



COMP3250

Computer Networks

Session 2, In person-scheduled-weekday, North Ryde 2022

School of Computing

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General Information

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Credit points

10

Prerequisites

130cp at 1000 level or above including ((COMP1010 or COMP125) and (COMP2250 or COMP247)) and ((DMTH137 or MATH1007 or MATH2907 or DMTH237 or ELEC2040 or ELEC240))

Corequisites

Co-badged status

Unit description

This unit gives an understanding of advanced topics in the design and implementation of computer networks. It provides an in-depth understanding of key protocols of the TCP/IP protocol suite, and its relationship to emerging technologies. This unit allows students to develop knowledge and expertise in key areas such as intra- and inter-domain routing protocols, multicast protocols, different transport protocols, Quality of Service, and multimedia. These concepts are reinforced through tutorials and laboratory sessions. Knowledge gained during the unit builds upon communication protocols; topological designs; wide area and local area networks; wireless/mobile networks; as well as practical hands-on skills on Cisco equipment. It allows students to expand their skill set by exposure to socket programming paradigm enabling them to better understand the design and implementation of protocols. Some of the reasoning tasks that the students complete require focused thinking instead of iteratively modifying and testing a program. It also enhances students' skills in critical thinking and problem solving using challenging assignments.

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 an understanding of advanced knowledge in networking (especially in Internet technologies) and be able to communicate this knowledge to wider audience
- ULO2:** Design TCP/IP based networks and protocols and to integrate such networks with other networking technologies
- ULO3:** Have a working knowledge of practical advanced networking and write professional documentation
- ULO4:** Demonstrate an understanding of security issues in computer networking.
- ULO5:** Engage in independent professional work with a high level of autonomy and accountability.

General Assessment Information

General Assessment Information

The assessment of this unit consists of two quizzes, two assignments and a final exam. The quizzes will be carried out online in iLearn. You will submit the solutions to the two assignments via iLearn by the due date. The form and date of the final examination will be announced later in the semester.

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) will be applied each day a written 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. 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](#).

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

Supplementary Exam

In general, 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.

Assessment Tasks

Name	Weighting	Hurdle	Due
Final Examination	40%	No	Exam Period
Practicals	10%	No	Weeks 2-11
Assignment 1	15%	No	Week 8
Quizzes: On Campus	20%	No	Weeks 5 and 11
Assignment 2	15%	No	Week 12

Final Examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 40 hours

Due: **Exam Period**

Weighting: **40%**

Final exam.

An examination allows us to individually and securely assess student's mastery of the coursework material. The examination will be closed book.

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Practicals

Assessment Type ¹: Practice-based task

Indicative Time on Task ²: 0 hours

Due: **Weeks 2-11**

Weighting: **10%**

Practical marks are obtained by attendance of practical sessions and making a suitable attempt at the practical work during the session. To receive your marks you must attend the practical section and demonstrate your completion of the section to your practical supervisor. Earning the marks will require not only successful completion of the exercises, but presentation of

appropriate documentation, as outlined in the question sheets. You should complete the practical session in the week it is allocated. (and the practical material is structured against the lecture material with this in mind).

Note: We **advise** you to complete **all sections** to gain a good understanding of the covered topics.

On successful completion you will be able to:

- Have a working knowledge of practical advanced networking and write professional documentation
- Demonstrate an understanding of security issues in computer networking.

Assignment 1

Assessment Type ¹: Problem set

Indicative Time on Task ²: 20 hours

Due: **Week 8**

Weighting: **15%**

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

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Quizzes: On Campus

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 20 hours

Due: **Weeks 5 and 11**

Weighting: **20%**

There will be two quizzes in the following weeks: **5** and **11**. Each quiz is worth **10** marks. A quiz is a short test that will be based on your previously attempted discussion questions and previous lecture material. The quizzes will be held online in your practical class. The quiz questions will be handed over to you at the beginning of your Practical class and will be 1 hour in duration. .

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Assignment 2

Assessment Type ¹: Problem set

Indicative Time on Task ²: 10 hours

Due: **Week 12**

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 networking related problems.

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-

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

Lectures

Live on campus 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.

Lecture recordings will be made available through Echo360.

Practicals

Practical classes give you an opportunity to practice your practical networking skills under the supervision of a demonstrator. Each week you will be given a number of problems to work on; it is important that you keep up with these problems as doing so will help you understand the material in the unit and prepare you for the work in assignments.

Note that while the practical material is structured against the lecture material, you need to keep in mind that there will not always be a one to one mapping between the practical exercises and the lecture topics. This is because you need some practical sessions to get acquainted to new tools and devices thereby limiting the number of practical time slots available to experiment with technologies discussed in some lectures.

There will be one **2** hour long practical session each week starting week **2** and each practical exercise is worth **2** marks. The practical sessions are conducted in a specially-equipped networking laboratory. There is no opportunity to conduct practical work outside the assigned sessions. Weeks **12** and **13** are catchup weeks and provide an opportunity to do any practical exercise/s that were missed over the course of the semester (weeks 2-11).

Quizzes

There will be two quizzes in the following weeks: **5**, and **11**. A quiz is a short test that will be based on your previously covered lecture material. For example, week 5 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 **20%** of the total mark and serve as a feedback

mechanism to monitor your progress in the unit.

Tutorial

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.

Assignments

Your assignment is to be submitted online using **Turnitin**.

Late Submission

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- Assignment 2: YES, Standard Late Penalty applies

Text

The Recommended Text

[Internetworking with TCP/IP Volume 1, 6th edition Douglas Comer](#)

Computer Networks (5th Edition) by Andrew S. Tanenbaum and David J. Wetherall (you could use the 4th edition as well)

[Link](#) to the book.

Reference Text List

[Computer Networks and Internets: Global \(6th\) Edition by Douglas Comer](#)

[Computer Networking: A Top-Down Approach 7th edition by James F. Kurose and Keith W. Ross](#) (older editions - 5th and 6th editions can be used as well)

Request For Comments (RFCs): Series of memoranda encompassing new research, innovations, and methodologies applicable to Internet technologies.

RFC documents are available to public for free. We will be posting these documents on ilearn as well.

General Notes

In this unit, you should do the following:

- Attend lectures, take notes, ask questions.
- Attend your weekly Practical session
- 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.

Unit Schedule

Unit Schedule

Tentative Lecture Schedule

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

1	Introduction to TCP/IP, IP addressing	Chap: Tanenbaum - 5, 1 pgs 45-54, Comer-21
2	Introduction to Routing, Intra-Domain Routing	Chap: Tanenbaum - 5 (pgs 362-380), Comer - 1, 2, 21, 27
3	Intra domain Routing (Contd), CIDR	Chap: Tanenbaum - 5 (pgs 362-380, 447-449), Comer- 27 (section 27.16)
4	Inter-Domain Routing	Chap: Tanenbaum - 5 (pg 479), Comer - 27
5	Inter Domain Routing (Contd)	Chap: Tanenbaum - 5 (pg 479), Comer - 27 Quiz 1
6	IP Multicast	Chap: Tanenbaum - 5 (pg 382), Comer - 26.

7	IP Multicast (Contd), Introduction to transport Layer	Chap: Tanenbaum - 5 (pg 382), Comer - 26	
Break	Continue to Work on assignment 1		
8	Transport Layer-Transmission Control Protocol (TCP)	Chap: Tanenbaum - 6, Comer - 26.	Assignment 1 due.
9	TCP Contd, Network Security Part I	Chap: Tanenbaum - 8, Comer - 32-33.	
10	Network Security Part II	Chap: Tanenbaum - 8, Comer - 26.	
11	Internet Protocol (IP) version 6: An Introduction	Chap: Tanenbaum - 5 (pg 455), Comer - 20.	Quiz 2
12	Software Defined Networks (SDN)	Chap: Tanenbaum - 7. RFC 3117. Comer - 4	Assignment 2 due
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 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 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.

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.
- **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.

Note: 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.

Note:

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.

Changes since First Published

Date	Description
21/07/2022	Links to the text books