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# Course Outline – Special Topics 1: Computer Programming for Information Professionals

## General Information

Course #	GLIS 691
Term & Year	Winter 2021
Course schedule	Fridays, 8:35–11:25 (we will meet from 10:05–11:25)
Number of credits	3 Credits
Course location	Online

## Instructor Information

Name and Title	Dr. Karyn Moffatt
E-mail	karyn.moffatt@mcgill.ca
Virtual office hours	By appointment

## Communication

Questions on the content or logistics of the course should be posted to the course discussion group so that the whole class can benefit. Email should be used for questions of a personal nature. To ensure that your emails are properly filed for prompt reading, include [GLIS 691] in the subject line. Expect a 24hr response time during the week and a 72hr response time over the weekend. Students should regularly monitor their McGill email addresses to ensure they do not miss important communications.

## Forms of Address

I grew up calling my father by his first name because he felt strongly that children should be treated as equals. While this may or may not have led to a greater sense of equality in my young self (it certainly led to complicated conversations on the playground), it has resulted in a certain discomfort with formality. **However, we unfortunately live in a society in which not everyone is equally granted respect based on their accomplishments and credentials.**<sup>1</sup> I further acknowledge that as a straight non-disabled white cis person, I am granted much more assumed respect than many of my equally qualified peers. Within SIS, I have witnessed honorifics used inconsistently (even within the same sentence), and have made blunders myself. **I strongly encourage you to address all faculty with appropriate honorifics, especially in group or public settings.** This acknowledges *and signals* respect for their accomplishments and expertise. It can be challenging. I myself struggle to remember to switch over (no, faculty do not address each other as “Prof. Such and Such” in private). Further, I ask that you

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<sup>1</sup> As evidenced by the recent commentary on Dr. Jill Biden's use of 'Dr.': <https://www.nytimes.com/2020/12/12/us/jill-biden-doctor-wsj.html>

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reflect on your natural inclinations, and consider whether perceptions over for whom it feels more natural to use an honorific are perhaps rooted in bias over who deserves such respect.

## Course Overview

This course introduces the fundamentals of computer programming, with a focus on the application of these techniques to the domain of information science. Topics will include software principles and practices, programming concepts and techniques, data structures, and algorithms. This course is oriented towards those with no prior programming experience. Those with modest prior experience are welcome to join the class but are asked to be mindful that the class will be paced towards the novice learner. Those with more substantive past programming experience or who are eager for a more intensive dive into the topic may find other independent learning opportunities more appropriately paced to their learning needs (e.g., GLIS 689).

## Learning Outcomes

By the end of the course, you should be able to:

- Use and understand terminology relevant to programming and data representation
- Implement simple algorithms relevant to information studies, including text manipulation
- Connect concepts and techniques taught in the course to work and careers in the field of information studies.

## Instructional Method

The class will be taught in a flipped format. At the start of each week, pre-class content will be posted to MyCourses, including links to video recorded lectures, readings, and practice exercises. It is expected that students will complete all pre-class content **prior** to the synchronous meeting time, including watching lectures, completing readings, and *attempting* practice exercises.

During our scheduled meeting time, we will meet over zoom for the latter half of our assigned time slot meeting time (i.e., we will meet from 10:05–11:25 on Fridays). The focus will be on coding demonstrations (where I, or one of the TAs, demonstrate example problems) and working on programming exercises in small breakout groups. Coding demonstrations will be recorded and posted following the class, as will instructions for all activities conducted during class time. Students who are unable to join the scheduled class time will be able to follow along independently and will not be penalized.

The course will use the Python programming language. In particular, we will be using *Python version 3.6* and *JupyterLab*, an interactive environment for programming in Python. Both can be installed via the *Anaconda* installer. Class time will be devoted to stepping you through this process, but if you are interested in trying it yourself, you can follow the installation guide linked below. It was developed by [LibraryCarpentry.org](https://librarycarpentry.org), an organization

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focused on building software and data skills for people working in library- and information-related roles, and includes video tutorials for Windows and macOS. (Note that in the very last step the guide introduces the *Spyder* IDE (integrated development environment). We will be using *JupyterLab* and not *Spyder*. To launch *JupyterLab*, either type `jupyter-Lab` in the terminal (instead of `spyder`) or launch the *Anaconda* program from your computer and choose *JupyterLab* from the options).

<https://librarycarpentry.org/lc-python-intro/setup>

## Required Course Materials

We will be using the following text book in the course. It is freely available online through the author's website, but if you prefer a paper copy you can buy one from Amazon.ca for about \$13:

Python for Everybody: Exploring Data in Python 3. By Charles Russell Severance.  
CreateSpace Independent Publishing Platform (2016). <https://www.py4e.com/book>  
<https://www.amazon.ca/Python-Everybody-Exploring-Data/dp/1530051126>

The following book is also very good and you may wish to also consult it, but it is not required. It is available through the McGill Library as an eBook.

Practical Programming: an Introduction to Computer Science Using Python 3.6  
by Paul Gries, Jennifer Campbell, & Jason Montojo. 3rd Edition (2017).

## Computing Requirements

You will need access to a computer in order to complete the programming assignments (as well as to watch the video lectures, attend class sessions, access MyCourses, etc.) Most likely the computer you are using for your other courses should be sufficient, but please contact me by email if you have concerns about your computing resources. Full details on the system requirements are available from <https://docs.anaconda.com/anaconda/install/> but the main requirements are listed here:

- License: Free use and redistribution under the terms of the `../eula`.
- Operating system: **Windows 8 or newer**, **64-bit macOS 10.13+**, or Linux, including Ubuntu, RedHat, CentOS 6+, and others.
- If your operating system is older than what is currently supported, you can find older versions of the Anaconda installers in our archive that might work for you. See Using Anaconda on older operating systems for version recommendations.
- System architecture: Windows- 64-bit x86, 32-bit x86; MacOS- 64-bit x86; Linux- 64-bit x86, 64-bit Power8/Power9.
- Minimum 5 GB disk space to download and install.

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## Other materials

Although programming is ultimately done on a computer, planning and working out solutions is best done on paper. Please make sure you have access to a pen and paper, or a whiteboard and markers during class and when working on exercises and assignments.

## Course Content

This is the first offering of this course. Moreover, it is being offered online, in the midst of a pandemic. As such, the exact timing of the course schedule will evolve and adapt according to the needs of the class. The following lists the topics, I intend to cover, with the expectation that we likely won't cover all of these. A more detailed tentative schedule of topics will be posted to MyCourses, which will be updated periodically.

- What is programming? Why should you learn to do it?
- Variables, expressions, and statements
- Conditional execution
- Functions and abstraction
- Iteration
- Collections: Lists, dictionaries (and possibly sets and tuples)
- Iteration: repeating code using loops
- Reading and writing to files
- Algorithms:
  - Searching and sorting
  - Indexing and parsing
  - Recommender systems
  - Sentiment analysis

## Evaluation

The following provides a breakdown of the course deliverables and how they will be graded. More detailed instructions will be provided over the course of the term. You are expected to prepare for and participate in class. A 48 hour no penalty grace period will be given on all assignments. Beyond that point, no late assignments will be accepted unless a physician's certificate is provided.

### Lab Activities — 20% of final grade

Each week you will be given a set of exercises to work on. These lab activities will provide you with the opportunity to apply the material learned in class and check your progress. You are encouraged to work on your lab exercises with a partner or in small groups. Working with a partner can help enrich the learning process; however, it is your responsibility to ensure you are effectively using your partner to help you learn and are not merely copying someone else's work.

These exercises are not directly handed in. However, each week will be associated with a take-home quiz available on MyCourses. If you have completed the exercises the quiz should

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be easy (i.e., they will be designed to draw directly from the exercises). The quizzes are auto-graded and you can attempt them as many times as you wish with your highest score counted. Each quiz will remain open for two weeks following the week it is given (i.e., Week 1's quiz will be available until Week 3, January 29, 2020).

Although there are no grades directly associated with the lab exercises, they have been designed to prepare you for the larger assignments. It is extremely difficult to do well on the assignments without completing the lab exercises. Full solutions will be posted following the closing of the associated quiz (i.e., about two weeks following the lab), but it is extremely important that you attempt each lab to the best of your ability before consulting the solution.

#### Individual Assignments — 80% of the final grade (3 assignments worth 20%, 30%, and 30% respectively)

There will be three individual assignments in the course. The first will be a position paper in which you will examine the relationship between the course content and your career aspirations. This assignment will be worth 20% of your final grade. The other two assignments will be worth 30% each and will bring together the topics in the course to solve programming problems relevant to the field of information studies (tentatively, these assignments will explore sentiment analysis and recommender systems). These assignments must be completed independently, but you are encouraged to talk to others to help you think through the solution. I realize that this can be a fine line to walk. The overarching goal is to ensure that you are learning and demonstrating what you have learned. I will operationalize that by defining appropriate behaviour as discussing solutions in general and inappropriate behaviour as sharing code.

#### Readings and Exercises (not graded)

Each week a set of readings will be assigned. These readings (as well as their associated online exercises) should be completed before the lab (or even better before watching the lecture!). Unlike the lab exercises, which are designed to challenge you on core computational concepts (the focus of the course), the textbook exercises will help you to memorize the syntax and rules of Python (which are not the focus of the course, but mastering them will make the rest of the course easier).

#### Class Participation (not graded)

Active class participation enriches both your learning experience and that of your peers. Though no grade is explicitly given for class participation, rarely extra credit can be awarded for exceptional effort. Note that participation  $\neq$  talking the most. There are many different ways of contributing to class:

- Carefully and thoughtfully reading all course material **before** each class including reviewing the lab activities before we meet
- Being an active listener. Paying attention to others when they are speaking and limiting your use of distracting technologies during class
- Helping others during the breakout sessions, and actively seeking help when you are stuck (Note that this doesn't mean sharing and copying answers, but rather receiving or providing an explanation meant to help the asker to find the answer him/her self).

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- Participating in discussions, either by offering your own thoughts, constructively commenting on those of others, or asking thoughtful and challenging questions
  - Posting relevant information or questions to the class discussion board and/or acknowledging or building on the postings of others
  - Coming to office hours to discuss course content or ask questions

## McGill Policy Statements

In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded. This does not apply to courses in which acquiring proficiency in a language is one of the objectives.

*Conformément à la Charte des droits de l'étudiant de l'Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté (sauf dans le cas des cours dont l'un des objets est la maîtrise d'une langue).*

McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures" (see McGill's guide to academic honesty for more information). *L'université McGill attache une haute importance à l'honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le guide pour l'honnêteté académique de McGill).*

## Additional Statements

As the instructor of this course I endeavor to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me and the [Office for Students with Disabilities](#), 514-398-6009.

No audio or video recording of any kind is allowed in class without the explicit permission of the instructor.

Instructor generated course materials (e.g., handouts, notes, summaries, exam questions, etc.) are protected by law and may not be copied or distributed in any form or in any medium without explicit permission of the instructor. Note that infringements of copyright can be subject to follow up by the University under the Code of Student Conduct and Disciplinary Procedures.

End-of-course evaluations are one of the ways that McGill works towards maintaining and improving the quality of courses and the student's learning experience. You will be notified by e-mail when the evaluations are available on Mercury, the online course evaluation system. Please note that a minimum number of responses must be received for results to be available to students.

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McGill University is on land which has long served as a site of meeting and exchange amongst Indigenous peoples, including the Haudenosaunee and Anishinabeg nations. We acknowledge and thank the diverse Indigenous people whose footsteps have marked this territory on which peoples of the world now gather.

In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.

Additional policies governing academic issues, which affect students, can be found in the McGill Charter of Students' Rights (The Handbook on Student Rights and Responsibilities is available at [www.mcgill.ca/files/secretariat/Handbook-on-Student-Rights-and-Responsibilities-2010.pdf](http://www.mcgill.ca/files/secretariat/Handbook-on-Student-Rights-and-Responsibilities-2010.pdf)).