

BIOMEDICAL ENGINEERING (BMD-ENGR)

Restrictions

Courses under this subject code may have program (major, minor, certificate) specific enrollment restrictions. The Courses (<http://catalog.umkc.edu/course-offerings/undergraduate/>) section of the Catalog shows all courses offered by UMKC. Specific course restrictions are detailed in Pathway. If you have questions about your course options, please contact Roo Advising (or your academic advisor).

Please select the 'COURSES' tab above to view all courses within this subject code.

Courses

BMD-ENGR 115 Introduction to Biomedical Engineering Credit: 1

As an introduction to Biomedical Engineering, the following topics will be covered in the course: Biomechanics, Biomedical Devices, Biomedical Computation Modeling, Biomaterials, Bioelectronics, Bioimaging, and Biomedical Signal Processing.

BMD-ENGR 215 3D Modeling and Printing Credit: 1

Using current computer aided design tools, 3D modeling and printing for Biomedical Engineering applications are introduced.

Prerequisites: BMD-ENGR 115.

BMD-ENGR 315 Biomedical Instrumentation Credits: 3

The purpose of this course is to provide an opportunity for students to gain a hands-on, in-depth understanding of biomedical instrumentation including: electrophysiology, biomechanics, and medical imaging. To prepare for these topics, an introduction to measurements and instrumentation as well as a review of data sampling and signal processing theory will be provided.

Prerequisites: E&C-ENGR 380 and MEC-ENGR 411.

BMD-ENGR 325 Biomedical Systems Physiology Credits: 3

As the advanced human physiology course for biomedical engineering majors, the following systems will be examined: nervous, cellular, musculoskeletal, cardiovascular, respiratory, endocrine, gastrointestinal, and renal. Mathematical models and engineering analyses will be used to describe system performance, where applicable, with an emphasis placed on topics relating biomedical engineering to medical diagnostic and therapeutic applications.

Prerequisites: BIOLOGY 316, MATH 345, and MEC-ENGR 285.

BMD-ENGR 335 Biomedical Transport Phenomena Credits: 3

Principles of momentum and mass transfer with applications to biomedical systems is the focus of this course. The topics covered will include convection, diffusion, osmosis, conservation of momentum, mass and energy as applied to cellular and organ level transport. A special emphasis will be placed on basic fluid transport related to blood flow, and mass transfer across cell membranes.

Prerequisites: BIOLOGY 316, MATH 345, and MEC-ENGR 285.

BMD-ENGR 415 Bioelectromagnetics and Bioelectricity Credits: 3

As an introduction to the fields of Bioelectromagnetics and Bioelectricity, this course will cover the interaction between biological tissue and externally incident electromagnetic waves with frequencies that range from DC all the way to the visible range and higher as well as the intrinsically generated electrical signals by biology cells and tissues.

Prerequisites: PHYSICS 250, MATH 345, and E&C-ENGR 276.

BMD-ENGR 495WI Biomedical Capstone Design Credits: 3

As the capstone design course for Biomedical Engineering majors, this course will cover modern design theories and methodologies, with an emphasis on the initial stages of the design process, effect of design choices on the earth and living systems, and the principles of embodiment design and the life-cycle considerations.

Prerequisites: Senior Standing, BMD-ENGR 215, BMD-ENGR 315, MEC-ENGR 492, and ENGLISH 225.