



THE UNIVERSITY OF
NEW SOUTH WALES
SYDNEY · 2052 · AUSTRALIA

SCHOOL OF SURVEYING & SPATIAL INFORMATION SYSTEMS

GMAT 0753

Introduction to Spatial Information Systems

Course Outline – Session 1, 2006

*This document, and other material, is available at the Course Website:
<http://www.gmat.unsw.edu.au/gmat0753/>*

(User name and password supplied in class)

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1. Staff involved in the Course and their Contact Details

1.1 Lecturer(s): Dr Samsung Lim

Office: EE406 (Consulting hours: Thursday 10-12)
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1.2 Lab/Tutoring Supervisor: Dr Yincai Zhou (Consulting hours: Thursday 10-12)

Office: EE414B
Email: y.zhou@unsw.edu.au Phone: 9385 5252

2. Educational Aspects of the Course

2.1 How this course relates to others in the program

This course is designed for students to learn introductory level Spatial Information Systems (SIS) and to acquire basic skills of Geographic Information Systems in order to apply such skills to defining and solving geographically related environment problems.

2.2 Aim of the Course

To provide an overview of the available sources of Geo-spatial information and to introduce technologies used with Geo-Spatial information systems and the principles of how they operate.

2.3 Learning Outcomes

By the end of this session students should be able to develop simple data models and working examples of GIS applications.

2.4 Teaching Strategies

This course was originally designed for running 2 hours per week for 14 weeks, however, it will run on a basis of 1-hour lecture plus 2-hour labs per week for 9 weeks. Lectures are designed to explain generic algorithms and fundamental theories, and lab exercises are for basic techniques and practical applications.

2.5 Suggested Learning Methods

This course is multi-disciplinary. GIS software (ArcGIS) and computer programming language (Visual Basic) are involved in the course activities.

2.6 UNSW Graduate Attributes

This course provides an environment that fosters in our students the following attributes is listed:

The skills involved in scholarly enquiry	Significant
an in-depth engagement with relevant disciplinary knowledge in its interdisciplinary context	Significant
The capacity for analytical and critical thinking and for creative problem solving	Significant
The ability to engage in independent and reflective learning	Significant
The skills to locate, evaluate and use relevant information (Information Literacy)	Significant
The capacity for enterprise, initiative and creativity	Significant
an appreciation of and respect for, diversity	Significant
a capacity to contribute to, and work within, the international community	Minimal
The skills required for collaborative and multidisciplinary work	Significant
an appreciation of, and a responsiveness to, change	Significant
a respect for ethical practice and social responsibility	Some

3. Proposed Course Schedule

Any changes will be notified in the class and at the course website.

Week No.	Thursday (Lecture) 2-3 pm EE 224	Thursday (Lab) 3-5pm EE401A
1 27/2	Introduction to the course Introduction to GIS	Introduction to ArcGIS No lab report this week.
2 6/3	Map Projections Map and Attribute Information, Map Scale and Projections, Coordinate Systems, Coordinate Transformations	Map Projections & Coord. Transformations To convert coordinates using ArcGIS.
3 13/3	Raster vs. Vector Data Structures Compact raster structures and data analysis. TIN. Database storage of vector and raster data structures.	Image Registration To register an image to some control points using ArcGIS.
4 20/3	Data Input, Verification, Storage, and Output Sources of geographical data. Geographical data collectors and providers. Acquiring digital datasets from a data supplier.	Digitise, Edit & Clean To familiarize yourself with on screen digitising and the clean and build functions for data refinement and forming arc-node and polygon topology.
5 27/3	Creating Continuous Surfaces The visualization of continuous surfaces. Methods for interpolation. DEM.	Surface Modelling To introduce the use of 3D modelling procedures in ArcGIS.
6 3/4	Spatial Analysis using Continuous Fields Basic Operations for spatial analysis with discretized continuous fields.	Topographic Representation and Modelling Familiarization with topographic data types, input to ArcGIS, modelling.
7 10/4	No Lecture	Spatial Analysis To familiarize yourself with the Spatial Analyst functions in ArcGIS.
	Mid-session Recess	Mid-session Recess
8 24/4	Database Search by attribute, search by geography, query interface, SQL languages	Tables, Relationships and Queries To access and to model spatial relationships between data.
9 1/5	Visual Basic Programming with ArcGIS Map Controls Computer programming for GIS applications	GIS Application Development No lab report this week. Design your own GIS application and develop it by Week 13.
10 8/5		
11 15/5		
12 22/5	Course Summary Sample final exams.	
13 29/5	Final Exam Internal final exam for 1 hour.	Submit Your GIS Application Development Before Final Exam
14 5/6		

4. Assessment in the Course

Assessment for the course includes:

- | | | |
|-------------------|-----|--------------------------|
| • Lab reports (7) | 35% | Due 7 days after the lab |
| • GIS Application | 45% | Due Week 13 |
| • Final Exam | 20% | Week 13 |

5. Course Resources

5.1 Lecture Material (check the course website):

<http://www.gmat.unsw.edu.au/gmat0753/>

The Powerpoint lecture slides are available for download as PDF files at the course website.

5.2 Text and Reference Books

Bernardsen, Tor, 2002. Geographic Information Systems: An Introduction, Wiley, New York.

5.3 Computational Aids

Computer software relevant to this course and available in the School's computer lab EE 401A, is ArcGIS v9.x and Visual Basic v6.x.

6. Administrative Matters

6.1 Expected work load

At UNSW, the normal workload expectations of a student are 25-30 hours per session for each unit of credit, including class contact hours, preparation and time spent on all assessable work.

To assist students with the organisation of their studies, the expected workloads of the various components of the course are listed below. It is strongly suggested that students use the listed hours to plan their work during session.

Lectures (9 x 1hr)	9hr
Labs (9 x 2hr)	18hr
Assignment	25hr
Field exercises & demos	
Revision of Lectures, preparation of lab reports, background reading (approximately 4hr x 9wk)	36hr
Total	88hr

6.2 Rules

Students should read the University Calendar or Student Guide for details of University Rules and special considerations.

Students are reminded that the University regards academic misconduct as a very serious matter. Unauthorised material must not be taken into a test or examination. Any work submitted for assessment must be entirely the student's own work. The penalty for any suspected academic misconduct ranges from zero mark for the assignment or exam involved, through failure of the subject, to expulsion from the University. If absent from an examination, class test or practical, students must submit written documentation to the University, via the Student Centre in the Chancellery.

All assignments or practical reports are compulsory parts of the course and must be handed in by the due date. A mark of zero will be given for any submission which violates this rule.

If a student is unable to submit on time due to illness or other legitimate reason, then a brief written explanation must be given to the lecturer for consideration as soon as is feasible. In some cases the lecturer may grant an extension to the submission date provided he has been contacted before the due date.

Further assessment may be granted in this course at the lecturer's discretion. If further assessment is granted then performance in tutorials may be considered as well as an oral exam including use of a computer.

If students attend less than 80% of their possible classes they may be refused final assessment.

6.3 Grievances

In the first instance all grievances should be discussed with the lecturer involved. If the problem cannot be resolved, students should contact the School's Grievance Officer in writing.

6.4 Rules for lab/tutorial classes

The lab/tutorial exercises form an important part of the subject. A good deal of time and care has gone into the organisation of these classes to ensure that you get the maximum benefit from the time that you spend and the software which is available. All lab/tutorial reports require individual work. Students are required to read the supplied instructions well before the exercise is commenced.

SUBMISSION OF REPORTS ON LAB/TUTORIAL WORK

Time: Reports may be submitted at any time prior to the due date. **Late submissions will not be marked**, unless accompanied by an appropriate reason. Reports should be submitted to your lab/tutorial supervisor.

Contents of Reports: Your report should have a front/title page, then a summary of results page, then the rest of the report including computations and plans. The front cover of all submissions should include: Course No. and Name, Student No. and Name, Title of Exercise

Further information about the labs will be distributed during the lectures, and are available on the class web site. Rules for labs are given in the following section.

All assignments and assessment items should be submitted with a signed Assessment Cover Sheet:

<p>I declare that this assessment item is my own work, except where acknowledged, and has not been submitted for academic credit elsewhere, and acknowledge that the assessor of this item may, for the purpose of assessing this item:</p> <p>Reproduce this assessment item and provide a copy to another member of the University; and/or,</p> <p>Communicate a copy of this assessment item to a plagiarism checking service (which may then retain a copy of the assessment item on its database for the purpose of future plagiarism checking).</p> <p>I certify that I have read and understood the University Rules in respect of Student Academic Misconduct.</p> <p>Signed:date: <input type="text"/><input type="text"/> <input type="text"/><input type="text"/> <input type="text"/><input type="text"/></p>

All students *repeating* the subject are advised as below:

1. To apply for exemption from practicals submit your details in writing to the Course Administrator.
2. If exemption from practicals is granted, assessment in the subject will be based only on the written examinations and the assignment.
3. The contents of the written examinations may include material from practical exercises.

Rules:

Students should read the University Calendar or Student Guide for details of University rules.

Students are reminded that the University regards academic misconduct as a very serious matter. Any work submitted for assessment must be entirely the student's own work. Students must acknowledge the source (references) of material used in reports and assignments. Unauthorised material must not be taken into a test or examination. The penalty for any suspected academic misconduct ranges from zero mark for the assignment or test involved, through failure of the subject, to expulsion from the University. If absent from an *examination, class test or practical* students must submit written documentation to the University, via the Student Centre in the Chancellery.

An assignment or report must be handed in before the due time. Zero mark will be given for any submission that violates this rule. If a student is unable to submit on time due to illness or other legitimate reason then a brief written explanation must be given to the lecturer as soon as the student returns to university. *In some cases a lecturer may grant an extension to the due time for other reasons provided he has been contacted before the due date.* Any late submission must be made before solutions are issued to the class.

Marked assignments and reports that are not collected within 2 weeks of their general distribution to the class, will be discarded.

If students attend less than 80% of scheduled classes they may be refused final assessment.

Application for special consideration on medical grounds will only be considered if a candidate was absent from an examination. Being present during an examination and then applying for special consideration will result in further assessment in only very exceptional cases.

Plagiarism

Plagiarism is the presentation of the thoughts or work of another as one's own.*

Examples include:

- direct duplication of the thoughts or work of another, including by copying material, ideas or concepts from a book, article, report or other written document (whether published or unpublished), composition, artwork, design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person's assignment without appropriate acknowledgement;
- paraphrasing another person's work with very minor changes keeping the meaning, form and/or progression of ideas of the original;

- piecing together sections of the work of others into a new whole;
- presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor; and,
- claiming credit for a proportion a work contributed to a group assessment item that is greater than that actually contributed.†

Submitting an assessment item that has already been submitted for academic credit elsewhere may also be considered plagiarism. Knowingly permitting your work to be copied by another student may also be considered to be plagiarism. An assessment item produced in oral, not written form, or involving live presentation, may similarly contain plagiarised material.

The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does *not* amount to plagiarism.

Students are reminded of their Rights and Responsibilities in respect of plagiarism, as set out in the University Undergraduate and Postgraduate Handbooks, and are encouraged to seek advice from academic staff whenever necessary to ensure they avoid plagiarism in all its forms.

The Learning Centre website is the central University online resource for staff and student information on plagiarism and academic honesty. It can be located at:

www.lc.unsw.edu.au/plagiarism

The Learning Centre also provides substantial educational written materials, workshops, and tutorials to aid students, for example, in:

- correct referencing practices;
- paraphrasing, summarising, essay writing, and time management;
- appropriate use of, and attribution for, a range of materials including text, images, formulae and concepts.

Individual assistance is available on request from The Learning Centre.

Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting, and the proper referencing of sources in preparing all assessment items.

* Based on that proposed to the University of Newcastle by the St James Ethics Centre. Used with kind permission from the University of Newcastle.

† Adapted with kind permission from the University of Melbourne.

Please visit the School's Plagiarism Statement:

<http://www.gmat.unsw.edu.au/currentstudents/general/plagiarism.htm> for the key information on the new plagiarism policy. From the page the students can download the policy document (as a PDF), and the assessment cover sheets (as DOC or PDF).