

Course Information

Location and Time: Manchester 244, TuTh 1:30-2:45 (Aug 26 – Dec 9)

Instructor

Prof. Samuel (Sam) Cho

Office Location: Olin 301B

Office Hours: F 11:30a-12:30p or by appointment

Email: choss@wfu.edu

Course Overview

Physics of biologically important molecules, especially proteins and nucleic acids. Topics covered include the physical basis of biomolecular structure, the energetics, and statistical mechanics of biomolecular dynamics, and the electrostatics and solvation of biomolecules.

Textbook

Molecular and Cellular Biophysics, Meyer B. Jackson (required)

Grading Scheme

10%	Homework
20%	Quizzes
30%	Midterm
40%	Final Exam

Homework

All assigned homework will be due at the beginning of class on the following class. Working with others is encouraged, but each student must turn in their own individual work. No late work will be accepted.

Academic Misconduct

Any form of academic misconduct, as specified in the Honor Code at Wake Forest University and described in the Student Handbook will be reported to the Judicial Council and the Dean of Colleges for appropriate action.

Topics
Introduction to Biological Macromolecules
Nucleic Acids Structures
Amino Acid & Protein Structures
Intermolecular Forces: Electrostatics, Lennard-Jones, & Hydrophobic
Calculations of Conformations
Thermodynamics Overview
Molecular Associations
Polymer Solutions
Polymer Conformations and Dynamics
Statistical Mechanics Overview
Chemical Kinetics Overview
Transition State Theory & Kramer's Theory
Kinetic Experiments
Introduction to Molecular Dynamics Simulations
Course Grained Models: HP and Go Models
Protein and RNA Folding Problems (and Solution?)
Protein-Protein Associations
Protein Aggregation
RNA Folding and Protein-RNA Binding Mechanisms
GPU-based MD Simulations