COMP2250

Data Communications

Session 1, Special circumstances, North Ryde 2021

Department of Computing

Contents

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
(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
- 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

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 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

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: **10%**

The practical work in this unit makes up 10% of your mark. The practical work is divided up into ten 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.

Each practical contributes 1% of your total mark for the unit.

Practical classess will commence during week 2 of the semester. Students must be enrolled in two practical classes: Practical_1 and Practical_2.

Practical_1 will utilise specialised networking equipment located in an specialised laboratory whereas Practical_2 will be conducted in a regular computing laboratory.

The student cohort has been divided into two streams:

Students in streams 1 though 15 will attend thier Practical_1 in weeks 2, 4, 6, 8, 10, 12 and Practical_2 in weeks 3, 5, 7, 9, 11, 13.

Students in streams 16 though 30 will attend thier Practical_1 in weeks 3, 5, 7, 9, 11, 13 and Practical_2 in weeks 2, 4, 6, 8, 10, 12.

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: **15%**

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

Assignment 2

Due: **Week 12** Weighting: **15%**

The second assignment tests your understanding of selected networking technologies.

Module Exams

Due: **Attempt 1 (Weeks 3, 8, 10, and 13), Attempt 2 (Final exam period)** Weighting: **60%**

The module examinations ask students to answer conceptual questions about the course material as well as solve simple networking problems. Module exams are run in the first hour of the workshop in which the student is enrolled. Students may only attend module exams in workshops they are enrolled in. In the case a student cannot attend a module exam, a request fo r special consideration must be made. Students will be offered two attempts at each module exam, once during the teaching session and the second time during the final exam period. The student's best mark for each module is used in their final mark. A student's final mark for a module is the maximum mark they achieved in any of the student's attempt for that module.

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
Practical Workshops	10%	No	Weekly

Name	Weighting	Hurdle	Due
Assignment 1	15%	No	Mid-semester break
Assignment 2	15%	No	Week 12
Module Exams	60%	No	Weeks 3, 8, 10, 13, and Final exam period

Practical Workshops

Assessment Type [1]: Demonstration
Indicative Time on Task [2]: 0 hours
Due: **Weekly**
Weighting: **10%**

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 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.
- 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.

Assignment 1

Assessment Type [1]: Report
Indicative Time on Task [2]: 25 hours
Due: **Mid-semester break**
Weighting: **15%**

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 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.

Assignment 2

Assessment Type [1]: Report
Indicative Time on Task [2]: 30 hours
Due: **Week 12**
Weighting: **15%**

The second assignment tests your understanding of selected networking technologies.

On successful completion you will be able to:

- 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.

Module Exams

Assessment Type [1]: Examination
Indicative Time on Task [2]: 20 hours
Due: **Weeks 3, 8, 10, 13, and Final exam period**
Weighting: **60%**

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

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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 Learning Skills Unit 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 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/).

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 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 moule 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		Practical Workshop	
Week	Module	Lecture	Reading	Assessment	Weight	Stream 1-15	Stream 16-30

1	Networking Fundamentals (NF)	Introduction	Ch 1			Week 1 No Labs	
2		LANs	Ch 7			09WW 240 Comware CLI	04RPD G15 Wireshark
3	Layers and Stacks (LS)	Network Layer	Ch 5	Module Exam NF (30 min)	10%	04RPD G15 Wireshark	09WW 240 Comware CLI
4		Data-Link Layer	Ch 4			09WW 240 Subnetting	04RPD G15 IP Headers
5		Transport Layer - TCP	Ch's 5 & 2			04RPD G15 IP Headers	09WW 240 Subnetting
6		Application Layer, Transport Layer - UDP	Ch 5			09WW 240 Switches, MAC and ARP	04RPD G15 TCP and FTP
Mid-Semster Break		Break week 1		Assignment 1	15%		
		Break week 2					
7		Physical Layer	Ch 3			04RPD G15 TCP and FTP	09WW 240 Switches, MAC and ARP
8	Network Security (NS)	Network Security I	Ch 11	Module Exam LS (60 min)	20%	09WW 240 Module Exam	04RPD G15 Module Exam
9		Network Security II	Ch 11			04RPD G15 NAT	09WW240 Dynamic Routing - RIP
10	Internetworking and Network Architecture (IA)	Backbone Networks	Ch 8	Module Exam NS (30 min)	10%	09WW240 Dynamic Routing - RIP	04RPD G15 NAT

11		Wireless Networks	Ch 7			04RPD G15 WiFi	09WW 240 VLANs
12		MAN and WAN	Ch 9	Assignment 2	15%	09WW 240 VLANs	04RPD G15 WiFi
13		The Internet	Ch 10	Module Exam IA (60 min)	20%	04RPD G15 Module Exam	09WW 240 Module Exam
14	Formal Exam Period	Exams week 1		Final Exam NF, LS, NS, IA (180 min)			
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). 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). 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) 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

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) 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 Enquiry Service

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

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/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.