Faculty of Engineering
School of Electrical Engineering & Telecommunications

ELEC 1111

Electrical and Telecommunications Engineering

SESSION 2, 2013
ELEC1111

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Course convener

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Course details

Credits (UOC)

Course ELEC1111 is 6 UOC with an expected average workload of approximately 10-12 hours per week during session.

Contact hours

The course consists of:

- 3 hours of lectures (2 + 1 hrs)
- 1 hour of tutorial (starting in Week 2)
- 2 hours of laboratory every week (starting in Week 2)

Lectures

Please consult the timetable for the current timetable:

http://www.timetable.unsw.edu.au/current/ELEC1111.html

Course Information

Context and aims

ELEC1111 is an introductory course in Electrical Engineering. It gives an overview of the fundamental aspects of electrical and telecommunications engineering. The course provides basic technical skills to analyse simple circuits and understand the principle of operation of electrical machines and systems. 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.
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 electronic circuits, and their analysis.
3. Be familiar with basic laboratory equipment and techniques to measure electrical quantities.

Prerequisites and assumed knowledge

There are no prerequisites for this course but it would be helpful to have a physics and mathematics background at high school level, in particular, 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 a knowledge of basic aspects of Electrical and Electronics.
• Use Kirchhoff’s laws, circuit theorems and node voltage methodology to solve simple circuits,
• Be able to solve simple first order transient circuits.
• Apply simple steady state sinusoidal analysis to circuits.
• Have a basic understanding of machines and transformer operation.
• Have an understanding of basic principle of power generation, transmission and distribution.
• 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 electrical and electronics.
• 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.

Teaching strategies

The teaching in this course aims at establishing a good fundamental understanding of the areas covered by using

• Formal lectures
• 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.
• Video lectures will be posted in the Moodle website. Note these the video lectures are NOT intended as a replacement of the face-to-face lectures. It is possible that some material will
be provided by video lecture only later in session. They are of great benefit for students to review lecture material at their own pace, particularly for examination preparation.

- Midsession test, to enable students to assess their understanding of the concepts.

Draft Lecture schedule:

<table>
<thead>
<tr>
<th>Week No</th>
<th>Summary of Lecture Program</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction, Circuit Basics &amp; Lab Safety</td>
</tr>
<tr>
<td>2</td>
<td>Kirchhoff’s laws, Series &amp; Parallel circuits, Power &amp; Energy</td>
</tr>
<tr>
<td>3</td>
<td>Nodal &amp; Mesh analysis</td>
</tr>
<tr>
<td>4</td>
<td>Network Theorems</td>
</tr>
<tr>
<td>5</td>
<td>Inductors &amp; capacitors</td>
</tr>
<tr>
<td>6</td>
<td>First order circuits – RL &amp; RC circuits, transient responses</td>
</tr>
<tr>
<td>7</td>
<td>Intro to sinusoids, <strong>Midsession test</strong></td>
</tr>
<tr>
<td>8</td>
<td>AC systems</td>
</tr>
<tr>
<td>9</td>
<td>Operational amplifiers</td>
</tr>
<tr>
<td>10</td>
<td>Digital logic circuits</td>
</tr>
<tr>
<td>11</td>
<td>Electrical machines and transformers</td>
</tr>
<tr>
<td>12</td>
<td>Conventional and non-conventional power plants</td>
</tr>
</tbody>
</table>

Tutorials

Start in week 2. Refer to myUNSW web site (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.
- 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.

Laboratories

Start in week 2.

**Students must watch online the Safety Video Lecture in Week 1 and sign the Occupational Health and Safety Declaration form before being allowed to undertake the labs from Week 2. The Safety Lecture and Occupational Health and Safety Declaration form can be obtained via Moodle. The declaration form must be handed to the lab demonstrators on the day of your first lab.**
Laboratory Purchase
The following items will be required in the laboratory:
- Soldering and components kit - $10.
- Safety goggles - $5 (or bring your own)
- Prototyping board - $15 (useful if you are continuing with EE&T)

Pay money at School Office in Elec. Eng. Building (room EEG1) for soldering and components kit. Once a receipt is issued, pick up the items from the Electronic Workshop (room EEG14A)

For students continuing in Electrical Engineering & Telecommunications, it is also recommended to purchase a **small pair of wire strippers** for cutting and trimming component wires, and a **small pair of long-nose pliers** for inserting components into a prototyping board. These two items may be purchased from most electronics or hardware stores and will be used extensively in this and future laboratory courses.

Assessment

You are expected to attend all lectures, tutorials, labs and midsession test, 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.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Weightage</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory experiments</td>
<td>15%</td>
<td>-</td>
</tr>
<tr>
<td>Laboratory practical test</td>
<td>5%</td>
<td>-</td>
</tr>
<tr>
<td>Midsession test (week 7)</td>
<td>20%</td>
<td>-</td>
</tr>
<tr>
<td>Final written exam</td>
<td>60%</td>
<td>Must pass to pass the course</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td>-</td>
</tr>
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</table>

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, either by e-mail or face-to-face consultation (consultation times will be posted on Moodle). Note: unless your tutorial attendance record is good, your request for consultation with the lecturer will not be granted.

1) Laboratory assessment

- You are required to maintain a lab book for recording your observations. A lab book is an A4 size notebook containing a mix of plain pages and graph sheets. You have to purchase your own lab book from any stores.
• It is essential that you complete the laboratory preparation before coming to the lab. You will be recording your observations/readings in your lab book first and then complete and submit the results sheet before leaving the lab.
• The results sheet will be assessed by the laboratory demonstrator.
• A practical test will be run during the laboratory period in weeks 8 & 9.
• Students must complete the safety form posted online before starting the laboratory component. If a student attends laboratory sessions without having completed the safety declaration the marks for those labs will be zero.

NOTE: There will be no lab exemptions in this course for repeat students.

2) Midsession assessment

• There will be a midsession assessment in week 7. It will be scheduled during the regular lecture time. The test could be either online or a written test similar to final exam. The exact details about the assessment will be announced by week 4.
• Repeat students are NOT exempt from this assessment.
• Note: For all class assessment tasks, i.e. laboratory test and midsession test, if the student is unable to attend for medical or other serious reasons (i.e., a death in the immediate family) the student must present medical certificates and/or other documentation to the lecturer within 1 week of the assessment task. If this is not done within the required time period then no consideration will be given. In case of missing the midsession test or the lab test for one of the reasons above, the assessment will be carried over to the final exam; i.e., the final exam percentage will be increased by the percentage of the assessment. For example, the final exam will be assessed for 80% instead of 60%, in case of missing the midsession test.

3) Final Exam

• The final exam will be a closed book exam for 3 hours. In principle, the examination may cover any aspect of the course that has been presented in lectures, tutorials and/or laboratories. You must pass the final exam to pass the course.
• If required, a supplementary examination for any student granted one by the School for major and documented medical reasons will be held shortly after the course results are released. Check with EE&T school office for dates. These dates are NOT flexible and students will need to ensure that they are available at this time if required.

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 of 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.

**Resources for students**

**Course web site**

- All announcements and course materials will be hosted on the UNSW Moodle at: [https://moodle_eng.unsw.edu.au/moodle/](https://moodle_eng.unsw.edu.au/moodle/)
- You should be automatically enrolled in ELEC1111 on Moodle. You will need your zPass to access this.
- All marks from can be found on Moodle.
- A discussion forum is available in Moodle where students can post their doubts and discussions. Any student can answer the questions by any other student. Only questions related to ELEC1111 can be posted.

**Recommended texts**

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

**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

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.

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 (93854734 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