

CIS 4930: INTRODUCTION TO BIOINFORMATICS

Syllabus

“In the year 2020 you will be able to go into the drug store, have your DNA sequence read in an hour or so, and given back to you on a compact disc so you can analyse it.”
Walter Gilbert (1980)

Basic Information

- Semester: FALL 2019
- Schedule: MWF, PERIOD 8 (3:00 to 3:50)
- Location: CSE E221
- Professor: Christina Boucher (www.christinaboucher.com)

Main Theme

This undergraduate course follows Compeau and Pevzner’s active learning approach to learning bioinformatics. Following their “Bioinformatics Algorithms” textbook, it covers fundamental topics in genomics, machine learning, and biological data science, it strikes a unique balance between practical challenges in modern biology and fundamental algorithmic ideas, thus capturing the interest of students of both biology and computer science. Each topic begins with a central biological question, such as “Are There Fragile Regions in the Human Genome?” or “Which DNA Patterns Play the Role of Molecular Clocks?” and then steadily develops the algorithmic sophistication required to answer this question. Each topic is complemented by an assignment in which the students implement and apply algorithms learned in class to analyze real biological data. They are given the tools needed to analyze their method to obtain meaningful biological results.

Coursework

Grades will be based on three assignments / mini-projects that will be done in pairs (each 30%) and a presentation (10%).

- Assignments: The assignments will combine a mixtures of algorithm design and implementation. The data will be provided in most cases and will require some linux / unix programming (demonstrations will be given in class). Class time will be given to discuss and work on the assignments.
- Presentation: There is a presentation that will be done in pairs. It is informal 5 to 10-minute presentation. It is strongly encouraged that all students attend.

The grading scale will be A = 100 to 80, B = 79 to 70, C=69 to 60, and D = 59 and lower. I reserve the right to be more lenient if I decide to use a curve.

Course Material

There are no required textbooks. But it is recommended that students look at the following book for extra explanation and in-depth reading: Bioinformatics Algorithms by Pavel Pevzner and Philip Compeau: <http://bioinformaticsalgorithms.com> In addition, conference and journal articles will be given as supplementary reading from time to time.

Course Policies

- **Regrading Policy:** You are free to ask me or one of the TAs why an answer did not get full credit. However, such verbal discussions will never result in extra points. Actual regrade requests must be made in writing, and then turned in to any of the TAs. Attach a separate page to your assignment/exam with the requested regrade and the reasons for the regrade. In no case may you write on the assignment/exam itself after it is graded. Requests must be made within one week of when we return the graded assignment/exam to class.
- **Make-up Policy:** Make-up test for the midterm and the final will be given only if you have a written official documentation of a valid excuse and you contact me prior to the exam.
- **Distractions:** Try to be extra careful not to cause any distraction in the classroom. Absolutely no phone calls or text messaging during the class. Also, please be on time to the lectures. If you are more than a couple of minutes late do not enter the classroom.
- **Announcements:** Students are responsible following the announcements on UF E- learning (Canvas). Schedule updates regarding the tests, presentations, and office hours will appear there.
- **Accommodations for Students with Disabilities:** Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation.
- **The University's Honesty Policy:** All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a student at the University of Florida and to be honest in all work submitted and exams taken in this class and all others. The following link contains additional information relating to academic honesty: - <http://regulations.ufl.edu/chapter4/4041.pdf>