ELEC8870
High Performance IC Design
Session 2, Special circumstances, North Ryde 2021
School of Engineering

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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
sourabh.khandelwal@mq.edu.au
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://students.mq.edu.au/important-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 depending 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**

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

**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)

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 Learning Skills Unit 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://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
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/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 Enquiry Service**

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
Equity 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.

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 is 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.