Software Design - Course Outline
SWEN 222: 2012 Trimester 2

This document is a draft and is yet to be finalised by the auditor.

This document sets out the workload and assessment requirements. 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.

The Course

This course looks at the problem of designing object-oriented software. The Java Programming Language is used as a vehicle for this, but the underlying principles apply to most modern object-oriented languages. The course will focus on a range of techniques for designing and developing large-scale systems, including design patterns and design-by contract.

The prerequisite for SWEN222 is SWEN221. If you have not passed this course recently, you should contact the Course Coordinator as soon as possible.

Objectives

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

- Demonstrate competence in the practical art of software engineering through the design and development of moderately-sized Java programs. 3(f)
- Appreciate a range of simple techniques for assessing the quality of a software design, and apply them to Java programs. 3(b)
- Appreciate the limitations of different solutions when designing Java programs, particularly with respect to Design Patterns and Design-by-Contract. 3(e)
- Work co-operatively in a team to produce a moderately-sized software project in Java. 2(a)
- Recognise when further information is needed during the design and development of a software project, and be able to find it as necessary by considering all pertinent sources of information. 3(d)
- Communicate effectively on the design and implementation of a software project by writing design documentation and related reports, and by giving (brief) oral presentations. 2(b)

The assignments, labs and lectures will contribute to all learning objectives.

Note: SWEN 222 is part of the Engineering program at Victoria University of Wellington. BE students are expected to exhibit a number of graduate attributes upon graduation. These course objectives contribute to the graduate attributes as indicated above. A full table of these attributes is available at Graduate Attributes.

Staff

The course organiser is Stuart Marshall. The lecturers for the course are Stuart Marshall, Marco Servetto and Stephen Nelson. Their contact details are:

- *Marco Servetto*
- Cotton 258
- servetto@ecs.vuw.ac.nz

- *Stephen Nelson*
- Cotton 260
- stephen@ecs.vuw.ac.nz

- *Stuart Marshall*
- Cotton 261
- stuart.marshall@ecs.vuw.ac.nz

Announcements and Communication

The main means of communication outside of lecture will be the web area at http://ecs.victoria.ac.nz/Courses/SWEN222_2012T2/. There you will find, among other things, this document, the lecture

. There you will find, among other things, this document, the lecture schedule, and the SWEN 222 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.

Important announcements for the course will be made at lectures, emailed to the course mailing list and posted on the SWEN 222 web site. We will assume that all students attend all lectures and check the web site and their ECS email at least three times a week.

Textbook

The textbook is:

Object-Oriented Design & Patterns, Cay Horstmann, Second Edition.

This text covers most of the relevant material, although sometimes in a different order. We will not cover everything in the text, and some material covered in lectures is not in the text book. Students will be assumed to have access to a copy.

Course Materials

We will usually hand out copies of the lecture slides, though we cannot guarantee to always have them ready for the lecture. All the course handouts will be available on the course web site. Notice that the slides may be incomplete and we expect students to attend lectures and complete them.

Resources

During the course, students may wish to scan in material they have written or drawn by hand. Scanners are available at the University Library, and also within ECS. A scanner is located on level 2 of the Cotton building, outside room CO258. To use this scanner, students should select "email", and enter their email address using the "keyboard" function.

Lectures

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

Topic	Lectures
Quality Metrics	2
Design Patterns	5
GUI Design	2
Design By Contract	3
Other	5

Lectures are: Tuesday and Thursday, 11:00 - 12:00 in Hugh McKenzie LT002 (see the University Timetable for more information).

Attendance at lectures is an essential part of the learning process. Lectures will be used to introduce basic ideas and techniques.

In addition to attending lectures, we expect you to spend at least one hour a week preparing for them by reading the suggested chapters of the textbook. These can be found in the Schedule.

Laboratories

Starting in the second week, you will be expected to attend one two hour supervised laboratory a week. In the laboratories, you will be asked to solve small problems that relate to the course material and/or assignments currently underway. **The laboratories are assessed, and attendance is mandatory**. A schedule for the laboratory times will be posted on the course web site and you will need to sign up to one of the available lab streams.

Assignments

The practical work for the course consists of 2 assignments and one large group project. The assignments will focus on the design and development of a relatively small program, with students working together in pairs. The group project will consist of a significantly larger program being developed by teams of 4 or 5 students working together. The group project will bring everything you've learnt together and is split into two parts: a milestone and the completed project. Practical work underpins this course, since it is essential for a proper understanding of the material. **Therefore, you are required to submit a reasonable attempt on all assignments in order to pass the course**. We expect that you will spend at least 6 hours a week working on the current assignment.

If you have access to a computer outside the labs, you may use it to work on the assignments/projects, but you will need to acquire your own software for writing Java programs. Please note that we do not have the resources to provide assistance if you have difficulties with a computer at home -- the tutors can only answer questions about the assignments/projects and the workstations in the laboratories. Note also that we cannot offer you any help with

assignment projects and the workstations in the laboratories. Note also that we cannot offer you any help with choosing, setting up, or fixing your own computer system, other than the general advice that we provide on the website.

Assessment

Your grade will be determined based on your lab and assignment marks, and a final examination:

Item	Weight
Assignments 1+2	20%
Group Project	20%
Labs	10%
Final Examination	50%

The test and exam will assess your understanding of the material presented in lectures, while the lab/project work will assess your ability to apply the techniques in practice.

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

Marking Criteria

The assignments and the group project will be marked on the following:

- **Design Documentation**. This must be provided for each assignment, and must include a brief overview of the design, as well as accompanying UML diagrams, and other documents where applicable. Marks will be awarded on an individual basis for clear communication, and for how effectively the solution solves the given problem. Marks will also be awarded for good justifications of why the design is the way it is, and for showing evidence that alternative approaches were considered.

- **Style**. Submitted projects are expected to follow the appropriate style guide, and include comments suitable for documentation purposes (e.g. Javadoc), as well as general understanding.

The group project will also be marked on the following:

- **Presentation**. Each group will be required to give a short presentation demonstrating their project, and (briefly) discussing its design. Marks will be awarded on an individual basis for clear communication, and for how effectively the solution solves the given problem.
- **Interview**. Each group will have a short interview with one or more staff regarding their project. This will provide an opportunity for staff to ask detailed questions regarding the project's design and implementation. Marks will be awarded on an individual basis for a demonstrated understanding of the issues involved in the project, particularly with reference to those aspects addressed by the individual in question.

The labs will be marked during the lab sessions, according to the following grade scale:

- 0: didn't attend
- E: no achievement on set problem(s)
- D: poor achievement on set problem(s)
- C: satisfactory achievement on set problem(s)
- B: good achievement on set problem(s)
- A: excellent achievement on set problem(s)

Tests and Exams

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 study and examination period for trimester 2 is 26 Oct - 17 Nov.

Practical Work

Hand-in dates for the assignments are:
- Assignment 1 - due Friday 3rd August, 2012 @ midnight
- Assignment 2 - due Friday 24th August, 2012 @ midnight
- Group Project - due Friday 12th October, 2012 @ midnight

- Group Project Demonstrations, final week.

Each piece of work should be handed in on the dates and times specified in the Schedule. Submission should be made via the online submission system (found on the course homepage). **Unless prior agreement with the course coordinator has been made at least 24 hours in advance, late submissions will be penalised 20% of their mark for every day overdue**. This means after 5 days zero marks will be awarded. In this case, the work should still be submitted in order to pass the mandatory requirements. However, submissions will not be accepted once any model answers have been given out. Approval for late submission will only be given in exceptional circumstances.

Plagiarism

We encourage you to discuss the principles of the course and assignments with other students, to help and seek help with programming details, technical issues, or 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

This course is focused on practical work and you must demonstrate adequate mastery of this to pass the course. Therefore, it is a mandatory requirement that you make a reasonable attempt on all assignments, including the group project. You are also required to attend one two hour laboratory session each week and achieve at least a 'D' grade in the final exam.

Additional Information

Workload

In order to maintain satisfactory progress in this course, you should plan to spend an average of at least 11 hours per week on this paper. A plausible and approximate breakdown for these hours would be:
- Lectures and labs: 4 hours
- Readings: 1 hour
- Assignments: 6 hours

School of Engineering and Computer Science

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

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

Withdrawal

The last date for withdrawal from this course with entitlement to a refund of tuition fees is Friday 12th March 2012. The last date for withdrawal without being regarded as having failed the course is Friday 14th May 2012 -- 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

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