

PENNSTATE

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Bioengineering

Bioengineering (or bio-medical engineering) is the application of engineering science and practice to the needs of modern medicine and to research problems in the biological sciences. Penn State has offered graduate degrees in bioengineering since 1972 and established an undergraduate major in bioengineering beginning with the class entering in 2001.

More than 200 students have completed the requirements for the bioengineering minor since establishment of the program in 1989. It is intended to provide a background in bioengineering to students wishing to pursue a bachelor's degree in any engineering discipline, with a view toward future industrial employment in the bio-medical industry. Many graduates have gone on to pursue graduate degrees in bioengineering or enroll in medical school.

Some of the courses in the minor may be used to satisfy requirements in the student's major program; however, a student should generally expect to take one to three additional courses beyond the minimum number required for completion of the major.

The minor requires at least nine credits of bioengineering coursework chosen from such diverse topics as medical instrumentation, analysis of physiological systems, biomaterials, medical imaging, design of artificial organs, continuum mechanics of biosystems, and biological response to materials.

CAREER ENHANCEMENT OPPORTUNITIES

Opportunities in medical instrument design and development, manufacture and sales, and in medical center research and operational support are available to students with almost any undergraduate engineering degree and an interest in medical applications. The medical device industry includes products for use in hospitals, home health care, and a wide variety of allied health concern areas.

ADMISSION REQUIREMENTS

Applicants wishing to enroll in the bioengineering minor should have completed MATH 141 and PHYS 211 and have excellent grades. A grade of C or better is required for all courses in the minor. Application forms are available from the Department of Bioengineering in 206 Hallowell Building.

PROGRAM REQUIREMENTS (18 credits)

Prescribed Courses (3 credits):

- CHEM 112

Additional Courses (6 credits):

- Select 3 credits of physiology from BIOL 141 or BIOL 472
- Select 3 credits* of molecular/cell biology from BIOL 230W, BMB 251, or BIOE 201

Supporting Courses (9 credits):

- Select 6-9 credits* of bioengineering from 3-credit courses at the 300, 400, or 500 level
- Select 0-3 credits* of electives from bioengineering-related courses (IE 327, ABE 408, CHE 438, NUC E 420, EE 485) or an honor's thesis on a bioengineering topic

*Total bioengineering credits must be at least 9. Total of all credits in prescribed, additional, and supporting categories must be at least 18. Only 3 credits of independent research (494 or 496) may be used toward the minor.

POSSIBLE COURSE PLANS

Option A:

- CHEM 112 (3 credits)
- BIOL 141 or BIOL 472 (3 credits)
- BIOL 230W or BMB 251 (3 credits)
- BIOE Electives (9 credits)

Option B:

- CHEM 112 (3 credits)
- BIOL 141 or BIOL 472 (3 credits)
- BIOE 201 (3 credits)
- BIOE Electives (6 credits)
- Approved Related Elective (3 credits)

This publication is available in alternative media on request.

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