BIOMEDICAL ENGINEERING MINOR

The intended student audience includes primarily undergraduates in electrical engineering, computer science, civil engineering, and mechanical engineering, but may also include chemistry, physics, math, and business, with additional prerequisite work. Since the field of biomedical engineering is extremely broad, the minor program is structured to allow some breadth and depth in the field. Because the course structure involves a chain of pre-requisite courses for non-engineers, students are encouraged to start this minor in their sophomore year of study.

18 semester hours

- 12 hours will be from upper division courses.
- All courses must be taken in residence CU Denver (no transfer hours).
- Students must meet all pre-requisites for all BIOE courses taken. Note in the tables below some courses have multiple pre-requisite entries.
- For a minor to be awarded the minimum GPA is 2.0 w/no individual course grade below C–
- The student's application is subject to the approval of the Chair for Bioengineering.
- Students may also apply BIOE courses required for the BIOE minor towards their major when applicable.
- Students planning to pursue a minor in Biomedical Engineering should apply as early as possible to facilitate course planning, and in no case later than census date of the semester prior to graduation with a BS.

Required Courses (9 hours):

- ENGR 1100, Fundamentals of Computational Innovation
- ENGR 1200, Fundamentals of Engineering Design Innovation
- Choose one of the following:
  - BIOE 3010, Bioinstrumentation
  - BIOE 3020, Introduction to Biomechanical Analysis
  - BIOE 3030, Introduction to Biomaterials
  - BIOE 3050, Cell & Molecular Bioengineering

Technical Electives (9 hours). Must complete three from the following list of courses:

- BIOE 3040 Physiology
- BIOE 4039/5039: Mechatronics and Embedded Systems (Fall)
- BIOE 4053/5053: Optics and Microscopy in Biomedical Research (Spring)
- BIOE 4054/5054: Regulatory Affairs (Fall)
- BIOE 4057/5057: Rehabilitation and Assistive Technology (Fall)
- BIOE 4063/5063: 3D Modeling for Bioengineers (Fall)
- BIOE 4064/5064: Advanced Matlab for Bioengineers and Life Scientists (Fall)
- BIOE 4067/5067: Human Factors and Usability Testing for Bioengineers (Spring)
- BIOE 4058/5058: Design, Disability and Aging (Spring)
- BIOE 4068/5068: Introduction to Medical Imaging (Fall)
- BIOE 4069/5069: Advanced Biomechanics (Fall)
- BIOE 4073/5073: Neural Interfaces and Bionic Limbs (Spring)
- BIOE 4083/5083: Polymers Biomedical Applications (Spring)
- BIOE 4100/5100: Image Processing for Bioengineers (Spring)
- BIOE 4300/5300: Medical Device Entrepreneurship (Fall)
- BIOE 4420/5420: Special Topics
- BIOE 5200: Stem Cell and Regenerative Medicine (Fall)
- BIOE 5420: Medical Device Market Dynamics (Fall)
- ELEC 4375: Engineering Neuroscience

Students will be exposed to many real-world applications and have hands-on engineering design experiences. as well as several important sub-areas of bioengineering are regulatory affairs, medical device entrepreneurship, and physiology.