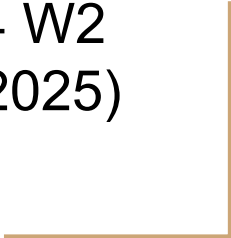




Programming, Problem Solving, and Algorithms

CPSC 203, 2024 W2
(January – April 2025)

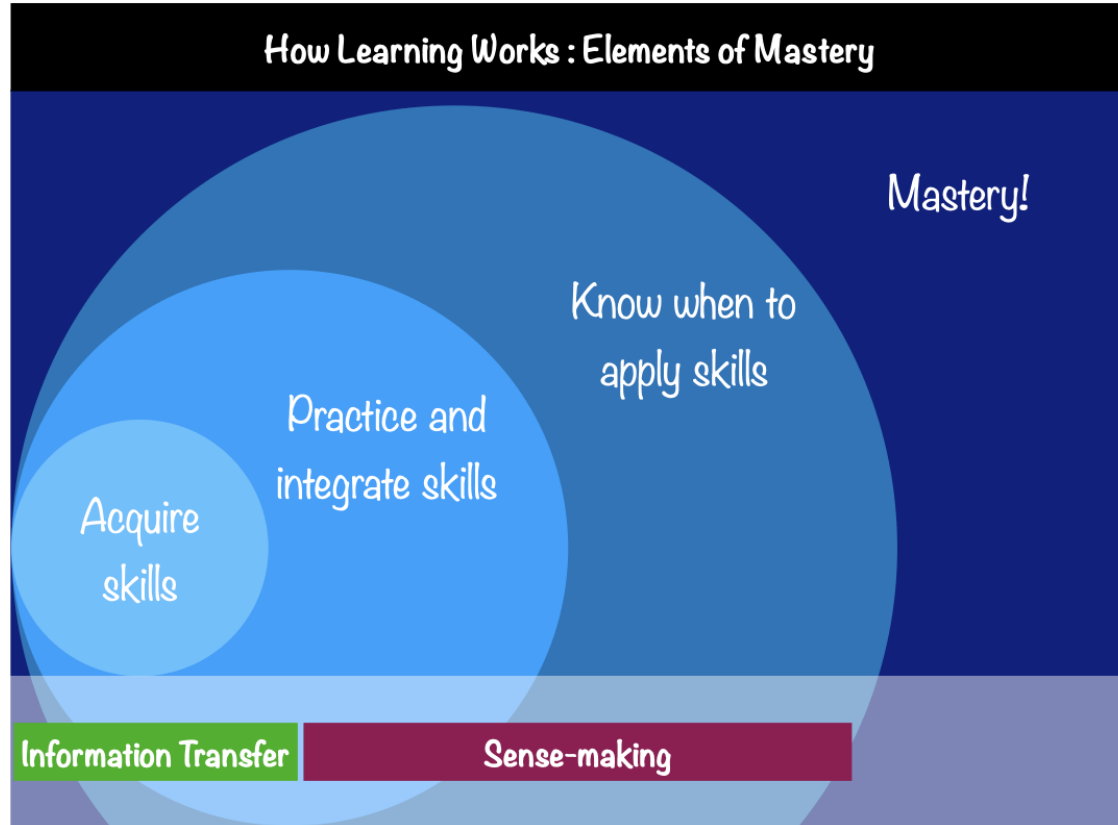


Warning

- Lectures may contain powerpoint slides
 - It is familiar and easy but a terrible way to learn
- Learning is a contact sport!
 - You will be surprised, confused, angry, and sad on the path to enlightenment



How Learning Works



A little about me



Ian M. Mitchell
Professor of Computer Science

Pronouns he/him/his.

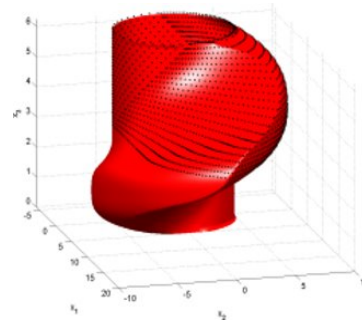
Research in:



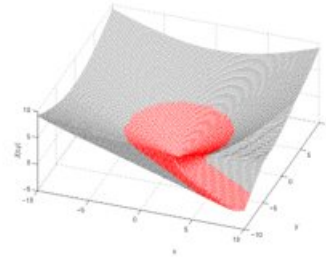
family dynamics during
extended travel



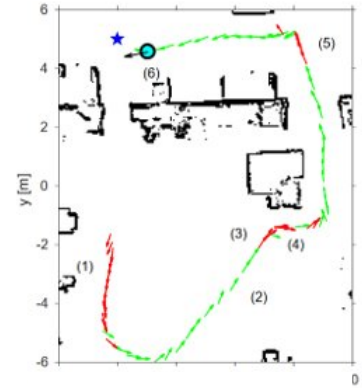
assistive technology



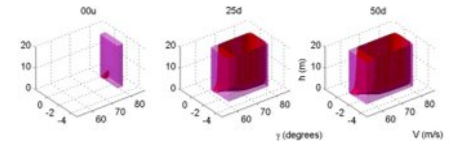
formal verification



numerical algorithms



robotics planning
& control



reproducible research

Course Designer – Dr. Cinda Heeren



- Professor of Teaching, at UBC since 2017 (previously at UIUC).
- Teaches mid-level required courses for CS Specializations (mostly cpsc221) + a similar course for non-majors!

Previous Instructor – Dr. Firas Moosvi



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

Course Overview

Handcraft	Billboard Hot 100	The Overstory and Pointillism	Artificial Music Composition	Road Trip Planning	Katniss' (?) Social Network
Design Objects Iteration	Web Scraping Data Frames Matplotlib	Voronoi Diagrams Efficiency	Markov Chains Random Numbers Graphs	Traveling Salesperson Intractable Problems	Natural Language

Project 1

Project 2

Project 3

This course consists of a sequence of six explorations, assembled to provide a tour through data structure applications and algorithmic design. Built around topics from arts, sciences, and technology, the explorations are thought provoking and engaging. You will emerge from the course with increased proficiency in Python programming, and with a broad spectrum of tools for algorithmic problem solving.

About This Course

- This course will teach you a bajillion different things!
 - Tools: Terminal, Markdown, Git, Visual Studio Code, PrairieLearn,
 - Computer Science: Python (!!!), efficiency, web scraping, graphs
 - Data Science: Pandas, DataFrames, Visualizations,
 - Algorithms: Many algorithms!
 - Art and Creativity: Lots of examples!

Course Components

- **Lectures:** In-class activities based on problem solving and design.
- **Labs:** Practice on lecture material
- **Problems of the week (POTW):** One per (week)day, 5/week, ~ 50 / term
- **Projects:** 3 total
- **Assessments:** 6 Tests (Examlets) + Final

<https://canvas.ubc.ca/courses/152117>

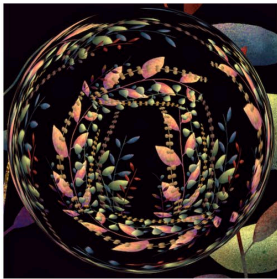
Labs!

- This course has labs...
- Unfortunately they weren't published for students to register in...
- More information coming soon...

Course Tools

- **Piazza:** Class Discussion Forum
- **PrairieLearn:** Platform to help us give you feedback on work you do!
- **GitHub:** Code repository and version control
- **Visual Studio Code:** Developer Environment
- **Canvas:** Just a place to find links to this stuff and more
 - Course web page, lecture recordings, ...

Course website (available Thursday)




Unsyllabus


About this course

- Course Syllabus (Official)
- Course Schedule
- Accommodations
- How to do well in this course
- Frequently Asked Questions

Getting Started

- Before term starts
- Before the first class
- After the First Class
- In the first week






THE UNIVERSITY OF BRITISH COLUMBIA


Computer Science

Faculty of Science


Unsyllabus

Teaching Team 


Information about the teaching team and how to contact us.

Course Schedule 


A table of course topics and a week-by-week plan of what we intend to cover.

Doing Well 


Strategies and tips on how to do well in this course.

Getting Help 

Learn how to get help and get support if you're struggling, academically or otherwise.

Evaluation 

Information about the grading system and evaluation scheme for this course.

Teaching Philosophy 

How this course will be taught and how humans learn (you may be surprised!).

Contents

- Important Details
- Contact Us
- Evaluation
- Passing requirements
- Learning Intentions
- Schedule
- Getting Help
- Syllabus vs. Unsyllabus
- Unsyllabus changes
- How do I do well in this course?
- Missed things
- Course Tools
- Teaching Philosophy
- Academic Integrity
- What should I think about if I'm considering withdrawing from the course?
- Acknowledgements
- Land Acknowledgement
- References

Passing requirements

- All students must satisfy ALL conditions to pass the course:
 1. Pass the Lab component with a grade of at least 50%,
 2. Pass the Test and Exam components (together) with a grade of at least 50%,
 3. Pass the Final Exam with a grade of at least 40%.

If students do not satisfy the appropriate requirements, the student will be assigned the **lower** of their earned course grade or, a maximum overall grade of 45 in the course.

On the use of computers in class

Laptop use is **encouraged** in CPSC 203 lectures and labs

However, there's a restriction:


- You may **only** use your laptop (or other screens, such as phones) for CPSC 203 material. Using screens for other purposes has been shown to reduce your learning and **lower your grades**.
- Using screens for other purposes has **also** been shown to reduce the grades of those around you. That's **not OK**.
- If you have something urgent to do with a screen, just leave the classroom!

How to Study

- This is **learn by doing** material!
 - Passively watching videos / live coding and reading our solutions will not be enough
 - You must solve the problems yourself and write out their solutions
- There are many opportunities for you to practice
 - Practice examlets, examlets, labs, problems of the week, projects, ...

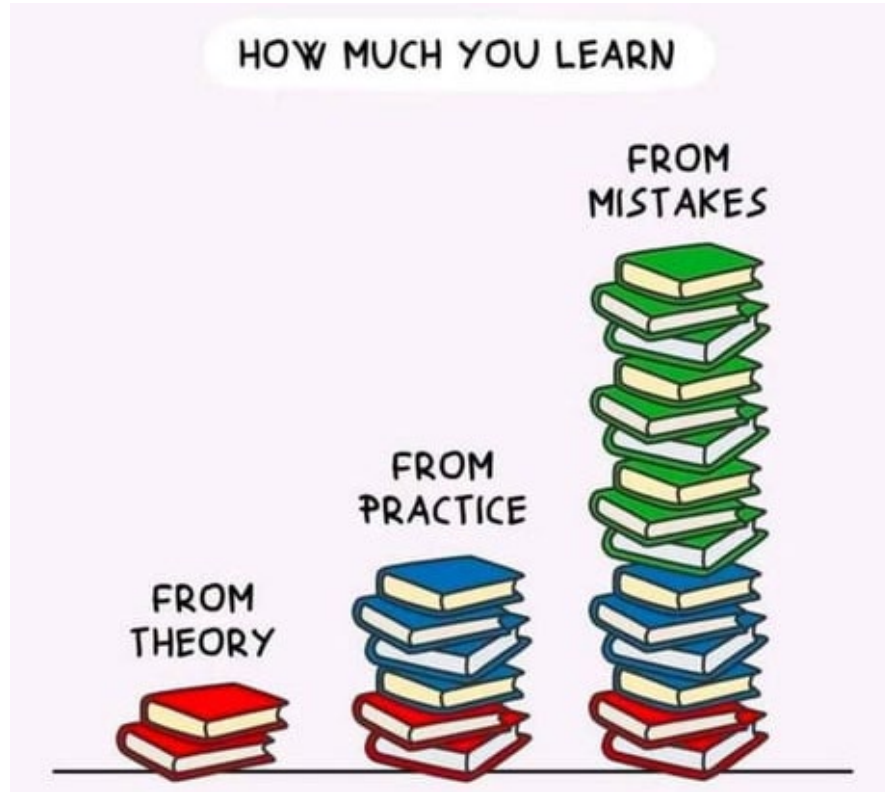
Possible sources of negative emotions

- Feeling confused about a topic
- Feeling of falling behind/not having enough time
- Some external events
- ...



We can usually
find a solution!
Talk to us!

Don't be afraid to try!



Enough with the slides already...

PrairieLearn CPSC 203, 2023W2 Assessments Gradebook

Firas Moosvi **student** ▼

Assessments		
	Available credit	Score
Tests (Examlet)		
T0 Test 0 - Course Policies (completion only, not for marks)	100% until 18:00, Thu, Apr 11 ⓘ	New instance
Class Activities		
CA1 Class 1 Activity	100% starting from 11:00, Tue, Jan 9 ⓘ	Not started

Any questions before we
continue?

Let's Learn Markdown!

(20 mins)

<https://commonmark.org/help/tutorial>

Time to Practice!

(20 mins)

<https://commonmark.org/help/tutorial>

The Magic Number for today is:

See you Thursday!