**Minor in Biomedical Physics**

The minor in biomedical physics involves the departments of biology, chemistry, computer science, engineering, mathematics and statistics, and physics. All students must take at minimum the second semester of an introductory physics course and the first level of calculus. Two physics courses are required that directly relate physics to medicine and the human body. We strongly recommend at least one course at the majors-level in biology or chemistry. With the aid of an advisor, the student can tailor the minor to fit particular career interests by choosing two additional courses from a list. The student is encouraged to do an independent study or research project as a capstone experience.

A minor in biomedical physics consists of four required courses and two electives. Please consult with the physics chair as soon as possible for advice on how to fulfill the requirements of the minor. Any alterations from the program require approval by the physics chair.

**Required courses** (and associated labs), 14-16 credits

Either PH 102: Introductory Physics II *and* MA 251: Calculus I

or PH 202 and PH 292: General Physics II + lab co-req *and* one majors course

in chemistry or biology

PH 383: Physics of Medicine and the Human Body

PH 384: Waves and the Physics of Medicine

**Two elective courses** (and associated labs), 5-7 credits

See below. Courses other than the ones listed below may be considered for the biomedical physics minor, but must have approval by the physics chair.

*Elective 1*: Choose one of the following courses that is not a requirement of your major. For engineering majors, this course should not be a requirement of the primary concentration but can fulfill a requirement of the secondary concentration. Other courses may be considered with approval by the physics chair.

* BL 109 - Modern Marvels of Biotechnology
* BL 150 - Foundations of Biology I and
* BL 151 - Foundations of Biology I Lab
* BL 152 - Foundations of Biology II and
* BL 153 - Foundations of Biology II Lab
* BL 206 - Human Anatomy and Physiology I and
* BL 207 - Human Anatomy and Physiology Lab I
* BL 208 - Human Anatomy and Physiology II and
* BL 209 - Human Anatomy and Physiology Lab II
* BL 255 - Introduction to Biomedical Research
* BL 317 - Comparative Physiology
* BL 332 – Microbiology and
* BL334 – Microbiology Lab
* BL 341 - Molecular Genetics with Lab
* BL 431 - Biochemistry I (or CH 431) and
* BL 433 - Biochemistry Lab I (or CH 433)
* BL 426 - Cell Biology and
* BL 427 - Cell Biology Lab
* BL 428 – Bioterrorism
* BL 438 – Exploring the Human Genome (or BL 438D)
* CH 101 - General Chemistry I and
* CH 105 - General Chemistry Lab I
* CH 102 - General Chemistry II and
* CH 106 - General Chemistry Lab II
* CH 301 - Organic Chemistry I and
* CH 307 - Organic Chemistry Lab I
* CH 310 - Medicinal Chemistry
* CH 311 - Physical Chemistry I and
* CH 315 - Physical Chemistry Lab I
* CH 312 - Physical Chemistry II and
* CH 316 - Physical Chemistry Lab II
* CH 431 - Biochemistry I (or BL 431) and
* CH 433 - Biochemistry Lab I (or BL 433)
* CS 151 - Computer Science through Programming
* EG 331 - Linear Circuit Analysis and
* EG 031 - Linear Circuit Analysis Lab
* EG 351 - Introduction to Engineering Materials and
* EG 051 - Materials Science Lab
* EG 423 - Engineering Materials and Manufacturing Processes
* EG 424 - Mechanical Design
* MA 304 - Ordinary Differential Equations
* PH 303 - Discovering Information in Data (or CS 403, DS 303)\*
* PH 312 - Modern Physics
* PH 397 - Experimental Methods I
* PH 398 - Experimental Methods II
* PH 300-Level Course
* PH 400-Level Course
* ST 265 - Biostatistics

*Elective 2*: Choose one of the following courses, which should involve experimental, theoretical, or computational work related to biophysics, bioengineering, bioinformatics, medicine, or any other subject requiring a quantitative approach to understanding a biological or medical system. Project-based courses require approval by the physics chair. Other courses may be considered.

* BL 399 - Biology Internship I
* BL 481 - Biology Research I
* BL 482 - Biology Research II
* BL 491 - Honors Biology Research I
* BL 492 - Honors Biology Research II
* CH 420 - Chemistry Research
* CS 496 - Computer Science Project I
* EG 490 - Forensic Studies Experience
* EG 495 - Engineering Research
* EG 497 - Engineering Design Project I
* EG 498 - Engineering Design Project II
* EG 499 - Engineering Internship
* PH 388 - Independent Project in Physics or Astronomy
* PH 391 - Physics Research
* ST 465 - Experimental Research Methods
* 3- or 4-credit course from the Electives course list that is not part of your major.\*

Notes

\* An integrative, project-based course is preferred, but in the event it cannot be set up, then a 3 or 4-credit course can be taken from the Electives course list that is not part of your major. Requires approval from the physics chair.