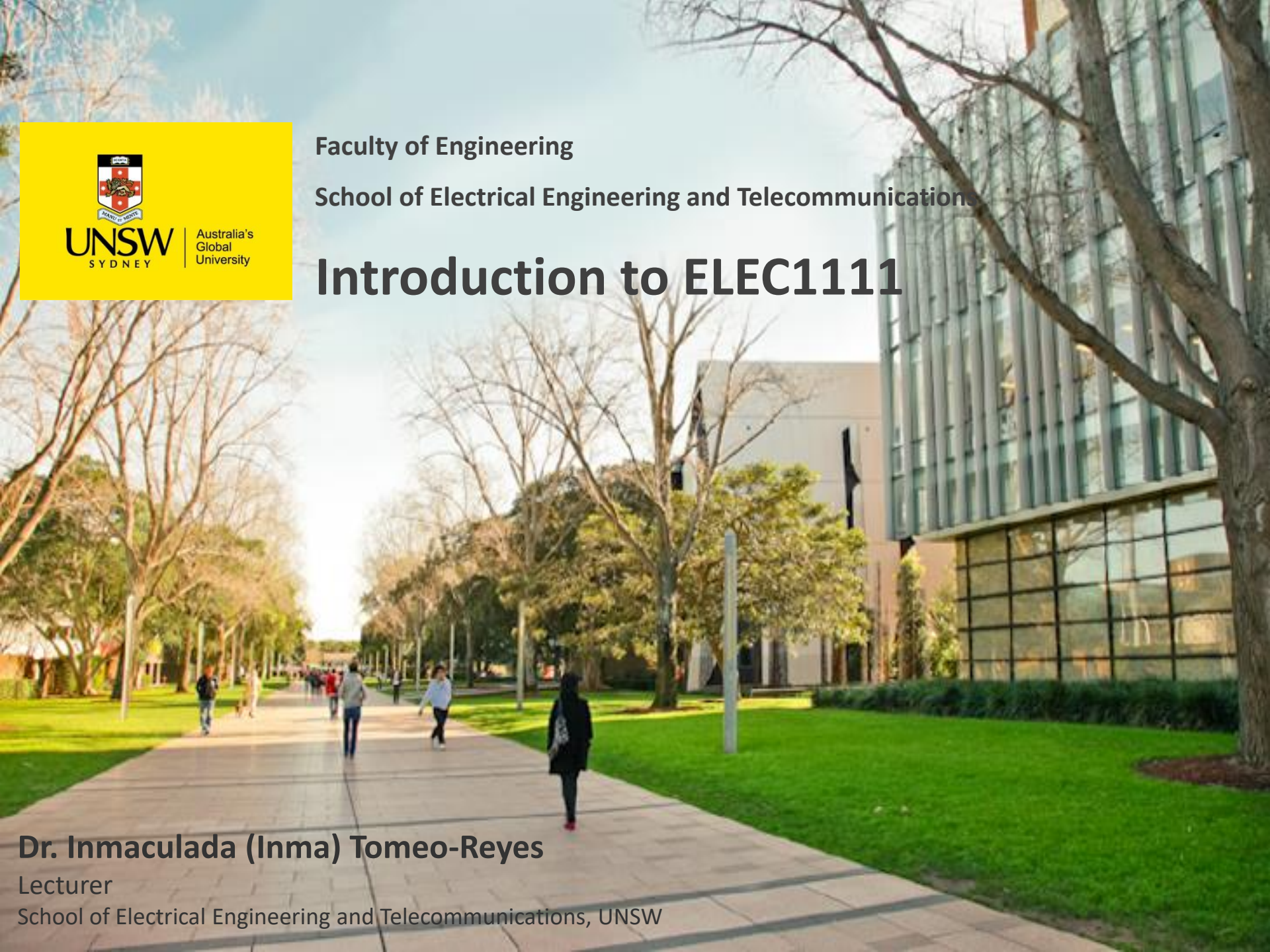


UNSW SYDNEY | Australia's Global University

Faculty of Engineering

School of Electrical Engineering and Telecommunications

Introduction to ELEC1111

Dr. Inmaculada (Inma) Tomeo-Reyes

Lecturer

School of Electrical Engineering and Telecommunications, UNSW

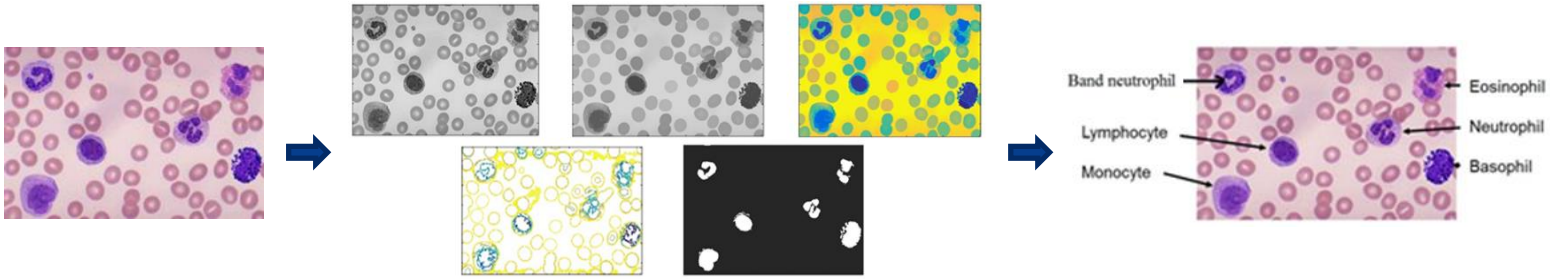
About Me

Background

- Lecturer (Education focused), UNSW, Australia (2018 –).
- Associate Lecturer, QUT, Australia (2015 – 2018).
- PhD in Electrical Engineering, QUT, Australia (2015).
- Research engineer, UC3M, Spain (2008 – 2011).
- Bachelor (2006) and Master (2008) of Telecommunications Engineering, and Master in Multimedia and Communications (2010), UC3M, Spain.

Main Research Interests

- Signal and Image Processing.
- Pattern Recognition and Machine Learning.
- Engineering Education.



About You

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General news and announcements for ELEC1111

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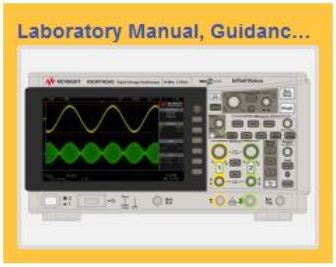


Please complete the survey by the end of this week.

UNSW SYDNEY

About the Course

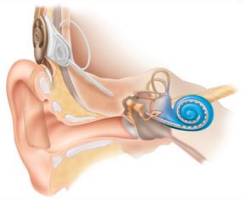
Features

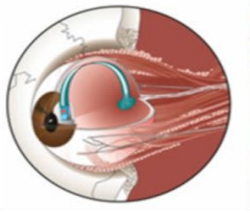
- Introductory course in Electrical Engineering.
- Provides an introduction to simple electrical circuits, as well as technical skills to analyse them.
- Hands-on experience in building and testing circuits.
- Pre-requisite for Circuits and Signals course (ELEC2134).

Assumed knowledge

- Physics (high-school level).
- Calculus (high-school level).
  - Matrices, linear equations and complex numbers.

Why Study This Course?





http://www.cochlear.com/wps/wcm/connect/au/home
http://www.saludamedical.com/home/

https://www.youtube.com/watch?v=lEr9cPpuAx8&feature=youtu.be

Course Staff

Lecturer/course coordinator

- Dr Inmaculada (Inma) Tomeo-Reyes
- School of Electrical Engineering & Telecommunications
- Room 444, EE&T building (G17)
- Email: i.tomeo-reyes@unsw.edu.au

Tutors

- Dr Hassan Habibi Gharakheili, h.habibi@unsw.edu.au
- Dr Branislav Hredzak, b.hredzak@unsw.edu.au
- Dr Hailong Huang, hailong.huang@unsw.edu.au
- Dr Saad Irtza, s.irtza@unsw.edu.au
- Dr Arash Khatamianfar, a.khatamianfar@unsw.edu.au
- Dr Inma Tomeo-Reyes, i.tomeo-reyes@unsw.edu.au

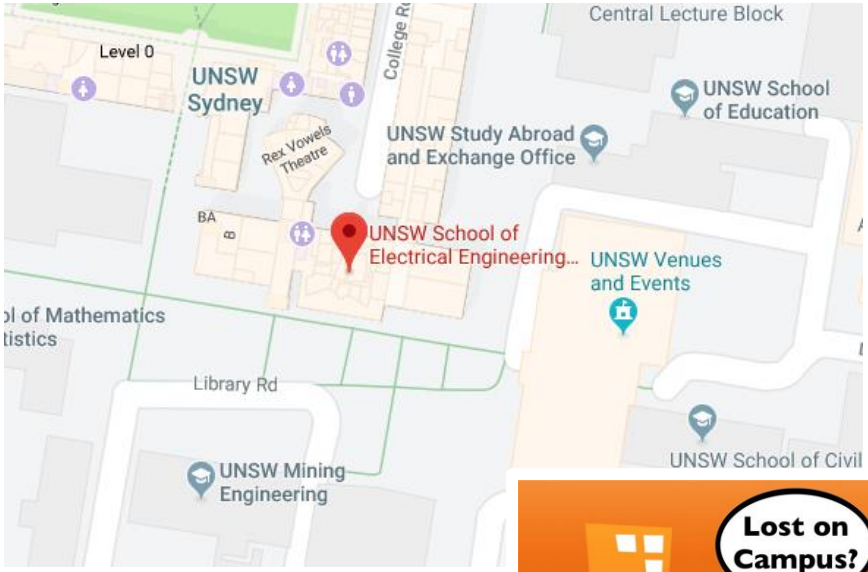
Mentors

- William Chen
- Matthew Vong
- Kern Sharma
- Arunan Sivanathan
- Anusuya Arunan
- Nathan Silver

Course Staff

Laboratory demonstrators

- Kern Sharma (Head lab demonstrator) kern.sharma@unsw.edu.au
- William Chen
- Matthew Vong
- Reede Rozowsky
- Jonathen Mervin
- Joshua Townsend
- Zimeng Liu
- Jason Dam
- Hugh Chan
- Ellington Bo Steanes
- Arunan Sivanathan
- Zhuoyu (Tony) Chen
- Laurence Boss
- Jack Armstrong
- Mahnee Przibilla
- Greta Paget
- Inma Tomeo-Reyes



How to Contact Us

Moodle

- Asking your questions in the Moodle forums helps to answer them for everyone.

Email

Use ELEC1111 in the subject line.

- Dr Inma Tomeo-Reyes (lectures, tutorials, labs or general questions): i.tomeo-reyes@unsw.edu.au
- Mr Kern Sharma (main contact for lab questions): kern.sharma@unsw.edu.au
- Dr Hassan Habibi Gharakheili (tutorials): h.habibi@unsw.edu.au
- Dr Branislav Hredzak (tutorials): b.hredzak@unsw.edu.au
- Dr Hailong Huang (tutorials): hailong.huang@unsw.edu.au
- Dr Saad Irtza (tutorials): s.irtza@unsw.edu.au
- Dr Arash Khatamianfar (tutorials): a.khatamianfar@unsw.edu.au

Consultation Times (Inma)

- Tuesdays: 14:00-16:00 (2 hrs).
- Thursdays: 16:00- 17:00 (1 hr).
- Mondays & Fridays: after the lecture.
- By appointment (preferred).

Need Help?

Post questions on Moodle forums (formal)

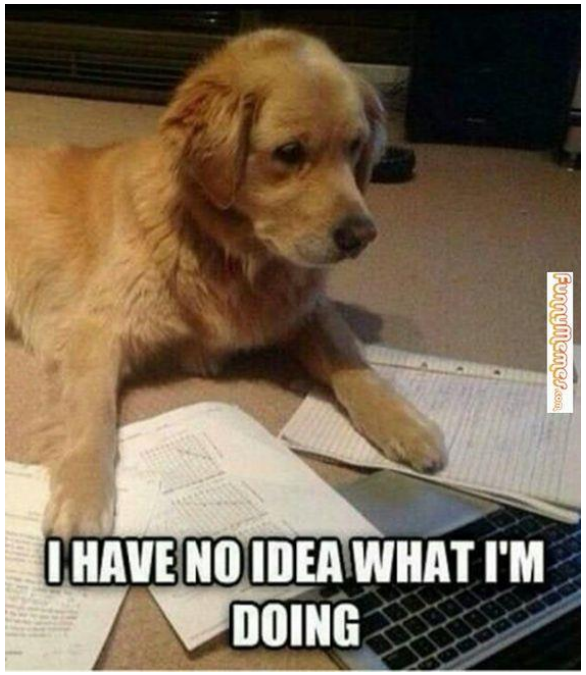
Ask your tutors/mentors in tutorial classes

Send me an email

Ask your lab demo during your labs

Use consultation time

Use Discord channel (informal)



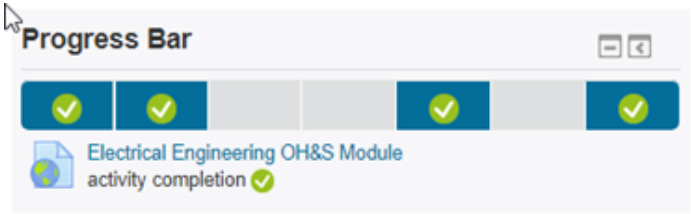
DON’T WAIT !

Online Learning System

Moodle

http://moodle.telt.unsw.edu.au

- Automatic access after enrolment in ELEC1111.
- All course materials will be available.
- All marks will be posted.
- All official announcements will be posted on Course Announcements (you will receive an email for each announcement).
- Discussion forums for general questions as well as for each of the topics (you will receive an email for each question, but you can ***unsubscribe***).
  - You can unsubscribe in "Manage forums subscriptions“ (no emails but you can access the forum).
  - You can also configure the email digest options, so that you do not receive one email every time.
- Possibility to keep track of the activities and tasks required to be completed.



Online Learning System

Course Resources

Calculator

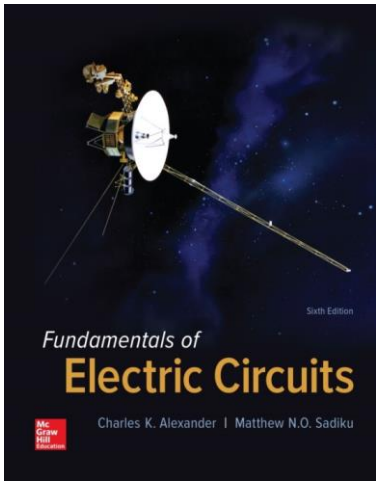
- UNSW approved exam calculators:

  https://student.unsw.edu.au/exam-approved-calculators-and-computers

- Recommendation: choose one with complex numbers computation capability.
  - “For the final exam (and your whole degree) get a Casio fx100au or Casio fx100au-plus. You just type in complex numbers straight in. It saves so much time. E.g. you can type (1 + j)/(3 at 60 degrees) and it will just figure out the answer in polar or rectangular form. If you don't get such a calculator, you will not do well. Learn how to use its functions prior to the exam.”

- Life saver and long-term investment.

Course Resources



Prescribed Textbook

- C. K. Alexander and M. N. O. Sadiku, *Fundamentals of Electric Circuits*, 6th ed., New York, NY, USA: McGraw-Hill, 2017.
- Where to get it:
  - UNSW Library.
  - UNSW Bookshop (print and electronic versions):
    Print version ($158): https://www.bookshop.unsw.edu.au/details.cgi?ITEMNO=9780078028229
    Electronic version ($55): https://unswbookshop.vitalsource.com/products/-v9781259663918
  - Upgrading your version of McGraw-Hill Connect to get your Smart Book ($44):
    Access via Moodle and follow instructions in “McGrawHill Connect Registration Steps.pdf”

Other Reference textbooks

- R. C. Dorf and J. A. Svoboda, *Introduction to Electric Circuits*, 9th ed., Hoboken, NJ: John Wiley and Sons, 2013.
- J. D. Irwin and R. M. Nelms, *Basic Engineering Circuit Analysis*, 11th ed., Hoboken, NJ: John Wiley and Sons, 2015.

Course Summary

Delivery mode

- **Lecture**, starting from Week 1 (4 hrs/week).
- **Face-to-face collaborative tutorials**, starting from Week 2 (2 hrs/week).
- **Laboratory Experiments,** starting from Week 2 (2 hrs/week).
- **Online resources**, to complete at your own pace, starting from Week 2:
  - Online tutorials.
  - Tutorial questions for practice.
  - Theoretical reviews and practice questions & problems from prescribed textbook (via McGraw Hill Connect).

Assessment

- Online quizzes.
- Mid-semester exam.
- Laboratory assessment and exam.
- Final exam.

Lectures

- 4 hours every week (3 sessions), starting from Week 1.
  - From week 2, the second lecture on Friday will be a “Lectorial” (combination of lecture and tutorial).

Day	Time	Location
Monday	10am - 12pm	Science Theatre
Friday	11am - 12pm	Science Theatre
Friday	5pm - 6 pm	Keith Burrows Theatre

Period	Summary of Lecture Program
Week 1	Introduction, Circuit Basics, Ohm’s law, Sources and Diodes
Week 2	Kirchhoff’s laws, Series & Parallel, Nodal and Mesh Analysis
Week 3	Circuit Theorems (Superposition, Thevenin, Norton, Source Transformation)
Week 4	Capacitors and Resistor-Capacitor (RC) Circuits
Week 5	Inductors and Resistor-Inductor (RL) Circuits
Week 6	Operational Amplifiers (Op Amps), **Mid-Semester Exam**
Week 7	AC Analysis I - Phasor and Impedance
Week 8	AC Analysis II - Circuit Theorems and AC Op Amps
Week 9	AC Power
Week 10	Digital Logic Circuits and Revision

NOTE: Lecture notes without solutions will be posted in Moodle before the Monday lecture. Lecture notes with solutions will be posted after the second Friday lecture.

Tutorials

Face-to-face collaborative tutorials

- 2 hours/week, starting from Week 2 (Monday to Friday - Check your timetable).
  - You will be given a practical problem(s).
  - You are expected to read the given problem(s) beforehand.
  - You are expected to attempt the given problem collaboratively in the class (groups of 6).
  - Tutors and mentors will help and check you solutions.

Online resources

To complete at your own pace, starting from Week 2.

Online tutorial videos

- You are expected to solve the questions (given on a separate PDF file) before watching the video.
- Watch the short videos on Moodle to learn the techniques and worked-out solutions.

Tutorial questions for practice

- You are expected to solve the questions (given on a separate PDF file) before checking the worked-out solutions.
- Carefully revise the worked-out solutions to learn the techniques.

Theoretical reviews and practice questions & problems from textbook

- Accessible to everyone from McGraw Hill Connect link in Moodle.
- Useful for following your progress if you respect due dates (note that due dates are only illustrative, since these activities are not assessed).
- You are expected to solve the questions before checking the feedback (worked-out solutions). You can check your result up to 5 times before revealing the feedback.
- Carefully revise the worked-out solutions to learn the techniques.

Laboratories

- 2 hours every week, starting from **Week 2** (Monday to Friday - Check your timetable).

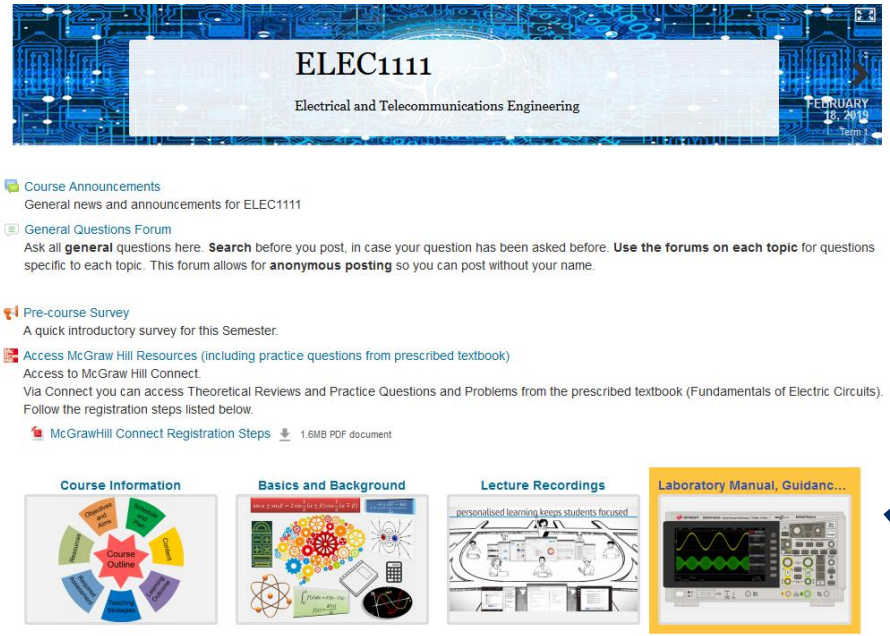
Period	Summary of Laboratory Program
Week 2	Lab/Experiment 1: Familiarization with Laboratory Equipment
Week 3	Lab/Experiment 2: Series and Parallel Circuits
Week 4	Lab/Experiment 3: Circuit Construction and Kirchhoff's Laws
Week 5	Lab/Experiment 4: Network Theorems
Week 6	Lab/Experiment 5: RC & RL Transients
Week 7	Lab/Experiment 6: Operational Amplifiers (Op Amps)
Week 8	**Lab Exam**
Week 9	**Lab Exam**
Week 10	Lab/Experiment 7: AC Circuits and AC Power
Week 11	Lab/Experiment 8: Digital Logic Circuits

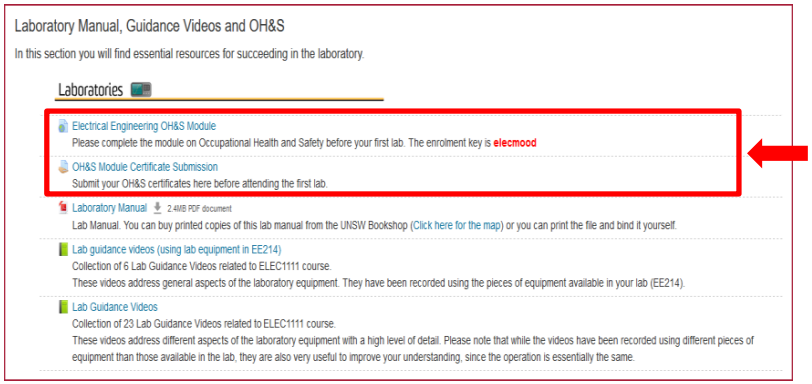
NOTE: Open laboratories will be organised in Week 7, before the lab exam. These will be organised at different time slots than those allocated to regular laboratories. Information will be provided closer to Week 7.

Laboratories

Electrical Engineering OH&S module and submission

- Self-enrolment module.
- Enrolment key is **elecmood**.
- Complete the module.
- Submit the certificate before the first lab.
- If you completed the module in the past, upload the old certificate.





Laboratories

Laboratory manual

- Can be purchased from UNSW Bookshop.
- PDF file on Moodle with Lab Guidance Video links.

Lab guidance videos

- On PDF version of the laboratory manual.
- Directly available on Moodle.

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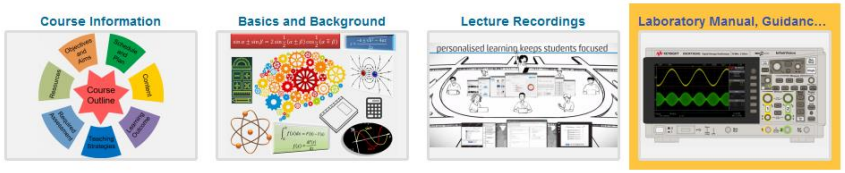
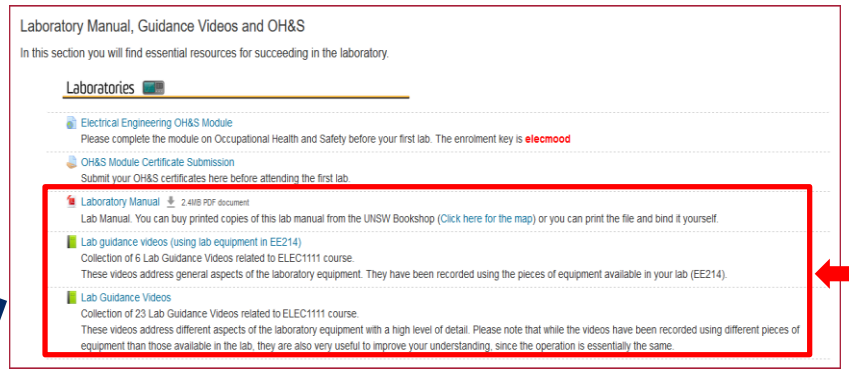




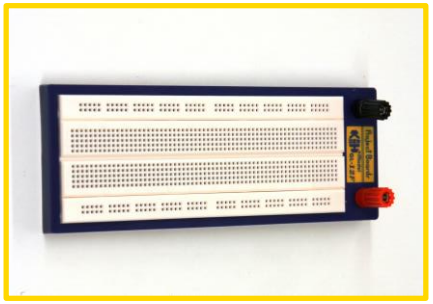
Laboratories

Lab component kit

Purchase from EE School Workshop office (Ground floor, G17 Building).

Prototyping board (breadboard)

Purchase from EE School Workshop office (Ground floor, G17 Building).



Laboratories

Pre-lab

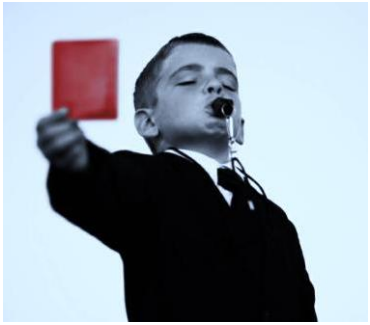
- Questions must be completed before attending the lab.
- Not permitted to attend the lab without completed pre-labs.

Experiments

- Follow the instructions.
- Collect all measurements.
- Draw proper figures and graphs.
- Maintain consistent accuracy.
- Keep and record all your results on your lab manual.
- Have clean and neat circuits.

NO PROPER CLOTHING?

NO LAB FOR YOU!



NOTE: Laboratories are done in pairs.

Attendance

Lectures

- At least 80% of the lectures (UNSW policy).
- Lecture videos will be available from Echo360 via Moodle.

Tutorials

- No restriction, but solutions to collaborative tutorials will not be provided unless you attend (different solutions are possible and they are checked in class).
- Online videos and tutorial problems for practice (with solutions) will be available on Moodle.

Laboratories

- Must attend at least 7 out of 8 labs.

AND

- Pass mark average for lab assessments (lab experiments).

AND

- Pass lab exam (Weeks 8 and 9).

Pass mark from lab component is a **Necessary Condition** for passing ELEC1111 course

Questions?

Assessment

Online quizzes	**5%**
Mid-semester exam	**25%**
Laboratory assessment & exam	**20%**
Final exam	**50%**

Repeating students are NOT exempt from any of these assessment items.

Online Quizzes

- One online quiz for each topic, starting from Week 2.
  - Useful to evaluate your progress on each topic (10 topics).
  - Module opens from Monday 9:00am to the next Monday 11:59pm.
- **Three** attempts for each quiz.
  - Instant feedback will be provided.
- Marked on your last attempt.
- The online quizzes mark will be the average mark of the 10 quizzes.
- The online quizzes mark accounts for **5%** of the total course mark.

Mid-semester Exam

- One-hour exam in Week 6 during usual lecture time.
  - Exact date and venue will be announced on Moodle.
- Covers all material from Week 1 to the end of Week 5.
- The mid-semester exam mark accounts for **25%** of the total course mark.

Laboratory assessment and exam

Laboratory assessment

- Each lab mark is a sum of pre-lab (20%) and experiment (80%) component marks.
- Marks for pre-labs and experiments will be awarded based on the effort and correctness of the results.
- Pre-labs and experiments will be marked during the lab time.
- The laboratory assessment mark will be the average of the 8 lab marks.
- The laboratory assessment mark accounts for **10%** of the total course mark.

Laboratory exam

- One hour practical exam in Weeks 8 and 9.
  - Time schedules will be announced on Moodle.
- The laboratory exam mark accounts for **10%** of the total course mark.

FAIL THE LAB!
FAIL THE COURSE !

Final Exam

- Standard closed-book two-hour written examination.
- Questions may be drawn from any aspect of the course.
- You must achieve a minimum of 40 marks out of 100 to pass the course.
- The final exam mark accounts for **50%** of the total course mark.

Questions?

Get Involved!

Find what interests you!

- Electronics?
- Quantum Computing?
- Power Engineering?
- Telecommunications?
- Control?

Join a student project

- BLUEsat
- Sunswift
- FIRST Robotics
- Or start your own
  - Student Project Seed Funding

- Get to know your fellow engineering students!
- Multidisciplinary work.
- Start researching interesting companies.
- Look for opportunities to meet professional engineers.

ELEC1111 offers fundamental tools and skill sets. What you build from these, depends on you.

Professional Societies

IEEE - Institute of Electrical and Electronics Engineers

- Student membership ~$30

IEEE
Advancing Technology for Humanity

Engineers Australia

- Student membership free

ENGINEERS AUSTRALIA

IET – The Institute of Engineering and Technology

- Student membership ~$30

IET The Institution of Engineering and Technology

Week 1: To-do List

- Read the course outline carefully.
- Check out Moodle.
- Fill the pre-course survey.
- Complete OH&S module and submit its form.
- Buy lab component kit and breadboard.

Questions?