Course Outline

ELEC1111: Electrical and Telecommunications Engineering

Faculty of Engineering

School of Electrical Engineering and Telecommunications

Session 1, 2010
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Course name

ELEC1111: Electrical and Telecommunications Engineering
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Session 1, 2010

Course staff

Course convener

Dr. Stephen Redmond, Room EE458, email: s.redmond@unsw.edu.au

Mentors

A mentor will be available for this course - consultation times and locations are to be decided.

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 (Stephen Redmond), either by e-mail or face-to-face consultation. Note: 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 3.

Course details

Credits (UOC)

Course Elec 1111 is 6 UOC.
Contact hours

The course consists of:

- 3 hours of lectures (2 + 1 hrs), one hour of tutorials and 2 hours of laboratory every week.

Lectures

Mathews Theatre B (K-D23-203): Tuesday 1 pm – 3 pm, Thursday 1 pm – 2pm.

Draft Lecture schedule:

Week No. | Summary of Lecture Program
--- | ---
1. | Introduction, Circuit Basics Overview + Lab Safety.
2. | Kirchhoff's laws
3. | Power & Energy, Series & Parallel
4. | Node Equations & Circuit analysis
5. | Thevenin & Superposition Theorems
6. | Circuit analysis + intro to inductors and capacitors
7. | 1st order Transients
8. | Intro to Sinusoidal analysis
9. | Transformers
10. | Opamps
11. | Introduction to Telecommunications
12. | Digital Logic

Tutorials

Start week 2. Refer to [http://my.unsw.edu.au/](http://my.unsw.edu.au/) for times and locations.

- 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/](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 three 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.

Laboratories

Start week 2 BUT must attend safety lecture (Thursday) Week 1 to be allowed to attend the lab.

Assessment

You are expected to attend all lectures, tutorials, labs and quizzes, in order to maximize 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.

Activity Assessment

Assessment - ELEC1111

<table>
<thead>
<tr>
<th>Activity</th>
<th>Assessment</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiki rough notes</td>
<td>5%</td>
<td>Scribes assigned randomly for each hour</td>
</tr>
<tr>
<td>Laboratory experiments</td>
<td>10%</td>
<td>Must attend 8/10 labs and get average above pass mark</td>
</tr>
<tr>
<td>Laboratory practical test</td>
<td>5%</td>
<td>Must pass to pass course</td>
</tr>
<tr>
<td>2 x weekly quizzes</td>
<td>20%</td>
<td>In 1 hour lecture slot (Week 5 &amp; 9)</td>
</tr>
<tr>
<td>Final written exam</td>
<td>60%</td>
<td>Must achieve 30% out of available 60% to pass course</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

Assessment - GMAT2610

<table>
<thead>
<tr>
<th>Activity</th>
<th>Assessment</th>
<th>Notes</th>
</tr>
</thead>
</table>


Laboratory experiments 10%
Laboratory practical test 5%
1 x weekly quizzes 10% in 1 hour lecture slot (Week 5)
Final written exam 75%
Total 100%

1) Rough Notes

- A number of students will be randomly selected each hour of each lecture to transcribe notes and enter them on the class wiki Rough Notes page for the week.
  - If you have a clash with your assigned slot, let me know and I'll reschedule you.
- These note must be up within 7 days of the assigned lecture time, after which time the page will be locked.
- 5% of the final mark is going for this contribution.
  - Marks are given for succinctness of information - NOT for the volume added.
- Each group of students will be marked as a group - with non-contributors getting less marks than the rest of their group.

2) 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 complete the safety form online (see Laboratories) before starting the practical laboratory component. If a student attends laboratory sessions without having completed the safety declaration 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:

- Complete the safety declaration
- 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)
- Obtain a pass mark average for the laboratory experiments.
- Pass the LAB EXAM.
3) Quizzes

- There will be two 45-minute quizzes during session as scheduled above. Repeat students are NOT exempt from these tests.
- Note: For all class assessment tasks, i.e. Laboratory and quizzes, if the student is unable to attend for medical or other serious reasons (i.e., 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; i.e., the final exam will become a higher % of the assessment.

4) Final Exam

- Final examination: the final exam will be a closed book exam 3 hour for elec1111. 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 30% (of the 60% which is available) 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.

Course Information

Context and aims

This 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:

1. Have an overview of what can be achieved with electrical engineering.
2. Understand elementary concepts of electrical and telecommunications circuits, and their analysis.
3. 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.

**Prerequisites**

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 a basic understanding of transformer operation.
- 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](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.

**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](http://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.

Resources for students

Course web site

• All announcements and course materials will be hosted on the UNSW Wikispace: http://elec1111.unsw.wikispaces.net
• You will need to join UNSW wikispaces (create a username and password)
• You must choose a username which is a concatenation of your first and last name: e.g. stephenredmond
• Then become a member of this wiki. The procedure by which this will happen is still to be decided.

• All marks from assignments, quizzes and exams can be found on Blackboard at: http://lms-blackboard.telt.unsw.edu.au
• You should be automatically enrolled in ELEC1111 on Blackboard.
• You will need your zPass to access this.

Recommended texts

• 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 texts and references

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.

The Learning Centre UNSW

Online academic skills resource library:
http://www.lc.unsw.edu.au/olib.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 Laboratory Regulations and Safety

- Laboratory regulations and safety (PDF)
- Evacuation procedures
- Occupational health and safety
- First aid

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