate degree award.

### **j Primary mode(s) of delivery and support**

(e.g. Face-to-face teaching, blended, block teaching, wholly online, etc).

Wholly online, supported by tutor.

### **k Assessment**

1. Report based on practical exercises (500 words and 30%)
2. Design a basic GIS to solve a management problem (3000 words and 60%)
3. Contribution to Blackboard discussion board (10%)

## I Suitable for access via Learning Centres?

Yes.

## 2 MODULE DESCRIPTOR

### a Aims

To convey an understanding of the essential elements of Geographical Information Systems (GIS) and to illustrate how the appropriate use of GIS can help solve problems with a spatial dimension.

### b Intended learning outcomes

On completion of the module the student should be able to:

- use the basic functions of a GIS;
- design a simple GIS to solve a relevant management problem;
- understand the components, structure and data types of Geographic Information Systems;
- identify and evaluate the strengths and weaknesses of geographical information systems.

### c Indicative content

- introduction to the development of geographical information systems and their constituent components;
- data models: levels of abstraction, raster and vector representations;
- data storage methods, SQL (standard query language) and database structures;
- data input: global positioning systems, aerial photographs, remote sensing, the incorporation of records from existing databases, thematic maps, data quality, errors, manual digitising and digital maps;
- basic analysis of spatial data: Interpolation, use of digital elevation models, Fuzzy sets, cost surfaces, use of SQL and other methods of spatial analysis;
- identification of a management problem suitable for GIS solution, analysis of the cost and benefits of using a GIS and feasibility;
- designing a GIS to solve a management problem: definition of questions to be asked of the GIS, identification of spatial data sources, linking thematic to spatial data, identification of potential methodologies;
- application of GIS to solve a management problem: a case study problem to be solved using the GIS designed previously;
- evaluation of GIS use in a range of applications.

### d Mode(s) of delivery and support for teaching and learning

Face-to-face	0 hours or	... %
Video-conference	0 hours or	... %
Supported online learning	65 hours or	... %
Self-directed learning	85 hours	... %
Total activity	150	100%

### e Assessment

1. Report based on practical exercises (500 words and 30%)
2. Design a basic GIS to solve a management problem (3000 words and 60%)
3. Contribution to Blackboard discussion board (10%)

## **f Key learning resources**

### **Reading List**

#### **Essential:**

1. Tim Ormsby, Eileen Napoleon & Robert Burke (2004). Getting to Know ArcGIS Desktop, 2nd edition ISBN 9781589480834. Price is between £35-£40. NB the book has accompanying 180-day free use of GIS software and it is essential that you buy the 2nd edition as there may be Microsoft conflicts with earlier versions. Also, the software company says that the software can only be installed once, so you must buy your own copy and then only install it on a computer which you will have easy access to.

2. Ian Heywood, Sarah Cornelius & Steve Carver (2006). An Introduction to Geographical Information Systems, 3rd edition ISBN 9780131293175. Free access to e-version of this textbook is available via UHI Library > Dawson books (<http://www.uhi.ac.uk/home/libraries/e-book-collections> )

#### **Recommended:**

Mark Monomier (1996). How to Lie with Maps, ISBN 9780226534213. Price ranges from £3-£8 from online booksellers. A very informative book about map production.

#### **Background:**

- Skidmore, A (2002) Environmental Modelling with GIS and Remote Sensing. Taylor & Francis. London. ISBN 9780415241700. Price from £34 new.

- Price, M & Heywood, DI (1994) Mountain Environments and Geographic Information Systems. ISBN 9780748400881. Second-hand price from £35, so check your library first.

### **Journals**

International Journal of Geographical Information Science, Taylor & Francis.  
Transactions in GIS, Blackwell Publishing.

#### **g Additional background information**

The course will be taught using an appropriate mixture of delivery modes and will include practical sessions. Students will get access to the software via free 180-day use of ArcView 9.2, contained on a CD-ROM which accompanies the Ormsby et al (2004) textbook. Earlier versions of ArcView will not be supported by Microsoft Vista, plus it is preferable that all students use the same version since there are some significant differences between ArcView 9.2 and earlier versions.

#### **h Specialist resource requirements**

- internet access to web and e-mail facilities;
- access to a modern PC not MAC (750 Mhz minimum, 1GHz recommended; processor, 256 MB RAM minimum, 512 MB recommended; Windows 2000, XP or Vista; CD ROM player; 800x 600 pixel monitor; speakers or headphones; access to the internet;
- access to on-line library resources;
- VLE, GIS software (180 day version of ArcView 9.2) accessed via the core text, CD-ROM based lectures and a PC.