Syllabus for Bioinformatics I

BINF 5351   (lecture 3 hr)   Monday, 1:30 pm - 4:20 pm
(lab 2 hr)   Wednesday, 1:30 pm - 3:20 pm

Course Description:
Within the last 20 years there has been a literal explosion in the quantity and variety of information in molecular biology. In order to cope with this ocean of data, molecular biologists have had to develop new tools that rely heavily on the power of statistics and computing yet still incorporate an understanding of the underlying biological principles. The development and application of these tools in conjunction with assembled databases of biological information has become a field of its own, known as either Bioinformatics or as Computational Biology. In the sister courses Bioinformatics I and Bioinformatics II, we explore the principles underlying the analyses of sequence and molecular databases and work to provide students with the understanding and practical experience for intelligent and efficient application of these tools. In part one, we focus primarily on the analysis of nucleic acid sequences. In part two, we expand these studies to include gene prediction, protein function and structure studies and analysis of whole genomes. Both of these courses are core components of the Interdepartmental Master's Degree in Bioinformatics. In addition, they are open to any graduate student with relevant experience in molecular biology. This course does assume that the student has some familiarity with both basic molecular biology and with the use of computers and the internet.

Course Goals: There are two major goals for this course. First, we want students to understand both the advantages and the limitations of a Bioinformatics approach to molecular biology. This requires that students understand the underlying principals for each technique and realize where compromises have been made and why. Second, we want students to have practical experience in the application of specific tools to research problems. This experience will include working in multiple computer environments, including unix, perl, and making use of specific web-based and computer based software tools including the Genetics Computer Group (GCG) suite.

Instructor:
Dr. Max Shpak.
Research Areas: Mathematical population genetics and population ecology, phylogenetics.
Office Hours: By appointment, students can come and see me almost any time that I'm in my office (call or email ahead of time to make sure I'll be in)

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Teaching Assistant:
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Course Resources:
The Required Text Books for this course is Bioinformatics by David Mount (2nd edition; Cold Spring Harbor Press). The primary text includes a proprietary web site that will be used as a source of exercises during the course. For lab we will be using Beginning Perl for Bioinformatics by James Tisdall (O’Reilly).
The course will be coordinated through a WebCT course connection (Webct.utep.edu). If you are not familiar with WebCT, please see the instructor. WebCT will provide an online syllabus, course calendar, course bulletin board, and some supplemental web sites and notes for lectures. Grades will also be presented through WebCT.

You will need regular access to a computer with internet connection. While this can be done through one of the computer labs at UTEP, there are advantages to having connectivity from your home. If you do not already have internet access but do have an internet capable computer, we can arrange connectivity through a UTEP dial up. See one of the instructors.

Determining Grades...
Grading for this course will be on a point system with the lecture exam grade comprising 2/3 of the final grade and lab in-class and homework assignments making up the other 1/3.

Lecture grade will be determined as follows:
Exams will consist of two written examinations to evaluate understanding of the underlying principles of the analyses presented in this course.

Lab grade will be determined as follows:
Lab assignments and homework will be assigned on a weekly basis. In general, the computer assignments will require you to provide both your syntax and output for full credit, as well as any appropriate annotations.

Course Schedule: Full course schedule will be available on WebCT. Exams are to be announced. Either or both exams may have take-home and in-class components.

COURSE POLICIES

POLICY ON HOMEWORK: All homework assignments are to be individual efforts unless specifically told otherwise.

POLICY ON MAKE-UP EXAMINATIONS: NO make-up exams will be given for reasons other than illness (doctor’s note required), absence with the instructor's prior approval, or when a student is on official University business (documentation required BEFORE the absence). Make-up exams will be scheduled on Fridays at 5 pm. The same policy
will be followed for missed laboratory work.

**POLICY ON ACADEMIC HONESTY:** Academic Dishonesty will not be tolerated. All university guidelines will be strictly followed. Please read these guidelines carefully. If you have any questions regarding the university policy please contact the Dean of Students.