

**16:118:509, 16:160:537 Biophysical Chemistry I  
01:160:437 Physical Chemistry of Biological Systems**

**An Introduction to Biomolecular Structure and Interactions  
Fall Semester, 2010**

**Instructors**

Professor David A. Case -- Wright-Rieman Labs, Rm 113; 445-5885; [case@biomaps.rutgers.edu](mailto:case@biomaps.rutgers.edu)  
Professor Babis Kalodimos -- Biomedical Engineering, Rm 209; 445-4500, x6209; [babis@rci.rutgers.edu](mailto:babis@rci.rutgers.edu)

**Time and Place**

Tuesdays and Thursdays 1:40-3:00 PM  
Hill Center, Rm 116

**Description**

Three-dimensional structures and interactions of proteins, nucleic acids, carbohydrates, lipids, and their macromolecular assemblies. A primarily descriptive course that emphasizes the connections between molecular structure, interactions, and biological function, and introduces students to the methods used to visualize and analyze macromolecular structures and assemblies.

**Textbook**

Liljas et al. *Textbook of Structural Biology*, World Scientific Publishing Co. (2009); paperback version recommended (ISBN: 978-981-277-208-4)

**Prerequisites**

Organic chemistry or permission of instructor. One semester of physical chemistry and one semester of biochemistry recommended.

**Requirements and Grading**

Homework (33%), in-class oral presentation (33%), and final written report (34%)

**Syllabus**

Week	Dates	Topics
1	Sept 2	Class introduction
2	Sept 7,9	Representations/visualization of macromolecular structures
3	Sept 14,16	Forces determining macromolecular structure
4	Sept 21, 23	Protein structural principles
5	Sept 28, 30	Protein-protein interactions; phosphorylation and signaling
6	Oct 5, 7	Protein folding and unstructured proteins
7	Oct 12, 14	DNA and RNA
8	Oct 19, 21	Protein/DNA interactions
9	Oct 26, 28	RNA machinery – microRNAs to the ribosome
10	Nov 2, 4	Membranes and membrane proteins
11	Nov 9, 11	Enzymes, substrates, and inhibitors
12	Nov 17, 19	Carbohydrates and glycoproteins
13	Nov 23	Viruses
14	Nov 30, Dec 2	Student projects/presentations
15	Dec 7, 9	Student projects/presentations