

Liverpool John Moores University

Title: GEOGRAPHIC INFORMATION SYSTEMS AND SCIENCE
Status: Definitive
Code: **7009ONLINE** (103116)
Version Start Date: 01-08-2011

Owning School/Faculty: Computing and Mathematical Sciences
Teaching School/Faculty: Computing and Mathematical Sciences

Team	Leader
Dhiya Al-Jumeily	Y

Academic Level: FHEQ7
Credit Value: 15.00
Total Delivered Hours: 36.00
Total Learning Hours: 150
Private Study: 114

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	12.000
Seminar	12.000
Tutorial	12.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	AS1	Report explaining the relationships between systems, science, and study, in relation to GIS.	100.0	

Aims

To deepen an understanding of the use of geographic information systems in supporting decision making in organisations.

To demonstrate how information technology can be used to carry out spatial analysis.

Learning Outcomes

After completing the module the student should be able to:

- 1 Understand and explain the relationships between systems, science, and study, in relation to GIS.
- 2 Know the principles and nature of geographic data and techniques that focus on digital representation in a variety of cartographic formats.
- 3 Apply georeferencing techniques.
- 4 Understand the concept of uncertainty in the application of geographic data.
- 5 Know and apply the techniques of geospatial analysis including the hardware to support the analysis, data modelling, data collection, geodatabases, and distributed GIS.
- 6 Understand and use analytical techniques in cartography and map production, geovisualization, query, measurement and transformation, descriptive summary, design and inference, and spatial modelling.
- 7 Know and explain management and policy aspects of GIS in an organisational context.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Written report	1	2	3	4	5	6	7
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Outline Syllabus

Part 1 Overview: Systems, science and study; typical applications.

Part 2 Principles: representing geography; the nature of geographic data; georeferencing; uncertainty.

Part 3 Techniques: GIS software and hardware; geographic data modelling; GIS data collection; creating and maintaining geographic databases; distributed GIS.

Part 4 Analysis: cartography and map production; geovisualization; query, measurement, and transformation; descriptive summary, design and inference; spatial modelling with GIS.

Part 5 Management and Policy: managing GIS; GIS and management, the knowledge economy and information; exploiting GIS assets and navigating constraints; GIS partnerships.

Learning Activities

The learning approach adopted will be based on student-centred, problem-based experiential methods. Students will participate in interactive e-lectures/seminars and, lab sessions. They will work on provided lab' sessions on the Internet to solve problems. They will also be expected to read about the subject paying special attention to the indicative references.

References

Course Material	Book
Author	Longley, P.A. & Goodchild, M.F.
Publishing Year	2005
Title	Geographic Information Systems and Science
Subtitle	
Edition	
Publisher	Wiley
ISBN	

Course Material	Book
Author	Chang, K.T.
Publishing Year	2002
Title	An Introdauction to Geographic Information Systems
Subtitle	
Edition	
Publisher	McGraw Hill
ISBN	

Course Material	Book
Author	Clarke, K.
Publishing Year	2002
Title	Getting started with Geographical Inforamtion Systems
Subtitle	
Edition	
Publisher	Pearson Education
ISBN	

Course Material	Book
Author	Davis, D.T.
Publishing Year	2002
Title	GIS for Everyone
Subtitle	
Edition	
Publisher	ESRI Press
ISBN	

Course Material	Book
Author	Harmon, D. & Limp, W.F.
Publishing Year	2002
Title	Inside GeoMedia
Subtitle	
Edition	
Publisher	Intergraph
ISBN	

Course Material	Book
Author	Heywood, D. Cornelius, S. & Carver, S.
Publishing Year	2002
Title	An Introduction to Geographical Information Systems
Subtitle	
Edition	
Publisher	Pearson Education
ISBN	

Course Material	Book
Author	Jones, C.
Publishing Year	2002
Title	Geographical Information Systems and Computer Cartography
Subtitle	
Edition	
Publisher	Pearson Education
ISBN	

Notes

Geographical Information Systems (GIS) is a proven technology and the basic operations of GIS today provide secure and established foundations for measurement, mapping, and analysis of the real world. GIScience provides us with the ability to devise GIS-based analysis that is robust and defensible. Geographic information (GI) technology – the geocomputational aspects – facilitates analysis, and continues to evolve rapidly, especially in relation to the Internet. Fundamentally, this module takes as its starting point the notion that GIS is an applications-led technology, yet successful applications need appropriate scientific foundations. Effective use of GIS is impossible if they are simply seen as black-boxes producing magic. The way spatial information is created and exploited through GIS affects us all, as owners of enterprises, and as employees, and as community members in any human settlement.

The module is developed from the perspective of recognizing that GIS and GIScience do not lend themselves to traditional classroom teaching alone. Only by a combination of approaches can crucial aspects of GIS learning be achieved. Finally, the ethos of this module is driven by real-world applications and real people, that respond to real-world needs. All online activities are scheduled.