

# Distributed Systems Design - Course Outline

## NWEN 401: 2013 Trimester 1

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This document sets out the workload and assessment requirements for NWEN 401. 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. This course runs in the first trimester 2013. A printed copy of this document is held in the School Office.

### Aim

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Distributed system concepts and techniques underlie much of modern computer technology; client-server, grid and web based systems based on high-bandwidth networks support applications ranging from business data processing to multimedia information systems. NWEN 401 aims to teach the concepts and principles used in the design and construction of distributed systems, with practical examples, providing a suitable knowledge base for those aiming for careers in advanced system and application development, or in research.

Topics will include:

1. Key concepts related to Distributed Systems and their different architectures.
2. Processes and communication between processes.
3. Naming and synchronisation.
4. Overlay networks and content distribution.
5. Replication and consistency.
6. Fault tolerance.

### Objectives

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On completing this course, you should be able to meet the objectives listed below. Note that as Distributed Systems Design is part of the Engineering program at Victoria University of Wellington, BE graduates are expected to exhibit a number of graduate attributes at the completion of the program. This course objectives contribute to the graduate attributes (GA) as indicated below. A full table of these attributes is available at [Graduate Attributes](#).

1. Be able to compare the principles and goals of distributed system design, the tradeoffs in using different mechanisms for building distributed systems, the principles of building secure and reliable distributed systems and key algorithms for coordination within distributed systems.
2. Be capable of applying their knowledge of distributed systems to solve problems related to the design and analysis of such systems (GA [3\(a\)](#), [3\(b\)](#), [3\(c\)](#), [3\(e\)](#)).
3. Be capable of implementing a distributed system and evaluating it using experimental techniques (GA [3\(c\)](#), [3\(f\)](#)).
4. Be able to apply an understanding of the social, cultural and environmental responsibilities of engineers with respect to fault tolerance (GA [1\(a\)](#)).
5. Be able to find, analyse and synthesise research literature related to distributed systems and present your synthesis both in oral and written form (GA [2\(b\)](#), [3\(d\)](#)).

### Textbook

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The textbook for NWEN 401 is: Distributed Systems: Principles and Paradigms 2nd Edition by Tanenbaum and van Steen.

### Lectures and Assessment

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

Lectures for NWEN 401 are:

4 Mar – 9 Jun 2013 | Mon, Tue | 1100 - 1150 | Murphy [Kelburn] 404 |

One of the above lecture times will be reallocated to adhoc tutorials.

### Tutorials

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TBA

## Assessment

Your grade for NWEN 401 will be determined based on the following assessment weightings:

| Item              | Due             | Weight |
|-------------------|-----------------|--------|
| Project One       | end of week 4   | 10 %   |
| Project Two       | demo in week 11 | 20 %   |
| Paper             | end of week 10  | 10%    |
| Presentation      | Week 12         | 10%    |
| Final Examination | Exam period     | 50%    |

## Projects

The first project is a performance evaluation of a simple client server application using several communication methods (objective 1 and 3). You will be assessed on the basis of work done and the analysis of results. This project is worth 10% of the final mark.

The second project involves implementing distributed file storage in a P2P network (objective 2 and 3). You will be assessed on the the basis of work done and the quality of your design and evaluation. You will need to implement a file system service interface. ~~Your interface will need to comply with a set of specifications, and therefore will be tested with clients submitted by other students. Likewise, the client will be accessed partly by testing with other students services. Prior to submission you will be assigned a random partner to cross-check your work. This group work must include an individual report, indicating what testing took place, any errors found, solutions implemented, and the parties involved. The group portion of the project will be worth 5% of the project's 20%.~~

This project will involve an interview at a time to be arranged. This project is worth 15% of the final mark.

## Term Paper

The term paper will require you to find literature relevant to your topic, analyse it and both present a written and oral report (objective 5). The term paper should not exceed 8 A4 pages of single spaced 10-point text with one inch margins. Diagrams and figures are strongly encouraged, and will count towards the page limit.

Your presentation will be based on this report.

## Examination

The exam will involve a mix of questions that require you to apply principles and techniques to solving problems (objective 1, 2, and 4). Preparation for the exam will take place in tutorials that will present questions on the same material and in the same style as the exam.

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 **two** 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 14 June - 3 July 2013.

## Use of Turnitin.com

Student work provided for assessment in this course may be checked for academic integrity by the electronic search engine <http://www.turnitin.com>. Turnitin is an online plagiarism prevention tool which compares submitted work with a very large database of existing material. At the discretion of the Head of School, handwritten work may be typed by the School and subject to checking by Turnitin. Turnitin will retain a copy of submitted material on behalf of the University for detection of future plagiarism, but access to the full text of submissions is not made available to any other party.

## Submission and Penalties

Both assignments, term paper and a copy of your presentation are to be submitted electronically.

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 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.

## Group Work

There is group work in project 2.

## Laboratories

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Occasional laboratories may take place as needed to support practical assignment work

## Workload

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In order to maintain satisfactory progress in NWEN 401, you should plan to spend an average of 10 hours per week on this paper. A plausible and approximate breakdown for these hours would be:

- Lectures: 2 hours
- Tutorials, assignments and term paper: 7-8 hours.

## School of Engineering and Computer Science

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

## Staff

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The course organiser and lecturer for (1st half) of NWEN 401 is [Kris Bubendorfer](#):

- [Kris Bubendorfer](#)
- [Cotton 338](#)
- +64 4 463 6484
- [kris@ecs.vuw.ac.nz](mailto:kris@ecs.vuw.ac.nz)

The lecturer for the course (2nd half) is [Winston Seah](#):

- Prof. Winston Seah
- [Cotton 336](#)
- +64 4 463 5233 x 8493
- [winston.seah@ecs.vuw.ac.nz](mailto:winston.seah@ecs.vuw.ac.nz)

## Announcements and Communication

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The main means of communication outside of lectures will be the NWEN 401 web area at [http://ecs.victoria.ac.nz/Courses/NWEN401\\_2013T1/](http://ecs.victoria.ac.nz/Courses/NWEN401_2013T1/). There you will find, among other things, this document, the [lecture schedule](#) and [assignment handouts](#), and the [NWEN 401 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.

## 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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You must attempt both projects, the term paper, the presentation, and the exam. You must get at least a **D** grade in the final exam.

## Passing NWEN 401

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To pass NWEN 401, 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 304 with entitlement to a refund of tuition fees is Fri 15 March. The last date for withdrawal without being awarded a failing grade is Fri 10 May -- though later withdrawals may be approved by the Dean in special circumstances.

Due to the revised Academic Progress Statute that applies from Trimester 1 2011, students withdrawing after the regulation 2 week period will be deemed to have **failed** that course as far as the application of the academic progress statute is concerned.

## 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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