



ITEC647

Data Communication

S1 Day 2015

Dept of Computing

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General Information

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Credit points

4

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; 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 using Cisco routers and switches. 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:

Have an introductory understanding of data communications including the following: (a) the importance and role of protocols, (b) how protocol stacks work and the layers of the internet protocol stack, (c) the functions of each layer of the internet protocol stack, (d) the function of selected protocols at each layer (in particular: IP addressing, routing and subnetting), (e) LAN structures, components, ethernet, MAC, and ARP, (f) Wireless and backbone networks, (g) Metropolitan and wide area networks and the Internet, (h) Network security, design and management. This learning outcome will be assessed against the standards for Network Protocols and Network Technologies.

Have a working knowledge of practical networking, including: (a) Design a simple local area network, (b) Basic configuration of networking devices, (c) Construction of simple networks, (d) Analysis of network traffic, (e) Network documentation. This learning outcome will be assessed against the standards for Technical Networking Proficiency.

Demonstrate competence at analysis, synthesis, design, and evaluation of proposed network technologies

Assessment Tasks

Name	Weighting	Due
<u>Weekly Tutorial Submissions</u>	8%	Every week
<u>Practical work</u>	8%	Every week
<u>Assignment 1</u>	12%	Week 6
<u>Assignment 2</u>	12%	Week 12
<u>Assignment 3</u>	20%	June 10, 2015 (week 14)
<u>Final Examination</u>	40%	End of semester exam period

Weekly Tutorial Submissions

Due: **Every week**

Weighting: **8%**

Each week tutorial problems will be posted in iLearn related to the lecture content for that week.

By the end of each week you are required to submit your responses in the manner specified in the questions for that week. Your answers will need to demonstrate appropriate depth of understanding.

General notes on Weekly Problem Submissions

The weekly problem submissions are important for your learning. Each week we set a number of questions that you should think carefully about. Some of those questions are identified for submission, and must be submitted electronically as specified in iLearn. Don't be late -- iLearn is a program and there is a strict cutoff time. Always try your hardest with these questions -- you only get the learning benefit if you think carefully. But don't worry if you're not completely sure about your answer. The important thing is to have a go and submit the best answer you have.

We'll try to ensure that the weekly questions don't involve too much writing. Lots of thinking, but not much writing! So you should expect that you can answer each week's questions in just a page or so.

The weekly problem submissions are compulsory, but will only be "sample" marked in detail (a small sample of student submissions will be fully marked). Feedback about the questions will be given in lectures, and if you'd like individual feedback or if you'd like to discuss a question in more detail you should raise it with your tutor or the lecturer concerned. The questions are meant to help your learning, so we will usually award you the full marks available each week if you have completed a reasonable attempt at the specified questions.

On successful completion you will be able to:

- Have an introductory understanding of data communications including the following: (a) the importance and role of protocols, (b) how protocol stacks work and the layers of the internet protocol stack, (c) the functions of each layer of the internet protocol stack, (d) the function of selected protocols at each layer (in particular: IP addressing, routing and subnetting), (e) LAN structures, components, ethernet, MAC, and ARP, (f) Wireless and backbone networks, (g) Metropolitan and wide area networks and the Internet, (h) Network security, design and management. This learning outcome will be assessed against the standards for Network Protocols and Network Technologies.

Practical work

Due: **Every week**

Weighting: **8%**

The practical work in this unit makes up 10% of your mark. The practical work is divided up into twelve sections and you are expected to complete them all. The first two will be available before the semester begins. Each section contributes up to 1% of your total mark for the unit (so you

can achieve full marks by completing perfectly ten sections, but do be sure to attempt all twelve).

To receive your marks you must attend the practical section and demonstrate your completion of the section to your practical supervisor. Earning the marks will require not only successful completion of the exercises, but presentation of appropriate documentation, as outlined in the question sheets. You should complete the practical session in the week it is allocated. (The practical material is arranged to correspond with the lecture material with this in mind).

Note that there are 12 practical sections but 13 practical sessions. This allows you to catch up on a missed practical section. It is possible to complete all 12 practical sections in the available practical classes and you should strive to complete all 12 sections so that you gain a good understanding of the topics covered.

General notes on Practicals

The practical sections can be submitted at your own pace. However, practicals are performed in groups so you should aim to stay in step with the weekly set practical sections. If you miss a week or fall behind, you may catch up in week 8 of the semester, but if you fall several weeks behind then it may not be possible to catch up. No allowance will be made for students who fail to finish work because they have left themselves insufficient time. Note that students must be supervised in the lab and it is **not possible** for you to access the practical lab outside of your enrolled practical session times.

Note that while the practical material is coordinated with the lecture material, you need to keep in mind that there will not always be a direct correspondence between the practical exercises and the lecture topics. This is because you need some practical sessions to get acquainted with new tools and devices thus limiting the number of practical time slots available to experiment with technologies discussed in some lectures.

On successful completion you will be able to:

- Have a working knowledge of practical networking, including: (a) Design a simple local area network, (b) Basic configuration of networking devices, (c) Construction of simple networks, (d) Analysis of network traffic, (e) Network documentation. This learning outcome will be assessed against the standards for Technical Networking Proficiency.

Assignment 1

Due: **Week 6**

Weighting: **12%**

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

Late submission of the assignment will be accepted, but penalised at the rate of 15% per day late. If you cannot submit assignments on time because of illness or other circumstances, please contact the convenor **at the earliest possible time**.

General notes on assignments

For all submitable assignment work you are encouraged to:

- set your personal deadline earlier than the actual one;
- keep backup of all important files;
- make sure that no one else picks up your printouts.

On successful completion you will be able to:

- Have an introductory understanding of data communications including the following: (a) the importance and role of protocols, (b) how protocol stacks work and the layers of the internet protocol stack, (c) the functions of each layer of the internet protocol stack, (d) the function of selected protocols at each layer (in particular: IP addressing, routing and subnetting), (e) LAN structures, components, ethernet, MAC, and ARP, (f) Wireless and backbone networks, (g) Metropolitan and wide area networks and the Internet, (h) Network security, design and management. This learning outcome will be assessed against the standards for Network Protocols and Network Technologies.

Assignment 2

Due: **Week 12**

Weighting: **12%**

The second assignment tests your understanding of various networking technologies.

Late submission of the assignment will be accepted, but penalised at the rate of 15% per day late. If you cannot submit assignments on time because of illness or other circumstances, please contact the convenor **at the earliest possible time**.

General notes on assignments

For all submitable assignment work you are encouraged to:

- set your personal deadline earlier than the actual one;
- keep backup of all important files;
- make sure that no one else picks up your printouts.

On successful completion you will be able to:

- Have an introductory understanding of data communications including the following: (a) the importance and role of protocols, (b) how protocol stacks work and the layers of the internet protocol stack, (c) the functions of each layer of the internet protocol stack, (d)

the function of selected protocols at each layer (in particular: IP addressing, routing and subnetting), (e) LAN structures, components, ethernet, MAC, and ARP, (f) Wireless and backbone networks, (g) Metropolitan and wide area networks and the Internet, (h) Network security, design and management. This learning outcome will be assessed against the standards for Network Protocols and Network Technologies.

Assignment 3

Due: **June 10, 2015 (week 14)**

Weighting: **20%**

The third assignment is unique to ITEC647 and will exercise students' higher level cognitive skills including analysis, synthesis, design and evaluation.

The assignment is due in the first week after lectures are completed to give you time to work with all of your learning from the unit.

Details of the assignment will be provided to you individually in lectures near the end of semester.

On successful completion you will be able to:

- Demonstrate competence at analysis, synthesis, design, and evaluation of proposed network technologies

Final Examination

Due: **End of semester exam period**

Weighting: **40%**

The final examination allows us to individually and securely assess each student's mastery of the coursework material. The examination will assess material covered by learning outcome #1. The examination will be closed book and three (3) hours in length.

Regarding the examination process, note that

- you must attend all required classes and submit all required assessments, otherwise the Executive Dean of the Faculty or delegated authority has the power to refuse permission to attend the final examination
- the University Examination period for First Half Year 2015 is from Monday 8th June to Friday 26th June
- you are expected to present yourself for examination at the time and place designated in the University Examination Timetable
- no early examinations for individuals or groups of students will be set. All students are

expected to ensure that they are available until the end of the teaching semester, that is the final day of the official examination period

- if illness or unavoidable disruption prevents you from sitting the examination at the designated time, you should contact the University in accordance with the Disruption to Studies policy. You will need to provide documentary evidence of the circumstances.

On successful completion you will be able to:

- Have an introductory understanding of data communications including the following: (a) the importance and role of protocols, (b) how protocol stacks work and the layers of the internet protocol stack, (c) the functions of each layer of the internet protocol stack, (d) the function of selected protocols at each layer (in particular: IP addressing, routing and subnetting), (e) LAN structures, components, ethernet, MAC, and ARP, (f) Wireless and backbone networks, (g) Metropolitan and wide area networks and the Internet, (h) Network security, design and management. This learning outcome will be assessed against the standards for Network Protocols and Network Technologies.

Delivery and Resources

Classes

Each week you should attend three hours of lectures, and a two hour practical. For details of days, times and rooms consult the [timetables webpage](#).

Note that practicals (lab sessions) commence in **week 1**. The week-by-week details of the practical (lab) classes will be available from iLearn.

You should have selected a practical at enrolment. **You should attend the practical that you are enrolled in.**

Textbook and Reading Materials

The textbook for this semester is:

- Fitzgerald, J. & Dennis, A, Business Data Communications and Networking, Eleventh or Twelfth Edition, Wiley, 2012 and 2014. ISBN 978-0-471-77116-6 and 978-1-118-89168-1

Additional reading that you may find useful for this unit:

- Stallings, W., Business Data Communications, 7th ed., Pearson Prentice Hall, 2012
- Kurose, J. & Ross, K., Computer Networking, 6th ed., Pearson, 2012
- Peterson, L. & Davie, B., Computer Networks: A Systems approach, 5th ed., Morgan

Kaufman, 2011

- Stallings, W., Data & Computer Communications, 10th ed., Prentice Hall, 2013
- White, C., Data Communications and Computer Networks, 7th ed., Thomsons, 2012

Web Resources

Unit Websites

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

This unit outline can be found on units.mq.edu.au.

echo360

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 equipment and the Cisco IOS
- Wireshark Packet Analyzer software
- TracePlus Ethernet: Performance and Packet Capturing tool

Unit Schedule

1	Introduction	Chapter 1	Introduction
2	Local Area Networks	Chapter 6 (Ch7, 12th Ed)	Introduction to Wireshark
3	IP	Chapter 5	Switches MAC addresses, ARP
4	TCP, Applications	Chapters 5 & 2	Subnetting
5	Physical Layer	Chapter 3	Internet Protocol
6	Data Link Layer	Chapter 4	TCP
7	Wireless Local Area Networks	Chapter 6 (Ch 7, 12th Ed)	Introduction to IOS
8	No Monday lecture (public holiday)		Catchup and revise
9	Backbone Networks	Chapter 7 (Ch 8, 12th Ed)	Building a routed network
10	Metropolitan and Wide Area Networks	Chapter 8 (Ch 9, 12th Ed)	Virtual LAN -1
11	The Internet	Chapter 9 (Ch 10, 12th Ed)	Virtual LAN -2
12	Network Security	Chapter 10 (Ch 11, 12th Ed)	Security
13	Network Security, Exam Prep	Chapters 11&12 (Chs 6&12, 12th Ed)	Security

The study break occurs between weeks 6 and 7	Labs are closed during the break
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Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.html

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/policy.html *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of 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/support/student_conduct/

Results

Results shown in *iLearn*, 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.

Disruption of studies

Special Consideration is intended for a student who is prevented by serious and unavoidable disruption from completing any unit requirements in accordance with their ability. Complete the application form at ask.mq.edu.au (search "Disruption to Studies") and provide evidence to support your case (such as a medical certificate). Depending on the circumstances presented, the convenor may choose to give you an alternative assessment, additional time for an assessment, make-up exam, etc. For successful special consideration regarding the final examination, you will usually be required to sit a **special examination** which will be scheduled after the conclusion of the official examination period. For details of the Disruption to Studies policy specific to the Department of Computing, see the Department's policy pages.

Grade Appeal

In case of problems arising with your final grade, the first step is to organise a review. The Department recommends that you request an appointment with the convenor of the unit in order

to review your grade. If the review does not solve the problem, a formal Grade Appeal can be lodged. For more information please refer to the grade appeal policy page at:

<http://www.mq.edu.au/policy/docs/gradeappeal/policy.html>

Academic Honesty and Plagiarism

Plagiarism involves using the work of another person and presenting it as one's own. This includes copying from the Internet. The Department, in line with [University policy](#), treats all cases of plagiarism seriously and deals with them in accordance with University policy.

For concrete examples of unacceptable behaviour, refer to the Academic Honesty Policy at: http://www.mq.edu.au/policy/docs/academic_honesty/policy.html

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 improve your marks and take control of your study.

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

Student-Staff Liaison Committee

The Department has established a Student-Staff Liaison Committee at each level (100, 200, 300) to provide all students studying a Computing unit the opportunity to discuss relevant issues or problems with fellow students and staff. If you would like to raise any issues or make comments, please attend a liaison committee meeting, or discuss the matter with one of the student representatives who will be attending the meeting.

The committee meets two or three times during the semester. For each meeting, an agenda is issued and minutes are taken. These are posted on the web at <http://comp.mq.edu.au/undergraduate-studies/liaison-committee-meetings/200-level/>

If you have concerns about anything related to the organisation or operation of COMP247, please convey those concerns to the unit convenor, either directly or through the liaison committee. If you have exhausted all other avenues, then you should consult the Director of Teaching in Computing or the Head of the Department of Computing. You are entitled to have your concerns raised, discussed and resolved.

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

IT Help

For help with University computer systems and technology, visit <http://informatics.mq.edu.au/help/>.

When using the University's IT, you must adhere to the [Acceptable Use Policy](#). The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Learning outcomes

- Have an introductory understanding of data communications including the following: (a) the importance and role of protocols, (b) how protocol stacks work and the layers of the internet protocol stack, (c) the functions of each layer of the internet protocol stack, (d) the function of selected protocols at each layer (in particular: IP addressing, routing and subnetting), (e) LAN structures, components, ethernet, MAC, and ARP, (f) Wireless and backbone networks, (g) Metropolitan and wide area networks and the Internet, (h) Network security, design and management. This learning outcome will be assessed against the standards for Network Protocols and Network Technologies.
- Have a working knowledge of practical networking, including: (a) Design a simple local area network, (b) Basic configuration of networking devices, (c) Construction of simple networks, (d) Analysis of network traffic, (e) Network documentation. This learning outcome will be assessed against the standards for Technical Networking Proficiency.
- Demonstrate competence at analysis, synthesis, design, and evaluation of proposed network technologies

Assessment tasks

- Assignment 1
- Assignment 2
- Assignment 3
- Final Examination

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

Learning outcomes

- Have an introductory understanding of data communications including the following: (a) the importance and role of protocols, (b) how protocol stacks work and the layers of the internet protocol stack, (c) the functions of each layer of the internet protocol stack, (d) the function of selected protocols at each layer (in particular: IP addressing, routing and subnetting), (e) LAN structures, components, ethernet, MAC, and ARP, (f) Wireless and backbone networks, (g) Metropolitan and wide area networks and the Internet, (h) Network security, design and management. This learning outcome will be assessed against the standards for Network Protocols and Network Technologies.
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Assessment tasks

- Assignment 1
- Assignment 2
- Final Examination

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Have an introductory understanding of data communications including the following: (a)

the importance and role of protocols, (b) how protocol stacks work and the layers of the internet protocol stack, (c) the functions of each layer of the internet protocol stack, (d) the function of selected protocols at each layer (in particular: IP addressing, routing and subnetting), (e) LAN structures, components, ethernet, MAC, and ARP, (f) Wireless and backbone networks, (g) Metropolitan and wide area networks and the Internet, (h) Network security, design and management. This learning outcome will be assessed against the standards for Network Protocols and Network Technologies.

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Assessment tasks

- Weekly Tutorial Submissions
- Practical work
- Assignment 1
- Assignment 2
- Final Examination

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- Have an introductory understanding of data communications including the following: (a) the importance and role of protocols, (b) how protocol stacks work and the layers of the internet protocol stack, (c) the functions of each layer of the internet protocol stack, (d) the function of selected protocols at each layer (in particular: IP addressing, routing and subnetting), (e) LAN structures, components, ethernet, MAC, and ARP, (f) Wireless and backbone networks, (g) Metropolitan and wide area networks and the Internet, (h) Network security, design and management. This learning outcome will be assessed against the standards for Network Protocols and Network Technologies.
- Demonstrate competence at analysis, synthesis, design, and evaluation of proposed network technologies

Assessment tasks

- Weekly Tutorial Submissions
- Assignment 3

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Have an introductory understanding of data communications including the following: (a) the importance and role of protocols, (b) how protocol stacks work and the layers of the internet protocol stack, (c) the functions of each layer of the internet protocol stack, (d) the function of selected protocols at each layer (in particular: IP addressing, routing and subnetting), (e) LAN structures, components, ethernet, MAC, and ARP, (f) Wireless and backbone networks, (g) Metropolitan and wide area networks and the Internet, (h) Network security, design and management. This learning outcome will be assessed against the standards for Network Protocols and Network Technologies.
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- Demonstrate competence at analysis, synthesis, design, and evaluation of proposed network technologies

Assessment tasks

- Weekly Tutorial Submissions
- Practical work
- Assignment 1
- Assignment 2
- Assignment 3
- Final Examination

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

- Have an introductory understanding of data communications including the following: (a) the importance and role of protocols, (b) how protocol stacks work and the layers of the internet protocol stack, (c) the functions of each layer of the internet protocol stack, (d) the function of selected protocols at each layer (in particular: IP addressing, routing and subnetting), (e) LAN structures, components, ethernet, MAC, and ARP, (f) Wireless and backbone networks, (g) Metropolitan and wide area networks and the Internet, (h) Network security, design and management. This learning outcome will be assessed against the standards for Network Protocols and Network Technologies.
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Assessment tasks

- Weekly Tutorial Submissions
- Practical work
- Assignment 1
- Assignment 2
- Assignment 3
- Final Examination

Changes from Previous Offerings

This offering of ITEC647 will include further expanded discussion of security. Security is a system-wide issue - it is relevant at many different places in the computer network and at many different levels of the network stack. In 2015, most weeks of lectures will include discussion of security related to the topics presented in that particular week. These discussions are in addition to the specific lectures on security towards the end of the semester that provide an in-depth

discussion of security issues as in previous years.

Also, in 2015 we have arranged for week 8 practical classes to provide a chance for any students who have fallen behind to catch up. There will be practical classes in week 8, but there will be no extra assigned practical material for that week. Students may use the lab time to complete or reinforce any of their learning from practicals 1-7 or possibly to start work on the week 9 practical work. We have found that week 8 is a critical time for students who have had difficulties and fallen behind, so be sure to take advantage of the opportunity to be thoroughly up to date before the rush at the end of semester.

Standards and Grading

Standards

L.O 1	Pass	Credit	Distinction	High Distinction
Network Protocols	Demonstrate an understanding of the definition and function of protocols and protocol stacks. Demonstrate an understanding of the function of each layer in the TCP/IP protocol stack. Demonstrate an understanding of the internals of each layer in the TCP/IP protocol stack, including IP addressing and routing	Satisfy the standard for Pass and in addition demonstrate a detailed understanding of most of the protocols at each layer of the TCP/IP protocol stack. Understand and be able to use subnetting.	Satisfy the standard for Credit and in addition demonstrate a sustained detailed understanding of the protocols at each layer of the TCP/IP protocol stack. Demonstrate some ability to reason with and use this knowledge to explain protocol design decisions.	Satisfy the standard for Distinction and in addition demonstrate a sustained ability to reason with and use this knowledge to explain protocol design decisions.
Network Technology	Demonstrate an understanding of the structure and use of the various types of networks. Demonstrate an understanding of the function of basic network components. Demonstrate some understanding of the technology used to implement wireless networks, backbone networks, MANs & WANS	Satisfy the standard for Pass and in addition demonstrate a detailed understanding of the technology used to implement wireless networks, backbone networks, MANs & WANS	Satisfy the standard for Credit and in addition demonstrate some ability to reason with and use this knowledge in making network design decisions.	Satisfy the standard for Distinction and in addition demonstrate a sustained ability to reason with and use this knowledge in making network design decisions.

L.O 2	Pass	Credit	Distinction	High Distinction

<p>Technical Networking Proficiency</p>	<p>Able to successfully connect and configure computers, switches and routers in a network. Limited ability to analyse network traffic using a packet sniffer. Limited ability to produce clear and comprehensive documentation of network setup, configuration and analysis.</p>	<p>Satisfy the standard for pass and in addition be able to successfully analyse basic network traffic flows using a packet sniffer and demonstrate ability to produce clear and comprehensive documentation of network setup, configuration and analysis.</p>	<p>Satisfy the standard for credit and in addition be able to analyse multi-protocol traffic flows using a packet sniffer and demonstrate consistent ability to produce clear and comprehensive documentation of network setup, configuration and analysis.</p>	<p>Satisfy the standard for distinction and in addition demonstrate originality and insight in the documentation and analysis of network setup, configuration and traffic</p>
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L.O 3	Pass	Credit	Distinction	High Distinction
<p>Technical Networking Proficiency</p>	<p>Provide sufficient evidence of competence to design and/or evaluate proposed network technologies. This would include demonstration of understanding and application of fundamental concepts of networking along with routine argumentation with acceptable justification and the communication of design decisions adequately in terms of the conventions of network engineering.</p>	<p>Satisfy the standard for pass and in addition provide evidence of learning that includes demonstration of substantial understanding of the fundamental networking concepts and the ability to apply these concepts in a variety of contexts. Analysis will include convincing argumentation with appropriate coherent justification. Technical communication will be fluent and clear.</p>	<p>Satisfy the standard for credit and in addition provide evidence of integration and evaluation of critical ideas, principles and theories, and distinctive insight and ability in applying relevant skills and concepts in relation to network technologies. There is demonstration of frequent originality in defining and analysing issues or problems and in providing solutions.</p>	<p>Satisfy the standard for distinction and in addition provide consistent evidence of deep and critical understanding of network design and analysis. There is substantial originality and insight in identifying, generating and communicating competing arguments, perspectives or problem solving approaches and in the critical evaluation of problems, their solutions and their implications.</p>

In particular, students who pass this unit will be expected to

- obtain a satisfactory overall mark (calculated according to the weightings given above).
- perform at a **Pass** level in the final examination.
- perform at a **Pass** level or higher in assignments, quizzes, and practicals combined.
- complete and present reasonable attempts of the practical exercises in the practical sessions.
- complete and present reasonable attempts for the weekly submissions on ilearn.
- complete and present reasonable attempts of both assignments.

Students obtaining a higher grade than a pass in this unit will (in addition to the above) have demonstrated by their overall performance, and their performance on the exam separately, that they have met the University's criteria for awarding higher grades as specified in the [University's Grading Policy](#).

In all of your work you are encouraged to:

- set your personal deadline earlier than the actual one

- keep backups of all important assessed tasks
- make sure no one else picks up your printouts or otherwise has inappropriate access to your work.

Teaching and Learning Strategy

The unit is taught via lectures and laboratory practical sessions. Lectures are used to introduce new material, give examples of the use of networking concepts and techniques and put them in a wider context. While lectures are largely one to many presentations, you are encouraged to ask questions of the lecturer to clarify anything you might not be sure of. Tutorial style discussions on important topics will be conducted in the lectures. These discussions will give you the opportunity to interact with your peers as well as the lecturer.

Practical classes give you an opportunity to practice your practical networking skills under the supervision of a demonstrator. Each week you will be given a number of problems to work on; it is important that you keep up with these problems as doing so will help you understand the material in the unit and prepare you for the work in assignments.

Each week **weekly problems** will be posted to develop your understanding of that week's material. Even though these exercises are only sometimes formally assessed, it is important that you work on them all on a weekly basis as these questions help you to understand the material, preparing you for the next week's work (they also prepare you for the examination - they are often previous exam questions or are similarly structured to exam questions - the more practice you have at such questions, the more likely you are to do yourself justice in the exam).

Remember that you are required to submit (via ilearn) your attempts at the specified problems each week.

Each week you should:

- Attend lectures, take notes, ask questions, seek feedback from the lecturer.
- Read appropriate sections of the text, add to your notes and prepare questions for your lecturer/practical demonstrator.
- Attend the practical session, do as many of the practical problems as you can and seek feedback from the practical demonstrator on your work.
- Prepare answers to weekly problems and submit the specified ones on ilearn. If need be, seek feedback from the teaching staff.
- Work on any assignments that have been released.

Lecture materials may sometimes be provided, but these notes are intended as an outline of the

lecture only and are not a substitute for your own notes or the textbook.