FACULTY of Engineering
SCHOOL of Electrical Engineering & Telecommunications

MINE2610
Mining Services
(Electrical Engineering Component)

Session 1, 2016
# MINE2610

## Mining Services

(Electrical Engineering Component)

## COURSE INTRODUCTION – Session 1 2016

### Course staff (Electrical)

- **Lecturer/Tutor:** Dr Ray Eaton, Faculty Dean's Unit, Level 6, K17  
  E-mail: r.eaton@unsw.edu.au  
- **Lab demonstrators:** TBC

### Consultations:

Please contact the course lecturer, Dr Eaton, initially by e-mail and then face-to-face consultation. A consultation time for MINE2610 will be confirmed from Week 8. ALL email enquiries should be made from your student email address; otherwise they will not be answered.

### Course details

#### Credits (UOC)

Course MINE2610 is 6 UOC course. The expected average workload for the electrical engineering component age is approximately 10-12 hours per week from Week 8-13.

#### Contact Hours:

<table>
<thead>
<tr>
<th>Lectures:</th>
<th>Pre-recorded video lectures provided. Lecture time used for tutorial and problem solving support. No additional face-to-face lectures required.</th>
</tr>
</thead>
</table>
| Tutorials: | Wed 11am-1pm Quad G031  
           | Thur 9am-11am TBC (weeks to be confirmed) |
| Week 8-13  |                                                                                                                                |
| Laboratories: | Tues 3pm-5pm Rm EE113  
            | Week 9-13  
|            | No other contact hours required for the Electrical Engineering part of the course. |

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Course Information

Context and aims
MINE2610 (Electrical) is an introduction to Electrical Engineering. It gives an overview of the fundamental aspects of electrical engineering. The course provides an introduction to electrical principles and provides basic technical skills to analyse simple practical circuits. In the practical section it provides experience in analysing simple circuits. It is packaged in such a way that students, having taken this course, can recognise, identify and analyse relevant practical, useful circuits and devices afterwards.

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 engineering and circuits, and their analysis.
(d) Be familiar with basic laboratory equipment, safety and techniques to measure electrical quantities.

Pre-requisites:
There are no pre-requisites for this component of MINE2610.

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 Engineering.
• Use Kirchhoff's laws, circuit theorems and node voltage methodology to solve simple circuits.
• Apply simple steady state sinusoidal analysis to circuits.
• Demonstrate a basic understanding of transformer operation.
• Demonstrate a basic understanding of electric machines and electrical safety.

Contribution of course to graduate attributes:
• Development of knowledge and a basic understanding in the main areas of electrical engineering.
• 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.eng.unsw.edu.au/hs/graduate-attributes 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

- Lectures provided as pre-recorded videos.
- 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.

Course schedule (Week 8-13)

Lectures = 3 hrs/week equivalent, Tutorial = 1 hr/week equivalent (from Week 9)
Labs = 2 hrs/weeks (from Week 9)

Indicative lecture schedule over 6 weeks:

<table>
<thead>
<tr>
<th>Period</th>
<th>Lecture Set No</th>
<th>Summary of Lecture Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 8</td>
<td>1</td>
<td>Introduction, Circuit Basics Overview + Lab Safety.</td>
</tr>
<tr>
<td>Week 9</td>
<td>2</td>
<td>Kirchhoff’s laws, Series &amp; Parallel</td>
</tr>
<tr>
<td>Week 10</td>
<td>3</td>
<td>Node Equations &amp; Circuit analysis</td>
</tr>
<tr>
<td>Week 10</td>
<td>4</td>
<td>Power &amp; Energy</td>
</tr>
<tr>
<td>Week 11</td>
<td>6</td>
<td>Introduction to inductors and capacitors, alternating current</td>
</tr>
<tr>
<td>Week 12</td>
<td>8</td>
<td>Transformers</td>
</tr>
<tr>
<td>Week 12</td>
<td>9</td>
<td>Electric Machines</td>
</tr>
</tbody>
</table>

Lectures

The electrical engineering part of the course will be delivered using pre-recorded video lecture presentations. You will need to watch these video lectures in your own time before the tutorials and labs. Advantages of the video recordings are:

- You will be able to watch them at your own pace.
- You can revisit the lecture content as many times as you like.
- Things that you might miss in a normal live lecture (e.g. difficult mathematical concepts) are available on the recording.

Note that not all video recordings will be released at once. Upon downloading and viewing a set of lectures, students will be required to undertake a small quiz on Moodle to gain feedback on their understanding. These quizzes ARE assessable and WILL contribute to your final grade. They are to ensure that students are viewing the lecture recordings.

Laboratory

Students are required to attend laboratory in from Week 8 to Week 13 as outlined in the Contact hours on Page 3. Laboratory attendance WILL be kept, and student MUST attend at least 80% of labs.

Students must view the safety lecture and sign the lab safety declaration form before being allowed to undertake the labs from Week 8. The safety lecture and declaration form can be obtained via Moodle.
Tutorials
Students are required to attend tutorials from Week 8 to Week 13 as specified in the Contact hours on Page 3. Tutorials are not in place as another form of lecture. It is important that you come to tutorials prepared. The tutorials will be run in the designated lecture time and will be used as problem solving sessions after the viewing of lecture material.

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.

Assessment (Electrical Engineering component only)
You are expected to view all lectures and attend all tutorials, labs and quizzes, in order to maximize learning. It is a UNSW requirement that you attend at least 80% of your classes. It is important to 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 exercise. 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>Assessment (As % of EE part)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory Practical Experiments</td>
<td>10%</td>
</tr>
<tr>
<td>On-line Fortnightly Quizzes</td>
<td>15%</td>
</tr>
<tr>
<td>Held at the end of Week 9, 11, 13</td>
<td></td>
</tr>
<tr>
<td>worth 15% total.</td>
<td></td>
</tr>
<tr>
<td>Final written examination</td>
<td>75%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100%</td>
</tr>
</tbody>
</table>

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. You have to attend at least 3 out of 4 of the lab weeks AND attain a pass assessment in labs.

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.
• You must attend all of the lab classes including.
• Obtain a pass mark average for the laboratory experiments.

2) **Quizzes:** the lecture videos will be split up into approximately 3 “sets”, each being associated with a small online quiz. Quizzes must be taken at the end of Weeks 9, 11, and 13, and will be available for 2-3 days only. **Students must obtain a minimum mark of 70% to be able to gain access to the next set of lecture videos.**

**Note: Negative Marks**
- The quizzes will attract negative marks for incorrect answers or guessed answers.

There is no limit to how many times each quiz may be attempted to achieve the 70% minimum. However the mark which contributes to the final grade will be taken as the maximum of the first and second attempt only.

3) **Final examination:** the final exam will be a closed book 2 hour exam. 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 subject.**

**Note:** For all class assessment tasks ie Laboratory and quizzes, if the student is unable to attend for medical or other serious reasons (e.g. a death in the family) the student must apply for special consideration. If the assessment task is greater than 20% then this must be done at Student Central, otherwise via the course convener. **ALL relevant documentation (e.g. medical certificates) must be presented within 3 days of the assessment.** 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 most likely be carried over to the final exam ie the final exam will become a higher % of the assessment. Please note that application for special consideration does not guarantee that it will be granted!

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 before the end of Week 7** (forms available from School of EE&T Office), and is only available 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.

**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 view lectures; a print-out of the slides is just as good.

3) 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.

4) 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!)
5) 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!

6) 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.

7) 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.

Resources on plagiarism and academic integrity can be located via:

https://student.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.

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

The course web site is Moodle. You will need your student z-pass to log on. It is important that you check Moodle several times per week. 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 the quizzes are available for personal viewing on this website.

Recommended Text(s):
“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.


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 on the School website: \url{http://www.engineering.unsw.edu.au/electrical-engineering}*