



# COMP2250

## Data Communications

Session 1, Weekday attendance, North Ryde 2020

*Dept of Computing*

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## General Information

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Credit points

10

Prerequisites

(COMP1000 or COMP115) or (COMP1350 or ISYS114)

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; network switching and routing; 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; and regulatory frameworks. Practical work includes basic network hardware set up and protocol performance in a specialised laboratory using dedicated switching and routing equipment. 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://students.mq.edu.au/important-dates>

## Learning Outcomes

**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 IP addressing, routing and subnetting by for example computing routing outcomes and determining effective and actual IP addresses.

**ULO3:** Differentiate among LAN components, and describe and, in particular instances calculate, how MAC addresses, address resolution and the ethernet protocol interact.

**ULO4:** Evaluate different network designs based on an awareness of different major network technologies including wireless, backbone, wide area networks, and the Internet

**ULO5:** Demonstrate technical networking proficiency including 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:** Develop plans for dealing with network security and management.

## General Assessment Information

### General Assessment Information

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

#### Late Submissions

No extensions will be granted without an approved application for Special Consideration. 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. For example, 25 hours late in submission for an assignment worth 10 marks – 20% penalty or 2 marks deducted from the total. No submission will be accepted after solutions have been posted.

#### Practicals

**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.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Practical Workshops</u>	10%	Yes	Weekly
<u>Assignment 2</u>	15%	No	Week 12
<u>Module Exams</u>	60%	Yes	Various (see unit schedule)

Name	Weighting	Hurdle	Due
<u>Assignment 1</u>	15%	No	Week 6

## Practical Workshops

Assessment Type <sup>1</sup>: Participatory task

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

Due: **Weekly**

Weighting: **10%**

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

To receive marks students must attend the practical section and demonstrate completion of the section to their practical supervisors. Earning the marks will require not only successful completion of the exercises, but presentation of appropriate documentation, as outlined in the questions.

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 IP addressing, routing and subnetting by for example computing routing outcomes and determining effective and actual IP addresses.
- Differentiate among LAN components, and describe and, in particular instances calculate, how MAC addresses, address resolution and the ethernet protocol interact.
- Evaluate different network designs based on an awareness of different major network technologies including wireless, backbone, wide area networks, and the Internet
- Develop plans for dealing with network security and management.

## Assignment 2

Assessment Type <sup>1</sup>: Practice-based task

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

Due: **Week 12**

Weighting: **15%**

The second assignment tests your understanding of selected networking technologies.

On successful completion you will be able to:

- Evaluate different network designs based on an awareness of different major network technologies including wireless, backbone, wide area networks, and the Internet
- Demonstrate technical networking proficiency including 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.

- Develop plans for dealing with network security and management.

## Module Exams

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

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

Due: **Various (see unit schedule)**

Weighting: **60%**

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

The module examinations ask students to answer conceptual questions about the course material as well as solve simple networking problems.

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 IP addressing, routing and subnetting by for example computing routing outcomes and determining effective and actual IP addresses.
- Differentiate among LAN components, and describe and, in particular instances calculate, how MAC addresses, address resolution and the ethernet protocol interact.
- Evaluate different network designs based on an awareness of different major network technologies including wireless, backbone, wide area networks, and the Internet
- Develop plans for dealing with network security and management.

## Assignment 1

Assessment Type <sup>1</sup>: Practice-based task

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

Due: **Week 6**

Weighting: **15%**

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

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 IP addressing, routing and subnetting by for example computing routing outcomes and determining effective and actual IP addresses.
- Differentiate among LAN components, and describe and, in particular instances

calculate, how MAC addresses, address resolution and the ethernet protocol interact.

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<sup>1</sup> If you need guidance or support to understand or complete this type of assessment, please contact the Learning Skills Team

<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 three hours of lectures, and a two hour practical workshop. For details of days, times and rooms 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 should have selected both a Practical\_1 and a Practical\_2 at enrolment. **You must attend the practicals that you are enrolled in.**

### Textbook and Reading Materials

The textbook for this semester is:

- 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

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

### Web Resources

#### Unit Websites

COMP2250 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:

- HP networking equipment and the Comware network operating system.
- 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 however 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:

Week	Module	Lecture Topic	Module Exam	Weight	Assignments	Reading	Workshop Streams 1-12	Workshop Streams 13-24
1	Networking Fundamentals (NF)	Introduction				Ch 1	No Labs	No Labs
2		LANs				Ch 7	Wireshark	Wireshark
3	Layers and Stacks (LS)	Network Layer	NF (30 min)	10%		Ch 5	IP Headers	IP Headers
4		Application Layer, Transport Layer - UDP				Ch 5	Subnetting	Subnetting
5		Transport Layer - TCP				Ch 5 & Ch 2	Transport and Application Layers	Transport and Application Layers

6		Link Layer			Assignment 1	Ch 4	Network OS and Command Line	DNS
7		Physical Layer				Ch 3	DNS	Network OS and Command Line
Mid Semester Break								
8	Network Security (NS)	Network Security I	LS (60 min)	20%		Ch 11		
9		Network Security II				Ch 11	NAT	Switches, MAC, ARP
10	Internetworking and Network Architecture (IA)	Wireless Networks	NS (30 min)	10%		Ch 10	Switches, MAC, ARP	NAT
11		Backbone Networks				Ch 8	WiFi	Router Configuration
12		MAN and WAN			Assignment 2	Ch 9	Router Configuration	WiFi
13		The Internet	IA (60 min)	20%		Ch 7		
14-16	Formal Exam Period		NF, LS, NS, IA (180 min)					

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). 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](#) (**Note:** *The Special Consideration Policy is effective from 4*



*December 2017 and replaces the Disruption to Studies Policy.)*

Students seeking more policy resources can visit the [Student Policy Gateway](https://students.mq.edu.au/support/study/student-policy-gateway) (<https://students.mq.edu.au/support/study/student-policy-gateway>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/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/study/getting-started/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](http://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 improve your marks and take control of your study.

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

## Student Enquiry Service

For all student enquiries, visit Student Connect at [ask.mq.edu.au](http://ask.mq.edu.au)

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

## Equity 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.

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/](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

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.