



# TELE3021

## Communication Systems

Session 2, Weekday attendance, North Ryde 2021

*School of Engineering*

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#### Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

#### 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

Sam Reisenfeld

[sam.reisenfeld@mq.edu.au](mailto:sam.reisenfeld@mq.edu.au)

Contact via E-mail

44 Waterloo Road, Room 135

Thursday, 4-6 pm pm

Tutor

Shahidul Islam

[shahidul.islam@mq.edu.au](mailto:shahidul.islam@mq.edu.au)

Contact via E-mail

44 Waterloo Road, G53

Credit points

10

Prerequisites

((ELEC2040 or ELEC240) and (MATH235 or MATH2055)and (TELE3001 or STAT394)) or admission to MEngElecEng or MEngNetTeleEng

Corequisites

Co-badged status

Unit description

This unit explores: Fourier theory, including frequency-time duality; analogue amplitude and frequency modulation; digital communication systems, including sampling, modulation and demodulation methods, source and line coding, multi-symbol signalling; noise and its effects including noise types and spectrum, information capacity, noise measures, noise performance of digital communication systems, error-control coding and decoding; and communication-system case studies.

## 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:** Design and analyze the performance of analogue communication systems

**ULO2:** Design and analyze the performance of digital communication systems

**ULO3:** Obtain the performance of communication systems using computer simulation

**ULO4:** Optimally select a communication system design for a particular application using power efficiency and bandwidth efficiency

## General Assessment Information

There are no hurdle tasks in this unit.

## Assessment Tasks

| Name  | Weighting | Hurdle | Due               |
|---|-----------|--------|-------------------|
| <a href="#"><u>Laboratory Report</u></a>            | 15%       | No     | Week 12           |
| <a href="#"><u>Communication Systems Report</u></a> | 35%       | No     | Week 12           |
| <a href="#"><u>Final Examination</u></a>            | 50%       | No     | Final Exam Period |

### Laboratory Report

Assessment Type <sup>1</sup>: Lab report

Indicative Time on Task <sup>2</sup>: 10 hours

Due: **Week 12**

Weighting: **15%**

Report on Laboratory Work

On successful completion you will be able to:

- Design and analyze the performance of analogue communication systems
- Design and analyze the performance of digital communication systems
- Obtain the performance of communication systems using computer simulation
- Optimally select a communication system design for a particular application using power efficiency and bandwidth efficiency

### Communication Systems Report

Assessment Type <sup>1</sup>: Report

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

Due: **Week 12**

Weighting: **35%**

5,000 word report on a major topic in Communication Systems

On successful completion you will be able to:

- Design and analyze the performance of analogue communication systems
- Design and analyze the performance of digital communication systems
- Obtain the performance of communication systems using computer simulation
- Optimally select a communication system design for a particular application using power efficiency and bandwidth efficiency

## Final Examination

Assessment Type <sup>1</sup>: Examination

Indicative Time on Task <sup>2</sup>: 24 hours

Due: **Final Exam Period**

Weighting: **50%**

Closed book final examination in the formal exam period

On successful completion you will be able to:

- Design and analyze the performance of analogue communication systems
- Design and analyze the performance of digital communication systems
- Obtain the performance of communication systems using computer simulation
- Optimally select a communication system design for a particular application using power efficiency and bandwidth efficiency

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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

Lecture will be given online.,

Lecture materials and Tutorial Questions will be uploaded to iLearn.

Lectures will be recorded on Echo Recordings.

Laboratories will use TIMS electronic modules manufactured by Emona Instruments and will also use Universal Software Radio Peripheral (USRP) modules and LabVIEW software supplied by National Instruments.

Recommended readings are ELEC321 lecture notes and the following reference books:

- S. Haykin, Communications Systems, 5th Edition, Wiley.
- B.P. Lathi, Z. Ding, Modern Digital and Analog Communication Systems, 4th Edition, Oxford University Press.
- L.W. Couch, II, Digital and Analogue Communication Systems, 6th or 7th Edition, Prentice Hall.
- S. Haykin, M. Moher, Introduction to Digital and Analog Communications, 2nd Edition, Wiley.
- B. Sklar. Digital Communications: Fundamentals and Applications, 2nd Edition, Prentice-Hall.
- H. Nguyen, E. Shwedyk, A First Course in Digital Communications, 1st Edition, Cambridge
- J.G. Proakis, M. Salehi, and G. Bauch, Contemporary Communication Systems Using Matlab, 2nd Edition, C.L. Engineering.
- D. Silage, Digital Communication Systems using Matlab and Simulink, Bookstand Publishing.
- Won Y. Yang, Matlab/Simulink for Digital Communication, First Edition, A-Jin Publishing.
- The Mathworks, MATLAB & Simulink Student Version 2011a, Prentice Hall.

## **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/support/study/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) (<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](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.

## Changes in Response to Student Feedback

Additional worked example problems will be presented in lecture and tutorial.