CSCI 3395 (Intro to Computational Biology & Bioinformatics), Fall 2020: Syllabus

Course description

This special topics course will discuss the emerging fields of Computational Biology and Bioinformatics. We will focus on classic and modern algorithms useful for a wide range of data analyses throughout many biological areas. All topics will be covered from a computational perspective, however, we will also discuss biological topics in order to place the computational issues in their proper context. The topics covered will include sequence analysis, phylogenetics, quantitative genetics, gene expression analysis, clustering, biological networks, and pathway analysis.

• MW 2:30 - 3:45pm, CSI 257

Prerequisites

 CSCI 2320 (Principles of Data Abstraction); may be taken concurrently; or permission of instructor)

Instructor contact information

- Dr. Matthew Hibbs
- Office: CSI 270K
- Office phone: (210) 999-7482
- Regular office hours will be held on: T 12-5, R 12-2, F 1-4, or by appointment.
 - All office hours will be online this semester. I occasionally have conflicts during these times. I will do my best to make those conflicts shown on my shared calendar.
 - The zoom room for office hours is at: <u>https://trinity.zoom.us/j/429373061</u>
 - The password for this room is "office"
- E-mail: mhibbs@trinity.edu
- Email is also a good way to contact me or ask questions. Responses are usually prompt. However, I'm not always available, and may take more time to respond. Additionally, if I happen to be at a computer, you can request that I open up the zoom session

<u>Course materials</u>

Web page

Most course-related information (this syllabus, schedule, homework and reading assignments, etc.) will be made available via the Web. Google classroom will be used to distribute all course materials, assignments, announcements, etc.

<u>Textbook</u>

<u>Bioinformatics Algorithms: An Active Learning Approach</u>, 3rd edition by Compeau and Pevzner The book is also <u>available from the authors for free online</u>.

Other references

If you would like to learn more background about Biology in general, I recommend the following books:

<u>The Processes of Life</u>, by Larry Hunter <u>The Thread of Life</u>, by Susan Aldridge

Also, there are many great references on computational biology on the web, far too many to list. The Internet is an amazing resource, especially for computer science, but as always, treat information from the web with caution.

Course requirements

<u>Grading</u>

The majority of this course will involve understanding, applying, and implementing important bioinformatics algorithms. As such, the bulk of your grade will be determined by these homework assignments. The remainder of your grade will be determined through attendance and class participation.

Homework assignments	80%
Attendance & Participation	20%

Homework assignments

Homework will consist of a combination of written problem sets (often asking you to apply/trace algorithms discussed in class, or to formally describe algorithms and their running times), to implement bioinformatics algorithms and apply them to simulated and real world data, and/or to utilize existing software and platforms to answer specific biological questions. Homeworks will vary in their size and scope, and as such, will be weighted appropriately. Some assignments will be individual, while others may be completed by student pairs.

Attendance & Participation

Classroom time is intended to be highly interactive and allow us to discuss biological questions and work through various ways to computationally approach those questions. All students should participate in these discussions by offering ideas, asking questions, and staying engaged with the topics discussed. Attendance will be taken through "participation polls" administered at the end of each class period.

Academic integrity at Trinity

All students are covered by the Trinity University Honor Code, which prohibits dishonesty in academic work. The Code asserts that the academic community is based on honesty and trust. It defines specific violations as well as the procedure to determine if a violation has occurred. It also covers the process of hearings for alleged violations and the various sanctions applied for specific violations, and it provides for an appeal process.

Collaboration and academic integrity in this course

Homework assignments should represent your own work, unless the assignment explicitly allows it to be completed by a pair of students, in which case results should represent the work of the pair. You may discuss your solutions and approaches with other students, but the material submitted should reflect your own knowledge and thought process. Submissions that are identical beyond coincidence (either to another student's work or to material online) will be considered to be in violation of the Honor Code, and will result in appropriate action. You are responsible for the security of your work, both electronic and hard copy.

Title IX/Sexual Misconduct Reporting

As a Responsible Employee who is committed to creating an environment where every member of our community can thrive, I want to let you know that I am a Mandatory Reporter under Texas state law. What that means is that I am am required to report any instances of sexual misconduct, including sexual harassment, non-consensual sexual intercourse, non-consensual sexual contact, sexual exploitation, intimate partner violence, stalking, and related retaliation that I am aware of to the Title IX Coordinator. So, if you share information with me about any incidents that implicate the Sexual Misconduct or Anti-Harassment Policies, I am required to report all information to the Title IX

Coordinator to make sure you have information about support resources and complaint resolution options. My report does not initiate the complaint process, and you are in control over how you choose to engage with our Title IX Coordinator. If you or someone you know has experienced sexual misconduct, including sexual harassment, I encourage you to share this information directly with the Title IX Coordinator or one of the individuals who has been designated as a confidential resource on campus. Information about reporting is available here: <u>Reporting</u>.

COVID-19 Pandemic Specific Information

University Health Protocols

To ensure that all members of the University community work in tandem to create a safe learning environment, the University <u>Policy on Protective Behavior</u> requires that the following health and safety protocols be observed on campus at all times:

- Six feet of social distancing must be maintained
- Students must wear an appropriate face covering in classrooms and in areas where other students, staff, or faculty may be present
- Personal hygiene and proper cough/sneeze etiquette must be followed

Failure to observe University health protocols will be considered a disruption of orderly conduct. In accordance with the Policy Regarding Disruption of Class, the instructor will issue a warning to the student; if the student continues to disrupt the class by failing to observe University health protocols, the instructor may drop the student from the class roster.

Excused Absences

For the duration of the COVID-19 pandemic, the following exception to the Excused Absences from Class policy has been approved: Students who are ill will be excused from classes.

To protect community health, we urge students to request an excused absence by informing instructors of the illness via email. Students must adhere to University health and wellness procedures for self-evaluation, follow-up, and quarantine as necessary. Please note: Untruthful student claims about illness may be regarded as a violation of the Academic Honor Code, which prohibits "falsification of academic records."

Students who experience a family emergency that interferes with academic performance are encouraged to contact Dr. Michael Soto, Associate Vice President for Academic Affairs, and David Tuttle, Dean of Students.

Electronic Recordings of Classroom Instruction

The COVID-19 pandemic requires the delivery of online instruction. For this reason, please be aware that all classroom instruction, including student participation in classroom activities, is subject to recording and dissemination on a secure course management system. The recordings will be made available only to students enrolled in the course to facilitate online learning and review. Students are expressly prohibited from capturing or copying classroom recordings by any means; violations will be subject to disciplinary action. Instructors who wish to use a recording outside of class must obtain the written consent of any students who are personally identifiable in the recording.