GEORGE MASON UNIVERSITY

SCHOOL OF SYSTEMS BIOLOGY

BINF 630 / BINF 530 / BIOL 580 / BINF 401: Bioinformatics methods

Instructors: Iosif Vaisman (ivaisman@gmu.edu)
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Office: Colgan Hall, Room 312A
Office Hours: By appointment

Spring 2024

Credit hours: 3.0 Credits
Meeting days and times: Thursday, 4:30 pm - 7:10 pm

Building and room: Colgan Hall, Room 304B and online (using Blackboard Collaborate Ultra)

Course description: The course covers theoretical approaches, techniques and computational tools for DNA and protein sequence, structure, and function analysis. The topics also include biological databases and internet-based bioinformatics resourses

Course Requirements: The course will include two homework assignments and the final exam (online). The assignments and the exam consist of theoretical questions and practical problems at the appropriate degree level. The date of the final exam can be found in the GMU academic calendar (https://registrar.gmu.edu/calendars/spring_2024).

Grading: grades will be based on two homework assignments (66%) and final exam (34%).

Course Outline

- Information Theory
- Bioinformatics and Computer Networks
- Databases and Database Management
- Data Mining and Knowledge Discovery in Databases
- Machine Learning and Artificial Intelligence
- Pairwise Sequence Alignment and Database Searching
- Multiple Sequence Alignments
- Gene Identification and Prediction, Genome Annotation
- Protein Secondary Structure Prediction
- Protein Structure Classification
- Protein Modeling and 3D Structure Prediction
- Protein Structure-Function Relationships

Course Website http://binf.gmu.edu/vaisman/binf630/

Policies

- The class provides inclusive and equitable learning environment.

- It is expected that students adhere to the George Mason University Honor Code as it relates to integrity regarding coursework and grades. The Honor Code reads as follows: "To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University community and with the desire for greater academic and personal achievement, we, the student members of the University Community have set forth this: Student members of the George Mason University community pledge not to cheat, plagiarize, steal and/or lie in matters related to academic work." More information about the Honor Code, including definitions of cheating, lying, and plagiarism, can be found at the Office of Academic Integrity website at http://oai.gmu.edu

- Students are encouraged to discuss course content, labs, and similar activities with other students; however, all assignment submissions must contain only original, individually completed work, unless a different arrangement approved by the instructor.

- Posting or sharing course content (e.g., recordings, exams, or anything not created by the student), using any non-electronic or electronic medium (e.g., web site) where it is accessible to someone other than the individual student is strictly prohibited without prior instructor's approval.

- Students must follow the university policy for Responsible Use of Computing (see http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/).

- Students are responsible for the content of university communications sent to their Mason email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account.

- Students with disabilities who seek accommodations in a course must be registered with George Mason University Disability Services. Approved accommodations will begin at the time the written letter from Disability Services is received by the instructor (see https://ds.gmu.edu/).