ELEC876

Advanced Electronics Engineering

S1 Day 2019

School of Engineering

Contents

General Information

Unit convenor and teaching staff
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Credit points
4

Prerequisites
Admission to MEng and ELEC643 and ELEC676

Corequisites

Co-badged status
ELEC677 ELEC476

Unit description
This unit integrates prior learning in a specialist area of engineering with problem solving, emerging technology and aspects of engineering application, technical reporting and self-management to prepare students to work at a professional capacity. The unit aims to address the application of fundamental principles and methods at an advanced level in the context of standards and practices, modelling, analysis, design and practical implementation. The unit also develops skills in the critical evaluation of information, software and sources of error and experimental methods. Learning will be achieved using case studies, laboratories, presentations, group work and traditional lecture format. The specific topics will focus on current advances in the area including advanced electronics systems such as PLLs, oscillators, analogue-to-digital conversion, power conversion and control, IC design, radio circuits and systems, RF measurements, and CAD.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

Apply circuit theory and EDA tools to design advanced electronic circuits.

Demonstrate proficiency in designing advanced circuits to meet functional specifications.

Engage in design review process in an engineering context.

Demonstrate self-learning, time management and project management skills.

General Assessment Information

In order to pass this unit a student must obtain a mark of 50 or more overall or obtain a passing grade P/ CR/ D/ HD.

Late submissions

Late submissions will get 10% mark deducted per day after the deadline.

Assessment Tasks

Name	Weighting	Hurdle	Due
Functional Specifications	10%	No	TBD
Final Design Report	30%	No	TBD
Progress Review meetings	20%	No	TBD
Laboratory work	15%	No	TBD
Final examination	25%	No	TBD

Functional Specifications

Due: **TBD**
Weighting: **10%**

The aim of this project is to derive a functional specification for a LNA to be used in a given receiver. This is a group assignment and will be required to submit a report detailing derived specifications with justifications.

On successful completion you will be able to:

- Demonstrate proficiency in designing advanced circuits to meet functional specifications.
- Demonstrate self-learning, time management and project management skills.

Final Design Report

Due: **TBD**
Weighting: **30%**

Students should design a LNA to meet the approved functional specifications. The final design needs to be submitted in a report including layout, simulation and compliance to specification. This is an individual assignment.

On successful completion you will be able to:

- Apply circuit theory and EDA tools to design advanced electronic circuits.

- Demonstrate proficiency in designing advanced circuits to meet functional specifications.
- Demonstrate self-learning, time management and project management skills.

Progress Review meetings

Due: **TBD**
Weighting: **20%**

Students should present the progress of the LNA design fortnightly during lab sessions. The progress report slides should have max 3 slides and submitted prior to the labs. The details on submission times will be made available on iLearn.

On successful completion you will be able to:

- Apply circuit theory and EDA tools to design advanced electronic circuits.
- Demonstrate proficiency in designing advanced circuits to meet functional specifications.
- Engage in design review process in an engineering context.
- Demonstrate self-learning, time management and project management skills.

Laboratory work

Due: **TBD**
Weighting: **15%**

Laboratories will be given to build up skills in several areas, including but not limited to, the proper advanced use of EDA/CAD tools to help with the final design. Reports are due 1 week after the Laboratory session.

On successful completion you will be able to:

- Demonstrate proficiency in designing advanced circuits to meet functional specifications.
- Demonstrate self-learning, time management and project management skills.

Final examination

Due: **TBD**
Weighting: **25%**

A final two-hour open-book examination will be conducted in the formal examination period to test competency and understanding of the theory learnt in lectures and labs.

On successful completion you will be able to:

- Apply circuit theory and EDA tools to design advanced electronic circuits.
- Demonstrate self-learning, time management and project management skills.

Delivery and Resources

Text Books:

Michael Steer, "Microwave and RF Design, A Systems Approach".

Notes:

Lecture notes will be provided.

EDA tools:

AWR will be provided for simulations.

Consultation hour:

This will be posted on iLearn.

Unit Schedule

Refer to iLearn and lecture notes for the unit schedule.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
- Grade Appeal Policy
- Complaint Management Procedure for Students and Members of the Public
- Special Consideration Policy *(**Note:** The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.)*

Undergraduate students seeking more policy resources can visit the Student Policy Gateway (https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of

Conduct: https://students.mq.edu.au/study/getting-started/student-conduct

Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- Workshops
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

Student Services and Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

PG - Capable of Professional and Personal Judgment and Initiative

Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

Learning outcome

- Demonstrate self-learning, time management and project management skills.

Assessment tasks

- Final Design Report
- Progress Review meetings
- Laboratory work

PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

Learning outcome

- Apply circuit theory and EDA tools to design advanced electronic circuits.

Assessment tasks

- Functional Specifications
- Final Design Report
- Final examination

PG - Critical, Analytical and Integrative Thinking

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

Learning outcome

- Demonstrate proficiency in designing advanced circuits to meet functional specifications.

Assessment tasks

- Functional Specifications
- Final Design Report
- Final examination

PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

Learning outcomes

- Apply circuit theory and EDA tools to design advanced electronic circuits.
- Demonstrate proficiency in designing advanced circuits to meet functional specifications.
- Engage in design review process in an engineering context.

Assessment tasks

- Functional Specifications
- Final Design Report
- Final examination

PG - Effective Communication

Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

Learning outcome

- Engage in design review process in an engineering context.

Assessment tasks

- Final Design Report
- Progress Review meetings