

BIOMEDICAL ENGINEERING (BME)

BME 3030 Introduction to Biomedical Engineering 3 Credits

This course provides a broad perspective of biomedical engineering as applied to topics in physiology and medicine including bioethics, biomechanics, and bio-instrumentation.

Components: Class

Prereqs/Coreqs: P: 'C-' or better in GENENG 2130; C: BIOLOGY 2340

BME 3230 Introduction to Medical Instrumentation 3 Credits

Introduction to medical instrumentation; safety; medical ethics; biopotential signals and sensors; biosignal data acquisition, amplification, and signal processing; error analysis; specifications; device approval process.

Components: Laboratory, Class

Prereqs/Coreqs: P: 'C-' or better in (ELECTENG 3210 and ELECTENG 3220) OR (MECHENG 3030 and GENENG 2930)

BME 4130 Biomechanics 3 Credits

An overview of the human motion analysis and mechanical behavior of biological tissues. Specific topics include: motion analysis, musculoskeletal modeling, structure and function of biological tissues, mechanical properties of biological tissues, and analysis of specific tissues (i.e. bone, muscle, and soft connective tissues).

Components: Class

Prereqs/Coreqs: P: 'C-' or better in GENENG 2340, BIOLOGY 2340, and either GENENG 2230 or ENGRPHYS 3240

BME 4330 Biofluidics 3 Credits

Basic concepts and problems of fluid and solid mechanics are introduced and applied to the analysis of blood flow in the macro and microcirculation, and to other physiological flows. Analysis of mathematical and computational models is combined with discussion of physiological mechanisms.

Components: Class

Prereqs/Coreqs: P: 'C-' or better in MECHENG 3300 and BIOLOGY 2340

BME 4530 Biomaterials 3 Credits

This course introduces students to the fundamental concepts of biology, materials science, chemistry, and engineering involved in biomaterials.

Specific topics include: chemical structure and properties of metals, ceramics and polymers used as biomaterials; biocompatibility and host response; drug release; and basic concept of biostatistics.

Components: Class

Prereqs/Coreqs: P: 'C-' or better in CHEMISTRY 1450, GENENG 2340, and BIOLOGY 2340 or consent of instructor