Course Outline

Introduction to Computer Science COMP 250

(Fall 2016 MWF 4:35-5:25 FDA Auditorium)

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Teaching Assistants (T.A.): See above URL and mycourses for this information.

Introduction

This course introduces you to two core topics in computer science: data structures and algorithms, and object oriented design. For the data structures, you will learn about various types of lists (arrays, linked lists, stacks, queues), trees, and graphs. You will also learn the basic algorithms that use these data structures, and how to analyze such algorithms in terms of the amount of computation they use. These analysis tools will be used heavily in many subsequent courses, in particular, COMP 251 and COMP 360.

The course also give you a deeper understanding of object oriented programming. You will learn how classes can be organized into hierarchies, and how variables and methods defined in the classes of the hierarchy are related to each other. These relationships will be developed more fully in subsequent courses such as COMP 303.

Prerequisites

The prerequisite for this course is COMP 202 Foundations of Programming or any one semester course on programming in a high level language such as C or Java. In the latter case, see the COMP 202 web page from last semester to make sure you have the appropriate background:


As a bare minimum, you should have written (and debugged!) several programs in a high level language. In particular, you should be comfortable with: variable types, conditional statements (if-then-else, switch), loops (while, for), basic data structures such as arrays, strings, the concept of a references (or pointers), various types of I/O (keyboard inputs or reading from a file, writing to console or to a file).
What more do you need beyond this bare minimum from COMP 202 in order to take COMP 250? Both COMP 202 and COMP 250 use Java which is an object oriented programming language. Those of you who have only programmed in C or Fortran or Matlab will be unfamiliar object oriented programming. This applies, in particular, if you are an Engineering student who has taken COMP 208 or a Physics student who has taken PHYS 257. If you want to take COMP 250 and you don’t know anything about object oriented programming, and in particular the Java language, you will need to do some work on your own in the first few weeks of the semester to catch up. In particular, I strongly suggest that you:

- scan through the lecture slides from COMP 202 and make sure you are aware what was covered in that course (see URL on previous page)
- work through the free online Java book “How to think like a computer scientist”. In particular, chapters 10 and 11 give a brief introduction to Objects and Classes, respectively. If you don’t know about object oriented programming, you need to do so ASAP.
- For more on object oriented programming in Java – in particular, Objects and Classes – see the first three bullets of: http://docs.oracle.com/javase/tutorial/java/index.html
- If you are a python programmer trying to learn Java, see http://interactivepython.org/courselib/static/java4python/index.html

**Other recommended courses (unofficial co-requisites)**

If you are registered for COMP 250 in Fall 2016, then I strongly recommend that you:

- also take MATH 235 or 240 (which one depends on your program), since these courses will help you with the math aspects of COMP 250. Getting through these course now will be a huge help for COMP 251. Indeed starting Fall 2017, one of these two MATH courses will be officially a co-requisite for COMP 251. (Note: CS students, if you cannot take MATH 240 this semester and you plan to take COMP 251 next semester, then you should also take MATH 240 next semester.)
- take Calculus 1, if you haven’t done so already
- do not attempt to take COMP 250, 206, 273 all in one semester, unless you have a lot of programming experience already. (Taking 250 and 206 is fine though, and indeed is recommended.)
Course Content and Resources, Announcements

A complete set of lecture notes will be made available on the public course web page, as will the lecture slides, Exercises, example code, etc.

Announcements will be made both on the public web page and on the mycourses COMP 250 page. You should subscribe to mycourses Announcements and to the Discussion Board, so that you do not miss out on important information for this course.

It is common for McGill students to have a Facebook page for each course. Feel free to use such a page, but be warned that I will not make postings on the FB page and that information that students post FB often will be incorrect.

MyCourses Discussion Board

Please do not email me (Prof. Langer) with technical questions about the course material. Instead, post your questions on the mycourses discussion board so that everyone can benefit from the correspondence. I will moderate the discussion board.

When posting to the discussion board, please obey the following. Posting that do not conform may be deleted.

- Use the search feature to see if your question has been asked before.
- Choose a suitable subject line, so that readers know what the posting is about.
- Proofread before posting. Consider that you are broadcasting this message to several hundred of your peers, not sending a text to your close friend.
- If you would like your posting to be deleted, just add a request within the thread and I will take care of it. No problem.
- If you have multiple questions that are unrelated, then use multiple postings. Otherwise threads will be tangled which will create confusion.
- Be polite. Be professional.
- If I answer one of your questions, then I do not expect you to reply with a "thank you" note. Its fine if you do, but don’t be surprised if I delete it to reduce clutter.
Evaluation

Your final grade will be calculated using the following percentage breakdown.

- **Four Assignments (40 % total)**
  - A1 to be posted in mid-late September
  - A2 to be posted in early October
  - A3 to be posted in late October
  - A4 to be posted in early November

  You will be given at least 10 days to complete each assignment.

- **Two in-class Tests (20 % = 2 × 10 %)**
  - Test 1 is Wed. Oct 5 in class
  - Test 2 in Mon. Nov. 14, *either in class or in the evening (TBD)*

- **Final Exam (40 % or 60 %, see below)** held during Final Examination Period.

  The midterm Tests and the Final Exam are all *closed book* (no crib sheet). No electronic devices are permitted (no calculators and no cell phones – for obvious reasons). If you need to know the time, ask the invigilator.

  The midterm Tests will consist of short answer questions. The Final Exam will be multiple choice.

  If your percentage grade on the Final Exam is greater than the average of your percentage grades on the two midterm Tests, then your Final Exam grade will count for 60% of your final grade. This policy is intended to allow some flexibility, for example, if you do poorly on at least one of the midterms or you do not write at least one of the midterms for whatever reason.

Other Miscellaneous Policies

**Re-grading:** Mistakes can occur when grading. Not surprisingly, requests for re-grading almost always involve those mistakes in which the student received fewer points than deserved, rather than more points than deserved. With that in mind: if you wish me or the TAs to re-grade a question on an exam or assignment, we will do so but, to avoid grade ratcheting, we reserve the right to re-grade other questions as well.

**Bonus points:** If you inform me of significant errors in the lecture slides, exercises, or assignments, then I will be very appreciative and I will make a note of it and you may be eligible for bonus points.
Final grade: There are many factors that determine your grades including how hard you work, how talented you are in this subject, how much time you have available because of other commitments, what your academic background is, what your health situation or family situation is, etc. However, when I assign your final course grade, I will not take these other factors into account. I assign the final grade only based on your assignment and exam scores.

Additional Work: Students with grades of D, F or J will not be given the opportunity to complete additional work to upgrade their grade.

Supplemental Exam: It will cover the same material as the Final Exam and will replace the Final Exam grade. For information on Supplemental Exams, see https://www.mcgill.ca/science/student/general/exams/supplemental.

Collaboration vs. cheating
I greatly encourage you to discuss the assignment problems with each other. However, this discussion must not go so far that you are revealing the solutions to each other. And it certainly should not go so far that you are sharing code. We realize there is sometimes a fine line between giving hints and revealing solutions, so we ask you try to follow a simple guideline: any discussion you have about an assignment should be open in the sense that you would be 100% comfortable if anyone else including the TAs or instructor were listening in.

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.

McGill policy on academic integrity

McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offenses under the Code of Student Conduct and Disciplinary Procedures. See http://www.mcgill.ca/students/srr/honest/ for more information.