# CSC207: Software Design

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## Calendar Description

An introduction to **software design** and development concepts, methods, and tools using a statically-typed object-oriented programming language such as **Java**. Topics from: **version control, unit testing,** refactoring**, object-oriented design and development, design patterns, advanced IDE usage, regular expressions**, and reflection. **Representation of floating-point numbers** and introduction to numerical computation.

## Prerequisite

**Prerequisite: CSC148 or CSC150**

CSC148 description: "Abstract data types and data structures for implementing them. Linked data structures. Encapsulation and information-hiding. Object-oriented programming. Specifications. Analyzing the efficiency of programs. Recursion."

If you do not have the prerequisite but have a strong grasp of the topics listed above, please contact me about a prerequisite waiver TODAY!

## Prerequisite knowledge

Language structures:

- variables, aliasing, control structures (if, while and for)
- strings, lists, dictionaries, linked lists, trees, classes

Concepts:

- recursion, searching, sorting, object-orientation

Skills:

- good coding style, solid tracing and debugging
- top-down design, OO decomposition
- asking (and answering) questions;
  knowing what you don't know and how to find out!

## Do you know this material already?

Contact me if you are comfortable with all of the following:

- Java, JUnit, and IDE usage
- using a UNIX shell (the basics)
- using version control
- object-oriented design and design patterns
- regular expressions
- working in a software development team

Regardless, you're welcome to stay!

## Coursework

**Labs** (8): 4%
**Exercises** (3): 7%
**Assignment**: 8%
**Project**: 24% (divided into phases; completed in teams)
**Midterm**: 12%, on paper, 50 minutes
**Final examination**: 45%, on paper, 3 hours

- must get 40% on the exam to pass the course;
  otherwise the final grade will be no more than 47

## Coursework — Labs

There will be eight required labs.

These are worth 4% of your grade (0.5% each).

Lab room assignments will be posted on the course website before the first lab. They will take place in BA3175, BA3185, and BA3195.

There will also be a couple of labs during which team meetings or demos will take place.

Ask your TA questions — they are there to help you!

# Coursework — Exercises

Three exercises, worth 1%, 3%, and 3% each.

Small, done individually.

Topics are chosen to prepare you for more significant pieces of work: the assignment, project, and tests.

Pre-marked:

- All marking is automatic, done by a script.
- The auto-tester will run several times over the course of a couple of days prior to the submission deadline.
- The results of the auto-tester will appear on MarkUs.

To earn the marks for an exercise, all tests must pass. Otherwise, the exercise mark will be 0.

# Coursework — Assignment

One assignment.

Done individually.

Topics:

- Java
- Basics of Object-Oriented Design
- Generics
- Understanding Basic UML

# Coursework — Project

**Phase 0**:
• Register partnership; submit teamwork-related information.

**Phase 1: Design** (teams of two)
• You choose your partner from your tutorial section.

**Phase 2: Implementation and Testing** (teams of four)
• Instructor forms teams by merging 2-person P1 teams.

**Phase 3: Implementation and Testing** (teams of four)
• Same team as in Phase 2.

We will use elements of Scrum, a modern software development process widely used in the industry today.

Your grade will depend on the finished product and **also significantly on your development process and teamwork**.

# Coursework — Project Demos

As part of Phase 1, each team will meet with their TA to demonstrate their P1 submission.

Phase 3 is divided into two sub-phases and as part of Phase 3a, each team will meet with their TA to demonstrate their P3a submission.

## Coursework "handouts" and submission

- All work will be submitted using subversion — you will learn more about subversion soon.
- You will have your own repository and repositories for your teams.
- You will get the assignment/exercise/project handouts by checking them out from the repository.
- You will submit your work by checking it in into your repository.

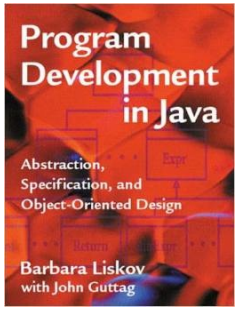
**Important**: You will NOT submit online using MarkUs. Web submission is disabled for this course.

## Textbook

There is no required textbook.

If you wish to own a good book on object-oriented software design, I recommend:

Barbara Liskov, John Guttag, *Program Development in Java: Abstraction, Specification, and Object-oriented Design*, Addison-Wesley, 2001.




## Academic Offences

Don't cheat.

Seriously, don't cheat.

It is an offence to claim someone else's work as your own or to give someone your work.

You must not share work outside your team or seek out inappropriate aid.

If in doubt of what's appropriate, ask me.

## Getting (and giving) help

Course website:
http://www.cdf.toronto.edu/~csc207h/winter/

Discussion board (Piazza):
http://piazza.com/utoronto.ca/winter2015/csc207

Labs: the TAs are there to help!

My office hours (tentative) in BA 4238:
- Mondays 11am-12pm, Wednesdays 2:30-3:30pm

Email:
- Do not email your TAs: they are not supposed to answer.
- Email me for personal matters only.
- Post your questions on the discussion board instead!

## Doing your work

- To install Subversion, Java, and Eclipse on your own computer, follow the instructions on the Software webpage.
- All of the tools you need are also available on CDF.
  - On CDF, launch Eclipse + ADT (Android Developer Tools), issue the command: `eclipse-android`
- The Software webpage includes instructions for how to access CDF remotely, but working via a remote connection will be slow compared to working locally.

## Questions?

First topic: version control