



# ITEC851

## Mobile Data Networks

S2 Evening 2017

*Dept of Computing*

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#### **Disclaimer**

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## General Information

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Credit points

4

Prerequisites

ITEC647

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:

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.

## General Assessment Information

The three Quizzes constitute **15%** of the total mark and serve as a feedback mechanism to monitor your progress in the unit.

Assignments constitute **35%** of the total mark. **All assignments are individual** assignments. Assignment must be submitted on time. Late submission of the assignment will be accepted, but penalized at the rate of 5% per working day late.

Assignment work must be written clearly, with good grammar, correct word usage, correct punctuation, and lack of spelling errors. Poor or bad expression will be penalized. Wherever required, all written work must be properly referenced and conform to standard stylistic conventions.

### General notes on assignment

For all submittable assignment work you are encouraged to:

- set your personal deadline earlier than the actual one;
- keep backup of all important files;
- make sure that no one else picks up your printouts.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Diagnostic Quiz</u>	0%	No	Week 3
<u>Quiz 1</u>	5%	No	Week 5 (in class)
<u>Quiz 2</u>	5%	No	week 8 (In class)
<u>Quiz 3</u>	5%	No	Week 12 (In class)
<u>Assignment 1</u>	20%	No	Week 8 (Thursday 6 pm)
<u>Assignment 2</u>	15%	No	Week 12 (Thursday 6 pm)
<u>Final Exam</u>	50%	Yes	TBA

### Diagnostic Quiz

Due: **Week 3**

Weighting: **0%**

Diagnostic Test: In this assessment students will be given questions that evaluate their familiarity with key areas of the course. This is an early assessment to give students an opportunity to gain feedback and initial progress in the unit. The assessment will take 30 minutes, be completed in Lecture class in week 3, This test will contribute to 0% of the overall grade.

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

### Quiz 1

Due: **Week 5 (in class)**

Weighting: **5%**

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. Quiz 1 contributes 5% of the total mark.

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

## Quiz 2

Due: **week 8 (In class)**

Weighting: **5%**

Quiz 2 is a short test (close book) that will be based on your previously covered lecture material for Weeks 4-7. The quiz questions will be handed over to you at the beginning of your Lecture class. Quiz 2 contributes 5% of the total mark.

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

## Quiz 3

Due: **Week 12 (In class)**

Weighting: **5%**

Quiz 3 is a short test (close book) that will be based on your previously covered lecture material for Weeks 8-11. Quiz 3 contributes 5% of the total mark

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

Due: **Week 8 (Thursday 6 pm)**

Weighting: **20%**

Individual Assignment

Assignment Type: Problem Solving:

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.

## Assignment 2

Due: **Week 12 (Thursday 6 pm)**

Weighting: **15%**

Individual Assignment

Assignment Type: Problem Solving-Research: This type of assignment is designed to help students build up their critical thinking skills while looking for solutions to real world mobile networking related problems.

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.

## Final Exam

Due: **TBA**

Weighting: **50%**

**This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)**

An examination allows us to individually and securely assess student's mastery of the coursework material. The examination material will be covered by learning outcomes #1 to #7. The examination will be closed book and three (3) hours in length.

The examination is a hurdle in this unit. Concretely, in order to pass the unit, you must get at least 40% of the marks in the final examination. Students who score between 30% and 40% will be eligible for a second chance examination.

Regarding the examination process, note that

§ you must attend all required classes and submit all required assessment, otherwise the Executive Dean of the Faculty or delegated authority has the power to refuse permission to attend the final examination

§ the University Examination period for Second Half Year 2017 is from Monday 13th November to Friday 1st of December 2017.

§ you are expected to present yourself for examination at the time and place designated in the [University Examination Timetable](#)

§ the timetable will be available in Draft form approximately eight weeks before the commencement of the examinations and in Final form approximately four weeks before the commencement of examinations

§ no early examinations for individuals or groups of students will be set. All students are expected to ensure that they are available until the end of the teaching semester, that is the final day of the official examination period

§ the only exception to not sitting an examination at the designated time is because of documented illness or unavoidable disruption. In these circumstances you may wish to consider applying for [Special Consideration](#).

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

## **Delivery and Resources**

ITEC851 is taught via lectures and informal tutorial sessions.

### **Classes**

Classes are held from 6-10 pm Thursday evenings. Lectures/Tutorials and other discussion are in **E5A-230** in the lecture slot.



## Lectures

Lectures are used to introduce mobile network technologies, protocols and design and put them in a wider context. You are encouraged to ask questions of the lecturer, both during and outside the lecture, to clarify anything you might not be sure of.

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, 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

There will be three quizzes in the following weeks: 5, 8, and 12. A quiz is a short test that will be based on your previously covered lecture material. For example, week 4 quiz will be based on lectures done in weeks 1-4. The quiz questions will be handed over to you at the beginning of your Lecture class. These quizzes contribute 15% of the total mark and serve as a feedback mechanism to monitor your progress in the unit.

## Tutorial

The tutorial gives you the opportunity to interact with your peers and with the lecturer. The tutorial sessions involve informal discussions with your peers and the lecturer. Each week you will be given problems to solve prior to the tutorial; preparing solutions is important because it will allow you to discuss the problems effectively with your lecturer and maximise the feedback you get on your work.

## Assignments

Your assignment is to be submitted online using **Turnitin**. Late submission of the assignment will be accepted, but penalised at the rate of 5% per working day late. If you cannot submit assignments on time because of illness or other circumstances, please contact the convenor at the earliest possible time.

## General Notes

In this unit, you should do the following:

- Attend lectures, take notes, ask questions.
- Attend your tutorial, seek feedback from your lecturer on your work.
- Prepare for and strive to do well in the three 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.

Lecture notes will be made available each week but these notes are intended as an outline of the lecture only and are not a substitute for your own notes or the recommended reading list.

## Required and Recommended Texts

There is no single text book containing material that could address all topics of unit. All necessary reading material will be provided by the lecturers.

### 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, 2011
- J. Schiller, Mobile Communications, 2nd Edition, Prentice Hall 2001.

## Unit Schedule

### Lecture Schedule (Tentative)

Week-Thursday	Lecture	Reading
03/08/2017 (Week 1)	Introduction	Recommended Reading List/Notes
10/08/2017 (Week 2)	Wireless Transmission	Recommended Reading List/Notes
17/08/2017 (Week 3)	Medium Access Protocols	Recommended Reading List/Notes
24/08/2017 (Week 4)	Wireless LAN	Recommended Reading List/Notes
31/09/2017 (Week 5)	<b>Quiz 1</b> Mobile IP-Cellular IP	Recommended Reading List/Notes
07/09/2017 (Week 6)	Transport Layer Design	Recommended Reading List/Notes
14/09/2017 (Week 7)	Introduction to Cellular Networks	Recommended Reading List/Notes

<b>Mid-Semester Break</b> (Two Weeks) <b>18/09/2017 - 02/10/2017</b>		
05/10/2017 (Week 8)	<b>Quiz 2 - Assignment 1 Due</b> Cellular-IP Integration: LTE; All IP architecture	Recommended Reading List/Notes
12/10/2017 (Week 9)	Mobile Ad Hoc Network (MANET)	Recommended Reading List/Notes
19/10/2017 (Week 10)	Advanced Topics	Recommended Reading List/Notes
26/10/2017 (Week 11)	Advanced Topics	Recommended Reading List/Notes
02/11/2017 (Week 12)	<b>Assignment 2 Due</b> <b>Quiz 3</b> Advanced Topics	Recommended Reading List/Notes
09/11/2017 (Week 13)	Guest Lecture Revision	

## Learning and Teaching Activities

### Lecture

Lectures are used to introduce mobile network technologies, protocols and design and put them in a wider context.

### Tutorial

Problem solving session. Tutorials are posted every Friday on ilearn. Even though these tutorial exercises are not formally assessed, it is important that students solve them on a weekly basis as these questions are often previous exam questions or structured like test/exam questions. The more practice you have at such questions, the more likely you are to do yourself justice in quizzes/exams. Solutions to these exercises will be regularly posted on ilearn unit site. If need be, this will also allow you to discuss the problems effectively with your lecturer/peers and maximise the feedback you get on your work. In case of any difficulty, seek help from the teaching staff.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy [http://mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

Assessment Policy [http://mq.edu.au/policy/docs/assessment/policy\\_2016.html](http://mq.edu.au/policy/docs/assessment/policy_2016.html)

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public [http://www.mq.edu.au/policy/docs/complaint\\_management/procedure.html](http://www.mq.edu.au/policy/docs/complaint_management/procedure.html)

Disruption to Studies Policy (in effect until Dec 4th, 2017): [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html)

Special Consideration Policy (in effect from Dec 4th, 2017): <https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/special-consideration>

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of 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/support/student\\_conduct/](https://students.mq.edu.au/support/student_conduct/)

## Results

Results shown in *iLearn*, 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).

## Special Consideration

Special Consideration is intended for a student who is prevented by serious and unavoidable disruption from completing any unit requirements in accordance with their ability. This application form needs to be filled and submitted to the Science Centre along with some evidence to support your case. Depending on the circumstances presented, the convenor may choose to give you an alternate assessment, additional time for an assessment, make-up exam, etc. If a Supplementary Examination is granted as a result of the Special Consideration process the examination will be scheduled after the conclusion of the official examination period. For details of the Special Consideration policy specific to the Department of Computing, see the Department's [policy page](#).

## Late Submission

There will be a deduction of 10% of the total available marks made from the total awarded mark for each 24 hour period or part thereof that the submission is late. This penalty does not apply for cases in which an application for special consideration is made and approved.

## Grade Appeal

In case of problems arising with your final grade, the first step is to organise a review. The Department recommends that you request an appointment with the convenor of the unit in order to review your grade. If the review does not solve the problem, a formal Grade Appeal can be lodged. For more information please refer to the grade appeal policy page at:

<http://www.mq.edu.au/policy/docs/gradeappeal/policy.html>

## Academic Honesty

Plagiarism involves using the work of another person and presenting it as one's own. The

Department, in line with [University policy](#), treats all cases seriously. In particular, the Department keeps a record of all plagiarism cases. This record is referred to so that an appropriate penalty can be applied to each case.

For concrete examples, refer to Academic Honesty Policy at: [http://www.mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://www.mq.edu.au/policy/docs/academic_honesty/policy.html)

## 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 improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

## Staff-Student Liaison Committee

The Department has established a Staff-Student Liaison Committee (800 level) to provide all students studying a Computing unit the opportunity to discuss related issues or problems with both students and staff. If you would like to raise any issues or make comments, please attend a liaison committee meeting, or discuss the matter with one of the student representatives who will be attending the meeting.

The committee meets two times during the semester. For each meeting, an agenda is issued and minutes are taken. These are posted on the web at <http://comp.mq.edu.au/undergrad/info/liaison/800-level/>

If you have concerns about anything related to the organisation or operation of ITEC851, please convey those concerns to the unit convenor, either directly or through the liaison committee. If you have exhausted all other avenues, then you should consult the Director of MIT (A/Prof Manolya Kavakli), Director of teaching (A/Prof Steve Cassidy) or the Head of Department (Dr. Christophe Doche). You are entitled to have your concerns raised, discussed and resolved.

## 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)

## 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.

## Graduate Capabilities

### PG - Capable of Professional and Personal Judgment and Initiative

Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

#### Learning outcomes

- 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.

#### Assessment task

- Final Exam

### PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

#### Learning outcomes

- 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

## **Assessment tasks**

- Diagnostic Quiz
- Quiz 1
- Quiz 2
- Quiz 3
- Assignment 1
- Assignment 2
- Final Exam

## **PG - Critical, Analytical and Integrative Thinking**

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

## **Learning outcomes**

- 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

## **Assessment tasks**

- Diagnostic Quiz

- Quiz 1
- Quiz 2
- Quiz 3
- Assignment 1
- Assignment 2
- Final Exam

## PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

### Learning outcomes

- 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

### Assessment tasks

- Diagnostic Quiz
- Quiz 1
- Quiz 2
- Quiz 3
- Assignment 1
- Assignment 2
- Final Exam



## PG - Effective Communication

Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

### Assessment tasks

- Assignment 1
- Assignment 2
- Final Exam

## PG - Engaged and Responsible, Active and Ethical Citizens

Our postgraduates will be ethically aware and capable of confident transformative action in relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able to appreciate the impact of their professional roles for social justice and inclusion related to national and global issues

This graduate capability is supported by:

### Learning outcomes

- 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.

### Assessment task

- Final Exam

## Changes from Previous Offering

Some new lecture topics introduced.

## Standards

Four standards, namely HD, D, CR, P summarize as many different levels of achievement. Each standard is precisely defined to help students know what kind of performance is expected to deserve a certain mark. The standards corresponding to the sample learning outcomes of this unit are given below:

LO	P	Cr	D	HD

LO#1				
In-depth knowledge and understanding of mobile technologies.	Provide basic description and definitions of mobile networking and protocol architecture	Describe across most of the topics in mobile networking and protocol architecture.	Discuss with breadth across most of the topics in mobile networking and protocol architecture.	Discuss with breadth and depth across most of the topics in mobile networking and protocol architecture.
LO#2				
Demonstrate an understanding of design of mobile networks	Demonstrate limited understanding of mobile technologies and protocols	Demonstrate detailed understanding of mobile technologies and protocols	Demonstrate an advanced understanding of mobile technologies and protocols	Demonstrate an in-depth understanding of mobile technologies and protocols
LO#3				
Competence in analysis of mobile network protocols.	Perform basic analysis of mobile technologies and protocols	Perform detailed analysis of mobile technologies and protocols	Perform advanced analysis of mobile technologies and protocols	Perform advanced analysis of mobile technologies and protocols
LO#4				
Exemplify a wide range of problems and research issues	Describe limited set of key issues related to Mobile networking	Explain some of the key issues related to mobile networking	Explain most of the key issues related to mobile networking	Discuss in depth all of the key issues related to mobile networking
LO#5				
Demonstrate an understanding of concepts, algorithms and protocols in mobile networking	Demonstrate limited understanding of mobile networking concepts, algorithms and protocols	Demonstrate detailed understanding of mobile networking concepts, algorithms and protocols	Demonstrate an advanced understanding of mobile networking concepts, algorithms and protocols	Demonstrate an in-depth understanding of mobile networking concepts, algorithms and protocols
LO#6				
Competence in analysis and evaluation of current mobile technologies.	Analyse and evaluate limited set of current mobile technologies	Analyse and evaluate limited set of current mobile technologies	Analyse and evaluate limited set of current mobile technologies	Analyse and evaluate limited set of current mobile technologies

## Grading

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.

- **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. The final examination in this unit is a hurdle requirement; you must get a mark of at least 40% in the examination to pass the unit. If you get a mark between 30% and 40% in your first attempt at the final examination, you will be given a second and final attempt.

Concretely, **in order to pass the unit**, you must obtain an overall total mark of 50% or higher, and a mark of 40% or higher in the final examination.

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.