COMP347

Computer Networks

S2 Day 2017

Dept of Computing

Contents

Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

General Information

Unit convenor and teaching staff
Unit Convenor
Rajan Shankaran
rajan.shankaran@mq.edu.au
Contact via EXT: 9537
E6A-337
By Appointment

Lecturer
Ian Joyner
ian.joyner@mq.edu.au
TBA

Lecturer/Prac supervisor
Damian Jurd
damian.jurd@mq.edu.au
E6A-347
TBA

Prac Supervisor
Samundra Deep
samundra.deep@students.mq.edu.au
TBA

Credit points
3

Prerequisites
(39cp at 100 level or above) including (COMP247 and COMP125 and (DMTH137 or DMTH237 or ELEC240))

Corequisites

Co-badged status
ITEC697

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://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, 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.

General Assessment Information

Assignment

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.

Assessment Tasks

Name	Weighting	Hurdle	Due
Diagnostic Test	0%	No	Week 3- In Class
Assignment 1	15%	No	Week 8
Assignment 2	15%	No	Week 12
Practicals	10%	No	Weekly
Quizzes	10%	No	Weeks 6 and 12
Final Examination	50%	Yes	TBA

Diagnostic Test

Due: **Week 3- In Class**
Weighting: **0%**

Diagnostic Test: In this assessment students will be given questions that evaluate their familiarity with key areas of the course. This is an early assessment to give students an opportunity to gain feedback and initial progress in the unit. The assessment will take 30 minutes, be completed in Lecture class in week 3, This test will contribute to 0% of the overall grade.

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.

Assignment 1

Due: **Week 8**
Weighting: **15%**

Assignment 1 (Problem Solving) will focus on Addressing and Routing.

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

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

The assignment 2 focusses on protocol design with security considerations.

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

Due: **Weekly**
Weighting: **10%**

Practical marks are obtained by attendance of practical sessions and making a suitable attempt at the practical work during the session. The practical work in this unit makes up 10% of your

mark. The practical work is divided up into 12 sections (Weeks 2- 12, Week 13-catch up session) . The first four will be available before the semester begins. Each section is worth 2 marks. 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 succesful 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.

Quizzes

Due: **Weeks 6 and 12**
Weighting: **10%**

There will be two quizzes in the following weeks: 6 and 12. Each quiz is worth 5 marks. A quiz is a short test that will be based on your previously attempted discussion questions and previous lecture material. The quiz questions will be handed over to you at the beginning of your Practical class. The quiz will occupy approximately half an hour of the practical class for that week. These quizzes contribute 10% of the total mark and serves as a feedback mechanism to monitor your progress in the unit.

If you are unable to attend your practical on the day of your quizz please contact the tutor **at the earliest possible time**.

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

Due: **TBA**
Weighting: **50%**

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

An examination allows us to individually and securely assess student's mastery of the coursework material. The examination material will be covered by learning outcomes #1 and #2.. The examination will be closed book and three (3) hours in length.

The examination is a hurdle in this unit. Concretely, **in order to pass the unit**, you must get at least 40% of the marks in the final examination. Students who score between 30% and 40% will be eligible for a second chance examination.

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.

Delivery and Resources

Classes

Lecture Classes are held in the following days:

Monday: 1:00 pm- 3:00 pm   W5C - 220

Tuesday: 5 pm -6 pm   W5C - 320

Practical Sessions are held in the following days:

Friday: 12;00 pm - 2:00 pm   E6A - 240 (Engineering Lab)

Friday: 2;00 pm - 4:00 pm   E6A - 240 (Engineering Lab)

Friday: 4;00 pm - 6:00 pm   E6A - 240 (Engineering Lab)

Lectures

3 hours of lectures each week.

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.

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.

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: 6, and 12. A quiz is a short test that will be based on your previously covered lecture material. For example, week 6 quiz will be based on lectures done in weeks 1-5. The quiz questions will be handed over to you at the beginning of your Lecture class. These quizzes contribute 10% 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 of the assignment will be accepted, but penalised at the rate of *5% per working day late*. If you cannot submit assignments on time because of illness or other circumstances, please contact the convenor at the earliest possible time.

Text

The Recommended Text

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

Reference Text List

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

Computer Networking: A Top-Down Approach Featuring the Internet third edition by James F. Kurose and Keith W. Ross

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

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

1	Introduction to TCP/IP, addressing	Chap: Kurose-1, 4, COmer-21
2	Introduction to Routing, Intra-Domain Routing	Chap: Kurose-4, Comer-1, 2, 21, 27
3	Intra domain Routing (Contd), CIDR	Chap: Kurose-4, Comer-27 (section 27.16)
4	Inter-Domain Routing	Chap: Kurose-4, Comer-27
5	Inter Domain Routing (Contd)	Chap: Kurose-4, Comer-27
6	IP Multicast	Chap: Kurose-3, Comer-26. **Quiz 1**
7	IP Multicast (Contd), Introduction to transport Layer	Chap: Kurose-3, Comer-26
Break	Continue to Work on assignment 1	
8	Transport Layer-Transmission Control Protocol (TCP)	Chap: Kurose-3, Comer-26. **Assignment 1 due.**
9	Network Security	Chap: Kurose-8, Comer-32-33.

10	Network Security (contd) and Design	Chap: Kurose-3, Comer-26.
11	Internet Protocol (IP) version 6: An Introduction	Chap: Kurose-3, 8, Comer-20.
12	Application Layer Protocols	Chap: Kurose-2. RFC 3117. Comer-4 **Quiz 2** **Assignment 2 due**
13	Review	

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_2016.html

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

Complaint Management Procedure for Students and Members of the Public http://www.mq.edu.au/policy/docs/complaint_management/procedure.html

Disruption to Studies Policy (in effect until Dec 4th, 2017): http://www.mq.edu.au/policy/docs/disruption_studies/policy.html

Special Consideration Policy (in effect from Dec 4th, 2017): https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/special-consideration

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.

Please pay particular attention to the Special Consideration policy and the Academic Honesty policy.

Disruption to Studies

Special Consideration must be given to students who have had a disruption to their studies where the university has determined that the disruption is serious and unavoidable. In cases where the disruption is found not to be serious and unavoidable the special consideration *may*

still be granted at the discretion of the unit convenor.

Depending upon the circumstances presented, the convenor may choose to give you an alternate assessment, additional time for an assessment, make-up exam, etc. If a Supplementary Examination is granted as a result of the Special Consideration process the examination will be scheduled after the conclusion of the official examination period. For details of the Disruption to studies policy please refer the disruption to studies policy. (http://www.mq.edu.au/policy/docs/disruption_studies/policy.html)

Late Submission

There will be a deduction of 5% of the total available marks made from the total awarded mark for each 24 hour period or part thereof that the submission is late. This penalty does not apply for cases in which an application for special consideration is made and approved.

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

Plagiarism involves using the work of another person and presenting it as one's own. The Department, in line with University policy, treats all cases seriously. In particular, the Department, keeps a record of all plagiarism cases. This record is referred to so that an appropriate penalty can be applied to each case.

For concrete examples, refer to 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

Staff-Student Liaison Committee

The Department has established a Staff-Student Liaison Committee at each level (100, 200,

300) to provide all students studying a Computing unit the opportunity to discuss related issues or problems with both 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/undergrad/info/liaison/300-level/

If you have concerns about the anything related to the organisation or operation of COMP347, 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 (Dr. Steven Cassidy) or the Head of Department (Dr. Christophe Doche). 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://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.

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

- 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.

Assessment tasks

- Assignment 1
- Assignment 2
- Practicals
- Final Examination

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcome

- Engage in independent professional work with a high level of autonomy and accountability.

Assessment tasks

- Assignment 1
- Assignment 2
- Practicals
- 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 outcome

- Engage in independent professional work with a high level of autonomy and accountability.

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

- 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.

Assessment tasks

- Diagnostic Test
- Assignment 1
- Assignment 2
- Practicals
- Quizzes
- 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

- 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.

Assessment tasks

- Assignment 1
- Assignment 2
- Practicals
- Final Examination

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

- 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.

Assessment tasks

- Diagnostic Test
- Assignment 1
- Assignment 2
- Practicals
- Quizzes
- 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 outcome

- Have a working knowledge of practical advanced networking and write professional documentation

Assessment tasks

- Assignment 1
- Assignment 2
- Practicals
- Final Examination

Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

Learning outcome

- Engage in independent professional work with a high level of autonomy and accountability.

Assessment task

- Practicals

Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

Assessment tasks

- Assignment 1
- Assignment 2
- Practicals

Grade Requirements

Standards and grading

Standards

L.O 1	Pass	Credit	Distinction	High Distinction
Advanced knowledge in networking	Demonstrate a basic understanding of the definition and function of complex protocols in TCP/IP protocol stack. Demonstrate a basic understanding of the functions of routing and multicasting in the TCP/IP protocol stack. Demonstrate an understanding of the internals of each technology in the TCP/IP protocol stack, including security	Satisfy the standard for Credit and in addition demonstrate a detailed understanding of most of the complex protocols discussed. Understand and be able to use CIDR and interdomain routing.	Satisfy the standard for Credit and in addition demonstrate a sustained detailed understanding of the complex protocols discussed. 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.

L.O2	Pass	Credit	Distinction	High Distinction
Protocol Design	Demonstrate a basic understanding of the structure and use of protocols.	Satisfy the standard for Pass and in addition demonstrate a detailed understanding of the protocol design with security support	Satisfy the standard for Credit and in addition demonstrate some ability to reason with and use the knowledge of protocol design in network design decisions.	Satisfy the standard for Distinction and in addition demonstrate a sustained ability to reason with and use the knowledge of protocol design in making network design decisions.

L.O 3	Pass	Credit	Distinction	High Distinction
Technical Networking Proficiency	Able to successfully connect and configure advanced network topologies with routers. Limited ability to analyse network traffic using a packet sniffer. Limited ability to produce clear and comprehensive documentation of network setup, configuration and analysis.	Satisfy the standard for pass and in addition be able to successfully trouble shoot advanced network configurations and analyse complex network traffic flows using a packet sniffer and demonstrate ability to produce clear and comprehensive documentation of advanced network setup, configuration and analysis.	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 advanced network setup, configuration and analysis.	Satisfy the standard for distinction and in addition demonstrate originality and insight in their documentation and anlysis of advanced network setup, configuration and traffic
LO#4				

Knowledge of Network Security	Demonstrate a basic understanding of basic role of security in networks	Satisfy the standard for Pass and in addition demonstrate a detailed understanding of network security.	Satisfy the standard for Credit and in addition demonstrate some ability to reason with and use the knowledge network security in network design decisions.	Satisfy the standard for Distinction and in addition demonstrate a sustained ability to reason with and use the knowledge of network security in making network design decisions.

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.The final examination in this unit is a hurdle requirement; you must get a mark of at least 40% in the examination to pass the unit. If you get a mark between 30% and 40% in your first attempt at the final examination, you will be given a second and final attempt.

Concretely, **in order to pass the unit**, you must obtain an overall total mark of 50% or higher, and a mark of 40% or higher in the final examination.

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.

 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.

Changes since First Published

Date	Description
12/07/2017	Examination hurdle description