Materials science of human implants. Design requirements imposed by the human body, and need for bodily protection.

425  Biomaterials and Biocompatibility
Fall. 3(3-0) Interdepartmental with Materials Science and Engineering. Administered by Materials Science and Engineering. P: MSE 250 RB; PSL 250 R. Open to juniors or seniors in the College of Engineering. SA: BME 424, MSE 324

Materials science of human implants. Design requirements imposed by the human body, and need for bodily protection.

444  Biosensors for Medical Diagnostics
Spring. 3(3-0) Interdepartmental with Biosystems Engineering. Administered by Biosystems Engineering. P: (BS 161 or BS 181H or LB 145) and (CEM 141 or CEM 151) and (ECE 302 or ECE 345 or BE 334 or CEM 331) R: Open to juniors or seniors in the College of Engineering. SA: BE 445

Biosensors, their components, properties, and associated electronics for applications in medical diagnostics.

490  Independent Study
Fall, Spring. 3 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Approval of department.

Individualized reading and research in biomedical engineering or bioengineering.

490A  Independent Study in Clinical Biomechanics
Fall. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Approval of department.

Individualized reading and research in the application of biomechanics to clinical cases.

490B  Independent Study in Biomaterials
Spring. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Approval of department.

Individualized reading and research in the application of biomaterials.

491  Special Topics
Fall, Spring. 3 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.

Special topics in biomedical engineering or bioengineering.

494  Biofluid Mechanics and Heat Transfer
Fall. 3(3-0) Interdepartmental with Mechanical Engineering. Administered by Mechanical Engineering. P: (ME 410 or concurrently) or (CEM 311 or concurrently) or (BE 350 or concurrently) R: Open to juniors or seniors or graduate students in the College of Engineering.

Applications of fluid mechanics, heat transfer, and thermodynamics to biological processes, including blood flow in the circulatory system, heart function, effects of heating and cooling on cells, tissues, and proteins. Pharmacokinetics.

495  Tissue Mechanics
Spring. 3(3-0) Interdepartmental with Mechanical Engineering. Administered by Mechanical Engineering. P: ME 370 or concurrently R: Open to students in the College of Engineering. SA: MSM 441

Application of solid mechanics to understanding mechanical responses of biological tissues. Microstructure and biological function for soft and hard connective tissues and muscle.

497  Biomechanical Design in Product Development
Spring. 3(3-0) Interdepartmental with Mechanical Engineering. Administered by Mechanical Engineering. P: ME 370 or concurrently R: Open to juniors or seniors in the Department of Mechanical Engineering. SA: BME 491A, MSM 445

Biomechanical product design with application to people or animals. Synthesis, prototyping, and analysis of designs. Project management. Market research.

803  Research Methods
Fall. 3(3-0)
Skills required for graduate research. Critically reviewing the literature, defining a fundamental research problem, effective oral and written technical presentations, ethics and statistics.

841  Translational Innovations Laboratory
Spring. 3(1-4) R: Open to doctoral students in the Department of Biomedical Engineering or approval of department.

Mentored research conducted in multidisciplinary team. Translational research. Development of biomedical technologies. Teamwork skills.

844  Biosensor Principles and Applications
Spring. 3(3-0) Interdepartmental with Biosystems Engineering. Administered by Biosystems Engineering. RB: Knowledge of biology, chemistry, and electronics. SA: BE 845

Nanotechnology-based biosensors, their components, desirable properties, and associated electronics. Applications related to healthcare, biodefense, food and water safety, agriculture, bio-production, and environment. Multidisciplinary interactions necessary for biosensor development.

892  Biomedical Engineering Seminar
Fall. Spring. 1(1-0)
Presentations of detailed studies of one or more specialized aspects of biomedical engineering

899  Master's Thesis Research
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 24 credits in all enrollments for this course.

Master's thesis research.

999  Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 36 credits. A student may earn a maximum of 36 credits in all enrollments for this course.

Doctoral dissertation research.