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, Civil Engineering and Engineering Physics), and Computer Science. There are no admissions requirements beyond a major in the School of Engineering. To complete this certificate a student will also need to complete their degree in one of these disciplines.

The following requirements must be met with a 2.0 GPA or higher in these courses to receive this certificate.

Bioengineering Core, 1 course from the following:

Code	Title	Hours
C&PE 656	Introduction to Biomedical Engineering	3
ME 633	Basic Biomechanics	3
EECS 730	Introduction to Bioinformatics	3

Bioengineering Electives, 3 courses from the following:

Biological Sciences: At least one course from:

Code	Title	Hours
BIOL 150	Principles of Molecular and Cellular Biology	3
BIOL 240	Fundamentals of Human Anatomy	3
BIOL 246	Principles of Human Physiology	3
BIOL 546	Mammalian Physiology	3

Advanced Electives: At least one course from:

Code	Title	Hours
BINF 701	Computational Biology I	5
BINF 702	Computational Biology II	5
BIOL 600	Introductory Biochemistry, Lectures	3
CHEM 330	Organic Chemistry I	3
C&PE 226	Fundamentals of Biomedical and Biomolecular Engineering	3
C&PE 657	Polymer Science and Technology	3
C&PE 676	Principles of Biomolecular Engineering	3
C&PE 686	Bioprocess Engineering	3
C&PE 752	Tissue Engineering	3
CE 573	Biological Principles of Environmental Engineering	3
EECS 644	Introduction to Digital Signal Processing	3
EECS 730	Introduction to Bioinformatics	3
EECS 740	Digital Image Processing	3
ME 640	Design Project (if taken with ME 643)	2
ME 750	Biomechanics of Human Motion	3
ME 751	Experimental Methods in Biomechanics	3
ME 753	Bone Biomechanics	3
ME 754	Medical Imaging	3
ME 755	Computer Simulation in Biomechanics	3
ME 757	Biomechanical Systems	3
ME 758	Physiological System Dynamics	3
ME 760	Biomedical Product Development	3
ME 765	Biomaterials	3
ME 767	Molecular Biomimetics	3
ME 790	Special Topics: _____ (Approved Bioadditive Manufacturing)	1-5
ME 790	Special Topics: _____ (Approved Biomedical Microdevices)	1-5

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:

Code	Title	Hours
C&PE 651	Undergraduate Problems	1-4
C&PE 661	Undergraduate Honors Research	1-3
ME 360	Mechanical Engineering Problems	1-3
ME 361	Undergraduate Honors Research	1-3
EECS 399	Projects	1-5
EECS 498	Honors Research	1-2
AE 592	Special Projects in Aerospace Engineering for Undergraduate Students	1-5
ARCE 490	Special Problems	1-3
ARCE 491	Honors Research	3
CE 490	Special Problems	1-5

EPHX 501	Honors Research	1-4
EPHX 503	Undergraduate Research	1-4

Approved external research experience such as a summer REU program in Bioengineering