

# Computer Network Design - Course Outline

## NWEN 302: 2012 Trimester 2

This document sets out the workload and assessment requirements for NWEN 302. It also provides contact information for staff involved in the course. If the contents of this document are altered during the course, you will be advised of the change by an announcement in lectures and/or on the course web site. A printed copy of this document is held in the School Office.

This course addresses the principles, architectures and protocols that have shaped the development of the Internet and modern networked applications. It examines network design principles, underlying protocols, technologies and architectures of the TCP/IP protocol stack. The design of various protocols in the stack, such as, protocols like ARP, ICMP, IP, DHCP, TCP, UDP, routing protocols like OSPF, and IPv6 will be covered in detail, together with logical link control, medium access control and physical media communications issues.

### Objectives

By the end of the course, students should be able to:

1. Explain the process in which packets are delivered from source to destination in the Internet (GA [3\(b\)](#))
2. Explain key routing algorithms, the process of how routing protocols communicate/exchange topology information and set up routing tables (GA [3\(a\)](#), [3\(b\)](#), [3\(d\)](#), [3\(e\)](#))
3. Explain the operation of the TCP flow and congestion control algorithms (GA [3\(a\)](#), [3\(b\)](#), [3\(c\)](#), [3\(d\)](#), [3\(e\)](#))
4. Explain the role of medium access control and implications of different types of physical layers (GA [3\(a\)](#), [3\(b\)](#), [3\(c\)](#), [3\(d\)](#), [3\(e\)](#))
5. Setup and interconnect networks with a emulation tool (GA [3\(b\)](#), [3\(d\)](#), [3\(f\)](#))
6. Write a simple packet sniffer, analysing data packets (GA [3\(b\)](#), [3\(d\)](#), [3\(f\)](#))
7. Implement simple networking and routing algorithms using TCP/IP primitives (GA [3\(b\)](#), [3\(d\)](#), [3\(f\)](#)).

### Textbook and recommended reference

The textbook for NWEN 302 is: James F. Kurose and Keith W. Ross, *Computer Networking: A Top-Down Approach Featuring the Internet*, Fifth Edition, Pearson, available from VicBooks.

A good reference book is: Ying-Dar Lin, Ren-Hung Hwang and Fred Baker, *Computer Networks: An open source approach*, McGraw-Hill, 2011, available in the library.

### Lectures, Tutorials, Laboratories, and Practical work

A [schedule](#) of lecture topics, readings, and assignment due dates is available online

- Lectures for NWEN 302 are: Wed 12:00-13:00 in MY632 and Fri 12:00-13:00 in MYLT101.
- There will be 2hr labs: Tue 15:00-17:00 or Fri 15:00-17:00 in CO246 (there are two 2hr timeslots, you may attend any of them) - **NOTE: Due to the availability of tutors, the second half (16:00-17:00) of the Tue session will NOT be supervised.**

### Assignments and Labs

There will be 4 lab projects, 2 set in weeks 1-6 and 2 set in weeks 7-12.

There will also be 4 homework assignments, 2 set in weeks 1-6 and 2 set in weeks 7-12.

### Workload

In order to maintain satisfactory progress in NWEN 302, you should plan to spend at least 10 hours per week on this paper. A plausible and approximate breakdown for these hours would be:

- Lectures: 2 hours
- Readings: 2 hours
- Assignments: 2 hours
- Labs: 4 hours

### School of Engineering and Computer Science

The School office is located on level three of the Cotton Building ([Cotton 358](#)).

## Staff

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The course organiser for NWEN 302 is [Dr Qiang Fu](#). The lecturers for the course are [Prof Winston Seah](#) and [Dr Qiang Fu](#). Their contact details are:

- Dr. Qiang Fu
- [Cotton 329](#)
- +64 4 463 5233 x 8829
- [qiang.fu@ecs.vuw.ac.nz](mailto:qiang.fu@ecs.vuw.ac.nz)
  
- Prof. Winston Seah
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Tutors:

- Cam Owen: [cameron.owen@ecs.vuw.ac.nz](mailto:cameron.owen@ecs.vuw.ac.nz)

## Announcements and Communication

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The main means of communication outside of lectures will be the NWEN 302 web area at [http://ecs.victoria.ac.nz/Courses/NWEN302\\_2012T2/](http://ecs.victoria.ac.nz/Courses/NWEN302_2012T2/). There you will find, among other things, this document, the [lecture schedule](#) and [assignment handouts](#), and the [NWEN 302 Forum](#). The forum is a web-based bulletin board system. Questions and comments can be posted to the forum, and staff will read these posts and frequently respond to them.

## Assessment

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Your grade for NWEN 302 will be determined based on the following assessment weightings:

| <u>Item</u>       | <u>Weight</u> | <u>Due</u>                           |
|-------------------|---------------|--------------------------------------|
| Assignment 1      | 2.5%          | Fri. Week 4                          |
| Assignment 2      | 2.5%          | Fri. 1st Week of mid trimester break |
| Assignment 3      | 2.5%          | Fri. Week 9                          |
| Assignment 4      | 2.5%          | Fri. Week 12                         |
| Lab 1             | 5%            | Fri. Week 5                          |
| Lab 2             | 10%           | Fri. 1st Week of mid trimester break |
| Lab 3             | 5%            | Fri. Week 9                          |
| Lab 4             | 10%           | Mon. Week 12                         |
| Final Examination | 60%           | TBD                                  |

## Exam

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The [timetable for final examinations](#) will be available from the University web site and will be posted on a notice board outside the faculty office. The final examination will be three hours long. No computers, electronic calculators or similar device will be allowed in the final examination. Paper non-English to English dictionaries will be permitted. The examination period for trimester 2 is 26 Oct - 17 Nov.

## Policies and Penalties for late Submission

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All assignments are to be submitted electronically via the ECS submission system and are due at 23:59 on the date specified. The penalty for late submissions will be a deduction of 20% of the marks per day late (00:00 the following day is counted as one day late).

All projects are to be submitted electronically via the ECS submission system and are due at 23:59 on the date specified. A project is penalised at 10% per day late (00:00 the following day is counted as one day late). After 5 days, projects will no longer be accepted for marking.

Any request for extension must be supported by a medical certificate or other acceptable documentation for non medical reasons. Medical certificates must be provided by a registered medical practitioner.

## Plagiarism

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Working Together and Plagiarism

We encourage you to discuss the principles of the course and assignments with other students, to help and seek help with programming details, problems involving the lab machines. However, any work you hand in must be your own work.

The [School policy on Plagiarism](#) (claiming other people's work as your own) is available from the course home page. Please read it. We will penalise anyone we find plagiarising, whether from students currently doing the course, or from other sources. Students who knowingly allow other students to copy their work may also be penalised. If you have had help from someone else (other than a tutor), it is always safe to state the help that you got. For example, if you had help from someone else in writing a component of your code, it is not plagiarism as long as you state (eg, as a comment in the code) who helped you in writing the method.

## Mandatory Requirements

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1. Obtain at least 40% of the total available marks across all the labs;
2. Obtain a D grade or better in the final exam.

## Passing NWEN 302

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To pass NWEN 302, a student must satisfy mandatory requirements and gain at least a **C** grade overall.

## Withdrawal

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The last date for withdrawal from NWEN 302 with entitlement to a refund of tuition fees is Friday 27 July 2012. The last date for withdrawal without being regarded as having failed the course is Friday 28 Sept 2012 -- though later withdrawals may be approved by the Dean in special circumstances.

## Rules & Policies

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Find key dates, explanations of grades and other useful information at <http://www.victoria.ac.nz/home/study>.

Find out about academic progress and restricted enrolment at <http://www.victoria.ac.nz/home/study/academic-progress>.

The University's statutes and policies are available at <http://www.victoria.ac.nz/home/about/policy>, except qualification statutes, which are available via the Calendar webpage at <http://www.victoria.ac.nz/home/study/calendar> (See Section C).

Further information about the University's academic processes can be found on the website of the Assistant Vice-Chancellor (Academic) at <http://www.victoria.ac.nz/home/about/avcacademic>

All students are expected to be familiar with the following regulations and policies, which are available from the school web site:

[Grievances](#)

[Student and Staff Conduct](#)

[Meeting the Needs of Students with Disabilities](#)

[Student Support](#)

[Academic Integrity and Plagiarism](#)

[Dates and Deadlines including Withdrawal dates](#)

[School Laboratory Hours and Rules](#)

[Printing Allocations](#)

[Expectations of Students in ECS courses](#)

The School of Engineering and Computer Science strives to anticipate all problems associated with its courses, laboratories and equipment. We hope you will find that your courses meet your expectations of a quality learning experience.

If you think we have overlooked something or would like to make a suggestion feel free to talk to your course organiser or lecturer.

[Course Outline as PDF](#)

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