



COMP347

Computer Networks

S2 Day 2019

Dept of Computing

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Disclaimer

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General Information

Unit convenor and teaching staff

Unit Convenor

Rajan Shankaran

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Contact via EXT: 9537

285, 4 Research Park Drive

By Appointment

Lecturer

Ian Joyner

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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

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.

Each Practical class is **2** hours in duration and is worth **2** marks. You work in a group but individual marks are assigned from group work.

Examination

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.

Note

- Second chances at hurdles are marked **pass/fail**. This means that the maximum that a student can receive at a second attempt is the hurdle requirement: if the hurdle requirement is **40%**, the maximum a student can receive is **40%**
- Students only receive a second attempt if they are capable of passing the unit. This means that the maximum they can receive from the second attempt (see the previous point) must be such that their final mark would add up to **50%+**

Supplementary Examination

If you receive special consideration for the final exam, a supplementary exam will be scheduled and you will be *informed via email* of the date, time and venue. By making a special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. Approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

If you are given a second opportunity to sit the final examination as a result of failing to meet the minimum mark required, you will be offered that chance during the same supplementary examination period and will be notified of the exact day and time after the publication of final results for the unit.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Quizzes</u>	10%	No	Weeks 5 and 11
<u>Assignment 1</u>	15%	No	Week 8
<u>Assignment 2</u>	15%	No	Week 12
<u>Practicals</u>	10%	No	Weekly
<u>Final Examination</u>	50%	Yes	TBA

Quizzes

Due: **Weeks 5 and 11**

Weighting: **10%**

There will be two quizzes in the following weeks: **5** and **11**. 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 quizzes will be held in your practical class. 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 quiz 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.

Assignment 1

Due: **Week 8**

Weighting: **15%**

Individual Assignment

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

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

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 **11** sections (Weeks **2- 12**, Week **13**-catch up session) . 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 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.

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 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.

Hurdle

- Second chances at hurdles are marked **pass/fail**. This means that the maximum that a student can receive at a second attempt is the hurdle requirement: if the hurdle requirement is **40%**, the maximum a student can receive is **40%**
- Students only receive a second attempt if they are capable of passing the unit. This means that the maximum they can receive from the second attempt (see the previous point) must be such that their final mark would add up to **50%+**

Supplementary Exam

If you receive Special Consideration for the final exam, a supplementary exam will be scheduled after the normal exam period, following the release of marks. By making a special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application.

Approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary 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: 11:00 am- 1:00 pm 14 Sir Christopher Ondaatje Ave - T4 Theatre

Wednesday: 2 pm -3 pm 14 Sir Christopher Ondaatje Ave - T3 Theatre

Practical Sessions are held in the following days:

Monday: 2:00 pm to 4:00 pm 9 Wallys Wlk - 240 Engineering Lab (9WW240)

Tuesday: 11:00 am to 1:00 pm 9 Wallys Wlk - 240 Engineering Lab (9WW240)

Tuesday: 1:00 pm to 3:00 pm 9 Wallys Wlk - 240 Engineering Lab (9WW240)

Wednesday: 10:00 am - 12:00 pm 9 Wallys Wlk - 240 Engineering Lab (9WW240)

Wednesday: 6:00 pm - 8:00 pm 9 Wallys Wlk - 240 Engineering Lab (9WW240)

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.

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 6 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 **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

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.

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 lecture series.

1	Introduction to TCP/IP, addressing	Chap: Tanenbaum - 5, 1 pgs 45-54, Comer-21	
2	Introduction to Routing, Intra-Domain Routing	Chap: Tanenbaum - 5 (pgs 362-380), Comer - 1, 2, 21, 27	
3	Intra domain Routing (Contd), CIDR	Chap: Tanenbaum - 5 (pgs 362-380, 447-449), Comer- 27 (section 27.16)	
4	Inter-Domain Routing	Chap: Tanenbaum - 5 (pg 479), Comer - 27	
5	Inter Domain Routing (Contd)	Chap: Tanenbaum - 5 (pg 479), Comer - 27	Quiz 1
6	IP Multicast	Chap: Tanenbaum - 5 (pg 382), Comer - 26.	
7	IP Multicast (Contd), Introduction to transport Layer	Chap: Tanenbaum - 5 (pg 382), Comer - 26	
Break	Continue to Work on assignment 1		
8	Transport Layer-Transmission Control Protocol (TCP)	Chap: Tanenbaum - 6, Comer - 26.	Assignment 1 due.
9	Network Security	Chap: Tanenbaum - 8, Comer - 32-33.	
10	Network Security (contd) and Design	Chap: Tanenbaum - 8, Comer - 26.	
11	Internet Protocol (IP) version 6: An Introduction	Chap: Tanenbaum - 5 (pg 455), Comer - 20.	Quiz 2
12	Application Layer Protocols	Chap: Tanenbaum - 7. RFC 3117. Comer - 4	Assignment 2 due
13	Review		

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](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.*)

Undergraduate students seeking more policy resources can visit the [Student Policy Gateway \(https://students.mq.edu.au/support/study/student-policy-gateway\)](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 \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](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/study/getting-started/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

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.

Supplementary Exam

If you receive [Special Consideration](#) for the final exam, a supplementary exam will be scheduled after the normal exam period, following the release of marks. By making a special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. Approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

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

Staff-Student Liaison Committee

The Department has established a Staff-Student Liaison Committee (300 level) 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 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 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 (A/Prof Steve Cassidy) or the Head of Department (Professor Michael Sheng). You are entitled to have your concerns raised, discussed and resolved.

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 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

If you are a Global MBA student contact globalmba.support@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

- Quizzes
- Assignment 1
- Assignment 2
- Practicals
- 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

- Quizzes
- Assignment 1
- Assignment 2
- Practicals
- 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

Changes from Previous Offering

New lecture content on Security and Backbone. Some new prac exercises have been added.

Grade Requirements

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.

Hurdle

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.

Note

- Second chances at hurdles are marked **pass/fail**. This means that the maximum that a student can receive at a second attempt is the hurdle requirement: if the hurdle requirement is **40%**, the maximum a student can receive is **40%**
- Students only receive a second attempt if they are capable of passing the unit. This means that the maximum they can receive from the second attempt (see the previous point) must be such that their final mark would add up to **50%+**

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.