

Course Organization

CPSC 217: Introduction to Computer Science for Multidisciplinary Studies I Winter 2023

Jonathan Hudson, Ph.D.
Instructor
Department of Computer Science
University of Calgary

January 9, 2023

Copyright © 2023



UNIVERSITY OF
CALGARY

Welcome!

Jonathan Hudson, Ph.D

L01 TueThu 14:00 - 15:15 TI Forum

L02 TueThu 15:30 - 16:45 TI Forum

L03 MonWedFri 12:00 - 12:50 ST 145

(attempts may be made to record using zoom)

Office: ICT 712

Office hours: 13:00-13:50 PM MonWed or by email-scheduled appointments.

jwhudson@ucalgary.ca

<https://pages.cpsc.ucalgary.ca/~jwhudson/CPSC217W23/>



Tutorials

Don't start this week. Tutorials start next week!

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

There is video on D2L you can look at to get your own computer setup prior to this tutorial.

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

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

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

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: 002436**
- **<https://app-ca.tophat.com/e/002436>**
- **No marking or attendance records**



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)

- By strict schedule posted on course website

There is an out-of-class midterm scheduled

- Thursday, March 9th, 2023 at 7:00 pm.

Registrar scheduled final

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**
- A higher final exam grade will replace a lower midterm grade (i.e. becomes worth 70%). If final is lower, then both exams will be used at regular weighting.

Assignments

- Four individual assignment (27%) consists of programming questions
- Each assignment is due at 11:59 pm on the Friday due date.

Assignments	Due at 23:59
Assignment 1	February 3
Assignment 2	March 3
Midterm	March 9
Assignment 3	March 24
Assignment 4	April 14

Example

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

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

Example

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

Example

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

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

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+)

Course Policies

- When you email include your first name, and last name.
- Please use “CPSC217W23” 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. **You can redownload any submission in D2L after completing it to verify that it submitted successfully.**

Classroom Norms

- Respect others:
 - Please limit conversations as they disrupt other students. Opportunities will exist during things like TopHat questions to discuss with classmates.
 - You can ask questions at any time. Please raise your hand so I can call on you. Ability to answer will be time and class pace dependent.
 - Usually when you have a question there are 10 other students with the same one that are thinking about it as well.
 - Arrive on time.
 - Refrain from disrupting others with content in class not related to the current material.
 - Avoid any activity that might disturb your classmates.
 - I make mistakes all the time coding! Let me know, or ask if you think I might have!

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.**

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*

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.

Getting Help

- Do your part: Attend the lectures and tutorials
- Act early!
- First try it yourself →
 - 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 😊

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!

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

Problem solving process

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

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.

```
Server: Msg 208, Level 16, State 1, Procedure vwTest, Line 4  
Invalid object name 'tableDoesNotExist1'.  
Server: Msg 208, Level 16, State 1, Procedure vwTest, Line 4  
Invalid object name 'tableDoesNotExist2'.  
Server: Msg 208, Level 16, State 1, Line 1  
Invalid object name 'vwTest'.  
Server: Msg 208, Level 16, State 1, Procedure vwTest2, Line 5  
Invalid object name 'tableDoesNotExist3'.  
Server: Msg 208, Level 16, State 1, Procedure vwTest2, Line 5  
Invalid object name 'tableDoesNotExist4'.
```



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

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

To do list

- Install Python 3 on your laptop (**There is a D2L video to assist this as well!**)
 - First tutorial will show you lab environment and possibly assist you in this setup.
 - Recommend PyCharm as an environment. (other IDEs allowed)

Access to CPSC

- The Python 3 is your primary work environment for this course.
- Assignments & exercises are acceptable if they run on Python 3.9.10
- 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.servicenow.com/it?id=kb_article&sys_id=29aedd1bdb3e63c0d1b63ccb7c961963
- Please do not use any non-Linux-based CPSC server for this course.

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

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

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

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

231 -> CPSC **Majors** Python and how to program (this course plus classes/objects)

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

331 -> (**Majors**) Data structures, hash tables, stacks, lists, trees, sorting, graphs, performance

Other Major Required Courses

Not currently easy to switch non-major to major

Best to do as soon as possible (will need good grade in non-major course and you will need to catch up on missing pre-reqs to catch up)

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

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

Non-CPSC Pre-Reqs

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>

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)

Onward to ... an Introduction to Computer Science!

Jonathan Hudson
jwhudson@ucalgary.ca
<https://pages.cpsc.ucalgary.ca/~jwhudson/>



UNIVERSITY OF
CALGARY