COMP 402 - Honours Project in Biology and Comp. Science (6 credits over two consecutive semesters)

Course Syllabus

Overview

Welcome to COMP 402 – the undergraduate research component of the CS&Bio joint honours! This class will be utterly unlike most other classes you've taken. During this course, you will conduct a research project under the guidance of a professor (typically from either Computer Science or Biology).

Restrictions and Prerequisites

Restriction: Only for students in the honours joint major in computer science and biology.
Prerequisites: 9 credits of COMP courses and 9 credits of BIOL courses.

Instructor

My name is Mathieu Blanchette – I'm a professor of Computer Science and, more importantly, I am the designated instructor for COMP 402 this semester. In this course, my job is to (1) ensure that each student is well situated to complete a solid research project and (2) participate in evaluating your research at the end of the semester (which culminates in your final grade).

You're welcome to come see me throughout the semester. I don't have official office hours for this class, so please send me an email if you'd like to meet and we'll find a time that works for both of us.

Email: Mathieu.blanchette@mcgill.ca

Course Structure

COMP 402 is a two-semester course. In most cases, this will mean working on the same research project with the same supervisor for these two semesters. Under certain unexpected circumstances, changing research and/or supervisor between the two semesters would be possible; please contact me before the end of the first semester if you think you need to make a change.

Your COMP 402 experience will primarily stem from the research that you do. As a result, the structure of this course is built around making that time as focused and productive as possible. With this in mind, the course will proceed through the three stages described below.

Semester 1, Weeks 1-3: Finalize project proposal

Identify a supervisor and a project. Ideally, you will identify a supervisor on your own; this could be any professor working in biology, genetics, biochemistry, biophysics, biostatistics, or bioinformatics (or any other area that combine computer science and life science). If you have great difficulties finding a potential supervisor, please let me know quickly; I should be able to help. Once you've found a supervisor and narrowed in on a project, you'll write up a 1 page project proposal. You'll submit this to me and I'll use it to evaluate whether your research project satisfies the (relatively flexible) guidelines of the course. I'll be checking projects for three criteria:

1. *Scope*: is this project something that can be plausibly completed in two semester?
2. *Merit*: is this project sufficiently interesting/open that it counts as research?
3. *Topicality*: Your project should involve a substantial amount of computer science research (e.g. algorithmic and software development) to address a problem arising from the analysis of biological data.

In your proposal, please make sure that you provide enough information for me to evaluate this. It is possible that I'll ask you to clarify or revise certain aspects of the proposal. This is why I have two deadlines (see below) for the project proposal. The first deadline is the time by which you must submit a proposal. The second deadline is the time by which we must have finalized the proposal (i.e., you've addressed any concerns or comments I have about the project).

In general, if you find a supervisor in the CS&Bio area, you shouldn't have a problem at all with this phase. Most often, your supervisor will provide you with a project idea which you'll work on. So you don't have to come to COMP 402 with any particular project ideas of your own.

Typically, you'll submit your project proposal and I'll immediately approve it – at which point you move onto the next stage. If I don't approve it, then we'll discuss my concerns and iterate on it until it's something we're both comfortable with.

Semester 1, Weeks 4-13: Research

Conduct your research under your supervisor's direction. Meet with him/her regularly as agreed between the two of you. I'm not involved in this at all.

Semester 1, Last day of class: Intermediate report

Submit your intermediate project report. Project reports should be at least 5 pages (not including figures and bibliography). A report should be written in the style of a journal publication – meaning that it should include the following sections: Introduction, Background, Methods, Results, Discussion, and Conclusions. A bibliography is essential and must be included. Your project report will be lightly graded on presentation and with most emphasis placed on content. It's expected that you write your report with feedback from your advisor prior to submitting it to me (this will help with presentation and content). Note that I don't expect this to be a perfect, publication-worthy manuscript – but I expect it to be written well enough for me to understand what you did, why it was important, and so forth.

Semester 2, weeks 1-13: Research
Continue to do research with your supervisor, unless this is not possible, in which case alert me immediately.

Semester 2, Last day of class: Final report
Submit the final version of your project report, describing your findings from the two semesters. The project report should be at least 10 pages and should follow the same format and guidelines as the intermediate report, upon which it should build.

Key Deadlines

1. June 15 2022: Project proposal due.
2. June 30 2022: Final project proposal due.
3. August 30 2022: Intermediate project report due.
4. December 3 2022: Final project report due

Expected workload

In accordance with the number of credits associated to the course, the expected workload is 9 hours per week over 26 weeks.

Grading

Your grade will be determined as follows:

30% grade given by supervisor at the end of Semester 1
30% grade given by supervisor at the end of Semester 2
15% grade by instructor on intermediate report
25% grade by instructor given on final report

McGill Policy Statements

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/students/srr/honest/ for more information).(approved by Senate on 29 January 2003)

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 site www.mcgill.ca/students/srr/honest/).

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."(approved by Senate on 21 January 2009 - see also the section in this document on Assignments and evaluation.)

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).

(This document was adapted from Derek Ruths' COMP 401 Winter 2015 syllabus)