COMP3250
Computer Networks
Session 2, Special circumstances, North Ryde 2021
Department of Computing

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Session 2 Learning and Teaching Update
The decision has been made to conduct study online for the remainder of Session 2 for all units WITHOUT mandatory on-campus learning activities. Exams for Session 2 will also be online where possible to do so.

This is due to the extension of the lockdown orders and to provide certainty around arrangements for the remainder of Session 2. We hope to return to campus beyond Session 2 as soon as it is safe and appropriate to do so.

Some classes/teaching activities cannot be moved online and must be taught on campus. You should already now if you are in one of these classes/teaching activities and your unit convenor will provide you with more information via iLearn. If you want to confirm, see the list of units with mandatory on-campus classes/teaching activities.

Visit the MQ COVID-19 information page for more detail.

https://unitguides.mq.edu.au/unit_offerings/132380/unit_guide/print
General Information

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Credit points
10

Prerequisites
130cp at 1000 level or above including ((COMP1010 or COMP125) and (COMP2250 or COMP247)) and ((DMTH137 or MATH1007 or MATH2907 or DMTH237 or ELEC2040 or ELEC240))

Corequisites

Co-badged status
Unit description
This unit gives an understanding of advanced topics in the design and implementation of computer networks. It provides an in-depth understanding of key protocols of the TCP/IP protocol suite, and its relationship to emerging technologies. This unit allows students to develop knowledge and expertise in key areas such as intra- and inter-domain routing protocols, multicast protocols, different transport protocols, Quality of Service, and multimedia. These concepts are reinforced through tutorials and laboratory sessions. Knowledge gained during the unit builds upon communication protocols; topological designs; wide area and local area networks; wireless/mobile networks; as well as practical hands-on skills on Cisco equipment. It allows students to expand their skill set by exposure to socket programming paradigm enabling them to better understand the design and implementation of protocols. Some of the reasoning tasks that the students complete require focused thinking instead of iteratively modifying and testing a program. It also enhances students' skills in critical thinking and problem solving using challenging assignments.

Important Academic Dates
Information about important academic dates including deadlines for withdrawing from units are available at [https://students.mq.edu.au/important-dates](https://students.mq.edu.au/important-dates)

Learning Outcomes
On successful completion of this unit, you will be able to:

- **ULO1**: Demonstrate an understanding of advanced knowledge in networking (especially in Internet technologies) and be able to communicate this knowledge to wider audience
- **ULO2**: Design TCP/IP based networks and protocols and to integrate such networks with other networking technologies
- **ULO3**: Have a working knowledge of practical advanced networking and write professional documentation
- **ULO4**: Demonstrate an understanding of security issues in computer networking.
- **ULO5**: Engage in independent professional work with a high level of autonomy and accountability.

General Assessment Information

Assignment Submission

Your assignment is to be submitted online using Turnitin.

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.

[https://unitguides.mq.edu.au/unit_offerings/132380/unit_guide/print](https://unitguides.mq.edu.au/unit_offerings/132380/unit_guide/print)
This penalty does not apply for cases in which an application for special consideration is made and approved. If you cannot submit assignments on time because of illness or other circumstances, please contact the convener at the earliest possible time.

**Assessment Tasks**

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Hurdle</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes-Online</td>
<td>20%</td>
<td>No</td>
<td>Weeks 5 and 11</td>
</tr>
<tr>
<td>Final Examination</td>
<td>40%</td>
<td>No</td>
<td>Examination Period</td>
</tr>
<tr>
<td>Assignment 1</td>
<td>15%</td>
<td>No</td>
<td>Week 8</td>
</tr>
<tr>
<td>Assignment 2</td>
<td>15%</td>
<td>No</td>
<td>Week 12</td>
</tr>
<tr>
<td>Practicals</td>
<td>10%</td>
<td>No</td>
<td>Weekly-Starting from week 3</td>
</tr>
</tbody>
</table>

**Quizzes-Online**

Assessment Type 1: Quiz/Test  
Indicative Time on Task 2: 20 hours  
Due: **Weeks 5 and 11**  
Weighting: 20%

There will be two quizzes in the following weeks: 5 and 11. Each quiz is worth 10 marks. A quiz is a short test that will be based on your previously attempted discussion questions and previous lecture material. The quizzes will be held online in your practical class. The quiz questions will be handed over to you at the beginning of your Practical class and will be 1 hour in duration.

On successful completion you will be able to:

- Demonstrate an understanding of advanced knowledge in networking (especially in Internet technologies) and be able to communicate this knowledge to wider audience.
- Design TCP/IP based networks and protocols and to integrate such networks with other networking technologies.
- Demonstrate an understanding of security issues in computer networking.
- Engage in independent professional work with a high level of autonomy and accountability.

**Final Examination**

Assessment Type 1: Examination
Indicative Time on Task: 40 hours
Due: Examination Period
Weighting: 40%

Online final exam.

An examination allows us to individually and securely assess student's mastery of the coursework material. The examination will be closed book and three (3) hours in length.

On successful completion you will be able to:

- Demonstrate an understanding of advanced knowledge in networking (especially in Internet technologies) and be able to communicate this knowledge to wider audience
- Design TCP/IP based networks and protocols and to integrate such networks with other networking technologies
- Have a working knowledge of practical advanced networking and write professional documentation
- Demonstrate an understanding of security issues in computer networking.
- Engage in independent professional work with a high level of autonomy and accountability.

Assignment 1
Assessment Type: Problem set
Indicative Time on Task: 20 hours
Due: Week 8
Weighting: 15%

Assignment Type: Problem Solving:

The purpose of the problem solving assignment is to help the students to get accustomed to dealing with real world problem situations/issues. It is designed to help students analyse a particular problem and find its best solution. Some questions may require an in depth research and will be a process to come up with an acceptable and reasonable answer.
On successful completion you will be able to:

- Demonstrate an understanding of advanced knowledge in networking (especially in Internet technologies) and be able to communicate this knowledge to wider audience.
- Design TCP/IP based networks and protocols and to integrate such networks with other networking technologies.
- Have a working knowledge of practical advanced networking and write professional documentation.
- Engage in independent professional work with a high level of autonomy and accountability.

Assignment 2

Assessment Type: Problem set
Indicative Time on Task: 10 hours
Due: Week 12
Weighting: 15%

Individual Assignment

Assignment Type: Problem Solving-Research: This type of assignment is designed to help students build up their critical thinking skills while looking for solutions to real world networking related problems.

On successful completion you will be able to:

- Demonstrate an understanding of advanced knowledge in networking (especially in Internet technologies) and be able to communicate this knowledge to wider audience.
- Design TCP/IP based networks and protocols and to integrate such networks with other networking technologies.
- Have a working knowledge of practical advanced networking and write professional documentation.
- Demonstrate an understanding of security issues in computer networking.
- Engage in independent professional work with a high level of autonomy and accountability.

Practicals

Assessment Type: Practice-based task
Indicative Time on Task: 0 hours
Due: Weekly-Starting from week 3
Weighting: 10%

Practical marks are obtained by attendance of practical sessions and making a suitable attempt at the practical work during the session. 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. (and the practical material is structured against the lecture material with this in mind).

**Note:** We *advise* you to complete all sections to gain a good understanding of the covered topics.

On successful completion you will be able to:

- Have a working knowledge of practical advanced networking and write professional documentation
- Demonstrate an understanding of security issues in computer networking.

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**

**Lectures**

Each lecture is a combination of live informal lecture session and asynchronous prerecorded lecture.

Asynchronous sessions i.e., pre-recorded weekly lectures will be made available on ilearn unit page which provides detailed explanation of the learning content. Students are expected to watch the pre-recorded weekly lectures to actively engage with the unit and prepare for tutorials/practicals.

Live lecture sessions will provide an opportunity for the students to ask questions on the topic of the week and to clarify anything that they might not be sure of. In order for these live sessions to be worthwhile, we strongly urge the students to watch the recordings before attending these sessions.
Lecture recordings will be made available through Echo360.

Practicals
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.

*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.

There will be one 2 hour practical session each week, Conducted in a specially-equipped networking laboratory. There is no opportunity to conduct practical work outside the assigned sessions.

Quizzes
There will be two quizzes in the following weeks: 5, and 11. A quiz is a short test that will be based on your previously covered lecture material. For example, week 5 quiz will be based on lectures done in weeks 1-4. The quiz questions will be handed over to you at the beginning of your Lecture class. These quizzes contribute 20% of the total mark and serve as a feedback mechanism to monitor your progress in the unit.

Tutorial
Tutorials are posted every Friday on iLearn. Even though these tutorial exercises are not formally assessed, it is important that students solve them on a weekly basis as these questions are often previous exam questions or structured like test/exam questions. The more practice you have at such questions, the more likely you are to do yourself justice in quizzes/exams. Solutions to these exercises will be regularly posted on iLearn unit site. If need be, this will also allow you to discuss the problems effectively with your lecturer/peers and maximise the feedback you get on your work. In case of any difficulty, seek help from the teaching staff.

Assignments
Your assignment is to be submitted online using Turnitin.

Late Submission
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.

This penalty does not apply for cases in which an application for special consideration is made and approved. If you cannot submit assignments on time because of illness or other
circumstances, please contact the convener at the earliest possible time.

**Text**

**The Recommended Text**

*Internetworking with TCP/IP Volume 1, 6th edition*  
*Douglas Comer*

*Computer Networks (5th Edition)*  
*by Andrew S. Tanenbaum and David J. Wetherall*

**Reference Text List**

*Computer Networks and Internets: Global (6th) Edition*  
*by Douglas Comer*

*Computer Networking: A Top-Down Approach 6th edition*  
*by James F. Kurose and Keith W. Ross*

**General Notes**

In this unit, you should do the following:

- Attend lectures, take notes, ask questions.
- Attend your weekly Practical session
- Prepare for and strive to do well in the three quizzes
- Read appropriate sections of the text, add to your notes and prepare questions for your lecturer/tutor.
- Prepare answers to tutorial questions.
- 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 Lecture Schedule**

Note: We anticipate that there may be some shifting of material depending on class progress during the semester.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to TCP/IP, IP addressing</td>
<td>Chap: Tanenbaum - 5, 1 pgs 45-54, Comer-21</td>
</tr>
<tr>
<td>2</td>
<td>Introduction to Routing, Intra-Domain Routing</td>
<td>Chap: Tanenbaum - 5 (pgs 362-380), Comer - 1, 2, 21, 27</td>
</tr>
<tr>
<td>3</td>
<td>Intra domain Routing (Contd), CIDR</td>
<td>Chap: Tanenbaum - 5 (pgs 362-380, 447-449), Comer- 27 (section 27.16)</td>
</tr>
<tr>
<td>4</td>
<td>Inter-Domain Routing</td>
<td>Chap: Tanenbaum - 5 (pg 479), Comer - 27</td>
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<td>----------------------------------------------------------------</td>
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</tr>
<tr>
<td>5</td>
<td>Inter Domain Routing (Contd)</td>
<td>Chap: Tanenbaum - 5 (pg 479), Comer - 27</td>
</tr>
<tr>
<td>7</td>
<td>IP Multicast (Contd), Introduction to transport Layer</td>
<td>Chap: Tanenbaum - 5 (pg 382), Comer - 26</td>
</tr>
<tr>
<td></td>
<td>Break</td>
<td>Continue to Work on assignment 1</td>
</tr>
<tr>
<td>11</td>
<td>Internet Protocol (IP) version 6: An Introduction</td>
<td>Chap: Tanenbaum - 5 (pg 455), Comer - 20.</td>
</tr>
<tr>
<td>12</td>
<td>Advanced Topics</td>
<td>Chap: Tanenbaum - 7, RFC 3117, Comer - 4</td>
</tr>
<tr>
<td>13</td>
<td>Review</td>
<td></td>
</tr>
</tbody>
</table>

**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). 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). 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 (https://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/admin/other-resources/student-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](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/](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 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](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/offices_and_units/information_technology/help/](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](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).
The policy applies to all who connect to the MQ network including students.

**Grading**

**Grades**

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.

**Note**: There are no hurdles in this unit.

Concretely, **in order to pass the unit**, you must obtain an overall total mark of **50%** or higher.

Students obtaining a higher grade than a pass in this unit will (in addition to the above)
• have a total mark of 85% or higher to obtain High Distinction;
• have a total mark of 75% or higher to obtain Distinction;
• have a total mark of 65% or higher to obtain Credit.

Note:

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.

All work submitted should be readable and well presented.

You should never commit plagiarism in any of your submitted work, including tutorial and practical answers.