The University of Southern Queensland

Course Specification

Description: Spatial Analysis and Modelling						
Subject	Cat-Nbr	Class	Term	Mode	Units	Campus
GIS	3405	14660	2, 2002	ONC	1.00	TWMBA

Academic Group: FOENS
Academic Org: FOES05
HECS Band: 2
ASCED Code: 031199

STAFFING

Examiner: Yan Liu
Moderator: Kevin McDougall

PRE-REQUISITES

Pre-requisite: GIS 1402

RATIONALE

The strength of most geographic and land information systems (GIS/LIS) depends on their capability to perform spatial analysis and modelling. Considered as the "heart" of GIS, spatial analysis and modelling makes GIS a powerful technology for land, environmental, and resource management. Thus, it is essential and advantageous for GIS and other professionals to be aware of the concepts, techniques, and applications involved in spatial analysis and modelling.

SYNOPSIS

Students will be introduced to the concepts, techniques, and applications of spatial analysis and modelling. Topics include: spatial statistics; overlay analysis; map algebra and cartographic modelling; spatial interpolation; surface analysis and terrain modelling; proximity analysis; network analysis; fuzzy sets; and spatial analysis issues and trends. Emphasis will be placed on how spatial analysis and modelling is used in practical applications, and as a functional component of a modern GIS/LIS. GIS software will be used to demonstrate and reinforce the various analytical and modelling concepts.

OBJECTIVES

On completion of this course, students should be able to:

- recognise the importance of spatial analysis and modelling for GIS/LIS applications;
- define the concepts and techniques involved in spatial analysis and modelling;

- choose and apply appropriate analytical operations and techniques needed for a particular GIS/LIS applications;
- make appropriate use of a GIS software supporting spatial analysis and modelling functions; and
- critically evaluate the relevance and validity of results from a specific spatial analysis and modelling task.

TOPICS

Description	Weighting (%)
1. Overview of GIS/LIS and spatial analysis and modelling	5.00
2. The types and characteristics of analytical operations and modelling in GIS	10.00
3. Spatial pattern and arrangement of point, line, and polygon features	10.00
4. Spatial statistics	10.00
5. Overlay analysis, map algebra and cartographic modelling	10.00
6. Spatial interpolation, surface analysis and terrain modelling	10.00
7. Distance relationships and proximity analysis	10.00
8. Network analysis: routing, districting and cost and allocation functions	10.00
9. Fuzzy sets and fuzzy geographical objects	10.00
10. Issues and trends in spatial data analysis and modelling	5.00
11. Applications and case studies	10.00

TEXT and MATERIALS required to be PURCHASED or ACCESSED:

Books can be ordered by fax or telephone. For costs and further details use the 'Book Search' facility at http://bookshop.usq.edu.au by entering the author or title of the text.

GIS3405 Spatial Analysis and Modelling External Study Package, USQ Publication,

Access to TNTLite software is required for this course. The software is available from the USQ Bookshop on CD.

REFERENCE MATERIALS

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.

Burrough, P. A. & McDonnell, R. A. 1998, *Principles of Geographical Information Systems*, Oxford University Press,

Chrisman, N. 1997, *Exploring Geographic Information Systems*, John Wiley and Sons,

DeMers, M. 1997, *Fundamentals of Geographic Information Systems*, John Wiley and Sons,

STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Assessment	50
Examinations	3
Lectures	26
Private Study	50
Tutorial	26

ASSESSMENT DETAILS

Description	Marks Out of	Wtg(%)	Required	Due Date
SPATIAL ANALYSIS & MODELLING 1	200.00	20.00	Y	06 Sep 2002
SPATIAL ANALYSIS & MODELLING 2	200.00	20.00	Y	18 Oct 2002
3 HOUR CLOSED EXAMINATION	600.00	60.00	Y	END S2 (see note 3)

NOTES:

3. Student Administration will advise students of the dates of their examinations during the semester.

OTHER REQUIREMENTS

1 It is the students' responsibility to actively participate in all classes scheduled for them, and to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course- related activities and administration.

2 To receive a passing grade in this course a student must normally achieve at least 45% in each of the assessments and at least 50% of the available marks for the course.

3 A minimum standard of communication skills must be demonstrated in order for a passing grade to be achieved.

4 The due date for an assignment is the date by which a student must submit the assignment to the USQ. The onus is on the student to provide proof of the submit date, if requested by the Examiner.

5 Students must retain a copy of each item submitted for assessment. This must be produced within five days if required by the Examiner.

6 In accordance with University's Assignment Extension Policy (Regulation 5.6.1), the examiner of a course may grant an extension of the due date of an assignment in extenuating circumstances.

7 If students submit assignments after the due date without prior approval then a penalty of up to 20% of the total marks for the assignment will apply for each working day late.

8 In the event that a due date for an assignment falls on a local public holiday in their area, such as a Show holiday, the due date for the assignment will be the next day. Students are to note on the assignment cover the date of the public holiday for the Examiner's convenience.

9 The Faculty of Engineering and Surveying will NOT accept submission of hand written or typed assignments by facsimile, e- mail or computer diskette. Students in remote locations who do not have regular access to postal services may be given special consideration.

10 The final grades for students will be assigned on the basis of the aggregate of the marks obtained for each of the assessments in the course.

11 A closed examination is an examination where the candidates are allowed to bring only writing and drawing instruments into the examination.

12 The Faculty of Engineering and Surveying does not offer supplementary examinations.

13 Students who have undertaken all of the required assessments in a course but who have failed to meet some of the specified objectives of a course within the normally prescribed time may be awarded the temporary grade: IM (Incomplete - Make up). An IM grade will only be awarded when, in the opinion of the examiner, a student will be able to achieve the remaining objectives of the course after a period of non directed personal study.

14 Students who, for medical, family/personal, or employment-related reasons, are unable to complete an assignment or to sit for an examination at the scheduled time may apply to defer an assessment in a course. Such a request must be accompanied by appropriate supporting documentation. One of the following temporary grades may be awarded IDS (Incomplete - Deferred Examination; IDM (Incomplete Deferred Make-up; IDSM (Incomplete Deferred Examination and Make-up).