

CGSC 1005B – Computational Methods in Cognitive Science
INSTITUTE OF COGNITIVE SCIENCE, CARLETON UNIVERSITY
Winter 2020

Lecture dates: Tuesdays and Thursdays, January 6th – April 7th, 2020
Lecture time: 8:35 – 9:55
Lecture location: TBA
Tutorials: B1: Friday, 1:05 – 2:25, SA 509
B2: Friday, 10:05 – 11:25, SA 513
B3: Friday, 2:55 – 3:35, SA 513
Instructor: Kasia (Katarzyna) Muldner, Ph.D.
Office: DT 2205
E-mail: kasia.muldner@carleton.ca (best way to reach me)
Office Hours: TBA
TAs: TBA

TA Office Hours: By appointment
PASS coordinator: Sameer Ladha
Office Hours: TBA
Contact: SameerLadha@cunet.carleton.ca

Course Description

Introduction to computational methods, with an emphasis on programming. No prior programming background required.

Programming is inherently a creative problem solving activity that requires computational thinking. We will approach programming using the lens of cognitive science, namely that programming involves finding appropriate *representations* for the problem at hand and implementing *operations on those representations*.

On the representation side, we will cover *variables, standard data types (e.g., numeric, strings, Boolean), data scope, advanced data structures (e.g., lists, dictionaries)*. On the operation side, we will cover standard programming building blocks needed to create operations on these representations, including *iteration, conditional execution, and functional abstraction*.

The skills that we will emphasize during the class include *program design*, by discussing various algorithms and approaches to solving problems (such as decomposition), *program implementation*, by writing Python code, and *debugging*, namely the ability to identify errors in programs through pattern matching and code tracing.

Text book required

There is no required text book. Some supplementary sources that we will refer are both freely available:

“Python for Everybody: Exploring Data Using Python 3”, by Charles R. Severance . The textbook is freely available online under an open source license, and can be downloaded here:

http://do1.dr-chuck.com/pythonlearn/EN_us/pythonlearn.pdf

“Python Programming for the Absolute Beginner”, Third Edition, 2010, by Micheal Dawson. It is freely available online through the Carleton library – here is a shortcut link to it: <http://tinyurl.com/ydcyxpdv>

Course Web Page (cuLearn)

The course website is located at <https://carleton.ca/culearn/>. On this site you will find the course syllabus, slides, and any supplementary materials. Please note that the course slides are there for you to use and you are welcome and encouraged to do so, **but you are prohibited from sharing the slides**. My slides are my intellectual property, are Copyrighted and may not be shared or repurposed outside of this class. Sharing the slides either by electronic or non-electronic means is a violation of Copyright and I reserve the right to take action if you do so. For more information on Carleton's policy on Copyright infringement see: <https://calendar.carleton.ca/copyrightcompliance/>

Evaluation

Assignments

There are 5 assignments (see table below for due dates and weights). **All assignments are due by 9:30am on the specified date**. Please avoid putting the assignment off until the last minute as this does not work well with programming tasks. Note that the assignments are not weighted equally – see below.

Assignment	Due Date	Weight
A1	Friday, January 24, 9:30am	3%
A2	Friday, Feb 6, 9:30am	3%
A3	Friday, Feb 28, 9:30am	4%
A4	Friday, March 20, 9:30am	5%
A5	Tuesday, April 7, 9:30 am	5%

Late policy: Assignments must be passed in on time – there is no grace period. This policy is to ensure that we can provide feedback in a timely manner. Late assignments will be accepted for up to 24 hours after the posted deadline, but they incur a penalty of 3% per hour (e.g., if an assignment is out of 100 points, an assignment that is passed in 1.5 hours late will receive a 6 point deduction) – after 24 hours, the assignment will be given a grade of 0. Technical problems such as connectivity issues do not exempt you from this penalty, so please don't wait till the last minute to submit. Some advice:

1. upload partially completed submissions as you work on them (you can submit multiple times)
2. submit the correct type of file (if the assignment requires a python file, submit a file that ends in .py, not a word file)
3. aim to submit your final submission at least 30 minutes in advance of the due date and time
4. download your submission and verify the contents after submitting

Issues with uploaded files. You will be asked to upload python code, which must be a .py file, rather than a word document. It is your responsibility to ensure that the file you uploaded is correct (see point 4 above, i.e., after uploading, download to ensure the correct file(s) was uploaded). If you are not sure, please ask before the deadline – we are happy to help.

Plagiarism and collaboration policy: You may collaborate with others at the **conceptual** level of assignments and tutorials (where conceptual is the algorithmic level, but NOT the code level). You may also collaborate at the code level with **one** other person – if you do, you must clearly indicate the name of the person you worked with on the assignment you pass in. **Group collaboration at the code level with more than 2 people is not permitted – this will be strictly enforced. Using code from another source (e.g., an individual outside of this class, a tutor, or a website) is considered plagiarism.** Please see the notice on academic integrity towards the end of the syllabus (e.g., "A student found in violation of academic integrity standards may be awarded penalties which range from a reprimand to receiving a grade of F in the course or even being expelled from the program or University").

Appeals: Contact the TA that marked your assignment within one week of the date the assignment was returned (posted to cuLearn).

Tutorials

The goal of the tutorials is to provide hands on practice on concepts discussed in tests, and thus solidify learning of those concepts. To receive a grade for a given tutorial, you must be present* and work on the tutorial material. Reading email, watching youtube, etc., does not count as working on the tutorial material. Likewise, unless otherwise specified, working on assignments is not permitted during tutorials – this is because the only way to learn programming is through repeated practice, and the tutorials provide that practice over and beyond assignments. However, some time will be provided in certain tutorials for assignment work. Each tutorial grade is out of 1, assigned as follows: 0 if did not show up or did not do any work during the tutorial, 0.5 if you came late and/or did some work, and 1 if came on time and worked on the tutorial materials the whole period.

* You have **one** “work from home” pass, allowing you to complete a tutorial from home rather than the lab; the work must be submitted before the following week’s tutorial by uploading to cuLearn and emailing your TA to let them know. Two caveats: (1) you must let you TA know before the actual tutorial if you plan to use this pass and (2) you are responsible for figuring out the tutorial material on your own.

** there are several tutorials marked “Assignment time” – if you finish the corresponding assignment before that tutorial and pass in the final version to cuLearn, you do not have to go to the tutorial (and you will get the tutorial credit). **If you use this option, you must let your TA know by emailing them before the tutorial.**

Tests + Exam

Test 1: The first test will cover content from the first portion of the course prior to test 1. More details will be provided before the test.

Test 2: The second test will focus on content starting with material after test 1 up to the content covered prior to test 2, but it will also include concepts prior to test1 (since the nature of programming is inherently cumulative). More details will be provided before the test.

Final Exam: The final exam will be **cumulative**, and so will cover content from the entire course. More details will be provided closer to the exam date.

The tests and exam are based on (1) course slides, which will be made available on cuLearn, (2) problem solving exercises done during tutorials and/or homework, (3) any assigned readings, (4) information presented during class, including class discussions. In particular, class attendance is strongly encouraged because **information will be provided during class beyond that in the textbook or slides**, including explanations of course themes, perspectives that are not in the textbook or in the slides, hints for tests, etc. Thus, if you miss a class, it is strongly recommended that you obtain a fellow student’s notes from that class.

Test Deferral Policy: If, for extraordinary reasons you must miss a test, you must notify the instructor as soon as possible, before the date of the test unless extreme circumstances prevent that (failure to do so will result in a grade of zero for the test). A deferred test will be permitted under only two conditions: illness or bereavement. Documentation is required in order to schedule a deferral. Note that if a test is missed, the Department does not support the reweighting of the course components (e.g., offering an exam that is worth 100% of the final grade).

Weighting of the Final Grade

Test 1:	18%	[January 30]
Test 2:	18%	[March 5]
Assignments:	20%	See table on previous page for exact dates
Tutorials:	10%	Weekly – see table on next page for schedule
Final Exam:	34%	[Regularly scheduled exam period]

E-mail Protocol and Guidelines

I will respond to e-mails within 24-48 hours (excluding weekends and holidays). Please do not send us code to be debugged over email unless you include a detailed code **trace** (details on what that involves will be provided in class) and a hypothesis for why it does not work. Often, if you have questions that require more than a yes/no type answer, the best forum for answering them is during class or office hours.

Lecture Schedule

Please note that dates for topics are approximate and may change; weeks colored blue have an assignment due; yellow highlighting indicates a test:

Lecture Date(s)	Lecture Topic	Tutorial Information
Week 1 Jan 7 + Jan 9	welcome and introduction foundations (variable, data types)	Tutorial 1
Week 2 Jan 14 + Jan 16	foundations con't, conditionals	Tutorial 2
Week 3 Jan 21 + 23	iteration	Tutorial 3
Week 4 Jan 28 + Jan 30	review test 1	Tutorial 4
Week 5 Feb 4 + Feb 6	iteration continued files	Tutorial 5
Week 6 Feb 11 + Feb 13	Lists + algorithms	Tutorial 6
reading week (Feb 17 - 21)		
Week 7 Feb 25 + Feb 27	more lists	Tutorial 7
Week 8 March 3 + March 5	review test 2	Tutorial 8
Week 9 March 10 + March 12	Nested structures functions	Tutorial 9
Week 10 March 17 + March 19	functions continued	Tutorial 10
Week 11 March 24 + March 26	algorithms	Tutorial 11
Week 12 March 31 + April 2	putting it all together	Tutorial 12
Week 13 April 7	Class cancelled, extra office hours	No tutorials

Regulations and Information Common to all Cognitive Science Courses

REQUESTS FOR ACADEMIC ACCOMMODATION

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

Pregnancy obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the [Student Guide](#)

Religious obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the [Student Guide](#)

Academic Accommodations for Students with Disabilities: The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the [PMC website](#) for the deadline to request accommodations for the formally-scheduled exam (if applicable).

PETITIONS TO DEFER

Students unable to complete a final term paper or write a final examination because of illness or other circumstances beyond their control or whose performance on an examination has been impaired by such circumstances may apply within five working days to the Registrar's Office for permission to extend a term paper deadline or to write a deferred examination. The request must be fully and specifically supported by a medical certificate or other relevant documentation. Only deferral petitions submitted to the Registrar's Office will be considered.

WITHDRAWALS

The last day to withdraw from a Winter 2020 course, without academic penalty, is April 7, 2020.

The last day to withdraw from a Winter course with a full fee adjustment (financial withdrawal) is January 30. Withdrawals after this date will create no financial change to term fees but will result in a grade(s) of WDN appearing on your official transcript.

OFFICIAL FINAL EXAMINATION PERIOD

Winter 2020 courses: April 13-25, 2020 (may include evenings & Saturdays or Sundays). **For more information on the important dates and deadlines of the academic year, consult the Carleton 2019-2020 Calendar.**

PLAGIARISM

The University Senate defines plagiarism as *"presenting, whether intentional or not, the ideas, expression of ideas or work of others as one's own."* This can include:

- reproducing or paraphrasing portions of someone else's published or unpublished material, regardless of the source, and presenting these as one's own without proper citation or reference to the original source;
- submitting a take-home examination, essay, laboratory report or other assignment written, in whole or in part, by someone else;
- using ideas or direct, verbatim quotations, or paraphrased material, concepts, or ideas without appropriate acknowledgment in any academic assignment;
- using another's data or research findings;
- failing to acknowledge sources through the use of proper citations when using another's works and/or failing to use quotation marks;
- handing in *"substantially the same piece of work for academic credit more than once without prior written permission of the course instructor in which the submission occurs."*

Plagiarism is a serious offence, which cannot be resolved directly with the course's instructor. The Associate Deans of the Faculty conduct a rigorous investigation, including an interview with the student, when an instructor suspects a piece of work has been plagiarized. Penalties are not trivial. They range from a mark of zero for the plagiarized work to a final grade of "F" for the course, and even suspension from all studies or expulsion from the University.

GRADING SYSTEM

Letter grades assigned in this course will have the following percentage equivalents:

A+ = 90-100 B = 73-76 C - = 60-62

A = 85-89 B - = 70-72 D+ = 57-59

A - = 80-84 C+ = 67-69 D = 53-56

B+ = 77-79 C = 63-66 D - = 50-52

F Failure. No academic credit

ABS Absent from the final examination

DEF Official deferral (see "Petitions to Defer")

FND "Failed, no Deferral" – assigned when the student is absent from the final exam and has failed the course on the basis of inadequate term work as specified in the course outline.

Standing in a course is determined by the course instructor, subject to the approval of the Chair and Faculty Dean.

ICS RESOURCES (613-520-2600, phone ext. 2522)

Department of Cognitive Science (2522)	2221 DT (Dunton Tower)
Registrar's Office (3500)	300 Tory
Student Academic and Career Development Services (7850)	302 Tory
Paul Menton Centre (6608)	501 University Centre
Writing Tutorial Service (1125)	4 th fl Library
Learning Support Services (1125)	4 th fl Library

Academic Advising

Visit the Cognitive Science Undergraduate Office, DT 2221 to discuss your program. Advisors can answer questions concerning:

- Course selection and meeting program requirements
- Your audit and transfer credits
- Gaining access to courses that are closed
- Information concerning prerequisites and preclusions
- Course equivalencies and substitutions
- Information about whether to pursue the (Honours Project Course) or the Thesis stream and CGPA requirements
- Community Practicum Course
- Concentrations
- Exchanges and course selection

DEPARTMENTAL DROP BOX POLICY – Located outside 2201 DT

Mail received prior to 8:30am will be date stamped with yesterday's date. Mail received before 8:30am on Monday's will be date stamped with the previous Friday's date. Please include your name, student number, course code and instructor's name. If any of this information is missing it may delay getting your paper to your instructor.