Biological Physics

Professor: Peter Erdi

The biological and medical sciences are changing rapidly. Many new discoveries now require an understanding of biological systems from a physical point of view. In particular, physics, mathematics, and computer science are becoming more essential now than ever before. Contemporary research areas in biological physics include phenomena at different levels of the organization from molecular, cellular, network and system levels. Protein conformational dynamics and folding, structure and dynamics of viruses, DNA conformational dynamics, kinetics of genetic expression, single molecule dynamics such as molecular motors, cell mechanics, information transfer in biological systems, membrane biophysics, multi-cellular phenomena, biological networks, evolutionary dynamics and neuroscience are particular examples. The biological physics concentration is designed to supplement the background usually provided in a standard biology, chemistry, or physics majors.

Requirements for the Biological Physics Concentration

Prerequisite Coursework
CHEM 110 Chemical Composition and Structure with Lab
CHEM 120 Chemical Reactivity with Lab
MATH 112 Calculus I
MATH 113 Calculus II
PHYS 150 Introductory Physics I with Lab
PHYS 152 Introductory Physics II with Lab

Required Courses
BIOL 112 Evolution and Genetics with Lab
BIOL 246 Cell and Molecular Biology with Lab
CHEM 210 Organic Chemistry I with Lab
CHEM 310 Physical Chemistry I with Lab

Two units from:
PHYS 205 Applications of Physics in the Biosciences
PHYS 215 Introduction to Complex Systems
PHYS 270 Nonlinear Dynamics and Chaos
COMP/PSYC 415 Computational Neuroscience

In accordance with College policy, concentrators in Biological Physics must pass the required courses with a C- or better.