Course Organization

CPSC 231: Introduction to Computer Science for Computer Science Majors I
Fall 2021

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Welcome!

Jonathan Hudson, Ph.D

L01 TueThu 09:30 - 10:45

L02 TueThu 15:30 - 16:45

(Zoom, recorded)

Office: ICT 712 (I will not be in it!)

Office hours: 13:00-13:50 PM Tuesdays and Thursdays (Zoom, link in D2L) or by email-scheduled appointments. (using waiting room, not recorded)

jwhudson@ucalgary.ca

https://pages.cpsc.ucalgary.ca/~jwhudson/CPSC231F21/

Tutorials

Start next week!

Also through D2L, will be recorded, however point is active interaction with TA for material, exercise, and assignment help.

Use link to your tutorial only.

Your enrollment tutorial TA will mark your assignment material and they are only responsible for the students enrolled in their tutorial.

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Why Computer Science?

- All sciences are impacted by computer science

- Opportunities for multidisciplinary study, work, and research

- Exciting innovations and discoveries that change our lives

- Fascinating subject with fun experiences and an extraordinary potential

- You will learn cool ways to solve problems

- You can enjoy being extremely creative

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Course Goal

From the calendar:

- "Introduction to problem solving, the analysis and design of small-scale computational systems, and implementation using a procedural programming language."

Goals:

- Design solutions to solve small scale and realistic problems

- Write programs based on a given design

- Debug and test programs

- Analyze your solution and the quality of your programs

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Lectures

We will learn fundamentals of programming using Python

We will cover:

- Variables

- Arithmetic operations

- Conditions and Loops

- Functions

- Strings, Lists, ,Tuples, Sets, Dictionaries

- Files, Exceptions, Command Line Arguments

- Recursion

- Classes and Objects

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Top Hat

- Download the top hat app on your smartphone got to TopHat on laptop.

- Create an account if you don't have one.
- Search for "Calgary" and select University of Calgary
- **Join Code: 390789**
- **https://app-ca.tophat.com/e/390789**
- **No marking or attendance records**

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Out of lecture?

There is no attendance taken at tutorials but they are highly recommended
- TAs will use classes to cover coding material in hands-on environment
- Material will be covered and there will also be assignment work/help

There will be limited CT (Continuous Tutorial)
- Using Discord channel to manage it
- By strict schedule posted on course website

There will be an in-person CT position as well that runs in the main CPSC lab

There is an out-of-class midterm scheduled
- Friday, October 29th, 2021 at 7:00 pm.

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Grading

Component	Weighting %
Exercises (8)	3%
Assignments (4)	6%,7%,7%,7%
Midterm	30%
Final	40%

- Each of the above components will be given a letter grade using the official University grading system. The final grade will be calculated using the grade point equivalents weighted by the percentages given above and then converted to a final letter grade using the official University grade point equivalents. (A+ are 4.3 for in-class component weighting)

- Must obtain a C- or better average on the exams to receive a C- or better in the course

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Assignments

- Four individual assignment (30%) consists of programming questions
- Each assignment is due at 11:59 pm on the Friday due date.

Assignments	Due at 23:59
Assignment 1	October 1
Assignment 2	October 22
Midterm	**October 29**
Assignment 3	November 19
Assignment 4	December 10

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Example

- A1: A+
- A2: B
- A3: C
- A4: D
- Exercises: 8/8 -> A+
- Midterm: B+
- Final: A-

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Example

- A1: A+

- A2: B

- A3: C

- A4: D

- Exercises: 8/8 -> A+

- Midterm: B+

- Final: A-

For Exercises Completed Out of 8
8 A+
7 A
6 B+
5 B
4 C+
3 C
2 D+
1 D
0 F

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Example

- A1: 4.3
- A2: 3
- A3: 2
- A4: 1
- Exercises: 4.3
- Midterm: 3.3
- Final: 3.7

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Example

- A1: 4.3
- A2: 3
- A3: 2
- A4: 1
- Exercises: 4.3
- Midterm: **3.7**
- Final: 3.7

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Example

- A1: 4.3
- A2: 3
- A3: 2
- A4: 1
- Exercises: 4.3
- Midterm: **3.7**
- Final: 3.7
- **3.7 GPA on midterm and final is at or above 1.7 GPA**

Example

- A1: 0.258
- A2: 0.21
- A3: 0.14
- A4: 0.07
- Exercises: 0.129
- Midterm: 1.11
- Final: 1.48

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Example

- A1: 0.258
- A2: 0.21
- A3: 0.14
- A4: 0.07
- Exercises: 0.129
- Midterm: 1.11
- Final: 1.48

- Sum: 3.397 (which is a B+)

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Course Policies

- When you email include your first name, and last name.

- Please use "CPSC231F21" as the prefix in the subject line

- Make-up examinations and deferred examinations will not be provided except in cases of extreme personal emergencies. If you miss midterm your final will take the full 70% weight of the two exams.

- There are no late submissions. Submit early and double check after submitting. You can submit multiple times on D2L with no issue, so excuses will not be accepted.

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Zoom Norms

- Respect others:
  - Keep your zoom muted unless asking a question. (please indicate in chat you have a question and I'll make time to let you ask)
  - Video is not necessary. However, for office hours and even smaller tutorials it is recommended.
  - You can ask questions via chat at any time. Ability to answer will be time and class pace dependent.
  - Arrive on time.
  - Refrain from using the chat for topics not related to the current material.
  - Use directed chat if you chat with someone you know. (Be aware that the directed chat is not private!)
  - Avoid any activity that might disturb your classmates.

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Academic Dishonesty

- *"A single offence of cheating, plagiarism, or other academic misconduct, on term work, tests, or final examinations, etc., may lead to disciplinary probation or a student's suspension or expulsion from the faculty by the Dean, if it is determined that the offence warrants such action."*

- We have tools that let me quickly see if assignments appear to be highly similar and techniques like changing names, comments, and other details will not trick them.

- Please refer to the University Calendar for more details.

- **This course is fundamental and is essential for CS studies.**

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Academic Dishonesty

- *All the work you submit must be your own.*

- *When you take algorithms or segments of code from somewhere else you must cite where you obtained them from.*

- *You need to understand all of the code in your work because the midterm and final are evaluating your understanding, not if you were able to make it work*

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Be Computer Science 'Lazy'

- Search internet for answers.

- If you find something, read and **understand** it.

- Then develop **your own** solution using what you've learned.

- Do not copy and paste the answer! It is considered plagiarism!

- Being computer science lazy is an important skill and we will return to it.

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Getting Help

- Do your part: Attend the lectures and tutorials

- Act early!

- First try it yourself$\rightarrow$

  - Study the material carefully
  - Break the problem down
  - Try to narrow down the question
  - Search on google for your answer

- Still unclear?

- Ask your TA

- Come to my office ☺

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Crisis line!

- If you think:
  - You suck at programming!
  - You suck at python!
  - You are not sure about this course!
  - You are OK with only a passing mark!!!
  - You tried but you didn't understand!

- Come to my office → I'll prove to you that you are wrong!

- Come early before things piled up!

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Computer Programming

- Providing precise instructions for the computer to execute.

- Programming is control

- The computer does exactly what you tell it to do → requires special attention to detail.

- Programming copes with change

- It is difficult to write perfectly crafted, useful, and flexible programs → Very valuable

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Problem solving process

- Problem solving
    1. Analyze goals and requirements
    2. Design a high-level solution
    3. Write code

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Programming errors

- You WILL get errors → It does NOT mean you suck at programming!

- Getting errors is normal!

- The errors challenge you.

- Learning how to resolve errors is an important skill.

Why Python 3?

- Python is a widely used high-level programming language for general-purpose programming

- Design philosophy emphasizes code readability
  - Whitespace indentation
  - Code blocks
- Efficient syntax
  - Allows programmers to express concepts in fewer lines of code

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Technology?

- Coding is a new skill!!!

- Pen and Paper Studies have shown that the process of taking notes on a lecture by hand help improve recall of the material over taking notes electronically.

- Working many of the problems we will experience in this course by hand will also help change your mental process and prepare you better for the exams

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To do list

- Install Python 3 on your laptop (There is a D2L video to assist this as well!)
  - Tutorials should have already done this
  - Recommend PyCharm as an environment. (other IDEs allowed)

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Access to CPSC

- The Python 3 is your primary work environment for this course.

- Assignments & exercises are acceptable if they run on Python 3.6.8+

- You can access the CPSC lab remotely. (no need to do this)
  - SSH (Secure Shell) allows you to establish a remote connection with the CPSC lab.
  - https://ucalgary.service-now.com/it?id=kb_article&sys_id=29aedd1bdb3e63c0d1b63ccb7c961963

- Please do not use any non-Linux-based CPSC server for this course.

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Editors

- Tools that allow you to create or make changes to a text file, commonly referred as text editors.

- Notepad ++ (Windows), atom.io, sublime text, **pycharm**, IDLE

- Text editors on the lab computers: *gedit*, both can be found in *Applications -> Accessories*
  - *emacs*

Start of CPSC

231 -> CPSC Majors **(Where you are now)** Python and how to program

233 -> CPSC Majors (Java object-oriented design) **NEXT**

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Required Courses

251 -> Set theory, graph theory, Boolean logic, truth tables, induction, proofs
    (For CPSC 331, 413, AI/theory)

331 -> Data structures, hash tables, stacks, lists, trees, sorting, graphs, performance

351 -> Theoretical Foundations of Computer Science II

355 -> Hardware I: ARM Assembly

413 -> Greedy algorithms, divide and conquer, dynamic programming (theory)

449 -> Programming paradigms (procedural, functional, logical languages)

457 -> Operating systems

SENG 300 -> Writing programs with other people

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Non-CPSC

PHIL 279/377 -> Mostly sentential logic and truth tables (logic for AI/theory)

PHIL 314 -> Ethics

MATH 211/213 -> Linear Algebra (matrix math for Graphics)

MATH 249/265/275 -> Intro calculus (functions, not a lot directly applicable)

Recommended Course Sequence

https://science.ucalgary.ca/current-students/undergraduate/program-advising/program-guides

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Above 300

- 300 Level -> 313 Computability, 329 Intro Sec., 359 Hardware 2
- 400 Level -> Introduction into a discipline of computer science (basic skills but rarely enough to be an expert in the area)
- 500 Level -> Intermediate into a discipline of computer science (more targeted understanding of an area)
- 600 Level and Above -> Graduate courses

- Many 500 level courses are grad/undergrad splits with different requirements within the course for either group
- A number of 400/500 level will have their own pre-reqs such as different math courses expected (MATH 311 for linear algebra II for example)

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Onward to ... an Introduction to Computer Science!

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