

MATH 577ab Summer 2005
Friday, 10:00-12:00, June 13-Aug.5, 2005

Course Objectives and Prerequisite

This course will first give an introduction to web resources used in Bioinformatics including NCBI, UCSC Genome Browser and other resources. We then introduce some commonly used programs such as pairwise and multiple sequence alignment, database search such as BLAST, phylogeny, and clustering. The later part of this course will be project based. It requires students to work with others in a team to accomplish a computational biology project, which includes study of biological background, algorithms, databases and current technologies from various literature sources. Students are asked to present their progress, design a web page, and submit final report.

Class Information

We meet on Friday, 10:00-12:00pm. Each team consists of four or five students assigned by instructors. Every member in a team has to work with other members and contributes to the project. A project consists of three sections:

1. Study of scientific background, which includes history, major discoveries, and significance of this topic.
2. Exploring current techniques, programs, and databases, which should be an in-depth survey of the advances, such as algorithms and database design, of this topic.
3. Designing a webpage, which may be just parsing requests by customers, sending them out to other web servers and parsing the reply webpage back to customers, and designing algorithms or programs.

In each section, a team is asked to do a 60 minute presentation in class. At the end of each section, both the presentation and the team report should be emailed to instructors. Every member is expected to participate in the presentations for all three sections (part of the grade depends on presentations). When a group presents, members in other groups are expected to ask questions. At the end of the semester, each group will post their project into the CMB website.

Each project is advised by a professor, and students can consult with professors for scientific issues. The projects will be supervised by Drs. Li, Sun, and Wall.

Grading

Every member in a team will be given the same grade. The final grade will be determined as follows. Section 1: presentation 15% and report 15%; Section 2: presentation 15% and report 15%; Section 3: presentation 20% and report 20%. If there is evidence showing that someone is not contributing to his/her team, instructors can split the team into two, and each such team will be required to finish the project independently.

Outlines of Schedule

6/17	Introduction to Web Resources: NCBI and Genome Browser (Sun)
6/24	Pairwise and Multiple sequence alignment, BLAST (Zhou)
7/01	Clustering, Phylogeny (Zhou)
7/08	Background Presentation by faculty member. Self Study of background materials
7/15	Section 1 presentation
7/22	Section 2 presentation
7/29	Section 3 presentation
8/04	Hand in final report