



COMP6250

Data Communications

Session 1, In person-scheduled-weekday, North Ryde 2023

School of Computing

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General Information

Unit convenor and teaching staff

Unit Convenor and Lecturer

Frances Louise

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By appointment only

Lectuer

Tao Gu

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Credit points

10

Prerequisites

Corequisites

Co-badged status

Unit description

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.

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.

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.

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

Requirements to Pass this Unit

To pass this unit, you must:

- Achieve a total mark equal to or greater than 50%

Late Assessment Submission

Late assessments are **not accepted** in this unit unless a [Special Consideration](#) has been submitted and approved.

Special Considerations

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.

Assessment Tasks

Name	Weighting	Hurdle	Due
Final Exam	40%	No	Week 14/15
Assignment 1	20%	No	Mid-session break
Assignment 2	20%	No	Week 12
Practical Workshops	20%	No	Week 2 onwards

Final Exam

Assessment Type ¹: Examination

Indicative Time on Task ²: 10 hours

Due: **Week 14/15**

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

Assignment 1

Assessment Type ¹: Report

Indicative Time on Task ²: 20 hours

Due: **Mid-session 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 ¹: Report

Indicative Time on Task ²: 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.
- 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.
- 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 an understanding of, and have an ability to develop plans for dealing with, issues regarding network security and management.

Practical Workshops

Assessment Type ¹: Demonstration

Indicative Time on Task ²: 0 hours

Due: **Week 2 onwards**

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.

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

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 practical 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, & Durcikova, A, 2021, *Business data communications and*

networking, 14th edn, John Wiley & Sons, Inc., Hoboken, NJ.

- Print: ISBN 978-1-119-70284-9
- E-Text: ISBN 978-1-119-70266-5
- Comer, D, 2015, *Computer networks and internets*, 6th Global edn, Pearson, Harlow, Essex.
 - Print: ISBN 978-1-292-06117-7
 - E-Text: ISBN 978-1-292-06182-5

Additional reading that you may find useful for this unit:

- Kurose, JF & Ross, KW, 2013, *Computer networking : a top-down approach*, 8th Global edn, Pearson, Harlow, Essex.
 - Print: ISBN 978-1-292-40546-9
 - E-Text: ISBN 978-1-292-41997-8
- Comer, D, 2014, *Internetworking with TCP/IP. Volume one*, 6th International edn, Harlow, Essex.
 - Print: ISBN 978-0-136-08530-0
- Tanenbaum, AS & Wetherall, DJ, 2014, *Computer networks*, 5th Global edn, Pearson, Harlow.
 - Print: ISBN 978-0-132-12695-3
 - E-Text: 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, and ask questions.

- Attend your weekly practical session and work on the practical exercises.
- 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 and are not a substitute for your own notes or the recommended reading list.

Methods of Communication

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

COVID Information

For the latest information on the University's response to COVID-19, please refer to the Coronavirus infection page on the Macquarie website: <https://www.mq.edu.au/about/coronavirus-faqs>. Remember to check this page regularly in case the information and requirements change during the semester. If there are any changes to this unit in relation to COVID, these will be communicated via iLearn.

Unit Schedule

Tentative teaching schedule, subject to change:			Assessment Due		Practical
Week	Lecture	Reading	Assessment	Weight	
1	Introduction	Ch 1			Week 1 No Labs
2	LANs	Ch 7	Weekly Practicals (Week 2 onwards)	20%	Wireshark
3	Network Layer	Ch 5			IP Headers
4	Application Layer, Transport Layer - UDP	Ch 5			Subnetting
5	Transport Layer - TCP	Ch's 5 & 2			PacketTracer
6	Data-Link Layer	Ch 4	Assignment 1	20%	TCP and FTP
7	Physical Layer	Ch 3			DNS

Mid-Semster Break					
8	Wireless Networks	Ch 7			Switches, MAC, and ARP
9	Network Security I	Ch 11			WiFi
10	Network Security II	Ch 11			NAT
11	Backbone Networks	Ch 8			VLANs
12	MAN and WAN	Ch 9	Assignment 2	20%	RIP
13	The Internet	Ch 10			Single Area OSPF
14-16	Exams week 1		Final Exam (120 min)		

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.