



FACULTY of Engineering
SCHOOL of Electrical Engineering & Telecommunications

ELEC 1111 & GMAT2610

Electrical and Telecommunications Engineering

SESSION I, 2009

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ELEC1111

Electrical and Telecommunications Engineering

School of Electrical Engineering
and Telecommunications

COURSE INTRODUCTION – session 1, 2009

Course staff

Course convener: Mr Ted Spooner Room EE124A, E-mail: e.spooner@unsw.edu.au

Mentor: A mentor will be available for this course - see Web site for consultation times and locations.

Consultations:

One of the main reasons for running the tutorials is that they provide opportunities for students to ask questions and get direct assistance. So first try to get help from your tutors during the tutorial periods. If this is still not satisfactory then students should feel free to contact the lecturer (Ted Spooner), either by e-mail or face-to-face consultation. Note that unless your tutorial attendance record is good, your request for consultation with the lecturer will not be granted.

In addition, the School also provides one-on-one tutoring for this Course (no charge). More details will be available in Week 1.

Course details

Credits (UOC)

Course Elec 1111 is 6 UOC

Course GMAT 2610 is 3 UOC as it is only the first 6 weeks of the ELEC 1111 subject.

Contact Hours:

The course consists of 3 hours of lectures, one hour of tutorials and 2 hours of laboratory every week.

Lectures: Monday 9am - 1am Science Theatre

Tuesday 2 - 4pm Matthews A

Tutorials: Start week 1 refer to My UNSW for times and locations

Laboratories: Start week 0 for safety lecture Wednesday 2-3pm Matthews A and then weekly - refer to My UNSW for times and locations

Course Information

Context and aims

This is an introductory course in Electrical Engineering. It gives an overview of the fundamental aspects of electrical and telecommunications engineering. The course provides an introduction to electrical and telecommunications principles and provides basic technical skills to analyse simple circuits. In the practical section it provides hands-on experience in building and testing circuits. It is packaged in such a way that students, having taken this course, can go away and build some practical, useful devices afterwards. It is a pre-requisite for the subsequent course on Circuits and Signals.

Course Objectives:

At the end of the course you should be able to:

- (a) Have an overview of what can be achieved with electrical engineering.
- (c) Understand elementary concepts of electrical and telecommunications circuits, and their analysis.
- (d) Be familiar with basic laboratory equipment and techniques to measure electrical quantities.

Relation to other courses

This course is an introduction to electrical engineering for both electrical and telecommunications engineering students and engineers in general across the faculty. It is a pre-requisite for many other courses both in electrical and other engineering schools.

Pre-requisites:

There are no pre-requisites for this subject but it would be helpful to have a physics and mathematics background at high school level.

Assumed knowledge:

Working knowledge of basic mathematics including differentiation and integration techniques.

Student learning outcomes

After the successful completion of the course, the student will be able to

- Have an understanding of the breadth of Electrical and Telecommunications through exposure to an overview of Energy Systems, Telecommunications and Control Systems.
- Use Kirchhoff's laws, circuit theorems and node voltage methodology to solve simple circuits,
- Be able to solve simple 1st order transient circuits.
- Apply simple steady state sinusoidal analysis to circuits.
- Have an understanding of ideal operational amplifier application circuits
- Understand simple combinational logic circuits.

Contribution of course to graduate attributes:

- Development of knowledge and a basic understanding in the main areas of energy, control, and telecommunications.
- Development of analytical and critical thinking (via laboratory work and creative problem solving).
- The ability to engage in independent and reflective learning, which is addressed by the laboratory exercises.

Please refer to <http://www.ltu.unsw.edu.au/content/userDocs/GradAttrEng.pdf> for more information about graduate attributes.

Teaching strategies

The teaching in this course aims at establishing a good fundamental understanding of the areas covered by using formal lectures, interactive lectures which will require student contributions,

tutorials which allow for exercises in problem solving and allow time for students to resolve problems in understanding of lecture material and laboratory sessions which support the formal lecture material and also provide the student with practical construction, measurement and debugging skills.

Assessment

You are expected to attend all lectures, tutorials, labs and quizzes, in order to maximise learning. It is a UNSW requirement that you attend at least 80% of your classes. You should prepare your tutorial questions in advance of attending the tutorial classes. You must prepare well for your laboratory classes, and will be tested on this preparation at the beginning of each lab. In addition to the lecture notes, you should read relevant sections of the recommended text. Reading additional texts would further enhance your learning experience. Group learning is also encouraged.

Elec 1111

Activity	Assessment
1. Laboratory Practical Experiments	10%
2. Laboratory Practical test	5%
3. Quizzes-Weeks 5 & 9 during the Monday Lecture time	20%
4. Final written examination	65%
TOTAL	100%

GMAT 2610

Activity	Assessment
1. Laboratory Practical Experiments	10%
2. Laboratory Practical test	5%
3. Quiz - Week 5 during the Monday Lecture time	10%
4. Final written examination	75%
TOTAL	100%

As shown in the table above, there are three components to the overall assessment, namely:

- 1) Laboratory assessment: after completing each experiment, your work will be assessed by the laboratory demonstrator. A practical test will be run during the laboratory period in weeks 10 & 11. **You have to attend at least 80% of the labs AND attain a pass assessment in labs AND pass the lab test to pass the course.**

Students must hand in a signed safety form before starting the practical laboratory component. If a student attends laboratory sessions without having submitted a signed safety form the marks for those labs will be **zero**.

A satisfactory performance in the laboratory component is a necessary requirement to pass this course. This means that even if you score 100% on the final written examination and on the quizzes, you will not pass the course if your laboratory assessment is not satisfactory.

In Summary to pass the laboratory component and therefore the course you MUST do all of the following:

- **Hand in a signed Safety Form.**
- **For Elec1111 during weeks 1-12 you must attend at least 8 out of the 10 lab classes plus the lab test (or have handed in medical certificates)**

- **For GMAT2610 during weeks 1-6 you must attend at least 4 out of the 5 lab classes plus the lab test (or have handed in medical certificates)**
- **Obtain a pass mark average for the laboratory experiments.**
- **Pass the LAB EXAM.**

2) Quizzes: there will be two 45-minute quizzes during weeks 5 and week 9. These will be held during the Monday Lecture time. GMAT2610 students only attend the first.

Note: For all class assessment tasks ie Laboratory and quizzes, if the student is unable to attend for medical or other serious reasons (ie a death in the family) the student must present medical certificates and/or other documentation to the lecturer within 2 weeks of the assessment task. If this is not done within the required time period then no consideration will be given. In the case of missing a quiz for one of the reasons above, the assessment will be carried over to the final exam ie the final exam will become a higher % of the assessment.

Final examination: the final exam will be a closed book exam 3 hour for elec1111 and 2 hr for GMAT2610. In principle, the examination may cover any aspect of the course that has been presented in lectures, tutorials and/or laboratories. **You MUST achieve at least 35% in the final exam to pass the subject.**

Note: For repeat students who have a laboratory exemption, the laboratory exam mark from the previous years will not be counted again, but the final examination will be worth a higher % of their final mark. A laboratory exemption is only available, on application (forms available from School of EE&T Office), to students who had a satisfactory laboratory assessment. All other students who have previously failed this course are expected to attend at their scheduled laboratory times and to repeat all aspects of the laboratory.

If required, a *supplementary examination* for any student granted one by the School for major and documented medical reasons will be held after the exams results are released. Check with EE&T school office for dates. The supplementary examination may be an oral exam where small numbers of students are involved.

Warning about 1st Year

In a survey of students at the end of 1st year by far the majority agreed that 1st year Uni was much harder than the HSC. Do not treat 1st year lightly!

How to fail this course

The following points may be read in a light-hearted manner if you are certain that they never apply to you. However, it is a sad fact of life that there are too many students who get caught out by their attitude to study only to find that a failure in this course has severely affected their progress in the degree program. Read carefully. Be aware of any such bad habits and take appropriate action while there is still time.

- 1) Plan my time badly. There is plenty of time before the next test, exam or deadline for a report.
- 2) Don't bother to attend lectures; a photocopy is just as good.
- 3) Assuming that the first 15 minutes of each lecture revises the previous one, I shall not bother to read through my lecture notes before the next lecture.
- 4) There is no need for me to prepare for the next laboratory as I can always use the first half of the laboratory period for that purpose.
- 5) There is no need to actually involve myself in the lab, my partner can do most of the work. (Remember the lab test is done individually not as a group!)

- 6) There is no need to try any of the set problems at the moment as I shall easily understand the solutions when I download them later in the Session. Better still, my friend may already have done the download and print!
- 7) I may forget to turn up, or better still, I shall turn up at the wrong place and/or time, for a test or examination.
- 8) There is no need to plan my time in other courses; I can always catch up by skipping this course for a couple of weeks.

Academic honesty and 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.

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/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.

Course schedule

Lectures = 1x2 hrs/week + 1x1 hr/week, Tutorial = 1 hr/week Labs = 2 hrs/week

Draft Lecture schedule:

Wk No	Summary of Lecture Program
1	Introduction, Circuit Basics Overview + circuit elements
2	Kirchhoff's Laws.
3	Power & Energy, Node Equations & Circuit analysis
4	Node Equations & Circuit analysis, Thevenin
5	Thevenin, Superposition Circuit analysis
6	Ls and Cs, 1st order Transients
7	Transients
8	Intro to Sinusoidal analysis
9	Introduction to Telecommunications
10	Op amps
11	Op amps
12	Digital Logic

Timetable

See handout.

Lectures

This is a single session course with one two hour lecture and one one hour lecture every week.

Laboratory

Students are required to attend a two-hour laboratory every week. Laboratory groups are determined at enrolment. You can check your personalized timetable on the myUNSW web site (<http://my.unsw.edu.au>). You are expected to work at the scheduled time in the laboratory. All laboratory changes must be discussed with Ted Spooner who has sole authority over laboratory group allocations.

Tutorials

Students are required to attend a one-hour tutorial every week. Tutorial groups are determined at enrolment. You can check your personalized timetable on the myUNSW web site (<http://my.unsw.edu.au>).

Note that no marks are awarded directly for any part of the tutorial program in this course. However, they should still be treated as an important aspect of the course, not to be taken lightly. There are two components of the tutorial program:

1. Sets of problems are provided to give the student personal practice in solution and understanding. These problems will be related to recent lecture material with an emphasis on the basic concepts.
2. Demonstrations of important problem solving techniques by tutors.
3. Occasional quizzes will be held during the tutorial periods to allow the students to assess their own progress in the course.

Resources for students

Course web site

The course web site is at: <http://vista.elearning.unsw.edu.au/>

You will need your student ID and password to log on. It is important that you check this web site weekly. It serves as the class notice board where all important messages about this particular course are posted. In addition, students can download lecture notes, lab notes, tutorial handouts and other course-related materials. Also, links to some useful web sites are provided.

As the course progresses, students' marks from assessments such as labs and quizzes are available for personal viewing on this website.

Recommended Text(s):

For those proposing to continue in electrical & telecommunications engineering:

- "Fundamentals of Electric Circuits" Alexander & Sadiku, McGraw Hill. (This is also the new text for 2nd yr EE.)

For those proposing to follow other areas

- "Electrical Engineering Principles and Applications" Allan R Hambley, Prentis Hall.

Further Text(s) and Reference(s):

The reference books provide further reading in electrical engineering as well as a detailed treatment of circuit theory and digital circuits.

- 1) L.S. Bobrow, *Elementary Linear Circuit Analysis*, Oxford, 1987 [P621.3192/106]. This was the previous text for this course and also for ELEC2031.
- 2) J.F. Wakerly, *Digital Design: Principles and Practices*, 3rd Edition, Prentice-Hall, 2000 [P621.395/100]. The previous edition was the text for this course and also for ELEC1041.
- 3) A.S. Sedra and K.C. Smith, *Microelectronic Circuits*, 4th Edition, Oxford, 1998 [P621.3815/292]. This book is the text for ELEC3006 but is useful because small signal analysis of micro-electronic circuits is a major source of application of linear circuit theory.
- 4) R.L. Boylestad, *Introductory Circuit Analysis*, 9th Edition, Prentice-Hall, 2000 [PQ621.3815/198].
- 5) K.J. Breeding, *Digital Design Fundamentals*, 2nd Edition, Prentice-Hall, 1992 [P621.3815/214].
- 6) J.R. Cogdell, *Foundations of Electrical Engineering*, 2nd Edition, Prentice Hall, 1990 [P621.3/198].
- 7) J. Millman and A. Grabel, *Microelectronics*, McGraw-Hill, 1987 [P621.38173/68].

The Learning Centre UNSW

Online academic skills resource library:

<http://www.lc.unsw.edu.au/oilib.html>

Interactive resource on avoiding plagiarism & academic integrity:

<http://www.lc.unsw.edu.au/plagiarism/>

First steps information for new students

<http://www.lc.unsw.edu.au/firststeps/>

The Learning Centre offers individual consultation on drafts of assignments and also runs academic skills workshops see:

<http://www.lc.unsw.edu.au>

Course improvement

This course is continually under review and constructive student feedback is always valued. Periodically student evaluative feedback on the course is gathered, using among other means, UNSW's Course and Teaching Evaluation and Improvement (CATEI) Process. Student feedback is taken seriously, and continual improvements are made to the course based in part on such feedback.

Administrative Matters

It is important that students familiarise themselves with all the School of Electrical Engineering and Telecommunications policy and procedures. These are available at:

<http://scoff.ee.unsw.edu.au/information/information.htm>

The major information headings are listed below.

Information for Current Students

USE OF EE&T FACILITIES

- [Laboratory Regulations and Safety](#)
- [Evacuation Procedures](#)
- [OHS](#)
- [First Aid](#)
- [Locker hire](#)

ACADEMIC ISSUES

- [The Learning experience](#)
- [Submission of Written Work](#)
- [Resubmission](#)
- [Late Submission](#)
- [Plagiarism and Academic Honesty](#)
- [UNSW Examination Rules](#)
- [Special Consideration, Illness and Misadventure](#)
- [EE&T Supplementary Assessment Policy](#)
- [Supplementary Examinations](#)
- [Attendance](#)
- [Conduct](#)
- [Academic Standing](#)
- [Grading](#)
- [Grievance Procedures](#)

Equity and diversity: those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course convener prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equity and Diversity Unit (9385 4734 or www.equity.unsw.edu.au/disabil.html). Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made. Information on designing courses and course outlines that take into account the needs of students with disabilities can be found at:

www.secretariat.unsw.edu.au/acboardcom/minutes/coe/disabilityguidelines.pdf