

CSE 590BI: Course Information

Course Title: Algorithms in Molecular Biology

Subject matter: Advances in biotechnology are making it possible to obtain massive amounts of data about the genetic information contained in living cells, the transmission of this information from parent to child, the changes in the information over evolutionary time, and the manner in which this information influences the chemical activity of cells. This course is an introduction to algorithmic techniques for the acquisition, analysis and interpretation of such data. It is open to graduate students in Computer Science, Molecular Biotechnology and related fields. The necessary background material from biology, biotechnology, computer science and statistics will be developed as the course progresses. Part of the course work will consist of projects conducted by teams of students with complementary backgrounds in the biological and information sciences.

Course administration: Graded, three units. Students will produce lecture notes on a rotating basis. Grading will be based on projects, homework assignments, lecture note preparation and possibly a take-home final.

Lectures: Tu, Th 12-1:20, Sieg 226

Instructors: Professors Richard Karp, Larry Ruzzo and Martin Tompa (Computer Science & Engineering)

Office Hours: Karp MF 1:30-2:30
Ruzzo Tu 2:30-3:30, W 1:30-2:30
Tompa M 2:30-3:30, Th 10:30-11:30

Guest Lecturers: Professors Phil Green, Leroy Hood, Maynard Olson, Gary Stormo (Molecular Biotechnology), Professor Joseph Felsenstein (Genetics)

Principal Topics:

- Fundamental concepts from molecular biology, analysis of algorithms and statistics;

- Sequence analysis;
- Sequence interpretation;
- Genetic mapping;
- Physical mapping;
- Sequence assembly;
- Phylogeny;
- RNA secondary structure.