

UNDERGRADUATE THESIS

OLD PROGRAM

THESIS A – ELEC/TELE/4910/4914

THESIS B – ELEC/TELE/4911/4915

COURSE OUTLINES - 2008

1. COURSE STAFF

- Thesis coordinator: Dr. Toan Phung
Room EE107 ; Tel.: 9385 5407
Email: toan.phung@unsw.edu.au
Consultation time: Mon-Fri 9am-12pm (or by appointment)
- Thesis supervisor: nominated by the student (together with thesis topic)

2. COURSE INFORMATION

In essence, this course is about research, development, and design work on an approved topic under the guidance of members of staff. The aim is to foster independent learning, research and problem solving skills.

A list of thesis topics offered by the school is published each year and can be viewed on the EE&T thesis/project database web site. Students are to make their own selection. Usually, the topic chosen is influenced by the students' future career directions. Note that some topics offered on the list are of a general nature, requiring the topic to be defined in discussion with the supervisor. Many topics can be modified to cater for specific student interests. There is provision for topics not on the published list to be suggested by students or industry. However, it is necessary to find a member of staff who is prepared to act as a supervisor (or co-supervisor) of such a topic.

In this course, students are given the opportunity to tackle a challenging engineering problem. To find the solution would require substantial effort. Typically, it involves literature survey and research in the initial phase, and then followed by development work which includes design, construction of experimental apparatus, software simulations or models with laboratory tests. The thesis is a major project and thus it should be carefully planned, managed, and executed. The deliverables should be clearly presented, in particular the contributions of the work carried out.

The thesis is a good introduction to work in industry and research, and is an important indicator of how well students are able to utilise what they have learnt throughout their course. It also plays an important role in the final grading of degrees.

The thesis consists of two parts (A and B) to be completed over the last two sessions of the BE degree course. Thesis Part A is 3 UOC and the pre-requisite is ELEC3117. This part is to be

carried out in the first Session and the timetable allocates four hours per week. Thesis Part B is 9 UOC and the pre-requisite is Thesis Part A. Part B is to be carried out in the following Session and the timetable allocates ten hours per week. However, as with other courses, students are expected to supplement this time with at least equal amounts of their own time. Both Part A and Part B will be formally assessed. Progression from Part A to Part B is subject to the achievement of a satisfactory grade for Part A.

Students can choose to do the thesis as an individual or as a group, see Section 7(a) for conditions. The course codes for different parts/types of thesis are:

- Thesis Part A (individual): ELEC4910, TELE4910
- Group thesis Part A: ELEC4914, TELE4914
- Thesis Part B (individual): ELEC4911, TELE4911
- Group thesis Part B: ELEC4915, TELE4915

3. STUDENT LEARNING OUTCOMES

At the successful completion of the course you should be able to:

- Apply appropriate skills, tools and techniques to solve or investigate an engineering problem.
- Appreciate the various facets and practical issues involved in such a process.

Contribution to graduate attributes:

- Development of in-depth knowledge and understanding in the discipline.
- Development of analytical and critical thinking.
- Ability to engage in independent learning.
- Information literacy - skills to appropriately locate, evaluate and use relevant information
- Development of effective communication skills.

4. TEACHING STRATEGIES

- One introduction lecture by the course coordinator (during the last week of the session preceding Session 1) – to explain thesis requirements, procedures, available resources, and assessment scheme.
- Regular meetings (typically about 30 minutes weekly) between supervisor and student – to discuss about thesis work, give advice and directions.
- Laboratory sessions (informal, throughout the two sessions) – to assist students in the experimental work.

5. ASSESSMENT

The normal practice is that a thesis/project is marked by the supervisor and one assessor, but in certain cases a second assessor is appointed. The method of assessment and the contribution to weighted averages is identical for Thesis and Group Thesis.

(a) Part A:

Part A will be graded either satisfactory or unsatisfactory, and only students with a satisfactory grade will be permitted to proceed to Part B. The Part A assessment will take account of the following:

- Progress with the topic during Session 1
- Seminar presentation
- Seminar participation (See below)

(b) Part B:

Part B is given a mark out of 100 by the supervisor and assessor with equal weight given to the marks of each examiner. If there is a significant difference between the marks, then a second, and if necessary additional assessors will be appointed. The Part B assessment will take account of the following:

- The Written Report
- Open Day demonstration
- Overall performance on the project

It is important to note that the *overall mark for your thesis work is solely based on the Part B assessment.*

Warning about plagiarism:

Material copied into a thesis/project report from textbooks, journal articles, the Internet or another thesis must be properly acknowledged. Without acknowledgment such copying amounts to plagiarism, which the University regards as a most serious offence and for which there is a severe penalty.

Students are reminded of their Rights and Responsibilities in respect of plagiarism and are encouraged to seek advice from academic staff whenever necessary to ensure they avoid plagiarism in all its forms. More information is available from the University web site: www.lc.unsw.edu.au/plagiarism.

6. THESIS SCHEDULE

The following is a schedule of compulsory activities for students who start their 4th year's thesis in Session 1, 2008 or Session 2, 2007.

ACTIVITY	SESSION 1 2008 START PART A	SESSION 2 2007 START PART A	COMMENT
Seminar Week	19-23 May 2008		Week 10 of Session
Thesis Submission	12.00 pm (noon) Tuesday 21 October 2008	12.00 pm (noon) Tuesday 3 June 2008	Last Tuesday of Session
Open Day	Friday 24 October 2008	Friday 6 June 2008	Last day of Session

7. ADDITIONAL INFORMATION ABOUT THE COURSE

(a) Which one to enrol: Thesis or Group Thesis ?

Only students with a weighted average of 65 or above will be allowed to do a thesis topic (individual thesis), but can also do a group thesis with other students if they wish.

Students with a weighted average of below 65 need to do a group thesis with other students. If your weighted average is below 65 you **cannot** do a thesis topic.

Students, who have a weighted average below 65 at the conclusion of Session 1, **MUST** nominate a group thesis topic. If such students do not nominate a group thesis topic, they will be treated as having no nominations

If you are unsure whether you should be doing a thesis topic or a group thesis topic please contact the EE&T School Office.

(b) How to nominate a thesis topic

The EE&T thesis database lists all the current thesis topics that can be taken by students. It can be found on the following web site:

<http://scoff.ee.unsw.edu.au/document/thesis/thesisTopicSelection.htm>

Once you have chosen a topic you like, and you have spoken to the supervisor of that topic and he/she has agreed that you are able to do the topic, you can then come to the school office and pick up a “*Topic Nomination Form*” which then needs to be signed by you and your supervisor. If you are doing a group thesis, only one nomination form needs to be submitted for all group members.

(c) Seminar

Technical skills are very important, but just as important is the ability to talk about your work in an informative and convincing way. The seminar provides the opportunity both to inform and to demonstrate your communication skills. Your talk should be addressed both to your examiners who will need to know details about your progress with the topic, and to students and staff members having a more general interest in the project.

Student seminars will take place at the times given in the Timetable at locations to be advised. The duration of each seminar will be 30 minutes including time for questions, for group thesis seminar, 45 minutes. The student giving the seminar must provide a one page typed “*Summary Sheet*” that introduces the topic area to those present. You are also required to be the chairperson for the seminar that follows yours even if it takes place on the following day. (See “Advice to Chairperson”). This is an important function and students must ensure that they perform this task.

If you are planning to do a “Microsoft Power Point” presentation, you need to bring your own laptop. However, you also need to make sure that the seminar room you are allocated in has the digital projector’s facility.

In addition to giving a seminar, you are required to attend and assess seminars given by at least six other students. “*Seminar Assessment Sheets*” will be issued to each student and these must be completed and returned to the School Office by the supervisor or assessor

attending the seminar at the end of each seminar. These sheets will be used as part of the assessment for Thesis Part A. You are also required to keep a record of the seminars attended on a “*Seminar Attendance Form*”. All forms will be available in the seminar rooms.

The Seminar Assessment sheet attached shows the areas of the presentation considered important.

(d) Thesis Submission

Two copies of the thesis/group thesis report, prepared in accordance with the specification given below, are to be submitted to the School Office not later than the deadline specified in the timetable. **Students who do not submit by the deadline will receive an Absent Fail (AF) for Part B. Even if the thesis is incomplete, it must be submitted. Requests for special consideration should be submitted as for all other subjects through the Registrar.** An extension of time may be granted after consideration of the thesis report and only under exceptional circumstances beyond the student's control. For further details see document “*Procedures Concerning Thesis Withdrawal, Suspension and Time Extension*”.

(e) Open Day

At the end of the thesis/group thesis period students are required to demonstrate their topics and to answer questions from staff and students. It is compulsory for all students including those with topics of a theoretical nature to be present on Open Day.

Usually Open Day is held on the last Friday of your final Session and demonstrations are normally given in the School laboratories. You should prepare a *poster* with appropriate diagrams and extracts from your thesis to help in the explanation of the overall project as well as giving suitable demonstrations of particular aspects of your achievements. When planning your Open Day presentation remember that, in addition to your assessors, many visitors will be third year students seeking information to help them choose their own thesis topic. Typically the Open Day times are 10.00am to 12 noon and 2.00pm to 4.00pm subject to change. Should you have classes on that day leave a note in the laboratory indicating when you will be available.

(f) Thesis Withdrawal

A student will be permitted to withdraw without failure from the thesis/project up to the end of Week 4 of the second session of their enrolment in the course. For further details see document “*Procedures Concerning Thesis Withdrawal, Suspension and Time Extension*”.

(g) Thesis Report Specification

- Two copies of each thesis/group thesis report must be submitted
- Paper must be A4 size (210 x 297 mm)
- Thesis must be typed or prepared using a wordprocessor. You are encouraged to use both sides of the paper.

- Margins must not be less than: 25mm (left and right edges, before binding), 25mm (upper edge), and 20mm (lower edge).
- The report must be spiral bound (at your own cost), and must include a title page headed:

**THE UNIVERSITY OF NEW SOUTH WALES
SCHOOL OF ELECTRICAL ENGINEERING AND TELECOMMUNICATIONS**

then: Title of Thesis/Project
Topic Number (if applicable)
Name of Author
Bachelor of Engineering (or other degree for which the thesis is submitted)
Submission Date (month and year)
Supervisor: (followed by name)

- All sheets must be numbered. The main body of the thesis must be numbered consecutively from beginning to end. Other sections must either be included or have their own logical numbering system.
- Formulas and other items difficult to type may be neatly hand-written in permanent black ink.
- Graphs, diagrams and photographs should be inserted as close as possible to their first reference in the text. Rotated graphs etc are to be arranged so as to be conveniently read, with the bottom edge to the outside of the page.
- Photographs must be permanently attached to sheets at least along their left edge. Double sided adhesive may be used to attach photographs. Photographs printed on A4 size lightweight paper may be bound directly into the thesis.
- Computer programs and engineering drawings should be bound into the thesis, usually in an appendix.
- CD may be attached to the back cover of the thesis folder using self adhesive tape or in a secure pocket.
- The author of the thesis is responsible for the preparation of the thesis before the deadline, proofreading the typescript and having corrections made as necessary.
- All students must submit a thesis summary sheet with their thesis report. This summary sheet is designed to assist in determining the overall input by students into the thesis work. Please note that a separate summary sheet must be submitted by individual student, even if part of a group submitting a group thesis. The guidelines for completing the summary sheet and the summary sheet form can be downloaded from the School Website.

8. SOME USEFUL ADVICES

(a) Resources

The thesis gives you the opportunity to take on a project on your own, to produce a self contained and rounded piece of work and write it up for others to assess and use. While the project is yours alone, you will need to obtain advice, information and assistance from others, for example your supervisor, technical officers responsible for laboratories, or computing and workshop staff.

Before carrying out any research it is important to be aware of what work has been done by other researchers before you. A Library Handbook is available on request from the School Office, or you can ask the Library staff for assistance with the available resources and how to access them.

The Internet has become a major source of information for research activities. Students should make as much use of this valuable resource as possible.

(b) First Session:

While most of your thesis/group thesis will be carried out in the second Session (ten hours/week), four hours/week have been timetabled for the thesis/project in the first Session. It is important that you take full advantage of this time (remember you are expected to supplement the nominal hours with an equal amount of your own time).

Regular meetings with your supervisor are important, especially during the early stages when it is important to check that what you are doing is indeed what is required. If you want to contact your supervisor outside a regular meeting time leave a message at the School office or at your supervisor's office arranging a time to meet. (Prearranged consultations are often more effective). You can also contact your supervisor by telephone or email, either at the University or (with permission) at home. Their email address can be found on the school website. <http://www.eet.unsw.edu.au>.

Defining a topic is difficult, but it is probably your most important task in the first Session. Once you have a clear idea of what is required, you can then analyse the alternative courses of action available for achieving your goal. However, if you have the wrong problem then no amount of brilliant analysis or design will achieve the required objective.

Once you have defined your problem, review what has been achieved before, and list what alternative courses of action or methods of solution are available. Analyse the alternatives and decide which of them is the most appropriate for the task in hand.

At this stage you should have a clear idea what you are going to do and what tasks have got to be performed on the way to achieving your goal.

It is a good idea to draw up a development schedule and allocate times for each task and important stages or project milestones. Milestones will include the first Session Seminar, Open Day and Thesis/group thesis Report submission day.

The time duration of each task should be carefully checked to ensure it is realistic and, in particular, allows sufficient time for tasks that are critical for the success of the project. For example, ordering components or if equipment is constructed, get the drawings to the workshop as soon as possible. Workshop time is always limited and long delays are frequently experienced. Discuss what you want with the Workshop Foreman with the aim of simplifying your design or modifying existing items.

Towards the end of the first Session you are required to give a Seminar presentation describing your work on the topic. Plan your presentation to last about 20 minutes plus ten minutes for questions and introducing the speaker. By this stage you will be knowledgeable in your topic, but you should present the material so that it can be understood by the fourth year students attending your seminar. Go at a steady pace and practice the right emphasis and timing by speaking into a tape recorder or even at the bedroom wall. Practice will give you confidence and remove some of the nervousness.

The seminar might have the following outline:

- Thesis/group thesis definition
- Literature review
- Description of preliminary work
- Outline and timetable schedule for work in Session 2.

(c) Second Session:

The second Session should see you complete your thesis/project, prepare an Open Day Demonstration and submit your Thesis/Group Thesis Report. It is wise to keep all these milestones in mind as you work to bring your chosen topic to fruition.

Keep careful notes and write up as you go. The importance of keeping good notes is understood by all of us who have been frustrated by losing an important reference or vital information about an experiment. Careful note taking can also simplify the final Thesis/Group Thesis Report write-up.

Start writing-up as soon as possible - Day 1 is not too early. This is good advice because writing-up often helps to clarify ideas and can suggest some additional investigations to pursue. It is better to make this kind of discovery early rather than later. Furthermore, writing-up is a major task that should not be rushed.

Try to have your draft complete well before submission date and discuss it with your supervisor before producing the final version. Transforming the draft into the final version requires considerable organisation. Typing, drawing of figures, copying and binding all take longer than you think, and word processors, printers and photocopiers can all break down during production - and often do. Allow at least a week for the normal contingencies (e.g. proof reading and the correction of typing errors), and for other problems (e.g. failed equipment and delivery delays). Equipment failure at 4:00am the morning the report is due is not an adequate reason for late submission.

(d) If Things Go Wrong

If you start having serious problems, don't ignore them or stop working; the problems won't go away. Talk over your worries with your supervisor to see what you can do to get going again. If you are still not able to resolve the problems, then see the thesis coordinator, the Director of Academic Studies in EE&T or the Student Counseling and Careers Unit. The Learning Centre also offers advice and support on these matters. Often some advice or perhaps reducing the scope of the project can get you working effectively for the rest of the year.