Advanced Network Applications - Course Outline
NWEN 304: 2012 Trimester 1

This document sets out the workload and assessment requirements for NWEN 304. 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 introduces the techniques, paradigms and protocols for building reliable and scalable network applications.

Topics will include:

1. Architectures for scalable network applications.
2. Middleware paradigms such as document-oriented, CRUD, hypermedia web services and the WS-* stack.
3. Caching, consistency protocols and dealing with large amounts of data.
4. Web security including authorisation and authentication protocols.
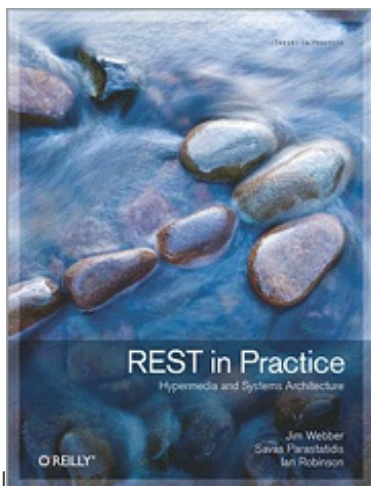5. Fault tolerance and graceful failure.

Objectives

Advanced Network Applications 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. Explain the need for security including the principles of authentication and authentication protocols (GA 3(a)).
2. Explain the basics of building networked applications and the tradeoffs involved in choosing an appropriate middleware paradigms for their implementations (GA 3(a), 3(e)).
3. Explain the role of caching and the tradeoffs involved in building scalable network applications (GA 3(a), 3(e)).
4. Explain the role of transactions in the development of fault tolerant network applications (GA 3(a)).
5. Be able to analyse the scalability and robustness of a proposed network application architecture based upon knowledge gained during the course (GA 3(c), 3(e))
6. Be able to develop and evaluate a network application implementation in terms of scalability and robustness (GA 3(b), 3(d), 3(e), 3(f))
7. Present explanations in written and oral form (GA 2(b)).

Textbook

The textbook is **essential** reading for doing well in the course. The lectures will provide a guide to the book but getting a good grade will require you to read the recommended readings before lectures.

REST in Practice -- Hypermedia and Systems Architecture, Jim Webber, Savas Parastatidis and Ian Robinson. Publisher: O'Reilly Media, September 2010. E-book edition is available for approximately $NZD 40.

In addition, we will draw upon material from:

- Distributed Systems: Principles and Paradigms by Tanenbaum and van Steen (will be available electronically).

- Operating Systems Concepts by Silberschatz, Galvin and Gagne (will be available electronically).
- Android Developer Guide (http://developer.android.com/guide/index.html)

Lectures, Tutorials, Laboratories, and Practical work

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

Lectures for NWEN 304 are:

5 Mar - 10 Jun 2012	Mon 1310-1400	New Kirk [Kelburn]	LT204
5 Mar - 10 Jun 2012	Thur 1310-1400	New Kirk [Kelburn]	LT204

Tutorials for NWEN 304 are:

5 Mar - 10 Jun 2012	Fri 1310-1400	New Kirk [Kelburn]	LT204

The scheduled labs for NWEN 304 are:

12 Mar - 10 Jun 2012	Either of Wed 1000 - 1050 or Wed 1310 - 1500	Cotton [Kelburn]	CO246

You must sign up to ONE of the lab sessions. There will be no labs in the week containing Anzac Day.

Assessment

Your grade for NWEN 304 will be determined based on the following assessment weightings:

Item	Weight
Four Assignments	10%
Three Projects	40%
Final Examination	50%

Homework assignments will not be accepted after model answers have been posted on the website. There will be five assignments handed out to do, the overall assignment grade will be calculated using the best four of five submitted. This means that each of the four assignments is worth 2.5% of your final grade.

Project work will be penalised at a rate of 10% per day late. However, for project work you have up to five grace days over the period of the course. This is a total number of days, if you use all five days up on your first project subsequent late projects will be penalised. Note that no work can be accepted after Friday midnight on Week 12.

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

Assignments and Laboratories

The internally assessed work consists of four assignments and three laboratory project. Laboratories will take place in CO246 but may also be worked upon at home or using other School machines. Copies of all work must be submitted via the online electronic submission system.

The assignments allow you to demonstrate your understanding of concepts (meeting objectives 1-4).

Dates and weightings for the assignments are shown in the table below.

Assignment	Released	Due	Weight
#1	12/03	25/03 23:59	2%
#2	26/03	22/04 23:59	2%
#3	23/04	06/05 23:59	2%
#4	07/05	20/06 23:59	2%
#5	21/05	08/06 23:59	2%

The laboratory projects allow you to demonstrate:

- That you can apply concepts in a practical context and evaluate what you have done (meeting objective 6).
- Your communication skills in demonstrations of your programs to the laboratory tutor (meeting objective 5).
- Your written communication skills through a written report (meeting objective 5).
- Your leadership and teamwork skills by working on project three in a small group (meeting objective 5).

Dates and weightings for the projects are shown in the table below. Submit your project code on the date specified. Project deliverables can include the code itself, a report and a demonstration.

Project	Submit code	Submit report	Demonstration	Weight
Building an online timetable reader	8/04 23:59	No report due	Week 5	10%
Building a "POXy" timetable reader	29/04 23:59	No report due	Week 8	10%
Innovation Project	07/06 23:59	04/06	Week 12	10% (code/demo), 10% (report)

Group Work

Projects one and two are carried out individually. Each individual's mark will be based upon how well they satisfied the project requirements. This will be assessed both by our own inspection of the code and you demonstrating the project's functionality in a laboratory session.

Project three is carried out by either an individual or a pair (preferred). Each member of a group will be given an individual mark based upon how well the group has satisfied the project requirements (up to 10%). The mark will be modified by how well I think that you understand the code (you must understand your own and the code written by your partners). This is assessed by interviewing you during the demonstration. In addition, you will receive up to an additional 5% based upon an individual report you submit at the end of the project.

Working in groups is not always straightforward so if you encounter problems please talk to one of the lecturers for the course and we will attempt to resolve the problem as amicably as possible.

Final 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 examination period for trimester 1 is 15 June - 4 July.

The examination is open book. You are allowed to bring in one A4 piece of paper that you may write on either side.

Workload

In order to maintain satisfactory progress in NWEN 304, you should plan to spend an average of at least *10 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 and tutorials: 3 hours
- Laboratory: 2 hours
- Assignments and Practical work: 5 hours

School of Engineering and Computer Science

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

Staff

The course organiser for NWEN 304 is Ian Welch. His contact details are:

- *Ian Welch*
- Cotton 337
- +64 4 463 5664
- ian.welch@ecs.vuw.ac.nz

Announcements and Communication

The main means of communication outside of lectures will be the NWEN 304 web area at

The main means of communication outside of lectures will be the NWEN 304 web area at http://ecs.victoria.ac.nz/Courses/NWEN304_2012T1/. There you will find, among other things, this document, the lecture schedule, assignments, laboratory material, and the NWEN 304 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.

Mandatory Requirements

1. Attempt all three projects.
2. Obtain a D grade or better in the final exam.

Passing NWEN 304

To pass NWEN 304, a student must satisfy mandatory requirements and gain at least a **C** grade overall.

Withdrawal

The last date for withdrawal from NWEN 304 with entitlement to a refund of tuition fees is Friday 16 March. The last date for withdrawal without being regarded as failing the course is Friday 18 May -- though later withdrawals may be approved by the Dean in special circumstances.

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 304 is located on the second floor of the Cotton Building.

Staff

The course organiser and lecturer for NWEN 304 is Ian Welch:
- *Ian Welch*
- Cotton 338
- +64 4 463 5664
- ian.welch@vuw.ac.nz

There are three tutors on the course: Ryan Chard and Paul Radford.

A class representative will be chosen during the first week of teaching.

Announcements and Communication

The main means of communication outside of lectures will be the NWEN 304 web area at http://ecs.victoria.ac.nz/Courses/NWEN304_2012T1/. There you will find, among other things, this document, the lecture schedule and homework assignments, and the NWEN 304 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.

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.

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

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

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.