Distributed Computing in Grids and Clouds - Course Outline
NWEN 406: 2013 Trimester 2

This document sets out the workload and assessment requirements for NWEN 406. 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.

Introduction

This course focuses on the principles, techniques and infrastructure needed to support computation in which elements of that computation experience distribution over a set of computing resources. The course will include detailed study of current approaches such as grids, clouds, and service oriented computing. This is a research-oriented reading course, as such students will need to be self directed and prepared to present seminars in class. The course is internally assessed and as such will have no final exam. The project work will be largely self selected, and involve a tech-fair at the end of the course during the exam period in place of a formal exam.

Objectives

Distributed Computing in Grids and Clouds 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 Distributed Computing in Grids and Clouds students should be able to explain (GA 3(a) & 3(b)):

1. *What a large scale distributed computing system is, what it does, and how it is designed and constructed,*
2. *eScience, how large scale distributed systems are leveraged to enable science in a range of fields,*
3. *alternative management paradigms for large scale distributed systems,*
4. *alternative programming models for large scale distributed systems,*
5. *basic mechanisms for protection and system security.*

The programming projects have been selected to emphasise these important high performance distributed systems concepts, resulting in:

1. *experience in writing distributed code in a production Grid (GA 3(d) & 3(e) 3(f)),*
2. *an appreciation of design in the selection of parallel algorithms (GA 3(b) & 3(c)),*
3. *an appreciation of the user experience (critical in eScience) (GA 2(b)*
4. *familiarity with UNIX/Linux; C or Java programming, Grid APIs (GA 3(f)).*

In addition to these objectives and graduate outcomes, the seminars and project presentations fulfill GA 2(b) and the essays directly address GA 3(d).

Textbook

There is no text book for this course, rather readings will be set from published scientific papers.

Lectures, Tutorials, Laboratories, and Practical work

A schedule of lecture topics, readings, and assignment due dates is available online. We will establish a seminar scehdule in week 1.

Lectures for NWEN 406 are:

Mondays, Thursdays and Fridays 5-6pm in Co523A.

There will be several lab tutorials in this course and Co 246 is booked for NWEN406 1-5 on Tuesdays.

Essays

Essays are the primary assessment in 406. There will be 5 essays, worth 10% each. Each essay will be at least 5 pages in length and be based on the readings set for the assigned topic. You are expected to perform your own literature searches, and the set readings should only form part of your reference list.

I intend to return your marked essays in n week(s), so that you can recieve feedback before the next topic essay is due. Due to the tight timing requirements on the marking and feedback, and the assignment of seminars - essays must be handed in on time.

Please look at the statute on plagiarism. All essays will be checked for plagiarism. Essays that are deemed to contain plagiarized material will not be marked. I will give a presentation in class on how to reference, quote and properly credit source material. This includes, text, images, graphs, figures etc.

Seminars

There are 2 15 minute seminars per student. Seminars have been allocated and are derived from the preceeding essay. You will only have a short time to prepare the seminars, so you must take this into account in planning your work schedules. If your seminar is inadequate you may be asked to repeat it.

Tutorials

There will be two lab tutorials - probably in week 3 and week 6.

Assignments and Projects

There will be 1 small and 1 large programming project. These will be set in week 3 and week 6.

In the small project you will use Hadoop, and in the large project you will select an 'embarrassingly parallel' problem of your choice and implement a working grid solution on our Sun Grid Engine ECS grid. You will need to submit your project plan in week 7 for approval. The project plan will include a comprehensive analysis of the problem and a preliminary a solution design. In the exam period we will hold a 'tech fair', in which all projects will be demonstrated and marked. The demonstration will include the final project report and evaluation, a poster, and the demonstration and oral presentation. Attendance is compulsory and should be treated in the same manner you would an exam.

Workload

In order to maintain satisfactory progress in NWEN 406, you should plan to spend an average of at least 10 hours per week on this paper. A plausible and approximate breakdown for these hours would be:
- Lectures and tutorials: 1
- Readings: 5
- Project: 4

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

Staff

The course organiser for NWEN 406 is Kris Bubendorfer, my contact details are:
- *Kris Bubendorfer* (coordinator)
- Cotton 338
- +64 4 463 5045
- kris.bubendorfer@ecs.vuw.ac.nz

Announcements and Communication

The main means of communication outside of lectures will be the NWEN 406 web area at http://ecs.victoria.ac.nz/Courses/NWEN406_2013T2/. There you will find, among other things, this document, the lecture schedule and assignment handouts, and the NWEN 406 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 406will be determined based on the following assessment weightings:

Item	Weight	Due
Essays (x5)	50%	Every 2 weeks
Seminar (x2)	10%	Scheduled per student
Project 1	10%	Week 5

Project 2	30%	During exam period

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.

Tests and Exams

There is no exam in NWEN 406, but we will have a Tech-fair scheduled during the exam break. The examination period for trimester 2 is 25 October - 16 November.

Plagiarism

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

The mandatory requirements for NWEN 406 are:

1. You must achieve a minimum of a C grade on the projects (the projects may be resubmitted - but resubmissions will be worth at most a C).
2. You must give both seminars and the project presentation.

Passing NWEN 406

To pass NWEN 406, a student must satisfy mandatory requirements and gain at least a **C** grade overall.

Withdrawal

The last date for withdrawal from NWEN 406 with entitlement to a refund of tuition fees is Friday 26 July 2013. The last date for withdrawal without being regarded as having failed the course is Friday 27 September 2013 -- 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.