



# COMP6250

## Data Communications

Session 1, Special circumstances 2021

*School of Computing*

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### Disclaimer

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### Notice

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group activities on campus, and most will keep an online version available to those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face activities for your unit, please go to [timetable viewer](#). To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

## General Information

Unit convenor and teaching staff

Convenor and Lecturer

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Credit points

10

Prerequisites

Corequisites

Co-badged status

### Unit description

*This unit has an online offering for S2 which is **synchronous**, meaning there will be set times to attend online lectures and tutorials.*

This unit introduces basic data communication concepts, theory and practice within the context of the use of communication networks in organisations.

Topics include:

- protocols and standards, including the OSI model
- in-depth understanding of key protocols of the TCP/IP protocol suite
- network switching and routing, including both intra-domain and inter-domain routing protocols
- LAN and WAN topologies
- wireless networking
- network hardware, such as routers, modems, repeaters, switches and hubs
- public telecommunication-based data services
- the effect of telecommunications on society
- the role of telecommunications within organisations
- introduction to security and network management
- organisational management of telecommunications
- introduction to network design
- regulatory frameworks

Practical work includes basic network configuration and protocol performance using specialised software.

This unit does not presume any knowledge of programming nor is there any programming work in the unit.

## 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:** Explain the importance and the role of network protocols including why they are organised into protocol stacks and how protocol stacks function.

**ULO2:** Demonstrate an understanding of network addressing, routing of traffic between networks and the mechanisms that allow applications to co-exist and interact.

**ULO3:** Differentiate among LAN components, describe addressing schemes at various layers and how they interact, techniques to resolve them, and in particular instances calculate addresses.

**ULO4:** Critically reflect on different major network technologies including wireless, backbone, wide area networks, and the Internet and, being aware of their properties, be able to evaluate different network designs.

**ULO5:** Demonstrate technical networking proficiency including demonstrated ability to configure, construct, and document, and in simple cases, design networks, as well as the ability to perform traffic analysis on local area networks.

**ULO6:** Demonstrate an understanding of, and have an ability to develop plans for dealing with, issues regarding network security and management.

## General Assessment Information

### Submission of assessable work

For all your assignments, and for your professional life in the future, you are encouraged to

- set your personal deadline earlier than the official deadline
- keep backups of all your important files
- make sure that no-one else has access to your files or documents

**Late work will not be accepted.** Develop good working habits and manage your time well. If your contributions are seriously affected by illness or misadventure you do your utmost to submit a request for special consideration **before** the due date, do not email the unit convenor directly.

### Practical Workshops

Due: **Weekly (starting week 2)** Weighting: **20%**

The practical work in this unit makes up 20% of your mark. The practical work is divided up into twelve weekly practical classes.

To receive your marks you must attend the practical section and demonstrate your completion of the practical exercises to your practical supervisor. Earning the marks will require not only successful completion of the exercises, but submission of appropriate documentation, as outlined in the question sheets. You must complete the practical session in the week it is allocated.

We will take the best ten out of your twelve submissions to calculate your final mark for this section.

Practical classess will commence during week 2 of the semester. Students must attend their enrolled practical session.

**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.

## Assignments

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 penalised, Wherever required, all written work must be properly referenced and conform to standard stylistic conventions.

### Assignment 1

Due: **Mid-semester break** Weighting: **20%**

The first assignment tests your understanding of local area networks, routing, and IP addressing.

### Assignment 2

Due: **Week 12** Weighting: **20%**

The second assignment tests your understanding of selected networking technologies.

## Final Exams

Due: **Final exam period** Weighting: **40%**

The final examination ask students to apply what they have learned during the semester to a provided scenario, which may involve the analysis, design, and troubleshooting of a network. In the case a student cannot attend the final exam, a request for special consideration must be made.

If you receive special consideration for the final exam, a supplementary exam will be scheduled for a time in June 2021. By making a special consideration application for the final exam you are declaring yourself available to sit during the supplementary examination period and you 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 approximately one week prior to the exam with the exact date and time of the supplementary examination.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Practical Workshops</u>	20%	No	Weekly
<u>Assignment 1</u>	20%	No	Mid-semester break
<u>Assignment 2</u>	20%	No	Week 12

Name	Weighting	Hurdle	Due
<u>Final Exam</u>	40%	No	Final exam period

## Practical Workshops

Assessment Type <sup>1</sup>: Demonstration

Indicative Time on Task <sup>2</sup>: 0 hours

Due: **Weekly**

Weighting: **20%**

To receive marks students must attend the practical section and demonstrate completion of the section to their practical supervisor.

Earning the marks will require not only successful completion of the exercises, but presentation of appropriate documentation, as outlined in the questions.

You must complete the practical session in the week it is allocated.

On successful completion you will be able to:

- Explain the importance and the role of network protocols including why they are organised into protocol stacks and how protocol stacks function.
- Demonstrate an understanding of network addressing, routing of traffic between networks and the mechanisms that allow applications to co-exist and interact.
- Differentiate among LAN components, describe addressing schemes at various layers and how they interact, techniques to resolve them, and in particular instances calculate addresses.
- Demonstrate technical networking proficiency including demonstrated ability to configure, construct, and document, and in simple cases, design networks, as well as the ability to perform traffic analysis on local area networks.

## Assignment 1

Assessment Type <sup>1</sup>: Report

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

Due: **Mid-semester break**

Weighting: **20%**

The first assignment tests students understanding of network stacks, layering, and addressing techniques.

On successful completion you will be able to:

- Explain the importance and the role of network protocols including why they are organised into protocol stacks and how protocol stacks function.
- Demonstrate an understanding of network addressing, routing of traffic between networks and the mechanisms that allow applications to co-exist and interact.
- Differentiate among LAN components, describe addressing schemes at various layers and how they interact, techniques to resolve them, and in particular instances calculate addresses.

## Assignment 2

Assessment Type <sup>1</sup>: Report

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

Due: **Week 12**

Weighting: **20%**

The second assignment tests students understanding of selected networking technologies.

On successful completion you will be able to:

- Demonstrate an understanding of network addressing, routing of traffic between networks and the mechanisms that allow applications to co-exist and interact.
- Differentiate among LAN components, describe addressing schemes at various layers and how they interact, techniques to resolve them, and in particular instances calculate addresses.
- Critically reflect on different major network technologies including wireless, backbone, wide area networks, and the Internet and, being aware of their properties, be able to evaluate different network designs.
- Demonstrate an understanding of, and have an ability to develop plans for dealing with, issues regarding network security and management.

## Final Exam

Assessment Type <sup>1</sup>: Examination

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

Due: **Final exam period**

Weighting: **40%**

The final exam asks students to apply the knowledge they have gained through the semester to one or more given network scenarios. Tasks to be completed may include elements of network design, troubleshooting, and the appropriate application of security controls.

On successful completion you will be able to:

- Explain the importance and the role of network protocols including why they are organised into protocol stacks and how protocol stacks function.
- Demonstrate an understanding of network addressing, routing of traffic between networks and the mechanisms that allow applications to co-exist and interact.
- Differentiate among LAN components, describe addressing schemes at various layers and how they interact, techniques to resolve them, and in particular instances calculate addresses.
- Critically reflect on different major network technologies including wireless, backbone, wide area networks, and the Internet and, being aware of their properties, be able to evaluate different network designs.
- Demonstrate technical networking proficiency including demonstrated ability to configure, construct, and document, and in simple cases, design networks, as well as the ability to perform traffic analysis on local area networks.
- Demonstrate an understanding of, and have an ability to develop plans for dealing with, issues regarding network security and management.

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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

### Classes

Each week you should attend two hours of lectures, and a two hour practical workshop. For details of scheduled classes consult the [timetables webpage](#).

**Note** that practicals workshops (lab sessions) commence in **week 2**. The week-by-week



details of the practical (lab) classes will be available from iLearn.

**You must attend the practical that you are enrolled in.**

## Textbook and Reading Materials

The textbooks for this semester are:

- Fitzgerald, J. & Dennis, A, [Business Data Communications and Networking, Thirteenth Edition](#), Wiley, 2017
  - Print: ISBN 978-1-119-57166-7
  - E-Text: ISBN 978-1-119-59525-0
- Comer, D. Computer Networks And Internets Sixth Edition, 2015. ISBN [978-0-133-58793-7](#).

Additional reading that you may find useful for this unit:

- Kurose, J. & Ross, K. Computer Networking: A Top-Down Approach 7th edn, Pearson, 2016
  - [Print](#): ISBN 978-1-292-15359-9
  - [E-Text](#): ISBN 978-1-292-15360-5
- Comer, D. Internetworking With TCP/IP Volume 1: Principles Protocols, and Architecture, 6th edition, 2014. ISBN [978-0-136-08530-0](#).

BE CAREFUL to buy correct Comer book!

- Tanenbaum, A. & Wetherall, D. Computer Networks, 5th Edition, Pearson, ISBN [978-0-133-07262-4](#)

Web Resources

### Unit Websites

Comp6250 is administered via [iLearn \(http://ilearn.mq.edu.au/\)](http://ilearn.mq.edu.au/).

This unit outline can be found in the university's [unit guides](#)

### Live Streaming

Digital recordings of lectures may be available. They will be linked from iLearn.

## Technologies Used and Required

In this unit you will be exposed to the following technology and tools:

- Cisco Packet Tracer software.
- Wireshark Packet Analyzer software.

## General Notes

In this unit, you should do the following:

- Attend lectures, take notes, ask questions.
- Attend your weekly Practical session.
- Ensure that you attend module exams during the first hour of your practical session.
- Read appropriate sections of the text, add to your notes and prepare questions for your lecturer/tutor.
- 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

Tentative teaching schedule, subject to change:				Assessment Due		Workshop
Week	Module	Lecture	Reading	Assessment	Weight	Practical
1	Networking Fundamentals (NF)	Introduction	Ch 1			Week 1 No Labs
2		LANs	Ch 7			Wireshark
3	Layers and Stacks (LS)	Network Layer	Ch 5			IP Headers
4		Data-Link Layer	Ch 4			Subnetting
5		Transport Layer - TCP	Ch's 5 & 2			TCP and FTP
6		Application Layer, Transport Layer - UDP	Ch 5			DNS
Mid-Semster Break		Break week 1		Assignment 1	20%	
		Break week 2				
7		Physical Layer	Ch 3			PacketTracer
8	Network Security (NS)	Network Security I	Ch 11			TBD
9		Network Security II	Ch 11			NAT

10	Internetworking and Network Architecture (IA)	IP Routing	Tannenbaum Ch's 18 & 22			Dynamic Routing - RIP
11		Backbone Networks	Ch 8			TBD
12		MAN and WAN	Ch 9	Assignment 2	20%	VLANs
13		Wireless Networks	Ch 7			WiFi
14	Formal Exam Period	Exams week 1		Final Exam	40%	
15		Exams week 2				
16		Exams week 3				

## 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](#)
- [Grade Appeal Policy](#)
- [Complaint Management 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](mailto:globalmba.support@mq.edu.au)

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

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)
- [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

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](#)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@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.

## Changes from Previous Offering

The unit has been reconfigured for 100% online delivery.