



ELEC8870

High Performance IC Design

Session 2, Special circumstances, North Ryde 2021

School of Engineering

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Disclaimer

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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

Senior Lecturer

Sourabh Khandelwal

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Contact via 9153

Room 319, 9 Wally's Walk

Mondays 12 noon to 1 pm Room 319, 9 Wally's Walk

Credit points

10

Prerequisites

Admission to MEngElecEng and 30cp at 3000 level or above

Corequisites

Co-badged status

Unit description

From modern telecommunications to tablet computing and from mobile handsets to the cloud, the limits of integrated circuit technology are being pushed to the limits of what is possible in terms of speed, size, and power. Beyond the IC itself, packaging concerns, both electrical and thermal, provide additional constraints in the design of the modern high performance integrated circuit. This unit will be taught from the research of both resident and visiting staff as well as from the latest research around the world.

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: Develop an understanding of different semiconductor technologies

ULO2: Develop proficiency in using standard electronic design automation (EDA) tools for IC design

ULO3: Perform integrated circuit (IC) design in a commercially used semiconductor technology

ULO4: Develop an understanding of the technical concept required for implementing

various high frequency on-chip active and passive circuits

ULO5: Demonstrate self-learning, time-management, technical report writing, project management (individually and as a group)

General Assessment Information

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

The submission of lab reports and assignments will be done via iLearn. Any lates submissions will lose 5% points per day after the submission deadline. No resubmissions permitted for lab reports and assignments. Extensions depeding on circumstances may be permitted at the discretion of unit convenor.

If you receive special consideration for the final exam, a supplementary exam will be scheduled by the faculty during a supplementary exam period, typically about 3 to 4 weeks after the normal exam period. By making a special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. Approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

Final project presentation will be in Week 13 during laboratory hours.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Lab report</u>	15%	No	Week 4, Week 8, Week 13
<u>Assignment</u>	15%	No	Week 3, Week 6
<u>Lab participation</u>	5%	No	Weekly lab
<u>Design Presentation</u>	15%	No	Week 13
<u>Final examination</u>	50%	No	Exam date

Lab report

Assessment Type ¹: Lab report

Indicative Time on Task ²: 12 hours

Due: **Week 4, Week 8, Week 13**

Weighting: **15%**

Three lab reports on design works

On successful completion you will be able to:

- Develop proficiency in using standard electronic design automation (EDA) tools for IC design
- Perform integrated circuit (IC) design in a commercially used semiconductor technology
- Develop an understanding of the technical concept required for implementing various high frequency on-chip active and passive circuits
- Demonstrate self-learning, time-management, technical report writing, project management (individually and as a group)

Assignment

Assessment Type ¹: Problem set

Indicative Time on Task ²: 12 hours

Due: **Week 3, Week 6**

Weighting: **15%**

Assignments based on lecture material

On successful completion you will be able to:

- Develop an understanding of different semiconductor technologies
- Develop proficiency in using standard electronic design automation (EDA) tools for IC design
- Perform integrated circuit (IC) design in a commercially used semiconductor technology
- Develop an understanding of the technical concept required for implementing various high frequency on-chip active and passive circuits

Lab participation

Assessment Type ¹: Design Task

Indicative Time on Task ²: 0 hours

Due: **Weekly lab**

Weighting: **5%**

Active and passive circuit implementation in the practical activities. Participation workload is assumed to take place inside the schedule teaching activity.

On successful completion you will be able to:

- Develop proficiency in using standard electronic design automation (EDA) tools for IC design
- Perform integrated circuit (IC) design in a commercially used semiconductor technology
- Demonstrate self-learning, time-management, technical report writing, project management (individually and as a group)

Design Presentation

Assessment Type ¹: Presentation

Indicative Time on Task ²: 12 hours

Due: **Week 13**

Weighting: **15%**

Powerpoint or other suitable format presentation on the final design task.

On successful completion you will be able to:

- Develop proficiency in using standard electronic design automation (EDA) tools for IC design
- Perform integrated circuit (IC) design in a commercially used semiconductor technology
- Develop an understanding of the technical concept required for implementing various high frequency on-chip active and passive circuits
- Demonstrate self-learning, time-management, technical report writing, project management (individually and as a group)

Final examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 49 hours

Due: **Exam date**

Weighting: **50%**

Final examination held in the formal exam period.

On successful completion you will be able to:

- Develop an understanding of different semiconductor technologies
 - Develop an understanding of the technical concept required for implementing various high frequency on-chip active and passive circuits
 - Demonstrate self-learning, time-management, technical report writing, project management (individually and as a group)
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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

Industry standard CAD tool Microwave Office will be used for design project and laboratory exercises. Students will be provided with details on how to access this tool.

Unit Schedule

Refer to iLearn and lecture notes for the lecture schedule.

There will be practical during week-1. The first week laboratory will get students oriented to the CAD tool which will be used in this unit.

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](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 \(https://students.mq.edu.au/su\)](https://students.mq.edu.au/su)

[port/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 \(https://policies.mq.edu.au\)](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.

Changes from Previous Offering

Based on student feedback, the laboratory exercises in the initial weeks have been modified so that they cover main parts of building the final design project.

ALTUM RF BEST STUDENT PRIZE

ALTUM RF (<https://www.altumrf.com/>) will award the top student of this unit during week 13 final project presentation session.

Top student is the student with highest marks in the unit by week-13. Final exam marks are not included for Altum RF award.

The award amount is 250\$. The award may be shared between multiple students if top students have equal marks.

Changes in Response to Student Feedback

Based on student feedback, the laboratory exercises in the initial weeks have been modified so that they cover main parts of building the final design project.