



THE UNIVERSITY OF
NEW SOUTH WALES
SYDNEY • 2052 • AUSTRALIA

SCHOOL OF SURVEYING & SPATIAL INFORMATION SYSTEMS

GMAT 4010

Thesis Part A

Course Outline – Session 1, 2009

Version: 10 February-2009

1. Staff involved in the Course and their Contact Details

1.1 Course Coordinator: Prof. Chris Rizos

Office: EE454 (Whenever present, you may just drop in, or send email)
Email: c.rizos@unsw.edu.au
Phone: 938 54205

1.2 Thesis Supervisors:

Once the selection of the thesis topic is made, the student will organise his or her own schedule of meetings with their Supervisor (typically a member of the staff of the School of Surveying & Spatial Information Systems). There may also be a co-supervisor for some of the projects.

1.3 Staff Absences During Session:

CR's absences in weeks 11 & 12 will not affect the course. There will not be face-to-face classes every week, see Course Schedule.

2. Educational Aspects of the Course

2.1 How this Course Relates to Others in the Program

This fourth year undergraduate 6UOC course in the B.E. (SSIS) program is unlike any attempted by a student up to this point. The aim of the course (together with the Session 2 extension – GMAT4015) is to provide the student with an opportunity to carry out a substantial project-type or research-type study program on a topic they select, under the direct supervision of a SSIS staff member. The primary objective of GMAT4010 is to carry out the appropriate background literature review and research that is needed to develop a **Thesis or Research Proposal** (or “blueprint”) for the Thesis, which will be undertaken in Session 2, in GMAT4015 Thesis B. *GMAT4010 is therefore a prerequisite for GMAT4015.*

The thesis is scheduled for the last year of study in the B.E. (SSIS) program. Hence students that have NOT completed all courses scheduled for Years 1 to 3 must be able to explain how they can complete all outstanding courses by the end of Session 1, 2009, without timetable clashes. Submit this documentation with your topic selection and attach timetables of S1/2009 and S2/2009.

The Course Coordinator will maintain regular communications with students via email.

2.2 Aims of the Course

Students are expected to demonstrate managerial, technical and scientific, and professional skills in researching, planning, executing and analysing an approved research or engineering project and to comprehensively report on the work orally and in writing, all within a stipulated time limit. Since the thesis topics are typically beyond the material taught in the degree program, the students have to show further that they are able to acquire, on their own, the additional knowledge and skills required for the successful completion of the work related to their thesis. GMAT4010 offers the opportunity to undertake the background research for their selected topic, and to prepare a Thesis or Research Proposal that forms the basis for the work to be undertaken in GMAT4015.

2.3 Learning Outcomes

By the end of this session you should be able to:

- (a) Demonstrate the managerial, technical and professional skills in researching and planning an approved research or thesis project.
- (b) Report, in writing and orally, the outcomes of their research and planning tasks.
- (c) Appreciate and demonstrate the acquisition of new knowledge and skills, as required for their selected research or thesis project.

2.4 Teaching Strategies

The Course Coordinator will guide the students in the selection of their thesis/project topics, and will discuss with them such issues as: review of literature, the nature of research, scheduling of

work and time management, report preparation, preparation of the Thesis or Research Proposal and a short oral presentation.

During the last summer break several topics were proposed by students themselves, or the students have developed topic ideas with the assistance of staff. These students can be assumed to have already commenced GMAT4010 and may start consultations with their Supervisor(s).

In the case of those students who have not already “locked in” a project with a staff member, they will be issued with a list of available thesis topics. (They may also propose their own topics, but a suitable Supervisor must also be found.) Students submit their selection (agreed to by a Staff member) or their own topic idea to the Coordinator by the lecture period of Week 2. The topic allocations will be announced by email immediately after. It is vital that students have their project idea finalised as early as possible. Should more than one student select a topic then, typically, preference will be given to the student that obtained better results in Year 1-3 courses that are relevant for that particular topic. However, special talents, interests and knowledge will also be considered. But the final decision will rest with the Supervisor.

The student is then expected to meet regularly with his/her allocated thesis Supervisor to discuss details of the selected project, and to develop the project plan that can be presented to the class, and which eventually leads to the submitted Thesis or Research Proposal.

2.5 Suggested Learning Methods

This course is unlike other courses previously undertaken by the student. The Course Coordinator will mentor the students, guiding them as they come to grips with the expectations of the research or engineering project. However, the most important aspect of the students’ learning will be influenced by their one-on-one relationship with their Supervisor. (He or she will either be a staff member, or a person from industry with an interest in the topic.) The Supervisor (there can be more than one) will guide the student in defining the project objectives and the work program, e.g. identifying the essential tasks and the resources or facilities, advising them where they may find background literature, and ensuring the research task is feasible within the time frame (and other constraints) that apply.

Since the thesis is likely to include aspects that are new to the student, it is vital that student and Supervisor meet, on average, at least the equivalent of one hour per fortnight. It is suggested that each Supervisor arranges a fixed weekly time for meetings with each thesis student, either individually or as a group (if appropriate). As a minimum, at each meeting, students should report progress of their thesis work over the preceding weeks and compare the actual with the planned progress. The work plan should be adjusted, if necessary. Students must keep a log of the meetings, using the Log Form provided. The log should be signed by the Supervisor each time a meeting is held.

The critical outcome of Session 1 will be a Thesis or Research Proposal. If the Proposal is judged to be acceptable, and the other criteria are met (see section 6.1), the student will be able to proceed to GMAT4015 in Session 2.

2.6 UNSW Graduate Attributes

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

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	Some
An appreciation of and respect for, diversity	NA

A capacity to contribute to, and work within, the international community	NA
The skills required for collaborative and multidisciplinary work	Some
An appreciation of, and a responsiveness to, change	Minimal
A respect for ethical practice and social responsibility	Some

3. Proposed Course Schedule

Note, these times are only for the formal face-to-face component of GMAT4010. There will be no classes in weeks 3, 5, 6, 7, 8, 11, 12. However, the student will meet with his/her Supervisor(s) according to their own schedule.

Week No. (Start Date)	Wednesday 10-11am EE418
1 (9/3)	Course outline, Purpose of thesis, Thesis format, Thesis topics, Assessment, etc
2 (16/3)	Thesis topic selection/allocation, & Industrial Training Requirements
3 (23/3)	NO CLASS
4 (30/3)	Planning the thesis tasks, Meet with Supervisors, Guidelines for preparation of Thesis Proposal
5 (6/4)	NO CLASS
	<i>Mid-Session Break</i>
6 (20/4)	NO CLASS
7 (27/4)	NO CLASS
8 (4/5)	NO CLASS
9 (11/5)	Project Plan presentations – Part 1
10 (18/5)	Project Plan presentations – Part 2
11 (25/5)	NO CLASS
12 (1/6)	<i>Submit Thesis Proposal</i>

4. Assessment in the Course

Assessment for the course includes:

- Project Plan Presentation: 15%
- Supervisor Report: 10%
- Thesis/Research Proposal: 75%

4.1 Project Plan Presentation

Each student is required to present a Project Plan in Week 9/10. The Project Plan presentation covers the following (just indicative):

- Outline of the literature research done, or will be done (to be completed by the time the Thesis or Research Proposal is submitted in Week 12).
- Definition of the scope of the project, the background, and reflection on what it means to the student.

*Note that this is the first "hurdle" of the course. If your Supervisor and the Course Coordinator feel that you have not made a serious effort to meet regularly, or to have progressed the project, or to have invested the expected time in the background research, *and therefore to have not made satisfactory progress* - as indicated by a substandard Project Plan Presentation (worth 15% of the total GMAT4010 grade) and/or negative Supervisor review (worth 10% of the total GMAT4010 grade) – then enrolment of the student in this course may be terminated. See section 6.1.*

4.2 Thesis or Research Proposal

The Thesis or Research Proposal is to be submitted Monday 2 June (end Week 12) to the School Office (EE426). The proposal must be presented to the same standard (in terms of layout, presentation, binding, English expression) as the final thesis. This Thesis/Research Proposal should reflect the result of a minimum of 50 hours of work. The Thesis/Research Proposal will be a report of no more than 40 pages, across all sections listed below. The Proposal should demonstrate that the student is clear about the meaning of the topic, has searched, found and read the reference literature, has analysed the steps required to progress to a successful completion of the task, has worked out how the different parts of the task should be approached (i.e. experimental design), has prepared a draft table of contents of the final thesis and has designed a feasible schedule that allows completion by Friday W12, Session 2. The contents/layout should include:

- **Definition of the thesis topic and statement of aims of the thesis**
- **Introduction** to the topic of the thesis. This includes a search for and review of the literature on the subject (background reading) identifying key works on which your thesis will be based. Summarise what these references have to say about your topic and pinpoint differences of opinion and approaches. Literature that is referenced in the Proposal is listed under "References". Literature that has been reviewed and is relevant in a general sense but is not directly referenced in the proposal is listed under "Bibliography". In short, you have to find out what others have published on your thesis topic, and how that relates and is useful for your task. Also include the basic considerations that have to be considered for your topic.
Note: It is suggested that this section is written in such a way that it can become the first section (or the first few sections) of the final thesis.
- **Proposed activities** (W13/S1 to W12/S2, in chronological and logical sequence): library searches, background reading, experiments, measurements, equipment or materials to be used, experimental design, etc.
- **A week-by-week timetable** for these activities, starting in W13/S1 through to W12/S2. Make separate columns for experimental work and for the writing of the thesis. Clearly identify

deadlines by which certain activities must have been completed.

Note: *Students with theses that require extensive and uninterrupted laboratory, field or other research periods might find it beneficial to plan some work in the mid-year break. Note, however, that some staff are busy with, and some equipment is used in, Survey Camps.*

- **Proposed table of contents** of the final thesis (as detailed as possible, as it applies to your topic, particularly as far as the 'body of Report' is concerned).
- **References**
- **Bibliography**

Assessment Conditions:

An assessment will be made by the Course Coordinator of the adequacy of the Research Proposal before it is handed to the student's Supervisor for assessment. If the proposal is deficient, the student will be asked to resubmit. If it again fails to meet the standard expected, a failure is awarded in GMAT4010 and the student will discontinue the course, and hence will be unable to enrol in the GMAT4015 course in Session 2.

If the Thesis/Research Proposal is judged adequate by the Course Coordinator, it will be passed-on to the Supervisor for assessment. The mark for the Proposal will be based on the completeness, the quality of the different sections, the presentation and, in particular, the depth, completeness and understanding shown in the main chapter 'Introduction'. Upon grading by the Supervisor, the Course Coordinator will also assess the Proposal. The composite mark in GMAT4010 will then be based on the Thesis/Research Proposal (75%), the Project Plan Presentation(15%), and the Supervisor's Review (10%), although the Course Coordinator may vary these proportions, or otherwise change the assessments.

The Thesis/Research Proposal should be submitted with a signed Assessment Cover Sheet:

<p>I declare that this Thesis/Research Proposal 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 Thesis/Research Proposal and provide a copy to another member of the University; and/or,</p> <p>Communicate a copy of this Thesis/Research Proposal to a plagiarism checking service (which may then retain a copy of the Thesis/Research Proposal 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>

5. Course Resources

5.1 Lecture Material

Most of the lecture material will be presented in an informal manner, illustrated with examples from the lecturer's own experience as a researcher.

5.2 Reference Books

There is no text book for this course. The following general reference books may assist the student:

- Anderson, J. and M. Poole (1994). *Thesis and Assignment Writing*. 2nd ed. Jacaranda Wiley, Brisbane.
- Day, R. A. (1989). *How to Write & Publish a Scientific Paper*. 3rd ed., Cambridge University Press, Cambridge.
- Hicks, C.R. and K.V. Turner (1999). *Fundamental Concepts in the Design of Experiments*. 5th ed. Oxford University Press.
- Howard, K. and J. A. Sharp (1983). *The Management of a Student Research Project*. Gower Publishing Company Ltd., Aldershot, U.K.
- Montgomery, D.C. (1991). *Design and Analysis of Experiments*. 3rd ed. John Wiley & Sons, New York.
- Pitson, J. (rev.) (1978). *Style Manual for Authors, Editors and Printers of Australian Government Publications*. 3rd ed. Australian Government Publishing Service, Canberra.
- Reynolds, L. and D. Simmons (1982). *Presentation of Data in Science*. 2nd print. Martinus Nijhoff Publishers, The Hague.

5.3 Past Theses

Past Theses are available from the School Library. Arrangements can be made to borrow or study these with your Supervisor.

5.4 Access to Equipment & Laboratories

Most of the equipment and laboratories at the School of Surveying & SIS can be made available to thesis students. However, all arrangements have to be made by the Supervisor with the respective laboratory managers.

Thesis students have access to the equipment held in the SSIS Survey Store, if the required equipment is not scheduled for class work or survey camps. Again, the Supervisor should advise the storeman of the requirements and options, and should nominate the students that have to have access to specific items. The student can then 'order' the equipment for specific times through the appropriate 'booking forms'.

For some projects equipment, datasets or software will be provided on loan by an outside organisation. There will be different arrangements for such situations. For example, the equipment may be used on campus for a restricted period of time. Or the gear can only be used on the organisation's premises. We encourage students and supervisors to work with industry and government agencies, however extreme care must be taken to ensure that no damage is done. Consult closely with your Supervisor in all such cases.

The Supervisor can, through the School Office, make keys for specific rooms available. Also consult your Supervisor about after hours access to labs, etc.

5.5 Supervisor

Perhaps your most important resource is your Supervisor. He (or she) will assist you in your "voyage of discovery". They will also be able to provide you with many literature resources pertinent to your project topic.

6. Administrative Matters

6.1 Criteria for Progression to GMAT4015

The following criteria must ALL be satisfied if the student is to be given a grade in GMAT4010 and permitted to progress to GMAT4015:

- **Project Plan Presentation:** The Supervisor and Course Coordinator will discuss your progress and make a decision whether to permit continuation in this course.
- **Industrial Training:** All engineering students are required to complete 60 days of Industrial Training (see <http://www.eng.unsw.edu.au/it/>). The student must either submit their final IT

Report (see guidelines at <http://www.gmat.unsw.edu.au/currentstudents/general/general.htm>), or a signed statement informing the School's IT Officer (Craig Roberts) of the status of their IT activities (with an indication as to whether the student will satisfy the IT requirements by the beginning of December 2008 – otherwise students risk NOT graduating in 2009).

- **Thesis or Research Proposal:** The Proposal must be judged satisfactory by both the Supervisor and Course Coordinator.

6.2 Expected Work Load

At UNSW, the normal workload expectations of a student are 25-30 hours per session for each Unit Of Credit (UOC), 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 this 6UOC course are listed below.

Lectures (4 x 1hr)	4hr
Short Presentations by students (2 x 2hr)	4hr
Meetings with Supervisor(s) (6 x 1hr)	6hr
Preparation of Presentation of Project Plan	6hr
Preparation of Thesis/Research Proposal (background reading, literature search, preliminary work, work schedule, planned Table of Contents, word processing)	120-150hr
Total	140-170hr

6.3 Rules

Students should read the University Calendar (or go to <http://www.handbook.unsw.edu.au/general/2009/SSAPO/GeneralRules.html>) for University Rules and special considerations. Students should attend all classes, as well as regularly meet with their Supervisor.

Students are reminded that the University regards academic misconduct as a very serious matter (see <https://my.unsw.edu.au/student/academiclife/assessment/AcademicMisconductStudentMisconduct.html>). Any work submitted for assessment must be entirely the student's own work (see 6.4). The penalty for any suspected academic misconduct ranges from zero mark for the assignment involved, through failure of the course, to expulsion from the University.

All assignments 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. (The Course Coordinator has the discretion to vary this penalty, depending upon circumstances.)

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 Course Coordinator (or sent as an email) for consideration as soon as is feasible. In some cases the Coordinator may grant an extension to the submission date provided he has been contacted before the due date and the thesis supervisor approves.

6.4 Academic Honesty & Plagiarism

What is 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.†

For the purposes of this policy, submitting an assessment item that has already been submitted for academic credit elsewhere may be considered plagiarism.

Knowingly permitting your work to be copied by another student may also be considered to be plagiarism (<https://my.unsw.edu.au/student/atoz/Plagiarism.html>).

Note that 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.

The Learning Centre website is main repository for resources for staff and students on plagiarism and academic honesty. These resources can be located via:

www.lc.unsw.edu.au/onlib/plag.html

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.

6.5 Grievances

In the first instance all grievances should be discussed with the Course Coordinator. The student is expected to meet regularly with his/her Supervisor. As this is a critical factor in the education process, if there are any problems in the student-supervisor relationship these must be drawn to the Coordinator's attention as soon as possible. The Coordinator may assign a new Supervisor.

6.6 OH&S

In the case of projects that have an element of fieldwork, either on campus or off it, OH&S issues must be addressed. Your Supervisor is expected to prepare the necessary Risk Assessment. See also http://www.hr.unsw.edu.au/ohswc/ohs/ohs_home.html.

6.7 Other Matters

Feedback on the course will be gathered by the Course Coordinator in order to improve the course in future years. This feedback will be garnered both informally by the Course Coordinator, as well as by more formal means such as the Course and Teaching Evaluation and Improvement (CATEI) Process.