



# COMP6255

## Introduction to Mobile Communications

Session 1, In person-scheduled-weekday, North Ryde 2025

*School of Computing*

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#### **Disclaimer**

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## General Information

Unit convenor and teaching staff

Unit Convenor and Lecturer

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Wednesday, 2-4 PM

Credit points

10

Prerequisites

COMP6250

Corequisites

Co-badged status

This unit is co-taught with COMP3255.

Unit description

This unit will delve into the fundamental concepts, design principles, and models employed in contemporary mobile and wireless networks. It places particular emphasis on Wireless Local Area Networks (WLANs) and Cellular Networks. Throughout this unit, students will gain a comprehensive grasp of pertinent protocols and technologies, along with their practical applications in the mobile and wireless field. Additionally, this unit will equip students with hands-on expertise in designing, configuring, installing, and resolving issues within wireless and mobile networks.

Learning in this unit enhances student understanding of global challenges identified by the United Nations Sustainable Development Goals ([UNSDGs](#)) Industry, Innovation and Infrastructure

## 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

In this unit, students are encouraged to engage actively in their learning through a multifaceted approach. Attending lectures consistently, taking comprehensive notes, and actively participating in discussions are vital components of this active participation. Regular attendance at workshops and practical sessions is emphasized, and students are advised to seek instructor feedback to enhance their understanding of assignments. Pursuing excellence in assignments is a fundamental expectation, requiring thorough preparation to showcase a firm grasp of the content while meeting prescribed standards. Additionally, students are urged to engage actively with assigned readings, supplementing their notes and formulating thoughtful questions for further clarification during discussions with lecturers or tutors. Thoughtful responses to tutorial questions, demonstrating a deep understanding of the material, and contributing meaningfully to discussions are also highlighted. Furthermore, timely completion of assigned tasks or simulation projects within given timeframes is essential for successfully and punctually fulfilling unit requirements. Overall, this holistic approach ensures students actively engage and excel in all aspects of their learning.

### Attendance and Participation Guidelines

- **Class Attendance and Active Engagement:** Attending most classes is strongly recommended, as well as actively participating in discussions by asking and answering questions and contributing perspectives from personal backgrounds and workplaces.
- **Utilization of Supplementary Resources:** Supplementary resources, including lecture materials and digital recordings available through Echo360 via iLearn login, are accessible for review purposes and in case of missed lectures. However, it is essential

to note that these recordings should not be solely relied upon, and copyrighted material may be excluded.

- **Effective Out-of-Class Communication:** iLearn is the primary platform for effective out-of-class communication and engaging in discussions on various topics. Accessible at <http://ilearn.mq.edu.au>, iLearn provides forums for active participation and is a valuable resource for information dissemination. Regularly reviewing iLearn and conducting background reading before each class is highly encouraged to enhance your overall learning experience.

## **Assignment Submission**

Your assignment is to be submitted online using iLearn.

## **Assignments**

The predominant weight in this class is allocated to Assignment 1 and Assignment 2, each contributing 40% to the final grade. These assignments are designed to assess students' proficiency in conceptualizing and implementing mobile communication networks and IoT solutions across various applications. Students are given a substantial four-week period to complete each assignment, with Assignment 1 due in Week 7 and Assignment 2 in Week 11.

The assessment breakdown for these assignments is as follows: Of the total 40%, 20% is allocated to designing and implementing a programming application, assessing students' practical skills. Another 10% is allocated to answering assignment-specific questions, assessing theoretical comprehension. The project report accounts for 5%, evaluating students' ability to articulate project details effectively. The final 5% is allocated to presentations and discussions, emphasizing communication skills and ensuring students understand the intricacies of their developed program. This assessment structure fosters a comprehensive understanding of mobile communication technologies and their applications.

## **Release Dates**

- Assignment 1: To be released no later than the end of Week 5.
- Assignment 2: To be released no later than the end of Week 9.

## **Workshop**

The workshop sessions will be held onsite over 12 meetings from Week 2 to Week 13. From Weeks 2 to 11, students will focus on practical modules, while Weeks 12 and 13 are reserved for make-up sessions. Make-up classes are exclusively for students who missed previous workshops, and each student may take a maximum of two make-up classes. The workshop component accounts for 20% of the overall grade, with each session worth 2 marks, totalling a maximum of 20 marks. Students are strongly encouraged to attend all sessions to develop a

comprehensive understanding of key mobile communication technologies and to design mobile communication networks for real-world IoT applications using industry-standard simulation tools. Full participation ensures a strong grasp of the practical aspects of wireless and mobile communication in real-world scenarios.

### **Late Assessment Submission Penalty**

Unless a [Special Consideration](#) request has been submitted and approved, a 5% penalty (of the total possible mark of the task) will be applied for each day a written report or presentation assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. The submission time for all uploaded assessments is 11:55 pm. A 1-hour grace period will be 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, please apply for [Special Consideration](#).

### **Assessments where Late Submissions will be accepted**

- Assignment 1 (Mobile communication network design) - YES, Standard Late Penalty applies
- Assignment 2 (Mobile network design and problem solving) - YES, Standard Late Penalty applies
- Workshop-based tasks (Lab Book) - YES, Standard Late Penalty applies

### **Supplementary Exam**

If you receive [Special Consideration](#) for the final exam, a supplementary exam will be scheduled after the normal exam period, following the release of marks. 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.

### **Requirements to Pass this Unit**

To pass this unit, you must achieve a total mark equal or greater than 50%. This unit does not have hurdle assessments.

### **Special Consideration**

The [Special Consideration Policy](#) aims to support students who have been impacted by short-term circumstances or events that are serious, unavoidable and significantly disruptive, and which may affect their performance in assessment. If you experience circumstances or events that affect your ability to complete the assessments in this unit on time, please inform the convenor and submit a Special Consideration request through <http://connect.mq.edu.au/>.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<a href="#">Mobile communication network design</a>	40%	No	11:55 PM on Sunday ending Week 7
<a href="#">Mobile network design and problem solving</a>	40%	No	11:55 PM on Sunday ending Week 11
<a href="#">Lab Book</a>	20%	No	Weekly workshop submission

### Mobile communication network design

Assessment Type [1](#): Design Implementation

Indicative Time on Task [2](#): 40 hours

Due: **11:55 PM on Sunday ending Week 7**

Weighting: **40%**

The purpose of this assignment is to help students to design a mobile communication network that meets the resource constraints and performance requirements of a mobile communication 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.
- Configure and troubleshoot a range of key mobile protocols and standards.
- Building, configuring, and troubleshooting networks and performance-testing.
- Explain how distributed applications are supported by mobile networks.

### Mobile network design and problem solving

Assessment Type [1](#): Practice-based task

Indicative Time on Task [2](#): 42 hours

Due: **11:55 PM on Sunday ending Week 11**

Weighting: **40%**

The purpose of this practice-based assignment is to help students to get accustomed to dealing with real world problem. Students will leverage their knowledge of mobile communication to critically analyse a particular problem related to mobile and/or IoT networks 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.
- 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.

## Lab Book

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

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

Due: **Weekly workshop submission**

Weighting: **20%**

Workshops provide students with the opportunity to grasp basic methods and use simulation tools to address mobile communication and networking problems. Students will leverage their weekly module completed during the workshop session to create a workshop lab book.

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.
- Building, configuring, and troubleshooting networks and performance-testing.

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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

### Delivery Time

COMP6255 is structured to include both lectures and tutorial/works hop sessions. Lecture classes are conducted onsite every Wednesday from 11:00 AM to 1:00 PM. Also, workshop classes occur onsite on Thursday from 7:00 PM to 9:00 PM. This attendance policy underscores the interactive and real-time nature of the learning experience, encouraging students to actively participate in lectures and workshops for an optimal educational outcome.

### Week 1 Classes

In Week 1, only the lecture session will take place, covering Introduction to Mobile Networks topics. Workshops will commence from Week 2.

### Lectures

COMP6255 lecture sessions are dedicated to the in-depth exploration of mobile communication technologies and networks, blending theoretical concepts, network design, and hands-on applications. The focus extends to practical implementation, particularly through networking simulator software, to provide students with a comprehensive understanding of conceptual and design principles. The unit emphasizes the application of this knowledge in designing mobile communication networks across various real-world scenarios. Mobile communication network simulation software tools (e.g., NetSim and MATLAB) will support the learning process. Lecture sessions provide the foundation for grasping conceptual knowledge, with practical applications during workshops, which involve tasks such as IoT networking and protocol implementation.

While weekly lecture notes will be provided, students are urged to view them as a guide rather than a substitute for personal notes or the recommended reading list. Active engagement with the material is encouraged, supplementing understanding through provided lecture notes, personal notes, and suggested readings. This proactive approach is crucial for a robust comprehension of the syllabus topics and contributes to an enriched learning experience in real-time operating systems.

### Course Reading Material Information

Please be aware that there isn't a single textbook covering all the content for this unit. However, your lecturer will provide comprehensive reading materials and detailed notes corresponding to each week's lecture topics. These resources will be provided every week for your convenience. It's essential to note that purchasing these books is not obligatory; their inclusion is based on individual preferences and needs. Students are encouraged to evaluate their requirements and



determine whether acquiring these supplementary resources aligns with their learning preferences and objectives.

- 5G Mobile and Wireless Communication Technology, By Afif Osseiran, Ericsson, Jose F. Monserrat, Universitat Politècnica de València, Patrick Marsch, Nokia Foreword by Mischa Dohler, King's College London, Takehiro Nakamura, NTT DoCoMo Inc.
- Cellular Communication Networks and Standards, By Wei Jiang, Bin Han
- MIMO Wireless Communications over Generalized Fading Channels, By Brijesh Kumbhani, Rakesh Singh Kshetrimayum
- MIMO Antennas for Wireless Communications-Theory and Design, By Leeladhar Malviya, Rajib Kumar Panigrahi, M.V. Karkikeyan
- The Wireless Internet of Things, A Guide to The Lower Layers, By Daniel Chew
- Practical Internet of Things Networking, Understanding IoT Layered Architecture, By Rolando Herrero

### **Methods of Communication**

Our primary means of communication will be through your university email and announcements on iLearn. It is crucial to consistently check your university email for important updates and information related to the course. Additionally, significant announcements will be posted on iLearn, a centralized platform for accessing vital details about the course. Should you have any queries or require assistance from the teaching staff, including the unit convenor, you have two communication channels. Firstly, you can post your queries on the iLearn discussion board, providing an interactive space for instructors and peers to engage in discussions. Alternatively, you may send emails to the corresponding addresses of the teaching staff using your university email address for official communication. Through these communication methods, we aim to ensure effective and timely dissemination of information and provide the necessary support throughout the course.

## **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 [connect.mq.edu.au](https://connect.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 the [Service Connect Portal](#), 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.

## Changes from Previous Offering

We value student feedback to be able to continually improve the way we offer our units. As such we encourage students to provide constructive feedback via student surveys, to the teaching staff directly, or via the FSE Student Experience & Feedback link in the iLearn page.

According to students feedback last year, we add more hands-on components to improve the practicality of this unit.

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Unit information based on version 2025.04 of the [Handbook](#)