

## **Biochemistry & Molecular Biology 961 section 1**

“Concepts in Protein Structure Analysis and Modeling”

\*Taught every other fall semester

Lecture: Tuesdays 3-4 pm in room 101 Biochemistry Lab: 2 hours, most likely on  
Thursdays 2-4 or 3-5 in 202 Biochemistry

### **Credits: 2**

Prerequisites: Biochemistry 803 or detailed knowledge of protein and nucleic acid sequences and structures; some use of computers; and permission of the instructors.

Enrollment limit: 20

Instructors:

Dr. Michael Feig (432-7439; 218B BCH)

Dr. Michael Garavito (355-9724; 513 BCH)

Dr. Robert Halgren (353-9136; 1205F Anthony)

Dr. Leslie Kuhn (353-8745, 502 BCH)

Dr. Kaillathe (Pappan) Padmanabhan (course coordinator; 353-0814; 202A BCH)

Dr. Honggao Yan (353-8786; 313A BCH)

Dr. William Wedemeyer (355-1604, 509A BCH)

Course description:

This is a hands-on course dealing with several aspects of protein structure analysis and modeling. We will go through UNIX basics, databases of three-dimensional structures of small molecules and proteins, and some of the most commonly used graphics software packages for visualizing and manipulating macromolecule structures. We will also learn the basics of BLAST and multiple sequence alignment and move on to methods of three-dimensional structure determination using X-ray diffraction and NMR and learn to analyze some of the structures determined by these methods. Finally for a protein sequence with unknown structure, the secondary structure will be predicted, and a three-dimensional homology model of the protein will be built and analyzed using some of the tools available on the Web with an emphasis on identifying structure-function relationships. The Accelrys suite of InsightII software package for analysis and modeling of protein structures will also be introduced. Lectures will cover the theory and demonstrate the computer methods used; lab hours will provide hands-on experience.

For more information and permission to enroll please contact Kaillathe (Pappan) Padmanabhan ([padmanab@msu.edu](mailto:padmanab@msu.edu))