

COMP 208

Computers in Engineering

Winter, 2019

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 www.mcgill.ca/integrity for more information).

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.

1. Instructor and Schedule

Nathan Friedman, ENGMC 325, 514 398-7076

email: nathan.friedman@mcgill.ca

Office Hours: Tu 3:00-4:30

We 10:30-12:00

Lectures (section 1): Tu, Th 1:00-2:30 in ENGMC 13

Lectures (section 2): M, W 1:00-2:30 in ENGMD 279

2. Teaching Assistants

Check MyCourses for the list of TA's, their contact information and a schedule of office hours. This information will be posted on the content section of MyCourses.

3. Course Resources

I encourage you come to office hours to meet and interact with the course staff. You are also welcome to contact the instructor or the TAs by email with questions you may have about assignments and the course material. Any questions which might be of interest to others in the class should be posted to the MyCourses discussion groups.

The discussion groups on MyCourses are an invaluable resource and we encourage you to raise any questions or issues of general interest there. The instructor and TA's will monitor these forums and try and help answer questions. Other students may have had problems similar to those you encounter and can be of great help.

Textbook

- We will be using an online text produced by zybooks
- There will be required exercises from this text book
- To access your copy of the text:
 1. Sign up at zyBooks.com
 2. Enter zyBook code McGillCOMP208Spring2019
 3. Click Subscribe
- **You must use your official McGill email address to subscribe.** If you use a different email address, your grades will not be recorded properly

MyCourses resources provide additional material. These resources include:

- Lecture notes
- Code for algorithms studied in class
- Previous midterms and final examinations
- Reference material on the languages studied

4. Tests and Assignments

There will a midterm test worth 20% of the final mark.

Completion of activities from the zybook text will be worth 10% of the final grade.

There will be 6 programming assignments. These will be worth 20% of the final grade.

The final examination will be worth 50% of the final grade.

Programs must be submitted using MyCourses with the source code and, if requested, test cases that demonstrate that the program meets the problem specification.

5. Course Outline

The course has four components. It first covers the design and implementation of programs using C as the programming language. A second and very different language, Matlab, will be studied and used. The concepts discussed will be applied to an assortment of algorithms that arise in solving many Scientific and Engineering problems.

The following is an approximate outline of the material covered. The times given may vary depending on the specific examples and applications chosen to illustrate the concepts. There will be review lectures before the midterm and before the final exam.

- A general introduction to programming and machine organization (2 lectures)
- Programming in C – getting started (1 lecture)
- Arithmetic expressions (1 lecture)
- Selection mechanisms in C (1 lecture)

- Loops (1 lecture)
- Functions (1 lecture)
- Files and arrays (2 lectures)
- Pointers (1 lecture)
- Number representation and more C operators (1 lecture)
- Multidimensional arrays (1 lecture)
- Additional Topics in C (1 lecture)
- Searching and Sorting Algorithms (1 lecture)
- An introduction to MatLab (4 lectures)
- Recursion (1 lecture)
- Mergesort (1 lecture)
- Finding the roots of nonlinear equations (1 lecture)
- Initial value problems for ordinary differential equations (1 lecture)
- Numerical Integration (1 lecture)
- Solving Linear Systems of Equations (1 lecture)