

**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, 2009**

Instructors and Contact Information

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Time and Location

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

Physical chemistry or permission of instructor. Organic chemistry and one semester of biochemistry highly recommended

Requirements

Midterm examination/project (33%), in-class oral presentation (33%), and final written report (34%)

Syllabus

Week	Dates	Topics
1	Sept 1, 3	Representations/visualization of macromolecular structures (WKO)
2	Sept 10	Forces determining macromolecular structure (DAC)
3	Sept 15, 17	Protein structural principles (DAC)
4	Sept 22, 24	Protein-protein interactions (WKO); phosphorylation and signaling (DAC)
5	Sept 29, Oct 1	Nucleic acid structural principles (WKO)
6	Oct 6, 8	Protein-DNA interactions (WKO)
7	Oct 13, 15	DNA condensation and packing/chromatin (WKO)
8	Oct 20, 22	RNA machinery – microRNAs to the ribosome (WKO)
9	Oct 27, 29	Membranes and membrane proteins (DAC)
10	Nov 3, 5	Midterm examination/project
11	Nov 10, 12	Enzymes, substrates, and inhibitors (DAC)
12	Nov 17, 19	Carbohydrates and glycoproteins (DAC)
13	Nov 24	Viruses (DAC)
14	Dec 1, 3	Student projects/presentations
15	Dec 8, 10	Student projects/presentations