

CPSC 101 / WMST 201: Connecting with Computer Science

Welcome! In this course, you will learn what computing and the field of computer science is about, through connections to scientific disciplines like biology and psychology and artistic disciplines like painting and music. No prior computing background is required.

You will get experience in creating artifacts, including web pages and computer-generated art, see an overview of the field of computer science and of computer programming, and gain an understanding of just how much computer science connects with other disciplines.

Many people, particularly women, tend to shy away from computer science courses. A goal of this course is to reverse this trend! We hope that the curriculum will appeal to women as well as men, while providing immersion in the activities of computer science. Hands-on activities will be emphasised. Our aim in designing programming assignments is to let you explore the connection between programming and creativity, and to support different styles and approaches to programming, rather than requiring that the program produces the 'right answer'. Contributions of both women and men in the field are highlighted in every module of the course.

Course Web Page

Check out <http://www.ugrad.cs.ubc.ca/~cs101/> regularly for valuable information, such as the lab schedule and e-mail addresses of your TAs. Announcements, handouts and lecture slides will be added to the page throughout the term. Usually, the lecture slides should be available the evening before class. If you wish, you can print them out and use them in class. Reading that is relevant to the lecture for a particular date is listed under that date, so you should check the web page and do the reading *before* that date.

Course Topics and Schedule

Here is a tentative outline of the topics that will be covered in the course:

1. Getting Acquainted.

Learning your way around the computer; user interfaces; computer networks, the internet, and the world wide web; computer interfaces of the future: haptics, virtual reality.

2. Creating a Web Page.

Web page creation using html; adding interactivity to a web page using javascript; programming concepts: data types, instructions, control flow statements.

3. Creating and Analysing Images with Computers:

History, profiles of computer artists; graphical drawing and painting applications.

Overview to programming approaches to image generation; 2D shape representation and manipulation on a computer; geometric art using Java, using iteration and randomness; algorithmic creation of trees, flowers, and more: generative systems, computer animation.

4. Computing, Language and Intelligence.

Can computers act intelligently? The Turing test, computational natural language processing; computers and learning connectionist models of computing.

5. Behind the Scenes.

How information is represented digitally: text, shapes, images, sound, touch; how information is processed: computer hardware; computer systems, compilers and interpreters.

6. Natural Computing.

Examples of 'computation' in nature; the genetic code: digital representation biological information in DNA; what is bioinformatics; biologically inspired computing methods.

7. Computing and Music.

Working with music on a computer; representing musical objects and data; musical algorithms; generative systems for musical composition; music and creativity.

Textbook

The required text is *Fluency with Information Technology: Skills, Concepts, and Capabilities* by Lawrence Snyder, Addison Wesley, 2005 (2nd edition). Here is a tentative list of the chapters that we will be covering: 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 17, 18, 19, 20, 21, 23.

Course Work and Exams

Graded class work will include in-class quizzes (15%), laboratory assignments (15%), a project (15%), an in-class midterm (20%), and a final exam (35%). Check the course web page for dates of assessments. (The exact marking scheme is subject to instructor discretion, but it is unlikely to change significantly.)

Labs

The labs are a critical component of this course. They provide hands-on experience with computer tools and will explore the concepts described in lectures. Lab topics are as follows:

- *Getting started*: Get your account, learn your way around the computer system in your lab, and create a simple document describing your interests and background.
- *HTML*: Learn how to create a web page using the HyperText Markup Language.
- *Javascript*: Learn how to enhance the features on your web page using Java applets.
- *Ultimate Paint*: Learn the features of a paint program.
- *Images in Javascript*: Integrate art/images and more advanced javascript to create a puzzle in this lab.
- *Self-Similar Objects in Java*: Learn a little about Java and use it to explore self-similar objects.
- *Eliza*: Have an intelligent conversation with a computer!
- *Project*: Choose a project that lets you learn about a topic covered in the course in more depth.

During scheduled labs, the lab is available only to those students registered in that particular lab section. Students *must* attend the lab section in which they are enrolled. If you wish to work on the lab exercises and project outside of lab hours, you may use the lab when it is not otherwise scheduled. However, the lab may be tightly scheduled during the semester, limiting additional available hours. Information on when the lab is available will be posted on the lab door.

Class Participation

Every student is expected to attend classes. Please **ask questions** in class! You may find the technical material intimidating at first. I will make every effort to help students understand and enjoy the material. If you are confused, probably many others are too. The best way to clear up confusion is to ask questions. Others will appreciate it if you take the plunge, and I do, too :-)

Credit

You will receive Science credit for taking either CPSC 101 or WMST 201. However, you will not receive credit for CPSC 101 or WMST 201 if you have already taken CPSC 111, 121, 122, 124, 152 or equivalent; but you may go on to take and receive credit for CPSC 111 and CPSC 121 after taking CPSC 101 or WMST 201. (See the UBC Calender for more details.)