

ENGINEERING, BIO (ENBI)

ENBI 4200 Medical Device Development (4 Credits)

Working in a fast-paced competitive biomedical R&D firm is a dramatic change of pace from most college classes. This course will create a realistic industry environment where students take on the role of development engineers to design and manufacture real-world medical devices. This course is intended to provide a working knowledge of the design and development process specifically for medical device applications.

ENBI 4500 Biofluids (4 Credits)

The application of fluid dynamics theory and design to problems within the biomedical community. Specific topics covered include the mechanics of inhaled therapeutic aerosols, basic theory of circulation and blood flow, foundations in biotechnology and bioprocessing, and controlled drug delivery. Cross listed with ENBI 3500.

ENBI 4510 Biomechanics (4 Credits)

An introduction to the mechanical behavior of biological tissues and systems. Specific topics covered include: Analysis of the human musculoskeletal system as sensors, levers, and actuators; Joint articulations and their mechanical equivalents; Kinematic and kinetic analysis of human motion; Introduction to modeling human body segments and active muscle loading for analysis of dynamic activities; Mechanical properties of hard and soft tissues; Mechanical and biological consideration for repair and replacement of soft and hard tissue and joints; Orthopedic implants. Cross listed with ENBI 3510.

ENBI 4520 Introduction to Cardiovascular Engineering (4 Credits)

An introduction to cardiovascular mechanics with a focus on the quantitative understanding of the mechanical phenomena that governs the cardiovascular system. Specific topics covered include: basic principles of circulation including macro and micro circulation, soft tissue mechanics, applications to cardiovascular diseases, modelling techniques, clinical and experimental methods, and design of cardiovascular devices.

Recommended prerequisites: ENME 2541 and ENME 2661.

ENBI 4530 Biomechanics of Human Movement (4 Credits)

An introduction to engineering-based analysis of human movement. Topics include: musculoskeletal anatomy, neuromuscular physiology, muscle mechanics, electromyography, sensorimotor integration, anthropometry, kinematics and kinetics. Recommended pre-requisite material: knowledge of MATLAB, ENGR 1572.

ENBI 4800 Adv Topics (Bioengineering) (1-5 Credits)

Various topics in Bioengineering as announced. May be taken more than once. Prerequisite: varies with offering.

ENBI 4991 Independent Study (1-5 Credits)**ENBI 4995 Independent Research (1-18 Credits)**