ELEC8150

Electronic Design Proficiency

Session 2, Special circumstances, North Ryde 2021

School of Engineering

Contents

Session 2 Learning and Teaching Update

The decision has been made to conduct study online for the remainder of Session 2 for all units WITHOUT mandatory on-campus learning activities. Exams for Session 2 will also be online where possible to do so.

This is due to the extension of the lockdown orders and to provide certainty around arrangements for the remainder of Session 2. We hope to return to campus beyond Session 2 as soon as it is safe and appropriate to do so.

Some classes/teaching activities cannot be moved online and must be taught on campus. You should already know if you are in one of these classes/teaching activities and your unit convenor will provide you with more information via iLearn. If you want to confirm, see the list of units with mandatory on-campus classes/teaching activities.

Visit the MQ COVID-19 information page for more detail.

General Information

Unit convenor and teaching staff
Convenor
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Appointment via email

Tutor
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Credit points
10

Prerequisites
Admission to MEngElecEng

Corequisites

Co-badged status
ELEC4150

Unit description
This unit aims to put in practice various design techniques students have been exposed to throughout prior study in electronic engineering and assess their design proficiency. The unit consists of three main design domain topics covering Electronic Circuits, Signals and Systems, and Embedded/Control Systems. Students are given design challenges to complete from each of the three design domains, which they must complete and demonstrate over several weeks.

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:

ULO1: Propose, design and demonstrate working solutions to given engineering problems, applying knowledge drawn from topics in Electronic Circuits, Signals and Systems, and Embedded/Control Systems.
ULO2: Demonstrate design proficiency through completing projects drawn from Electronic Circuits, Signals and Systems, and Embedded/Control Systems domain topics.
ULO3: Acquire necessary background knowledge through self-directed learning, and then critically appraise, design to a specification and prototype electronic systems.
ULO4: Work within the constraints imposed by the availability of components, hardware and software tools to produce designs that meet user requirements.
ULO5: Prepare design documents, communicate and explain design decisions, and critically reflect on personal and professional development

General Assessment Information

Overall you are expected to spend 150 hours or work and study in this unit. This will included time spent in the practical labs, but importantly a substantial amount of selfdirected time working on electronics design tasks. The 'estimated time on task' for each assessment item is an estimate of the additional time needed to complete each assessment outside of all scheduled learning activities and non-scheduled self-directed learning. These estimates assume that you actively engage with the scheduled learning activities, as well as time spent on self-directed design development.

Grading and Passing Requirement

The assessment consists solely of the lab and design work and in-semester online activity - there is no final examination in this unit. In order for students to pass this unit, they must obtained an mark accumulated across all assessments of 50% or greater.

For further details about grading, please refer below in the policies and procedures section.

DESIGN TASKS (3 x 30%; estimate time on task = 36 hours)

- Demonstration and Oral Defence (3 x 22%)
- Reflective Journal (3 x 8%)

Each of the three design tasks is equally weighted and worth 30% in total. On the completion of the design tasks, students will provide an individual demonstration and oral defence of their design work. The Demonstration and Oral Defence accounts for 22% for each design tasks. **For each design task, the demonstration and defence will be undertaken in the practical class time and take approximately 15 minutes.** In the case of receiving an unsatisfactory (fail) grade for a design task, students will get a chance to undertake a supplementary lab in the final week of the semester, Week 13. In this supplementary lab, students will get a chance to improve on only one failed design task, and the grade for that task will be capped at 50%.

During weeks when the design tasks are due, students are required to submit a

written Experiment Design Log (like a journal). In the design log, which is to be completed periodically during the semester, students will be able to self-reflect on their work and experiences with the design task. Students should provide a description of the research, design, experimentation, and successful and failed attempts towards their final design for the course. In the same log, the students should also provide a detailed reference and online resource list that they used in order to complete the design task. The Experiment Design Log accounts for 8% (8 out of 30 marks for each task) of the total mark of each design task. **The length of the experimental log/journal will vary, however entries to the log should be made regularly and each time you carry out work on the design task.**

At the conclusion and assessment of each design task, letter grades will be reported in iLearn and feedback will be provided on an individual basis. Note that although constructive collaboration with student colleagues is acceptable, **students MUST prepare their own design and reflective experimental log.**

More detail on the oral defence and log will be provided, including a template and rubrics.

GROUP-BASED ONLINE ACTIVITY/PARTICIPATION (10%; estimate time on task = 6 hours)

Students will be required to engage in online activity and participation throughout the duration of the unit via iLearn. This activity will be primarily via group-based discussion, centred and reflecting on the design tasks and professional engineering attributes. Meaningful contribution to these discussions will be required in order to gain a satisfactory participation score. Details of this assessment and the activities will be made available in iLearn.

Late Submissions and Resubmission

There will be no opportunity for any late demonstration and oral defence unless special consideration is granted.

Late submission of the experimental design log will incur a penalty of 10% off the graded submission mark per day. Extenuating circumstances will be considered upon lodgement of an application for special consideration.

Resubmissions of work are not allowed.

Assessment Tasks

Name	Weighting	Hurdle	Due
Defence and Demonstration 1	22%	No	Week 5 in practical class
Design Task 1 journal	8%	No	Week 5 - 25/08/2021
Defence and Demonstration 2	22%	No	Week 9 in practical class
Design Task 2 journal	8%	No	Week 9 - 06/10/2021
Design Task 3 journal	8%	No	Week 12 - 27/10/2021

Name	Weighting	Hurdle	Due
Defence and Demonstration 3	22%	No	Week 12 in practical class
Small group-based online discussion	10%	No	Week 13 - 05/11/2021

Defence and Demonstration 1

Assessment Type [1]: Viva/oral examination
Indicative Time on Task [2]: 8 hours
Due: **Week 5 in practical class**
Weighting: **22%**

Demonstration of design task 1

On successful completion you will be able to:

- Propose, design and demonstrate working solutions to given engineering problems, applying knowledge drawn from topics in Electronic Circuits, Signals and Systems, and Embedded/Control Systems.
- Demonstrate design proficiency through completing projects drawn from Electronic Circuits, Signals and Systems, and Embedded/Control Systems domain topics.
- Acquire necessary background knowledge through self-directed learning, and then critically appraise, design to a specification and prototype electronic systems.
- Work within the constraints imposed by the availability of components, hardware and software tools to produce designs that meet user requirements.
- Prepare design documents, communicate and explain design decisions, and critically reflect on personal and professional development

Design Task 1 journal

Assessment Type [1]: Reflective Writing
Indicative Time on Task [2]: 4 hours
Due: **Week 5 - 25/08/2021**
Weighting: **8%**

Reflective journal on Design Task 1, logging and reflecting on the design process.

On successful completion you will be able to:

- Propose, design and demonstrate working solutions to given engineering problems, applying knowledge drawn from topics in Electronic Circuits, Signals and Systems, and Embedded/Control Systems.
- Acquire necessary background knowledge through self-directed learning, and then critically appraise, design to a specification and prototype electronic systems.
- Prepare design documents, communicate and explain design decisions, and critically reflect on personal and professional development

Defence and Demonstration 2

Assessment Type [1]: Viva/oral examination
Indicative Time on Task [2]: 8 hours
Due: **Week 9 in practical class**
Weighting: **22%**

Demonstration of design task 2

On successful completion you will be able to:

- Propose, design and demonstrate working solutions to given engineering problems, applying knowledge drawn from topics in Electronic Circuits, Signals and Systems, and Embedded/Control Systems.
- Demonstrate design proficiency through completing projects drawn from Electronic Circuits, Signals and Systems, and Embedded/Control Systems domain topics.
- Acquire necessary background knowledge through self-directed learning, and then critically appraise, design to a specification and prototype electronic systems.
- Work within the constraints imposed by the availability of components, hardware and software tools to produce designs that meet user requirements.
- Prepare design documents, communicate and explain design decisions, and critically reflect on personal and professional development

Design Task 2 journal

Assessment Type [1]: Reflective Writing
Indicative Time on Task [2]: 4 hours
Due: **Week 9 - 06/10/2021**
Weighting: **8%**

Reflective journal on Design Task 2, logging and reflecting on the design process.

On successful completion you will be able to:

- Propose, design and demonstrate working solutions to given engineering problems, applying knowledge drawn from topics in Electronic Circuits, Signals and Systems, and Embedded/Control Systems.
- Acquire necessary background knowledge through self-directed learning, and then critically appraise, design to a specification and prototype electronic systems.
- Prepare design documents, communicate and explain design decisions, and critically reflect on personal and professional development

Design Task 3 journal

Assessment Type [1]: Reflective Writing
Indicative Time on Task [2]: 4 hours
Due: **Week 12 - 27/10/2021**
Weighting: **8%**

Reflective journal on Design Task 3, logging and reflecting on the design process.

On successful completion you will be able to:

- Propose, design and demonstrate working solutions to given engineering problems, applying knowledge drawn from topics in Electronic Circuits, Signals and Systems, and Embedded/Control Systems.
- Acquire necessary background knowledge through self-directed learning, and then critically appraise, design to a specification and prototype electronic systems.
- Prepare design documents, communicate and explain design decisions, and critically reflect on personal and professional development

Defence and Demonstration 3

Assessment Type [1]: Viva/oral examination
Indicative Time on Task [2]: 8 hours
Due: **Week 12 in practical class**
Weighting: **22%**

Demonstration of design task 3

On successful completion you will be able to:

- Propose, design and demonstrate working solutions to given engineering problems, applying knowledge drawn from topics in Electronic Circuits, Signals and Systems, and Embedded/Control Systems.
- Demonstrate design proficiency through completing projects drawn from Electronic Circuits, Signals and Systems, and Embedded/Control Systems domain topics.
- Acquire necessary background knowledge through self-directed learning, and then critically appraise, design to a specification and prototype electronic systems.
- Work within the constraints imposed by the availability of components, hardware and software tools to produce designs that meet user requirements.
- Prepare design documents, communicate and explain design decisions, and critically reflect on personal and professional development

Small group-based online discussion

Assessment Type [1]: Participatory task
Indicative Time on Task [2]: 6 hours
Due: **Week 13 - 05/11/2021**
Weighting: **10%**

Small group-based online discussion about professional engineering design

On successful completion you will be able to:

- Prepare design documents, communicate and explain design decisions, and critically reflect on personal and professional development

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[1] If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the Writing Centre for academic skills support.

[2] Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Context and Aims

Although the theoretical skills that students acquire during their time at university form a strong foundation for their future career, industry naturally place particular importance on the design skills of our graduates. The aim of this unit is to allow the students to demonstrate their ability to integrate the knowledge and concepts they have acquired so far throughout the Electronics Engineering degree program and apply them to carry out practical design.

Assumed Knowledge

This is a unit that draws on knowledge and practical skills gained in your prior engineering studies in electronic and electrical engineering. This unit does not focus on teaching the design process itself, nor the basic concepts of any of the discipline areas. Instead, the combination of the students' theoretical knowledge and design skills in these areas will be assessed.

Delivery Mode

This unit consists mainly of pratical classes in the laboratory. You will carry out the development and testing of your designs, with the electronics equipment in place and with support available for guidance. Students are expected to prepare for each of the design lab sessions (except for Week 1) prior to arriving at the laboratory. During the lab session, students will be guided and supported by the tutor. However, as this is an assessment exercise, the staff will provide careful guidance such that the fundamental contribution to the design task remains that of the student. Essentially, this means emulating a realistic work environment where the engineer must have the fundamental knowledge and design skills, but is able to solicit general guidance. These include: i) Design tasks that are formulated to enable the students to combine their theoretical knowledge acquired from technical subjects; ii) Assessments targeted at evaluating the students' abilities and identifying areas for improvement in their skill base; iii) A laboratory organisation that in addition to the evaluation of the design process, provides the opportunity for students to improve their presentation and communications skills, as well as their sense of working in an engineering community; iv) Consultation to allow the students to seek assistance.

Technology and Equipment

Students should have access to their own breadboard to carry out designs in this unit. The designs will also make use of software including MATLAB and CAD packages such as SPICE for circuit simulation. Access to student versions of these packages will be necessary in order to be able to carry out the self-directed design development work at home.

Keeping Informed

Assignment instructions, study materials and all announcements for this unit will be made avaiable through iLearn at http://ilearn.mq.edu.au. Please refer to it frequently. Announcements may also be made during classes but everything will be formally announced in the relevant sections of iLearn. Please note that you will be deemed to have received this information, so you should take careful note of all announcements.

Asking for Help

You are encouraged to ask questions on the unit, after the class times and by posting questions in iLearn discussion forums, in the first instance. All email enquiries should be made to the unit convenor and come from your student email address with ELEC4150 in the subject line; otherwise they will not be answered.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://policies.mq.edu.au). 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

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

To find other policies relating to Teaching and Learning, visit Policy Central (https://policies.mq.edu.au) and use the search tool.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/admin/other-resources/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 help you improve your marks and take control of your study.

- Getting help with your assignment
- Workshops
- StudyWise
- Academic Integrity Module

The Library provides online and face to face support to help you find and use relevant information resources.

- Subject and Research Guides
- Ask a Librarian

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.