



# ELEC8875

## Reconfigurable Antennas and Electronics

Session 2, Special circumstance 2020

*School of Engineering*

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#### **Disclaimer**

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#### **Notice**

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group learning activities on campus for the second half-year, while keeping an online version available for those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face and online activities for your unit, please go to [timetable viewer](#). To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

## General Information

Unit convenor and teaching staff

Unit Convenor

Raheel Hashmi

[raheel.hashmi@mq.edu.au](mailto:raheel.hashmi@mq.edu.au)

Contact via 98509130

136-44WR

Tuesday, 3-5pm

Credit points

10

Prerequisites

Admission to MEngElecEng or MEngNetTeleEng

Corequisites

Co-badged status

Unit description

Electronics systems that can adapt to changing conditions allow for higher performance and extended service life as well as creating more robust and tolerant application solutions. This unit will explore reconfigurable electronics from three perspectives: electronics devices useful for reconfiguration, reconfigurable antennas, and integrated systems.

## 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:** Describe the need of reconfigurability in the context of modern and future communication systems

**ULO2:** Explain the functionality of electronic components that are used to achieve reconfigurability

**ULO3:** apply software simulation tools to design, analyse, and characterise reconfigurable systems

**ULO4:** Critique the state-of-the-art in the context of reconfigurable electronics systems and analyse complex information relating to integrated reconfigurable electronics in a

professional demeanor

## General Assessment Information

### Grading and passing requirement for unit

In order to pass this unit a student must obtain a mark of 50 or more for the unit (i.e. obtain a passing grade P/ CR/ D/ HD).

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

### Late submissions and Re-submissions

Late submissions will attract a penalty of 10% marks per day. Extenuating circumstances will be considered upon lodgement of a special consideration application.

Resubmissions of work are not allowed after due date.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<a href="#"><u>Design Problem Assignment (Simple)</u></a>	20%	No	Week 5
<a href="#"><u>Design Problem Assignment (Complex)</u></a>	20%	No	Week 8
<a href="#"><u>Simulation Project Demonstration and Viva-Voce</u></a>	30%	No	Week 10
<a href="#"><u>Case Study and Analysis Report</u></a>	30%	No	Week 13

### Design Problem Assignment (Simple)

Assessment Type <sup>1</sup>: Design Task

Indicative Time on Task <sup>2</sup>: 16 hours

Due: **Week 5**

Weighting: **20%**

Written take-home assignment where students solve numerical problems and apply the solutions to qualitatively evaluate provided scenarios involving simple practical problems

On successful completion you will be able to:

- Describe the need of reconfigurability in the context of modern and future communication systems
- Explain the functionality of electronic components that are used to achieve reconfigurability

## Design Problem Assignment (Complex)

Assessment Type <sup>1</sup>: Design Task

Indicative Time on Task <sup>2</sup>: 16 hours

Due: **Week 8**

Weighting: **20%**

Written take-home assignment where students work on calculating and developing a design of a complex reconfigurable electronic system to meet pre-defined specifications

On successful completion you will be able to:

- Explain the functionality of electronic components that are used to achieve reconfigurability

## Simulation Project Demonstration and Viva-Voce

Assessment Type <sup>1</sup>: Design Implementation

Indicative Time on Task <sup>2</sup>: 30 hours

Due: **Week 10**

Weighting: **30%**

Demonstration and viva-voce relating to understanding of simulation tools and implementation of a functional design of one or more reconfigurable systems that meet pre-specified requirements

On successful completion you will be able to:

- apply software simulation tools to design, analyse, and characterise reconfigurable systems

## Case Study and Analysis Report

Assessment Type <sup>1</sup>: Case study/analysis

Indicative Time on Task <sup>2</sup>: 25 hours

Due: **Week 13**

Weighting: **30%**

Written report based on case studies of state-of-the-art reconfigurable systems, based on peer-reviewed research articles. Students think as a design engineer and critique on selected topics, in the light of the concepts and experiences gained through the learning activities in the unit. The

report is written as an article in the format suitable for an IEEE Conference publication, with abstract, introduction, conclusions and references, as well as the main body of the paper, detailing quantitative and qualitative analyses.

On successful completion you will be able to:

- Critique the state-of-the-art in the context of reconfigurable electronics systems and analyse complex information relating to integrated reconfigurable electronics in a professional demeanor

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<sup>1</sup> 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.

<sup>2</sup> 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

There will be a sequence of lectures and guest talks during the semester. These lectures will include new material to explore the trends in modern electronic systems requiring reconfigurability and its utilisation, as well as design considerations and methodologies to design such systems. Lecture notes, worked example problems, and software tutorials, will be posted to iLearn.

Software: CST Microwave Studio and CST Design Studio will be used in this unit. The unrestricted commercial version of CST software will be available to the students in the university's labs. Due to licence restrictions, students will be able to use the software on PCs of timetabled labs within the campus premises. A free student version of this software is available for the students to download and use on personal computers. Note that the student version is limited in terms of the problem size (number of mesh cells) that can be simulated and the models developed on the student version are not compatible with the unrestricted commercial version of CST software. Students are recommended to use the free student version for extra practice and exploratory simulations, as a supplement to the in-lab workshop tasks.

Reference material will be available through Library:

Research Articles from IEEE Xplore Online Digital Library - recommended by the lecturer

"Millimeter Wave Wireless Communications" by Theodore Rappaport, Robert Heath, Robert Daniels and James Murdock (Prentice Hall)

"Antenna theory : analysis and design" by Constantine A. Balanis (Harper & Row)

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](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.*)

Students seeking more policy resources can visit the [Student Policy Gateway \(https://students.mq.edu.au/support/study/student-policy-gateway\)](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 \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](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](http://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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](http://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](http://ask.mq.edu.au)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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/](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.