



COMP8280

Mobile Data Networks

Session 2, In person-scheduled-weekday, North Ryde 2024

School of Computing

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General Information

Unit convenor and teaching staff

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Practical Supervisor

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Credit points

10

Prerequisites

ITEC647 or COMP6250

Corequisites

Co-badged status

Unit description

This unit will aim to provide a sound understanding of the architecture and operating principles of mobile and wireless networks. The unit will cover two fronts: introduce students to the diverse literature on mobile data networks, and expose them to the fundamental issues in design and analysis of different mobile network architectures. A healthy mix of technological and research issues will be covered pertaining to a wide range of topics in mobile networking including wireless LANs, mobile network layer design, location management and mobility tracking, mobile transport layer design issues, and ad hoc 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:** Demonstrate in-depth knowledge and understanding of mobile technologies and apply them to solve practical real world problems in a professionally responsible manner.
- ULO2:** Demonstrate an understanding of the fundamental principles required to design mobile networks.
- ULO3:** Analyse the protocol architecture of mobile data and cellular networks.
- ULO4:** Exemplify a wide range of problems and research issues in the field of mobile networking.
- ULO5:** Demonstrate an understanding of the concepts, techniques, algorithms, and protocols employed in mobile data and cellular networks and be able to communicate these ideas to wider audience
- ULO6:** Evaluate critically a wide range of current trends and technologies in the field of mobile networking
- ULO7:** Engage in independent professional work with a high level of autonomy and accountability.

General Assessment Information

General Notes

In this unit, you should do the following:

- Attend lectures, take notes, ask questions.
- Attend your tutorial/practical, seek feedback from your lecturer on your work.
- Prepare for and strive to do well in the quizzes
- Read appropriate sections of the text, add to your notes and prepare questions for your lecturer/tutor.
- Prepare answers to tutorial questions.
- Work on any assignments that have been released.

Please note it is to your benefit to attend most of the classes, prepared to participate in discussions, ask and answer questions, and provide perspectives from your own background and workplaces. Resources to assist your learning Digital recordings of lectures are available as Echo360 through iLearn login. These are provided for review material and in case of missing lectures. Recordings should not be relied upon and copyrighted material may be omitted. iLearn is used for out-of-class communication as well as forums where active discussion of issues is encouraged. iLearn can be found at <http://learn.mq.edu.au>. You are encouraged

to review iLearn weekly and to do background reading before each class.

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 ask.mq.edu.au.

Written Assessments: If you experience circumstances or events that affect your ability to complete the written assessments in this unit on time, please inform the convenor and submit a Special Consideration request through ask.mq.edu.au.

Note that for workshops, a Special Consideration should only be applied for if you miss three or more than three of the weekly practical classes.

Requirements to Pass this unit

In this unit, the final mark will be calculated by combining the marks for all assessment tasks according to the percentage weightings shown in the assessment summary. There are no hurdles in this unit.

Concretely, in order to pass the unit, you must obtain an overall total mark of **50%** or higher. Students obtaining a higher grade than a pass in this unit will (in addition to the above)

- have a total mark of 85% or higher to obtain High Distinction;
- have a total mark of 75% or higher to obtain Distinction;
- have a total mark of 65% or higher to obtain Credit.

You are encouraged to:

- set your personal deadline earlier than the actual one;
- keep backups of all important assessed tasks;.
- make sure no one else picks up your printouts. All work submitted should be readable and well presented.

You should never commit plagiarism in any of your submitted work, including tutorial and practical answers.

Assignment Submission Guidelines and Late Submission

Your assignment is to be submitted online using Turnitin.

Online quizzes, in-class activities, or scheduled tests and exam must be undertaken at the time indicated in the unit guide. Should these activities be missed due to illness or misadventure, students may apply for Special Consideration.

All other assessments must be submitted by 5:00 pm on their due date.

Should these assessments be missed due to illness or misadventure, students should apply for Special Consideration.

Late Assessment Submission Penalty

From 1 July 2022, Students enrolled in Session based units with written assessments will have the following late penalty applied. Please see <https://students.mq.edu.au/study/assessment-exams/assessments> for more information.

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. For example, if the assignment is worth 8 marks (of the entire unit) and your submission is late by 19 hours (or 23 hours 59 minutes 59 seconds), 0.4 marks (5% of 8 marks) will be deducted. If your submission is late by 24 hours (or 47 hours 59 minutes 59 seconds), 0.8 marks (10% of 8 marks) will be deducted, and so on.

In this unit, late submissions will be accepted for the following assessment tasks::

- Quiz 1: NO, unless Special Consideration is granted
- Quiz 2: NO, unless Special Consideration is granted
- Assignment 1: YES, Standard Late Penalty applies
- Assignment 2: YES, Standard Late Penalty applies

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. The teaching staff will not entertain emails that do not originate from university email IDs.

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.

Assessment Tasks

Name	Weighting	Hurdle	Due
Assignment 2	40%	No	Report Due in Week 11: At 11:55 pm on Friday, 18/10/2024
Quiz 2	15%	No	Due in Week 10 (Week Starting 08/10/2024): In workshops
Practical exercises	10%	No	Weekly Starts in week 2 (week starting 29/07/2024).
Quiz 1	15%	No	Due in Week 5 (Week Starting 19/08/2024): In workshops
Assignment 1	20%	No	Due in Week 7: Due at 11:55 pm on Friday, 06/09/2024

Assignment 2

Assessment Type ¹: Project

Indicative Time on Task ²: 45 hours

Due: **Report Due in Week 11: At 11:55 pm on Friday, 18/10/2024**

Weighting: **40%**

Students will leverage their knowledge of mobile networks to research and critically analyse relevant literature in the discipline and present conclusions. The assessment also allows students to further develop their team working and professional communication skills. The project report (10 pages with citations) is due in week **11**. The Presentations are scheduled in weeks **11** and **12**.

On successful completion you will be able to:

- Demonstrate an understanding of the fundamental principles required to design mobile networks.
- Analyse the protocol architecture of mobile data and cellular networks.
- Exemplify a wide range of problems and research issues in the field of mobile networking.
- Demonstrate an understanding of the concepts, techniques, algorithms, and protocols employed in mobile data and cellular networks and be able to communicate these ideas

to wider audience

- Evaluate critically a wide range of current trends and technologies in the field of mobile networking
- Engage in independent professional work with a high level of autonomy and accountability.

Quiz 2

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 20 hours

Due: **Due in Week 10 (Week Starting 08/10/2024): In workshops**

Weighting: **15%**

Quiz 2 is a short test (close book) that will be based on your previously covered lecture material for weeks 5-9. The quiz questions will be handed over to you at the beginning of your Lecture class.

On successful completion you will be able to:

- Demonstrate in-depth knowledge and understanding of mobile technologies and apply them to solve practical real world problems in a professionally responsible manner.
- Demonstrate an understanding of the fundamental principles required to design mobile networks.
- Exemplify a wide range of problems and research issues in the field of mobile networking.
- Demonstrate an understanding of the concepts, techniques, algorithms, and protocols employed in mobile data and cellular networks and be able to communicate these ideas to wider audience

Practical exercises

Assessment Type ¹: Practice-based task

Indicative Time on Task ²: 0 hours

Due: **Weekly Starts in week 2 (week starting 29/07/2024).**

Weighting: **10%**

Students will demonstrate their learning by applying theoretical concepts to problem-solving and hands-on practical activities in the workshops scheduled.

On successful completion you will be able to:

- Demonstrate in-depth knowledge and understanding of mobile technologies and apply them to solve practical real world problems in a professionally responsible manner.
- Engage in independent professional work with a high level of autonomy and accountability.

Quiz 1

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 20 hours

Due: **Due in Week 5 (Week Starting 19/08/2024): In workshops**

Weighting: **15%**

Quiz 1 is a short test (close book) that will be based on your previously covered lecture material for weeks 1-4. The quiz questions will be handed over to you at the beginning of your Lecture class.

On successful completion you will be able to:

- Demonstrate in-depth knowledge and understanding of mobile technologies and apply them to solve practical real world problems in a professionally responsible manner.
- Demonstrate an understanding of the fundamental principles required to design mobile networks.
- Exemplify a wide range of problems and research issues in the field of mobile networking.
- Demonstrate an understanding of the concepts, techniques, algorithms, and protocols employed in mobile data and cellular networks and be able to communicate these ideas to wider audience

Assignment 1

Assessment Type ¹: Problem set

Indicative Time on Task ²: 25 hours

Due: **Due in Week 7: Due at 11:55 pm on Friday, 06/09/2024**

Weighting: **20%**

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. Some questions may require an in depth research

and will be a process to come up with an acceptable and reasonable answer

On successful completion you will be able to:

- Demonstrate in-depth knowledge and understanding of mobile technologies and apply them to solve practical real world problems in a professionally responsible manner.
- Demonstrate an understanding of the fundamental principles required to design mobile networks.
- Analyse the protocol architecture of mobile data and cellular networks.
- Exemplify a wide range of problems and research issues in the field of mobile networking.
- Demonstrate an understanding of the concepts, techniques, algorithms, and protocols employed in mobile data and cellular networks and be able to communicate these ideas to wider audience
- Evaluate critically a wide range of current trends and technologies in the field of mobile networking
- Engage in independent professional work with a high level of autonomy and accountability.

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 [Writing Centre](#) 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

COMP8280 is taught via lectures and informal workshop sessions.

Note:

There are no Hurdles in this unit.

Lectures commence in week 1; workshops commence in week 2.

Each week , students will have:

- **one 2-hour lecture, and**

- one 2-hour workshop.

Methods of Communication

We will communicate with you via your university email and through announcements on iLearn. Queries to convenors can either be placed on the iLearn discussion board or sent to the unit convenor via the contact email on iLearn

Lectures

Lecture sessions will provide an opportunity for the students to ask questions on the topic of the week and to clarify anything that they might not be sure of. In order for these lectures to be worthwhile, we strongly urge the students to watch the recordings before attending these lectures...

Lecture recordings will be made available through Echo360.

It should be noted that no single text book completely covers the content of this unit. A large portion of the lecture material is drawn from research papers, Industry White Papers and standard documents. Students are encouraged to read the weekly recommended reading list to gain a solid understanding of the topics that are covered.

Quizzes

The Quiz is an in-class test. It is a formative assessment that can be used to measure students' knowledge and comprehension of unit materials. Quiz Question types **may** include multiple choice, and true/false type of questions. Quizzes allow for formative assessment feedback on basic conceptual competence and therefore usually span multiple learning outcomes. There will be two quizzes in the following weeks: **5** and **10**. The quiz will be based on your previously covered lecture material. For example, week 5 quiz will be based on lectures done in weeks 1-4. Each quiz contributes **20%** of the total mark and serves as a feedback mechanism to monitor your progress in the unit.

These quizzes will be auto marked in iLearn. The results will be released on iLearn in a timely manner.

Assignments

The assignment is submitted through Turnitin and students can see Turnitin similarity reports. Results will be released on iLearn in a timely manner, subject to certain acceptable delays such as accommodating special consideration late assessments.

Assignment 1 (Individual)

This is a Problem solving type assessment task. 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. There is no group component to this assignment. This is an individual assignment. Answers will be marked based on technical correctness, completeness, clarity, and relevance.

Assignment 2 (Group)

In this assignment, students will leverage their knowledge of mobile and wireless communication to research and critically analyse relevant literature in the discipline and present conclusions. The assessment also allows students to further develop their team working and professional communication skills.

This assignment has two components: a presentation and a written report. The final mark will be awarded based on two components:

- - **In-class presentation (Individual Mark):** The presenter(s) should evoke audience participation and lead class discussions with other group members at the end of their presentation.
 - **Final Report (Group Mark):** Students will receive a group mark for the final report.

The final mark is the sum of the marks obtained in the written and oral (presentation) components. Detailed requirements and the marking criteria for each component are provided next.

Students will form small groups. Each group will prepare a presentation on report content of roughly 10-15 minutes (refer to the assignment specifications for more details). Presentations will be held in weeks 11 and 12.

Report and presentation: Students will be provided with a rubric at the start of the course so that they may work to specified standards.

Late Submission

From 1 July 2022, Students enrolled in Session based units with written assessments will have the following late penalty applied. Please see <https://students.mq.edu.au/study/assessment-exams/assessments> for more information.

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](#).

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

- Quiz 1: NO, unless Special Consideration is granted
- Quiz 2: NO, unless Special Consideration is granted
- Assignment 1: YES, Standard Late Penalty applies
- Assignment 2: YES, Standard Late Penalty applies

Workshops

Workshops include problem solving and practical hands on sessions.

The problem solving sessions will be held in the first half of the unit. These sessions involve informal discussions with your peers and the teaching staff. Each week you will be given problems to solve prior to the workshop class; preparing solutions is important because it will allow you to discuss the problems effectively with the teaching staff and maximise the feedback you get on your work.

The practical sessions will be held in the second half of the unit. Theory and practical work reinforce each other. Students through the use of various simulation tools will learn to model various mobile networking technologies and scenarios.

General Notes

In this unit, you should do the following:

- Attend lectures, take notes, ask questions.
- Attend your workshop sessions, seek feedback from the teaching staff on your work.
- Prepare for and strive to do well in the two quizzes
- Read appropriate sections of the text, add to your notes and prepare questions for your lecturer or other teaching staff.
- Work on any assignments that have been released.

Required and Recommended Texts

There is no single text book containing material that could address all topics of unit. All necessary reading material and elaborate and detailed notes on lecture topics will be provided by lecturers every week.

Other Useful Books (You need not buy unless you believe you need to own one)

- Aftab Ahmed, Wireless and Mobile Data Networks. John Wiley & Sons 2005.
- A. Jamalipour, The Wireless Mobile Internet: Protocols, Architectures, and Services, John Wiley & Sons Publishers, Chichester, UK, 2003.
- M. Grayson, K. Shatzkamer, K. Wierenga Building the Mobile Internet, Cisco Press, 201

Unit Schedule

Lecture Schedule (Tentative)

Note: We anticipate that there may be some shifting of material depending on class progress during the lecture series.

Week	Topic		Reading
1	Unit Introduction Medium Access Protocols I		Papers
2	Medium Access Protocols II		Papers
3	Wireless LAN I		Papers
4	Wireless LAN II		Papers
5	Network Layer Mobility	Quiz 1	Papers
6	Introduction to Cellular Networks		Papers
7	LTE and 5G Networks	Assignment 1 Due	Papers
8	Mobile Ad Hoc Networks		Papers
9	Mobile Communications Security		Papers
10	Advanced Topics	Quiz 2	Papers
11	Advanced Topics	Assignment 2 Report due	Papers
12	Presentation		
13	Presentation/Guest Lecture		

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 or if you are a Global MBA student contact 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/.

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.

Standards and Grading

Grades

At the end of the semester, you will receive a grade that reflects your achievement in the unit

- **Fail (F)**: does not provide evidence of attainment of all learning outcomes. There is missing or partial or superficial or faulty understanding and application of the fundamental concepts in the field of study; and incomplete, confusing or lacking communication of ideas in ways that give little attention to the conventions of the discipline.
- **Fail (FH)**: has obtained a raw mark over 50, yet failed all available attempt of at least one hurdle assessment.
- **Pass (P)**: provides sufficient evidence of the achievement of learning outcomes. There is demonstration of understanding and application of fundamental concepts of the field of study; and communication of information and ideas adequately in terms of the conventions of the discipline. The learning attainment is considered satisfactory or adequate or competent or capable in relation to the specified outcomes.
- **Credit (Cr)**: provides evidence of learning that goes beyond replication of content knowledge or

skills relevant to the learning outcomes. There is demonstration of substantial understanding of fundamental concepts in the field of study and the ability to apply these concepts in a variety of contexts; plus communication of ideas fluently and clearly in terms of the conventions of the discipline.

- **Distinction (D)**: provides evidence of integration and evaluation of critical ideas, principles and theories, distinctive insight and ability in applying relevant skills and concepts in relation to learning outcomes. There is demonstration of frequent originality in defining and analysing issues or problems and providing solutions; and the use of means of communication appropriate to the discipline and the audience.

- **High Distinction (HD)**: provides consistent evidence of deep and critical understanding in relation to the learning outcomes. There is substantial originality and insight in identifying, generating and communicating competing arguments, perspectives or problem solving approaches; critical evaluation of problems, their solutions and their implications; creativity in application.

In this unit, the final mark will be calculated by combining the marks for all assessment tasks according to the percentage weightings shown in the assessment summary. **There are no hurdles in this unit.**

Concretely, in order to pass the unit, you must obtain an overall total mark of **50%** or higher. Students obtaining a higher grade than a pass in this unit will (in addition to the above)

- have a total mark of 85% or higher to obtain High Distinction;
- have a total mark of 75% or higher to obtain Distinction;
- have a total mark of 65% or higher to obtain Credit.

You are encouraged to:

- set your personal deadline earlier than the actual one;
- keep backups of all important assessed tasks;
- make sure no one else picks up your printouts. All work submitted should be readable and well presented.

You should never commit plagiarism in any of your submitted work, including workshop and practical answers.

Unit information based on version 2024.03 of the [Handbook](#)