STAT/CSE/BIOL 598B *Bioinformatics II* (3 credits)

Spring 2012  
Instructor: Yu Zhang  
Office Hours: Tue 2:00-4:00pm or by appointment  
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Course Description:

Bioinformatics refers to the development and application of computational methods in molecular data analysis. This course is an introduction to Bioinformatics, with a focus on computational and statistical methodologies. The course will help students to acquire basic knowledge in molecular biology, and at the same time, acquire a deeper understanding of the logic and algorithms underlying current bioinformatics tools.

Topics (tentative):

- Introduction to R, a statistical programming environment.
- Review of statistical concepts and methods.
- Review of biology and data sources.
- Microarray data analysis.
- Differential gene expression analysis.
- Clustering algorithms, PCA, and dimension reduction.
- High-throughput sequencing technology.
- ChIP data analysis and gene regulation.
- Population genetics, genetics to disease.

Grading Policy:

Students will form small study groups and work together on 2~3 short term projects and a final project. Grading will be based on students’ team work and individual contribution. There are no exams. Both term and final projects will include literature review, data analysis, conclusions, and should be presented as short reports by each study group. Class attendance also affects final grading.

Text Books:

There are no textbooks required for this class. All course materials will be provided via ANGEL as PDF slides. Students are strongly encouraged to read related papers of the course materials. Reference papers will be given as the course proceeds.