Undergraduate Certificate in Bioengineering

The Bioengineering certificate introduces engineering and computer science students to Bioengineering. This undergraduate certificate grounds students in fundamentals of biological sciences, allows the students to take both survey and depth courses in Bioengineering, and has a capstone research or design experience.

The goals are:

1. To train students to apply basic sciences and engineering principles to biological and biomedical problems, and
2. To train students to do bioengineering research and solve problems related to the design and development of technologies that improve human health.

Bioengineering students are often involved in measurements, analysis, modeling, computations, design, and development. This certificate will provide skills useful for careers in the medical device and pharmaceutical industries as well as graduate programs in Bioengineering and Biomedical Engineering.

Please contact Bioengineering program (bioe@ku.edu) for more information.

This undergraduate certificate is open to those majoring in engineering disciplines (Mechanical, Electrical, Chemical, Aerospace, Petroleum, Computer, Architectural, or Civil Engineering or Engineering Physics), or Computer Science. To complete this certificate a student will also need to complete their degree in one of these disciplines. To be admitted, a student would need to have completed:

- 30 credit hours, majoring in an engineering discipline with a minimum 2.0 GPA, and
- Math 127 Calculus III (or Math 122 or equivalent)

Bioengineering Core, 1 course from the following:

C&PE 656 Introduction of Biomedical Engineering
ME 633 Introduction to Biomechanics
EECS 730 Introduction to Bioinformatics

Bioengineering Electives, 3 courses from the following:

Biological Sciences: At least one course from:
BIOL 150 Prin. Molecular & Cellular Biology
BIOL 240 Fundamentals of Human Anatomy
BIOL 246 Principles of Human Physiology
BIOL 546 Mammalian Physiology

Advanced Electives: At least one course from:
Chem 330 Organic Chemistry I or Chem 380 Organic Chemistry I, honors
BIOL 600 Introduction to Biochemistry
C&PE 752 Tissue Engineering
C&PE 657 Polymer Science and Technology
ME 750 Biomechanics of Human Motion
ME 751 Experimental Methods in Biomechanics
ME 753 Bone Biomechanics
ME 754 Biomedical Optics
ME 755 Computer Simulation in Biomechanics
ME 756 Biofluid Dynamics
ME 757 Biomechanical Systems
ME 758 Physiological System Dynamics
ME 767 Molecular Biomimetics
ME 760 Biomedical Product Development
ME 765 Biomaterials
ME 767 Molecular Biomimetics
ME 790 Biomedical Microdevices
EECS 644 Digital Signal Processing
EECS 730 Introduction to Bioinformatics
EECS 740 Digital Image Processing
CE 773 Biological Principles of Environmental Engineering
ME 640 Mechanical Engineering – Design Project (if taken with ME 643)

Research or Design, 1 course/experience from the following (*These should be approved by the bioengineering program prior to taking them*):

Capstone Design in Bioengineering/Biomechanics:
ME 643 Mechanical Engineering – Design Project Option C
Other approved senior level, capstone design course with a bioengineering-focused project
Approved Undergraduate Research in Bioengineering:
C&PE 651/661, C&PE 671, ME 360/361, EECS 399/498, AE 592, CE490, ARCE 690/691, or EPSX 501/503
Approved external research experience such as a summer REU program in Bioengineering