

BIOENGINEERING MINOR

Banner Code: BIOE

The minor in Bioengineering is available to both engineering and non-engineering majors. It provides considerable opportunities in a highly cross-disciplinary field involving the application of engineering concepts and tools to solve problems in biomedicine. The minor in Bioengineering prepares students to gain and reinforce their knowledge of biology and engineering fundamentals, and develop and apply skills to clinically-relevant challenges.

Admissions & Policies

Admissions

Students must have completed MATH 114 (Calculus II) with a grade of B- or better to be admitted to the minor.

Policies

For policies governing all minors, see AP.5.3.4 Minors.

Requirements

Total credits: 19-21

Minor Requirements

Required Courses:

| Code | Title | Credits |
|---------------|--|---------|
| BENG 101 | Introduction to Bioengineering | 3 |
| BIOL 213 | Cell Structure and Function (Mason Core) | 4 |
| BENG 313 | Physiology for Engineers | 3 |
| Total Credits | | 10 |

Technical Electives:

| Code | Title | Credits |
|---|---|---------|
| Select at least nine credits from the following list: | | 9-11 |
| Computational Modeling and Biomechanics | | |
| BENG 304 | Modeling and Control of Physiological Systems | |
| BENG 406 | Introduction to Biomechanics | |
| BENG 420 | Bioinformatics for Engineers | |
| Biomedical Imaging & Devices | | |
| BENG 301 & BENG 302 | Bioengineering Measurements and Bioengineering Measurements Lab | |
| BENG 437 | Medical Image Processing | |
| Nanomedicine & Biomaterials | | |
| BENG 421 | Introduction to Tissue Engineering | |
| BENG 441 | Nanotechnology in Health | |
| Neuroengineering | | |
| BENG 327 | Cellular, Neurophysiological, and Pharmacological Neuroscience | |
| Neuroscience | | |
| BENG 429 | Mason-Inova Applied Technologies | |
| Study Abroad | | |

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| BENG 417 | Bioengineering World Health Research Experience |
| BENG 395 | RS: Mentored Research in Bioengineering (Research Experience) |
| Students may choose to substitute two of the technical electives (up to 6 credits) from the following: | |
| ECE courses | |
| ECE 370 | Robot Design |
| ECE 410 | Applications of Discrete-Time Signal Processing |
| ECE 422 | Digital Control Systems |
| ECE 431 | Digital Circuit Design |
| ECE 470 | Introduction to Humanoid Robotics |
| ME courses | |
| ME 221 | Thermodynamics |
| ME 322 | Fluid Mechanics |
| ME 313 | Material Science |
| ME 432 | Control Engineering |
| SYST courses | |
| OR 442 | Stochastic Operations Research |
| SYST 468 | Applied Predictive Analytics |
| SYST 470 | Human Factors Engineering |
| NEUR courses | |
| NEUR 327 | Cellular, Neurophysiological, and Pharmacological Neuroscience |
| NEUR 461 | Special Topics in Neuroscience |
| BIOL courses | |
| BIOL 311 | General Genetics |
| BIOL 385 | Biotechnology and Genetic Engineering |
| BIOL 484 | Eukaryotic Cell Biology |
| BIOL 486 | Molecular Biology and Biotechnology Laboratory |
| CHEM courses | |
| CHEM 313 | Organic Chemistry I |
| CHEM 314 | Organic Chemistry II |
| CHEM 463 | General Biochemistry I |
| Total Credits | 9-11 |