CompSci 230
Software Construction

Course Information

S1 2015
V1.1 of 2015-03-02: corrected due-date for A4
Overview

- In Stage 1, you learned how to write programs to solve small problems.
  - In CompSci 230, we teach programming “in the large”.
- **Large software systems have many stakeholders.**
  - What will its users want?
  - Can we describe user requirements, accurately and succinctly?
- **Large software systems are very complex.**
  - Can we describe the design of a complex software system, accurately and succinctly?
  - Can we be sure that a complex system will do what it is designed to do, and that it will not do anything unintended?
- In CompSci 230, you will learn some incomplete answers to these difficult questions.
  - I will also attempt to teach you how to “learn how to learn” the technical skills you will need in the future – as a competent computer professional.
Syllabus

Four Themes:

- The object-oriented programming paradigm
  - Object-orientation, object-oriented programming concepts and programming language constructs – because, for many important problems, OO design is a convenient way to express the problem and its solution in software.

- Frameworks
  - Inversion of control, AWT/Swing and JUnit – because many important “sub-problems” have already been solved: these solutions should be re-used!

- Software quality
  - Testing, inspection, documentation – because large teams are designing, implementing, debugging, maintaining, revising, and supporting complex software.

- Application-level concurrent programming
  - Multithreading concepts, language primitives and abstractions – because even our laptops have multiple CPUs. Dual-core smartphones are now available...
Lecturers & Tutors

**Lecturers**

- **Clark Thomborson (Coordinator)**
  - W1-4: OO design in Java; W5-6: Frameworks; W11-12: Concurrency
  - Email: cthombor@cs.auckland.ac.nz
  - Office hour: Fri 3-4, in 810.845
  - Phone: (09) 3737 599 x85753

- **Diana Kirk**
  - W7-9: Software Quality; W10: Concurrency
  - Email: dianakirk@gmail.com
  - Office hrs: tbc

**Tutors (TBC)**
Assessments (tentative schedule)

See https://www.cs.auckland.ac.nz/courses/compsci230s1c/assignments/

Practical (20%)

Assignments (16%):
- Assignment 1, 4%, due 4pm Friday 27 March 2015 (end of 4th week)
- Assignment 2, 5%, due 4pm Friday 1 May 2015 (end of 7th week)
- Assignment 3, 5%, due 4pm Friday 22 May 2015 (end of 10th week)
- Assignment 4, 2%, due 4pm Friday 29 May 2015 (end of 11th week)
- Severe penalties for lateness

Quizzes (4%): Multichoice, online via Cecil
- Quiz 1, available from 9am Friday 13 Mar to 11:30pm Monday 16 March
- Quiz 2, available from 9am Friday 3 Apr to 11:30pm Monday 6 April
- Quiz 3, available from 9am Friday 8 May to 11:30pm Monday 11 May
- Quiz 4, available from 9am Friday 29 May to 11:30pm Tuesday 2 June
- No late submissions allowed

Theoretical (80%)
- Test 15%, 8-9pm Tuesday 21 April. Tentative: room reservation is not yet confirmed.
- Exam 65%, date and location TBC.

You must pass the practical (assignments + quizzes) AND the theoretical (test + exam), in order to pass the course.
- The practical passline may be lower than 50%! This is a decision of the examiners, so you should sit the exam even if you have poor practical marks.
Policy on Cheating and Plagiarism

- We use many ways to check that the work each student submits for marking is their own work and was not produced by, or copied from, someone else.
  - We start our checks by running a comparison program, which automatically compares all submissions from students.

Note:
- All assignments deemed to be too similar will be assigned a zero mark, and will be invited (by email) to discuss the situation with the course supervisor.
- Offenders may be referred to the University Disciplinary Committee. See http://www.auckland.ac.nz/uoa/home/about/teaching-learning/academic-integrity.

- Both the person who copied the work and the person whose work was copied are allocated a zero mark.
  - It is important that you do not lend your assignments to others. Never give anyone a copy of your assignment. It is the responsibility of each student to ensure that others do not copy their work.
Assessments (con’t)

- **You cannot re-sit** a test or exam in this course.
  - You should always sit your tests & exams, if at all possible.
  - You should see a registered doctor, dentist, or counsellor as soon as possible.
- **You can apply for** aegrotat and compassionate consideration, if you feel that personal circumstances affected your performance or preparation.
- **Severe penalties for late assignment submissions:**
  - -20% of possible marks, if submitted by 4pm on Monday after the due date.
  - -50% of possible marks, if submitted by 4pm on the Wednesday after the due date.
  - Contact the coordinator, if you have a medical condition or an exceptional, unforeseen difficulty which prevents you from completing the assignment on-time.
- **Lateness on quizzes**
  - We release the answers on the due date, so we **cannot allow late submissions**.
Tutorials

- Tutorials are optional, but highly recommended!
  - Please note: there are no tutorials in the first week of lectures.

- Currently, all tutorials are held in 303S-G75 or 303S-B75.
  - Your tutorial (lab) section is visible on Student Services Online.
  - You’re welcome to attend other tutorial sections, but there are only enough seats for the enrolled students -- so you may be asked to leave.

- What happens at a tutorial:
  - You’ll do exercises based on prior lecture material.
  - You’ll prepare for the current assignment.
  - You’ll discuss sample answers to prior assignments and quizzes
  - You’ll ask course-related questions, and the tutor will either answer them or “kick them upstairs” – by suggesting you ask this question during lecture!
    - You’ll get the most out of your tutorials if you participate actively.
    - You’ll get very little (or nothing!) out of attending tutorials (or lectures!) if you try to “learn by osmosis”. You’ll learn most by “giving it a go”, seeing what happens, and thinking about it.
Quizzes

- Quizzes are run online through Cecil.
  - You MUST sit each quiz during the time period and you MAY use any computer in any lab or at home as long as there is a network connection (no slower than 64K) to the Cecil website.
  - Each quiz has 4 to 8 questions, and contributes 1% to your total marks.
  - You may make up to three attempts at each quiz, with your best mark being counted.

    - Best strategy: test yourself after you do the reading. Read some more after you complete the test. Form (or join) a study group to discuss similar problems.
    - Terrible strategy: randomly guess.
    - Worst strategy: memorise the answers to the quiz questions. This would be a complete waste of time – you won’t pass the exam!

- Answers will be revealed after the closing date.
Need Help?

- Required readings are online, mostly from **The Java Tutorials**
  - My primary goal is to help you “learn how to learn technical material.”
  - If you merely listen to lectures, you’ll learn very little.

- Recommended readings are available in the library or online.

- The course website has lecture notes, examples, and some other useful resources, including links to software such as **Eclipse**.

- Don’t hesitate to ask your tutors and lecturers for help if you’re “stuck”!
  - But… there are only a few of us, and hundreds of students. Response may be slow.
  - Unlike in stage-1 papers, we will **not** spoon-feed you with solutions.
  - You are expected to explore. Discover your own solutions to your own problems! If you’re not making mistakes, you’re not learning!! (Can you recognize a mistake?)

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Reading assignment #1

Before lecture on Thursday:

1. **About the Java Technology**, in the **Getting Started** trail of the **Java Tutorials**;
2. The first two sections (on classes and objects) in the **Classes and Objects** lesson of the **Learning the Java Language** trail;
3. Section 2 (on ‘Getting Started’) in **java4python v3**;
4. The first five subsections (to ‘Import’) of Section 3 in **java4python v3**.

This isn’t “leisure reading” – you won’t remember much, and you won’t be able to do anything with what you remember, unless you are reading to discover an answer to your questions! For starters:

- “What is X?”
- “Why should I care about X?”