Advanced Network Engineering - Course Outline

NWEN 403: 2010 Trimester 1

This document sets out the workload and assessment requirements for NWEN 403. 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.

Objectives

Advanced Network Engineering is part of the Engineering program at Victoria University of Wellington. BE graduates are expected to exhbit a number of graduate attributes at the completion of the program. This course contributes to the graduate attributes (GA) as indicated below. A full table of these attributes is available at Graduate Attributes.

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

1. select and use appropriate packet sniffers and network tools such as tcpdump and Wireshark, monitoring and analysing network traffic, debugging network setup and retrieving network information (GA 3(b), 3(d), 3(f)).
2. select and use appropriate network management tools, monitoring and managing network devices (GA 3(b), 3(d), 3(f)).
3. address network devices and set up domain name translation services (GA 3(a), 3(b), 3(f)).
4. design, set up and configure a simple enterprise network including setting up switching and routing (GA 3(a), 3(b), 3(d), 3(e), 3(f)).
5. present and communicate network engineering problems and solutions (GA 2(b)).
6. explain the concepts of Media Access Control (MAC) applied in wired/wireless networks (GA 3(a), 3(c)).
7. demonstrate advanced network knowledge into TCP/IP protocol suite including the capability of identifying certain research problems (GA 3(a), 3(d), 3(e)).

Textbook

NWEN 403 will not use any specific textbook, although some of the material will be based on the NWEN302 text book by Kurose and Ross (Computer Networks: A top down approach featuring the Internet). This book is available from the library.

Other material within the course is taken from a number of books and magazine, journal or conference papers. These are in the library (digital library includes ACM and IEEE/IET journals, magazines and conferences) and useful books include:

- Andrew Tanenbaum Computer Networks, 4th edition.
- Dimitri Bertsekas and Robert Gallager, Data Networks, second edition.
- William Stallings, Data and Computer Communications, eighth edition.
- William Stallings, Highspeed Networks and Intranets, second edition.
- Howard Berkowitz, Building Service Provider Networks

There are also a large number of online journals and books in the library and also on the Internet/web there are various resources, such as:

- IBM Redbook TCP/IP Tutorial and Technical Overview (published 2006). The IBM Redbook is a PDF document of more than 900 pages which is freely available and is a good resource for IP networking information.

Much of the material in this course will be provided from papers taken from learned societies publications such as conference proceedings, magazines and journals (e.g. IEEE - particularly the COMSOC, ACM) and various sources of online information, e.g. the IETF (www.ietf.org), the web pages of Cisco Systems, Juniper Networks etc. See the course schedule and other resource page for further information.

Lectures, Tutorials, Laboratories, and Practical work

A schedule of lecture topics, readings, and assignment due dates is available online.

Lectures for NWEN 403 are:

Day	Time	Room
Tuesday	1510-1600	CO119
Wednesday	1610-1700	CO119

Labs for NWEN 403 are:

Day	Time	Room
Friday	1500-1700	CO246

Assignments and Projects

There are three labs and one presentation for NWEN 403. All the lab tasks will be performed with the network facilities in CO246. All the lab reports will be submitted through the online submission system. Labs 1 and 2 are each worth 10% of the final grade. Lab 3 is worth 20% of the final grade. The presentation is worth 10% of the final grade.

- Lab 1 is about the use of packet sniffers and low level network tools, serving objective 1.
- Lab 2 is about network management tools and DNS, serving objectives 2 and 3.
- Lab 3 is about setting up a simple enterprise network, serving objective 4.
- The presentation is for you to present your work for Lab 3, serving objective 5.

The lab time-slot 1500-1700 on Fridays is dedicated for NWEN 403. However, students may use the lab facilities in CO246 at any time, provided other courses are not using this lab or you are not interfering with other courses. All the labs must be carried out **individually** and **independently**.

Workload

In order to maintain satisfactory progress in NWEN 403, you should plan to spend an average of at least *10 to 12* hours per week on this paper. The course is 15 points, i.e. 150 hours of effort approximately overall for satisfactory progress. A plausible and approximate breakdown for these hours would be:

- Lectures: 2 hours
- Reading and Practical work: 8-12 hours

School of Engineering and Computer Science

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

The notice board for NWEN 403 is located on the second floor of the Cotton Building.

Staff

The course organiser for NWEN 403 is Qiang Fu. The lecturers for the course are Qiang Fu and Wei Li. Their contact details are:

- *Qiang Fu*
- Cotton 329
- +64 4 463 5233x8829
- qiang.fu@ecs.vuw.ac.nz

- *Wei Li*
- Cotton 331
- +64 4 463 5233x
- wei.li@ecs.vuw.ac.nz

Announcements and Communication

The main means of communication outside of lecture will be the NWEN 403 web area at http://ecs.victoria.ac.nz/Courses/NWEN403_2010T1/. There you will find, among other things, this document, the lecture schedule and assignment handouts, and the NWEN 403 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

Your grade for NWEN 403 will be determined based on the following assessment weightings:

Item	Weight	Due
Lab 1	10%	Week 4
Lab 2	10%	Week 6
Lab 3	20%	Week 10

Presentation	10%	Week 10
Final Examination	50%	TBD

Late submissions will be penalised at a rate of 10% per day, and will not be accepted more than five days after the due date. Late submissions will be accepted by prior arrangement with the course coordinator for valid reasons such as medical (doctors note required) and family emergencies.

Note: Bachelor of Engineering students should be aware that copies of their assessed work may be retained for inspection by accreditation panel.

The Exam

The final examination will assess your understanding of the material covered in lectures and labs, but have a focus on the theoretical side of this course.

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 study and examination period for trimester T1 is 9th June to 30th June.

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

1. Obtain at least 50% of the total available marks across all the assignments;
2. Obtain a D grade or better in the final exam.

Passing NWEN 403

To pass NWEN 403, a student must satisfy mandatory requirements and gain at least a **C** grade overall.

Withdrawal

The last date for withdrawal from NWEN 403 with entitlement to a refund of tuition fees is Fri 12 March 2010. The last date for withdrawal without being regarded as having failed the course is Fri 14 May 2010 -- though later withdrawals may be approved by the Dean in special circumstances.

Rules & Policies

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.