Course: BIOINFORMATICS PRACTICUM - BNFO 620

Semester: Spring 2023
Place: Harris Hall (3112) computer lab or online via Zoom
Time: **Tue, Thu, 3:30-4:45 pm** or by appointment (Tue: class, Thu: team meetings)
Dates: Jan 17 – May 5, 2023
Credit hours: 3

Instructor: Dr. Peter Uetz
            Harris 3136
            uetz@vcu.edu

Office hours: by appointment

Required text, course materials: original research articles and reviews, Wikipedia
            articles

Course web site: VCU Canvas

Course description (from Bulletin, updated): Practical application of bioinformatics to
            biodiversity, genomic and proteomic analyses. Students will work in small
            groups to plan, develop and execute a project designed to solve practical
            challenges in the realm of bioinformatics. Proficiency in various aspects of
            bioinformatics will be developed.

Course Goal learning outcomes: Students will learn **how to approach a research or
            development project** by investigating what is known about a certain topic
            or problem, develop a strategy to answer open questions (or develop a tool
            to answer such questions), and finally **implement a computer program,
            tool, or carry out an analysis** using existing programs. The ideal end goal
            is a publishable product, either as a tool or research paper, describing the
            results of the project.

            Students will get a list of possible projects from which they have to choose
            their favorite project, second and third favorite. Students will then be
            assigned to a project in groups of 3 (or sometimes 4). A project list is
            available in advance of the course, so students have time to decide or ask
            questions.

            In order to document their background research and the current state of
            knowledge, students will write and publish a **Wikipedia** page or section.

            Students will also **present** their project, their progress, and the results of
            their study to the class.

Pre-requisites. Molecular biology basics, basic scripting / programming (negotiable).

Specific objectives in 2022. See Canvas page for BNFO 620 for project details.

Grading (weights): 60% - Project report or manuscript
       20% - Wikipedia article
       20% - progress reports, milestones, presentation(s)

Grading Scale*: 90 to 100 = A
      75 to <90 = B
      60 to <75 = C   * subject to change
      50 to <60 = D
      Below 50 = F

Project report. While the report will be graded at the end of the class, students are encouraged to start working on their report within a few weeks into the semester. They will first write a **background (introduction)** section to describe the problem they are working on, the state-of-the-art, i.e. the currently knowledge of the problem, previously published studies, results, and solutions of similar and related problems. Next, they will describe the **methods**, that is, the data and tools they use, either from existing sources or created themselves. The approach needs to be documented in detail. Towards the end of the semester, **results** should be written up. This can be a truly scientific insight or a newly generated data set or tool. Finally, students should produce a **discussion**, that is, a description of what has been achieved, how this compares to previous studies, and how the newly obtained data fits into the existing body of knowledge. Comments on future plans or what remains to be done may and should be added as well.

Class Attendance and Time Expectations: You are expected to attend every class / team session and to spend 2-3 hours every week outside of the class doing research and working on your Wikipedia article. Depending on progress, class sessions may be replaced by team meetings. Each student is expected to give a short presentation on their chosen subject and why their Wikipedia subject (article) needs work.

Wikipedia article. Your article will be an important part of this course. You will write an article, edit one substantially, or write a new section of an existing article. You are expected to add the equivalent of 1/2 page of text (≥200 words), 2 images and one table (maybe replaced by a figure).

Presentation: the presentation is not directly graded, but if well done, may count as a bonus and lift your grade.

Full additional syllabus statement

Students should visit http://go.vcu.edu/syllabus and review all syllabus statement information. The full university syllabus statement includes information on safety, registration, the VCU Honor Code, student conduct, withdrawal and more.

Use VCU Libraries to find and access library resources, spaces, technology and services that support and enhance all learning opportunities at the university. (https://www.library.vcu.edu/)