



# CPSC 100





# CPSC 100

## Computational Thinking

### Syllabus + Introduction

**Instructor: Dr. Firas Moosvi**  
Department of Computer Science  
University of British Columbia

# Land Acknowledgement

I acknowledge that I am presenting this session today on the **traditional, ancestral, and unceded** territory of the **xwməθkwəy̓əm** (Musquem) peoples.





# Plan for Today

- About Me
- About You
- Syllabus
- Computation Thinking



## Firas Moosvi

Lecturer

University of British Columbia



# Biography

I am a Lecturer in the Computer Science department at the University of British Columbia. Though I mainly teach computer science now, I am a multidisciplinary educator with a PhD in Physics and is also interested in data science and education in general. I strongly believe in computational literacy for all and aims to make STEM courses accessible through Active Learning techniques and open education resources. My two main research umbrellas are the scholarship of teaching and learning (SoTL), and Learning Analytics. I am looking at how learning analytics data can provide insight to surface and ultimately reduce inequities in STEM programs. I am also heavily invested in promoting and implementing alternative grading systems in large classes, at scale. I am always happy to collaborate on teaching and learning projects, [drop me a note here!](#)

## Interests

- Scholarship of teaching and learning
- Authentic assessments
- Alternative grading paradigms
- Learning analytics
- Data visualization and science communication

## Education

-  PhD in Medical Physics, 2019  
University of British Columbia
-  MSc in Medical Biophysics, 2012  
University of Toronto
-  BSc in Biophysics, 2009  
University of British Columbia

# Research Interests



## Learning Technologies

Use of learning technologies to enhance teaching and learning.



## Active Learning

A learning method that de-emphasizes didactic teaching and actively engages students with material via problem solving, case studies, role plays and other methods.



## Learning Analytics

Extracting trends from learner data using analytical tools to improve learning.



## Equity in STEM

Developing and implementing methods of inclusive teaching to reduce systemic inequities in STEM education.



## Visualizations

Representing data using effective graphs, plots, and other special visualizations.



## Alternative Grading

Challenging the systems and structures associated with traditional grading in higher education.

# Learning Goals

# What are Learning Goals?

# Learning Goals

A learning goal is designed to tell you what information you should learn about a topic

- At the beginning of the topic, the learning goal may not even make any sense
- By the end of a topic, it should help you know what to study

# Learning Goals for the course

# Learning Goals

At the highest level, this course has three main goals.

Students who complete this course will be able to

- explain foundational computing concepts,
- explore applications built on these foundations,
- describe the implications of the applications.

# How are you going to learn?

# How to learn?

***The best way to learn is by doing***

Weekly Labs - in labs you will

- Get hands-on practice with a computer
- Work on projects

“Lectures” will involve

- Doing exercises
- Discussing the readings (in small and large groups)
- Hearing concepts explained
- Answering clicker Questions



# What does this mean for you?

You will need to read and review slides for the next class before coming to class.

Sometimes, there will be assigned pre-class readings or videos.

You need to come to class prepared to *do* things:

- Bring a web-enabled device (tablet, laptop, even a phone will do)
- Follow-along the slides posted on the course website
- Be prepared to be **ACTIVE!**

# About this course



# About this course

## CPSC 100 - Computational Thinking [3]

- Monday / Wednesday / Fridays, 4-5 PM in MCML 360
- “Lectures” will involve:
  - In class activities on PrairieLearn
  - Clickers by show of hands
  - Discussions

# What this course includes



## Introduction to Computational Thinking

- Algorithms + Block based programming
- Data representation + Data Mining + Data Visualization
- Artificial Intelligence (AI)

## Possible extra topics

- Ethics of AI, Human Computer Interaction (HCI)

## Hands-on practice with tools + project

# What this course includes



## Course Schedule

This is the tentative plan for CPSC 100 this term. This subject to change.

Week	Week of	Topic
1	Sep 1	Introductions
2	Sep 8	Algorithms and Using AI
3	Sep 15	Algorithms and Programming
4	Sep 22	Programming
5	Sep 29	Data Representation
6	Oct 6	Internet and HCI
7	Oct 13	Catch-up Week
8	Oct 20	Artificial Intelligence
9	Oct 27	Artificial Intelligence
10	Nov 3	Data Mining
11	Nov 10	Fall reading break
12	Nov 17	Data Provenance
13	Nov 24	Data Visualization
14	Dec 1	Final Projects

# What this course is NOT

## 1) A typical Computer Science course

- You will do more reading/writing than coding

## 2) A coding-based course

- You will not really be programming (only block-based)

## 3) An “easy A”

- Course is set up reward students who do the work!

This is **NOT** a  
"GPA booster class"





# Course Logistics

## Course website

[students.cs.ubc.ca/~cs-100/2025\\_W1](http://students.cs.ubc.ca/~cs-100/2025_W1)

## Communication

Ed Discussion (join via link on Canvas)

**It is your responsibility to check Ed for announcements**

At least once a day!

# Class Etiquette



# Course Etiquette

**Be professional, respectful and thoughtful**

Attend class on time and prepared

Don't distract others

**Please stay home if you are not feeling well**

Review posted course material

Contact classmates to catch up



# Professionalism

**A high level of professionalism is expected**  
Respectful communication in class, emails, etc.

## **A typical Ed Discussion Post:**

Tag the post correctly (Lab, LL, Test, Logistics, etc.)

A greeting, a clear message, a closing

Using ChatGPT for posts is NOT recommended

*Blatant violations of this will be returned for revision*



# My Expectations of you

**Reach out if you need help**

Academic, mental health, etc.

**Be honest**

Academic integrity, always ask if you're unsure

**Be a considerate team member**

Attend (on-time) and participate in meetings

Do your share of the job, well and on time.

# Syllabus Review

# Computational Thinking

# What is Computational Thinking?

“Computational thinking is the **thought processes** involved in formulating problems and their solutions so that the solutions are in a form that can be effectively carried out by an information-processing agent” [Cuny, Snyder, Wing 10].



## DECOMPOSITION

Breaking down problems into smaller, easier parts.



## PATTERN RECOGNITION

Using patterns in information to solve problems.



## ABSTRACTION

Finding information that is useful and taking away any information that is unhelpful.



## MODELLING AND SIMULATION

Trying out different solutions or tracing the path of information to solve problems.



## ALGORITHMS

Creating a set of instructions for solving a problem or completing a task.



## EVALUATION

Assessing a solution to a problem and using that information again on new problems.



# ACTIVITY (Groups of 5)

**Discuss in your groups the following question:**

Which of the 6 computational thinking skills do you think **are the most important (rank them)?**

Which do you think are the **most intuitive**?



# Wrap up

# Wrap Up

- Due Friday at 6 PM:
  - First lab (Lab 0) to be done on your own
  - Learning log (LL0)
  - Syllabus Quiz (Test 0) - not for real marks
- Labs start next week
- First test (Test 1) is next week!