

Provisional Syllabus for Bio/Che/CSc 6640 Fundamentals of Bioinformatics

Four credit hours.

Course Instructors: Dr. Irene Weber, Office PSC585, phone 404 413-5411, e-mail: iweber@gsu.edu

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Lecture: Monday/Wednesday 1:00-2:45 pm, Room: Classroom South 203.

Office Hours: Tuesday 1:00-2:00 pm or by appointment for Dr. Weber, and by appointment for Dr. Harrison.

Course Description: A "hands-on" approach to bioinformatics using PCs, the internet, and computer graphics to analyze, correlate and extract information from biological databases, emphasizing sequence and structure databases for proteins and nucleic acids and introduce the computing skills necessary for bioinformatics. Topics include: sequences and three-dimensional structures of proteins and nucleic acids, the major databases, algorithms for sequence comparison, data mining, and prediction of structure and function.

Course Objectives: The goal of the course is to introduce the concept of bioinformatics, especially as applied to the analysis of sequence and structure databases for proteins and nucleic acids. Students will perform practical examples using computers and programs available in any laboratory or home setting. This course is multidisciplinary and will incorporate biology, chemistry, computer science and mathematics. This is not a trivial course and regular attendance, completion of reading, homework and assignments is necessary for success.

Course Grading: The 2 exams will constitute 40% of the final grade (20% for each exam), graduate students will complete and present a project for 20% (undergraduates can substitute a third exam) the other 40% will be based on attendance, completing the class assignments and participating in the discussions. You are allowed ONE EXCUSED (with a doctor's note or equivalent) absence. Assignments and exams will be graded and returned in approximately one week. If it will take longer, we will notify you.

Nominal Grading Scale: A+ >97%, A 90-96%, A- 88-89%, B+ 86-87%, B 80-85%, B- 78-79%, C+ 76-77%, C 70-75%, C- 68-69%, D 60-67% and F 0-59%. Grades will be rounded to the nearest whole number.

Exams: Students will be assigned seats for exams. Makeup tests and exams will not be given. If there is a disaster, an accident, or an illness a makeup test can be scheduled provided 1) the instructor is notified promptly and in advance if possible of the reason, and 2) you supply an original letter addressed to me on letterhead from a physician, hospital or relevant authority and signed by the physician, hospital administrator, or relevant authority, stating why you could not make it to the test. Missed tests and assignments will be graded as 0 (zero).

If Georgia State University is closed (for example due to a weather emergency), test dates and assignment due dates will be re-scheduled on the next class day.

Academic Honesty: All students should read and be aware of the University's Policy on Academic Honesty (<http://www2.gsu.edu/~wwwfhh/sec409.html>). Failure to follow the policy can result in either or both of the following: academic (grade) penalty and/or disciplinary (notation on transcript, expulsion) penalty.

All work submitted for grading must be the students' own. Students who copy and paste other's work without using quotation marks, students who do not cite the sources, and students who do not place the citations in the text of the paper will be considered to be plagiarizing. Plagiarism will be determined by the judgment of the instructors. Plagiarism will result in a score of 0 (zero) for the work or dismissal from the course and notification of the Dean of Students. Do not allow others to copy your work since all students will receive 0 (zero).

Students who copy exam answers from another student, use their cell phone during an exam, use additional resources (cheat sheet, notes on hand, etc.), or give answers to another student will be considered to be academically dishonest and will receive a zero for the exam as well as a possible disciplinary penalty.

Homework: Suggested exercises will be given in class. These class assignments will re-enforce the lectures and be similar to test problems. Performing them will help you get a good grade.

Assignments: Graded assignments can be thought of as open-book quizzes. If part of the answer is written in a book or paper, the student is responsible for copying out the section and supplying a reference. (i.e. you can copy published work,

but you must cite it properly). Students are expected to supply the answers in their own words; a string of citations, however correct, will only receive partial credit.

Absence from Class: Students are required to attend ALL classes. Students are responsible for the materials covered in class. Should a student be absent, it is their responsibility to get the notes and handouts from that lecture. Most importantly, if there is an assignment given on a missed class, it still must be handed in on the prescribed date. If there is a disaster, an accident, or an illness a makeup assignment can be scheduled provided 1) the instructor is notified promptly and in advance if possible of the reason, and 2) you supply an original letter addressed to me on letterhead from a physician, hospital or relevant authority and signed by the physician, hospital administrator, or relevant authority, stating why you could not complete the assignment.

Accommodation for disability: Students who wish to request accommodation for a disability may do so by registering with the Office of Disability Services. Students may only be accommodated upon issuance by the Office of Disability Services of a signed Accommodation Plan and are responsible for providing a copy of that plan to instructors of all classes in which an accommodation is sought.

Student evaluation of course: Your constructive assessment of this course plays an indispensable role in shaping education at Georgia State. Upon completing the course, please take time to fill out the online course evaluation.

Course website:

<http://asterix.cs.gsu.edu/~weber/links.html> for public databases and bioinformatics servers.

Tentative Topic Schedule

1. Introduction to Bioinformatics
2. Living organisms, genes and genomes
3. Major biological databases
4. Basics of Biological Chemistry
5. Sequence and 3D Structure of Proteins
6. Sequence and Structure of DNA and RNA
7. Fundamentals of Computer Science
8. Algorithms for sequence alignment.
9. Analysis of sequences
10. Prediction of protein structure and function
11. Individual guided bioinformatics project

Note: The course syllabus provides a general outline only; deviations may be necessary.