

# CPSC 110 Course Outline

## Learning Goals

The course-level learning goals for CPSC 110 are:

- 1) Understand a systematic design process.
  - a) This is demonstrated by being able to write programs for a reasonably complex task, where the ability to use the "one task - one function" rule can be demonstrated.
- 2) Understand that programs are written both to run on computers and for people to read.
  - a) This is demonstrated by being able to write code that is readable, well organized, documented, and tested.
- 3) Understand the relation between information and data.
  - a) This is demonstrated by being able to design the data representation for a reasonably complex problem, and to describe the information encoded in the given data.
- 4) Understand that the structure of the data a program operates on determines many elements of the program's structure.
  - a) This is demonstrated by being able to identify correspondences between a data definition and a program that operates on that data. Also by being able to identify how potential changes to a data definition would affect a program.
- 5) Understand that one can replace repetitive code with an abstraction in a systematic way. Understand that this is at the heart of designing libraries.
  - a) This is demonstrated by being able to produce examples of code before and after abstraction: before, where one can see the repeated code, and after, where one can see the abstraction and verify that it provides the solution to the original problem, as well as several other similar problems. Students should also be able to design a program that uses existing libraries or existing code to solve a new problem.
- 6) Understand that programs can be described using notations other than code, and that these models can facilitate program design.
  - a) This is demonstrated by being able to identify correspondences between non-code models of a program and the program itself and by being able to use non-code models in program design.

## 110 Course Organization

In CPSC 110, we use a variety of different online platforms, and therefore it is important that you are familiar with them as we proceed through the term. This page provides with a quick overview of the platforms and a video on how these platforms will work with each other.

CPSC 110 is based on the [edX Systematic Program Design series](#), and therefore much of the material we will use through the term will be hosted on edX. This includes:

- Videos, which you will watch before and after lectures
- edX quizzes, which you will complete for marks
- Practice problems (in the problem bank)
- Discussion forum, which we will use throughout the course for the following:
  - posting problem sets and/or additions/corrections to problem sets
  - posting information about exams
  - posting to-do notes after each lecture, and correcting errors in lecture notes
  - for students to get help on the course material (by posting your own questions and answering other student's questions)
- Other reference material (like the design recipes)

You can find all the 110-specific material within the 0: Welcome to 110 section, such as the course syllabus, schedule, overall grading scheme, course policies, and lab materials.

Although we will be using edX extensively throughout the term, you should treat the materials in edX like a textbook. That is: most of the material will pertain to our course, but there may be some details in the videos that might not be relevant.

### Term Schedule

This schedule, used with the modules under Courseware, allows you to determine when your specific lecture and lab section covers which material. You are responsible for all the material from all the modules that are listed. Individual instructors will post TODO notes on the discussion forums to tell you what you need to watch before lecture to prepare and after lecture for review.

Problem sets are due via the 110 handin button on the dates specified below. The exact due time and problem set files can be found on the discussion forums.

Dates	Monday	Tuesday	Wednesday	Thursday	Friday				
Jan 1 - Jan 5	New Year's Day		BSL	BSL	HtDF				
			NO LAB	<u>Intro Lab</u>	<u>Intro Lab</u>				
Jan 8 - Jan 12	HtDF	HtDF	HtDD	HtDD	HtDD				
	<u>Intro Lab</u>	<u>Intro Lab</u>	<u>Intro Lab</u>	<u>HtDF lab</u>	<u>HtDF lab</u>				
				PS1	PS1				
Jan 15 - Jan 19	HtDD	HtDD	HtDW	HtDW	HtDW				
	<u>HtDF lab</u>	<u>HtDF lab</u>	<u>HtDF lab</u>	NO LAB	NO LAB				
			PS2	PS2					
Jan 22 - Jan 26	HtDW	HtDW	Self Ref	Self Ref	Ref				
	<u>Balloon lab</u>	<u>Balloon lab</u>	<u>Balloon lab</u>	<u>Balloon lab</u>	<u>Balloon lab</u>				
			PS3	PS3					
Jan 29 - Feb 2	Ref	Ref	Naturals	Naturals	Helpers				
	<u>Editor lab</u>	<u>Editor lab</u>	<u>Editor lab</u>	<u>Editor lab</u>	<u>Editor lab</u>				
				PS4	PS4				
Feb 5 - Feb 9	Helpers	Helpers	BSTs	BSTs	Mutual Ref				
	NO LAB	NO LAB	NO LAB	<u>Helper (make-up)</u>	<u>Helper (make-up)</u>				
			MIDTERM 1						
Feb 12 - 16	Family Day (no class)	Mutual Ref	Mutual Ref	2 One Of	2 One Of				
		<u>Helper lab</u>	<u>Helper lab</u>	<u>Helper lab</u>	<u>Helper lab</u>				
					PS6				
Feb 19 - Feb 23	Mid-term break	Mid-term break	Mid-term break	Mid-term break	Mid-term break				
Feb 26 - Mar 2	Local	Local	Local	Abstraction	Abstraction				
	<u>Mutual Ref lab</u>	<u>Mutual Ref lab</u>	<u>Mutual Ref lab</u>	<u>Mutual Ref lab</u>	<u>Mutual Ref lab</u>				
					PS7				
Mar 5 - Mar 9	Abstraction	Abstraction	Abstraction	Gen Rec	Gen Rec				
	<u>2 One Of + Local lab</u>	<u>2 One Of + Local lab</u>	<u>2 One Of + Local lab</u>	<u>2 One Of + Local lab</u>	<u>2 One Of + Local lab</u>				
					PS8				
Mar 12 - Mar 16	Search	Search	Search	Accumulators	Accumulators				
	NO LAB	NO LAB	NO LAB	<u>Search lab</u>	<u>Search lab</u>				
	MIDTERM 2				PS9				
Mar 19 - Mar 23	Accumulators	Accumulators	Accumulators	Graphs	Graphs				
	<u>Search lab</u>	<u>Search lab</u>	<u>Search lab</u>	<u>Accumulators Lab</u>	<u>Accumulators Lab</u>				
					PS10				
Mar 26 - Mar 30	Graphs	Graphs	Graphs	NO CLASS	Good Friday (no class/lab)				
	<u>Accumulators Lab</u>	<u>Accumulators Lab</u>	<u>Accumulators Lab</u>	<u>Graphs (make-up)</u>					
Apr 2 - Apr 6	Easter Monday (no class/lab) PS11	Mutation	Mutation	Wrap-up	Wrap-up				
		<u>Graphs lab</u>	<u>Graphs lab</u>	<u>Graphs lab</u>	<u>Graphs lab</u>				

## **Exam Schedule**

### Midterm 1

- Date: Wednesday, Feb 7th - 6pm
- Will cover all material up to and including the Naturals module (all material means videos, lecture, problem sets, labs, lecture notes, etc)

### Midterm 2

- Date: Monday, March 12th - 6pm
- Will cover all material up to and including the Gen Rec module (all material means videos, lecture, problem sets, labs, lecture notes, etc)

### Final exam

- Date: Tuesday, April 17th at 8:30am
- Location: TBD
- Will cover all material up to and including the Mutation module (all material means videos, lectures, lecture notes, labs, problem sets... all of it)