



# COMP6255

## Introduction to Mobile Communications

Session 1, In person-scheduled-weekday, North Ryde 2023

*School of Computing*

### Contents

---

<a href="#"><u>General Information</u></a>	2
<a href="#"><u>Learning Outcomes</u></a>	2
<a href="#"><u>General Assessment Information</u></a>	3
<a href="#"><u>Assessment Tasks</u></a>	4
<a href="#"><u>Delivery and Resources</u></a>	6
<a href="#"><u>Unit Schedule</u></a>	7
<a href="#"><u>Policies and Procedures</u></a>	8

---

#### **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.

## General Information

Unit convenor and teaching staff

Young Lee

[young.lee@mq.edu.au](mailto:young.lee@mq.edu.au)

Lecturer

James Phung

[james.phung@mq.edu.au](mailto:james.phung@mq.edu.au)

Credit points

10

Prerequisites

COMP6250

Corequisites

Co-badged status

COMP3255

Unit description

This unit will examine mobile communication technologies such as WCDMA, WLAN and LTE as well focus on Radio Access Network (RAN) technology. This unit will describe principles and design constraints, and provide advanced insights into the features of 5G networks such as New Radio (NR), NG-RAN distributed architecture, and network slicing. It will also expose the students to core principles that underpin mobile technologies such as multiple access techniques, power/interference management, security management, traffic models, and Quality of Service. This unit will also impart practical skills in designing, configuring, installing, and troubleshooting mobile networks.

## 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:** Identify and apply the appropriate techniques such as mobility management, location/handoff management, routing, frequency management, cross-layer optimisation, cellular systems, and IP interfacing.

**ULO2:** Configure and troubleshoot a range of key mobile protocols and standards.

**ULO3:** Perform security management for mobile communications.

**ULO4:** Building, configuring, and troubleshooting networks and performance-testing.

**ULO5:** Explain how distributed applications are supported by mobile networks.

## General Assessment Information

The University's academic honesty policy will be enforced. You may assist your fellow students with general concepts, pointers to resources and useful tools or commands that are publicly available. You may not become involved in any way in helping a fellow student to find the solution to their particular task, nor may you share with them any aspect of the solution of your particular task. If you decide to develop or modify a tool (including software tools, procedures or methods) to assist you in solving your programming task, you may not provide that tool to your fellow students, nor may you publish it.

Each assessment task must be the sole work of the student turning it in. Any cheating will be handled under the University's Academic Honesty Policy.

### Requirements to Pass this Unit

To pass this unit you must achieve a total mark equal to or greater than 50%.

### Late Assessment Submission Penalty

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark) will be applied each day a written assessment is not submitted, up until the 7<sup>th</sup> day (including weekends). After the 7<sup>th</sup> day, a grade of '0' will be awarded even if the assessment is submitted. Submission time for all written assessments is set at **11:55 pm**. A 1-hour grace period is provided to students who experience a technical concern.

For any late submission of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, students need to submit an application for [Special Consideration](#).

### Assessments where Late Submissions will be accepted

In this unit, late submissions will be accepted as follows:

- Workshop tasks – NO, unless Special Consideration is granted
- Quizzes – NO, unless Special Consideration is granted
- Assignments – YES, Standard Late Penalty applies

### Special Consideration

If you experience serious and unavoidable difficulties that affect your ability to meet the due dates for progress or the closing date of an assessment task, you may apply for special consideration as explained at <https://students.mq.edu.au/study/my-study-program/special-consideration>. If the request is accepted, the action may be to grant an extension of the relevant due date(s), or it may be to require you to submit an alternative assessment item.

If you apply for special consideration, please note:

- Apply promptly. Late applications may make it impossible to sensibly offer an extension, and you may risk having to complete a different assessment task which would mean starting from scratch. For example, if you are ill for two days just before the due date, an extension of two days would be reasonable, but that extension cannot be granted more than two days after the due date since the extension end date would have already passed!
- Email the convenor (young.lee@mq.edu.au) and unit lecturer to let us know what is happening. This will make it easier for us to respond in a timely manner

## Assessment Tasks

Name	Weighting	Hurdle	Due
<a href="#">Workshops</a>	10%	No	Weekly
<a href="#">Quizzes</a>	30%	No	Weeks 4 - 13
<a href="#">Assignment 1</a>	20%	No	Week 7
<a href="#">Assignment 2</a>	40%	No	Week 12

### Workshops

Assessment Type <sup>1</sup>: Practice-based task

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

Due: **Weekly**

Weighting: **10%**

Workshops give students an opportunity to practice your practical networking skills under the supervision of a demonstrator. It will also allow students to discuss the problems effectively with their tutor/peers and maximise the feedback they get on their work.

On successful completion you will be able to:

- Configure and troubleshoot a range of key mobile protocols and standards.
- Building, configuring, and troubleshooting networks and performance-testing.

### Quizzes

Assessment Type <sup>1</sup>: Quiz/Test

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

Due: **Weeks 4 - 13**

Weighting: **30%**

The Quiz measures students' knowledge and comprehension of unit materials. Quiz Question types include multiple choice, matching items, true/false, short answer and many more. Quizzes usually span multiple learning outcomes.

On successful completion you will be able to:

- Identify and apply the appropriate techniques such as mobility management, location/handoff management, routing, frequency management, cross-layer optimisation, cellular systems, and IP interfacing.
- Configure and troubleshoot a range of key mobile protocols and standards.
- Perform security management for mobile communications.
- Explain how distributed applications are supported by mobile networks.

## Assignment 1

Assessment Type <sup>1</sup>: Practice-based task

Indicative Time on Task <sup>2</sup>: 20 hours

Due: **Week 7**

Weighting: **20%**

Problem Solving and analysis: The purpose of the problem solving assignment is to help the students to get accustomed to dealing with real world problem situations/issues. It is designed to help students analyse a particular problem and find its best solution.

On successful completion you will be able to:

- Identify and apply the appropriate techniques such as mobility management, location/handoff management, routing, frequency management, cross-layer optimisation, cellular systems, and IP interfacing.
- Perform security management for mobile communications.
- Explain how distributed applications are supported by mobile networks.

## Assignment 2

Assessment Type <sup>1</sup>: Practice-based task

Indicative Time on Task <sup>2</sup>: 38 hours

Due: **Week 12**

Weighting: **40%**

Design and implementation: Design, configure, implement mobile infrastructure for a given application scenario.

On successful completion you will be able to:

- Identify and apply the appropriate techniques such as mobility management, location/handoff management, routing, frequency management, cross-layer optimisation, cellular systems, and IP interfacing.
- Perform security management for mobile communications.
- Building, configuring, and troubleshooting networks and performance-testing.
- Explain how distributed applications are supported by mobile networks.

---

<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

### Classes

Each week you should attend a two-hour online lecture and a two-hour in-person tutorial. Lectures are a core learning experience where we will discuss the theoretical underpinnings and concepts that are essential to this unit. Key ideas for assessment tasks will be discussed from time to time in lectures. Lecture recordings shall be provided in iLearn.

Tutorials provide an opportunity for you to ensure your understanding of the key concepts of the unit and develop skills to apply these concepts to practical mobile communications systems and services.

### iLearn Web Site

All learning materials will be published on iLearn including lecture slides and assessment details.

You are required to check the iLearn website at least once a week to ensure that you are aware of the latest materials available there.

### Unit Forum

A forum for unit discussions is provided on iLearn. Students are free to post questions, comments or hints in relation to any aspect of the unit, except that you should avoid posting any questions, hints, comments or solutions that could be interpreted as cheating.

### **Textbooks**

1. Cory Beard and William Stallings, "[Wireless Communication Networks and Systems](#)"; Pearson, 2015, ISBN-13: 978-0133594171
2. A.J. Goldsmith, [Wireless Communications](#), Cambridge University Press, First Edition, 2005
3. Syed S. Husain et al., "[End-to-End Mobile Communications: Evolution to 5G](#)"; 2021 McGraw Hill, ISBN-13: 978-1260460254

### **Methods of Communication**

We will communicate with you via your university email or through announcements on iLearn. Queries to the teaching staff members including the unit convenor can either be placed on the iLearn discussion board or sent to corresponding email addresses from your university email address.

### **COVID Information**

For the latest information on the University's response to COVID-19, please refer to the Coronavirus infection page on the Macquarie website: <https://www.mq.edu.au/about/coronavirus-faqs>. Remember to check this page regularly in case the information and requirements change during semester. If there are any changes to this unit in relation to COVID, these will be communicated via iLearn.

## **Unit Schedule**

The detailed unit schedule will be available on iLearn. The unit is organised into three main wireless/mobile communications modules, with topics approximately as follows.

Weeks 1-4: Foundational wireless/mobile communications concepts, such as wireless transmission and medium access control,

Weeks 5-7: Wireless LAN,

*Week 8: No class (ANZAC Day),*

Weeks 9-11: Mobile/Cellular Networks,

and

Week 12: emerging technologies and applications

Week 13: Review

## 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](#)
- [Assessment Procedure](#)
- [Complaints Resolution 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)

## Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

## Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>



## The Writing Centre

The [Writing Centre](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the 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

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)
- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and processes

## Student Enquiries

Got a question? Ask us via [AskMQ](#), or contact [Service Connect](#).

## 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.