

# Software Design - Course Outline

## SWEN 222: 2016 Trimester 2

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This document sets out the workload and assessment requirements for SWEN 222. 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

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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

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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

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The course organiser is David J. Pearce. The lecturers for the course are [David Pearce](#) and Timothy Jones. Their contact details are:

- *David J. Pearce*
- [Cotton 231](#)
- +64 4 463 5833
- [djp@ecs.vuw.ac.nz](mailto:djp@ecs.vuw.ac.nz)
- Office Hours: *Tuesday 2-4pm, Wednesday 2-4pm*

- *Timothy Jones*
- [Cotton 254](#)
- [tim@ecs.vuw.ac.nz](mailto:tim@ecs.vuw.ac.nz)

Class Rep:

- *Linus Go*
- [golinu@ecs.vuw.ac.nz](mailto:golinu@ecs.vuw.ac.nz)

## Trimester Dates and Lecture Times

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SWEN 222 is a trimester 2 course. The trimester starts on Monday 11th July and ends on 12th November. The examination period at the end of the course is 21 October - 12 November,

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 Wednesday, 16:10 - 17:00 in Hugh Mackenzie LT205 (see the [University Timetable](#) for more information). Please note the Thursday lecture slot will not be used.

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 looking over any recommended readings.

## Laboratories

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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

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The practical work for the course consists of two 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 both assignments and group project in order to pass the course.** We expect that you will spend at least 6 hours a week working on the current assignment / project.

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 choosing, setting up, or fixing your own computer system, other than the general advice that we provide on the website.

## Workload

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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

## Textbook

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There is no official textbook for SWEN222. However, the following is a recommended reading and is available in the library:

*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 this book.

## Course Materials

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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.

# Assessment

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

<u>Item</u>	<u>Weight</u>	<u>Notes</u>
Assignments 1+2	20%	Report component limited to 500 words
Group Project	20%	Individual report component limited to 1000 words
Labs	10%	
Final Examination	50%	

The 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

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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:

- **Demonstration.** 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.

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)

## Due Dates

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Hand-in dates for the assignments are:

- Assignment 1 - due Friday 5th August, 2016 @ midnight
- Assignment 2 - due Friday 19th August, 2016 @ midnight
- Group Project -
  - Integration Day, Week 10 (in labs)
  - Software + Document due Tuesday, 11th October, 2016 @ midnight
  - Group Project Demonstrations, final week
  - Individual Reports due Friday, 14th October, 2016 @ midnight

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, the policy on late submissions is as follows:**

- **Late work will be penalised 20% per day after the deadline.** 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.

- **Each student has three "late days"**. You may choose to use these for any assignment(s) during the course. No penalty will be applied for these late days. You do not need to apply for them - any late days you have left will be automatically applied to assignments that you submit late.

## Exam

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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 2 is 21 October - 12 November.

## Mandatory Requirements

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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 at least 8 of the 10 weekly two hour lab sessions and achieve at least a 'D' grade in the final exam.

## Passing SWEN 222

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To pass SWEN 222, 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 SWEN 222 with entitlement to a refund of tuition fees is Friday 22 July 2016. The last date for withdrawal without being regarded as having failed the course is Friday 23 September 2016 -- though later withdrawals may be approved by the Dean in special circumstances.

## 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.

## Additional Information

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### School of Engineering and Computer Science

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

### Resources

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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.

### Announcements and Communication

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The main means of communication outside of lectures will be the SWEN 222 web area at [http://ecs.victoria.ac.nz/Courses/SWEN222\\_2016T2/](http://ecs.victoria.ac.nz/Courses/SWEN222_2016T2/). There you will find, among other things, this document, the lecture schedule and assignment handouts, 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.

### 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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