BIO425 / 790 Computational Biology - Spring 2021

Prof. Konstantinos Krampis

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Office hours: Fridays 1-3pm
Office location: virtual, via Hunter Zoom: **https://huntercollege.zoom.us/j/81409576181**

General information: Please note *I will not respond to individual emails* regarding questions on homeworks, deadlines, course materials etc. These questions should be posted on the corresponding discussion forums on the Blackboard, as described in the syllabus. Email is reserved for items not suitable for the discussion forum, for example if you missed a homework deadline due to medical or similar emergency and you request a chance to submit (only acceptable with proof of the emergency, otherwise late submissions will not be accepted).

Regarding *office hours*, they *are not recitation hours*, meaning that office hours are not used for one to one explanation of the material (but you are welcome to stop by discuss any issues you have with learning in the course). During the course we will have regular material review / recap sessions, along with assessment quizzes, discussions and answering of questions on the Blackboard discussion forum.

Course purpose and description.

This course covers advanced computer programming techniques for biological data analysis, specifically genomic datasets. We will be using the Python programming language as the main bioinformatics tool, along with a computational platform based on the Google cloud to run our analysis. We will be writing Python programs to analyze genomic data (DNA, RNA, Proteins), that are publicly accessible. The analysis will involve loading and processing the data with Python, creating visualizations and drawing interpretations from the data, along with understanding the biological mechanisms and scientific hypothesis represented in the data and our analysis. At the end of course, you will have a solid understanding of bioinformatics analysis, and will be able to utilize the concepts learned in the course further into graduate school research, or the workplace.

Instructional format.

The course follows a hybrid format, combining asynchronous online instruction, in combination with live instruction. The asynchronous sessions will be delivered via Blackboard learning modules, that include materials such as pre-recorded videos, texts and other reading material, along with assessments in each module. The asynchronous modules become available every week at the scheduled time of the course, and are in a format that need to be completed sequentially. Along with the modules every week, *a homework will be posted that is due exactly one week later*, by the time of the next scheduled class.

While you are not required to go though the material at the scheduled time of the course, *it is highly suggested to do as soon after it is posted*, in order to start working on the homework. Following every few asynchronous modules and as we build towards more advanced concepts, I will schedule live lectures via Zoom meetings (approximately every 2-3 weeks).

Assessment, homework and grades.

The overall grade for the class can be divided in the following categories:

- Homeworks 40%

- Class participation 40%

- Final project 20%

The homeworks are posted weekly along with the class material, and are due by the next week's class scheduled time. The homework is a mix of multiple choice or similar fill-in questions, along with writing Python code to complete a particular bioinformatics tasks. *The code must be written individually and not working in groups*. Code is like written English prose, and plagiarism can be easily identified, *students who engange in plagiarism will be contacted, and points will be deducted from the final grade*.

The class participation involved reading the material posted weekly, and I track via Blackboard the completion of the reading material by each student, and it might be also requested that you submit an assessment or screenshot for completed material as part of each homework. In addition, posting on the discussion forum on a certain topic will be requested frequently, the posting will follow a certain evaluation rubric and the posting counts as class participation. When we have live instruction Zoom sessions, attendance will be taken.

The final project will involve an extended coding project covering all the material in the course, and it will posted up to 2 weeks before the official finals week at Hunter College, and will be due by the official date of the semester ends.