BS in Physics with Emphasis in Biological Physics

Degree Program Description

Physics is the science that studies the structure and properties of matter and transformations of energy. With math as the language and experimental verification as a guide, physical study has established the fundamental laws of nature that are the foundation of all natural science and technology. The study of physics includes learning the general principles and the phenomena that have been discovered and developing the skills that enable such knowledge to be advanced through research. Biological physics is an interdisciplinary area that employs and develops the theories and methods of the physical sciences for the investigation of biological systems. There is a long history of the quantitative tools and techniques originally developed within the physics community finding critical applications in biology. Examples range from the first visualization of the DNA double helix via X-ray diffraction to the widespread use of magnetic resonance imaging in hospitals throughout the world. Currently, biological physics is one of the fastest growing physics research areas that is vital for many other fields, including medicine, bioengineering, and biology. Students specializing in this area have career opportunities in medical centers, research institutes and biotechnology industries, as well as the more traditional academic venues.

Major Program Requirements

Students interested in biological physics may choose to pursue a BS in Physics with an Emphasis in Biological Physics (the emphasis will show up on the transcript). For this option, students must take the required physics courses (http://catalog.missouri.edu/undergraduategraduate/collegeofartsandscience/physics/bs-physics/) for the regular BS degree, PHYSCS 4520 Introduction to Biophysics, and four additional physics elective courses. Three of the physics electives must be chosen from the list below:

- PHYSCS 4190 Physics and Chemistry of Materials 3
- PHYSCS 4410 Analysis of Biological Macromolecules and Biomaterials 3
- PHYSCS 4420 Introduction to Biomedical Imaging 3
- PHYSCS 4500 Computational Biological Physics 3
- PHYSCS 4510 Single Molecule Biophysics 3
- PHYSCS 4950 Undergraduate Research in Physics 1-3
- PHYSCS 4960 Senior Thesis in Physics 3
- PHYSCS 4520 Introduction to Biophysics 3
- MATH 1500 5
- MATH 1700 5
- CHEM 1320 or CMP_SC 1050 3
- ENGLISH 1000 3

Only courses with a grade of C- or above will be counted toward the emphasis area. In addition, students must complete all College of Arts and Science and University graduation requirements (http://catalog.missouri.edu/academicdegerequirements/universityrequirements/), including University general education (http://catalog.missouri.edu/academicdegerequirements/generaleducationrequirements/).

Semester Plan

Below is a sample plan of study, semester by semester. A student’s actual plan may vary based on course choices where options are available.