COMP2250

Data Communications

Session 1, In person-scheduled-weekday, North Ryde 2022

School of Computing

Contents

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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
- 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://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 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

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.

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.

Late Submissions

Late submissions will not be accepted without an approved Special Consideration request. Assessments submitted after the due date will receive a mark of zero.

Assessment Tasks

Name	Weighting	Hurdle	Due
Practical Workshops	20%	Yes	Weekly
Module Exams	40%	No	Weeks 3, 7, 9, 11, and 13
Assignment 1	20%	No	Week 6
Assignment 2	20%	No	Week 11

Practical Workshops

Assessment Type [1]: Demonstration
Indicative Time on Task [2]: 0 hours
Due: **Weekly**
Weighting: **20%**
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

To receive marks students must attend the practical session and demonstrate completion of the exercises 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.

Module Exams

Assessment Type [1]: Examination
Indicative Time on Task [2]: 20 hours
Due: **Weeks 3, 7, 9, 11, and 13**
Weighting: **40%**

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

Assignment 1

Assessment Type [1]: Report
Indicative Time on Task [2]: 30 hours
Due: **Week 6**
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 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 11**
Weighting: **20%**

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.

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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

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 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:

- Cisco networking equipment and the IOS 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.

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
- 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). 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

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.

Changes from Previous Offering

The unit is now a hybrid on-campus/online offfering. Accordingly, the weightings of the assessments items has changed to reflect this.