INTERDISCIPLINARY DEGREES

Graduate Directors in Engineering: Keith Schubert and Stephen T. McClain

The Department of Electrical and Computer Engineering and the Department of Mechanical Engineering jointly administer degrees that are interdisciplinary in nature.

- Biomedical Engineering, M.S.B.M.E. (https://catalog.baylor.edu/graduate-school/curriculum-departments-institutes-instruction/school-engineering-computer-science/interdisciplinary-degrees/biomedical-engineering-msbme/)
- Master of Engineering, M.E. (https://catalog.baylor.edu/graduate-school/curriculum-departments-institutes-instruction/school-engineering-computer-science/interdisciplinary-degrees/master-engineering-me/)

Biomedical Engineering (BME)

BME 4353 Image Formation and Processing (3)
Cross-listed as ELC 4353
See ELC 4353 for course information.

BME 4370 Biomaterials: Form and Function (3)
Pre-requisite(s): A grade of C or better in ME 3320
A traditional mechanical/materials engineering approach will be used to explore the structure and function relationship of naturally occurring biological materials. Emphasis is on mechanical design and function with some discussion of physical properties. Materials used in medical devices will be compared and contrasted with naturally occurring biomaterials.

BME 4372 Bioinstrumentation (3)
Cross-listed as ELC 4372
See ELC 4372 for course information.

BME 4374 Biomechanics (3)
Pre-requisite(s): A grade of C or better in ME 3320
Introduction to biomechanics. Topics covered include: review of fundamental principles of mechanics, human musculoskeletal physiology and anatomy, properties of biological materials, methods and practice of measuring biological signals, biomechanical modeling and simulation, and applications of biomechanical study.

BME 4396 Special Topics in Biomedical Engineering (3)
Pre-requisite(s): Consent of department chair
Study of advanced topics in biomedical engineering. This course may be repeated once under a different topic.

BME 4452 Biomedical Digital Signal Processing (4)
Pre-requisite(s): A grade of C or better in ELC 3335 and STA 3381
Discrete-time signals and systems, sampling theory, z-transforms, spectral analysis, filter design, applications, analysis, and design of digital signal processing systems. Laboratory emphasis on biomedical applications of digital signal processing. Credit cannot be earned for ME 4452 if credit is earned for ELC 4451.

BME 4V97 Special Projects in Biomedical Engineering (1-6)
Pre-requisite(s): Consent of department chair
Advanced topics and/or special project activities in biomedical engineering.

BME 5351 Multidimensional Signal Analysis (3)
Cross-listed as ELC 5351
See ELC 5351 for course information.

BME 5353 Biomedical Signal Analysis (3)
Cross-listed as ELC 5353
See ELC 5353 for course information.

BME 5357 Cardiovascular Engineering and Instrumentation (3)
Cross-listed as EGR 5357, ELC 5357, ME 5357
A quantitative approach to the function and performance of cardiovascular elements, including ECG signal generation, blood flow rheology, and ventricular/vessel wall mechanics. Principles of measurement instrumentation including Fick dilution, ultrasound, and magnetic resonance imaging are explored. Major implant types, as well as FDA submission pathways, are examined.

BME 5360 Introduction to Biomedical Engineering (3)
Pre-requisite(s): Consent of instructor
Introduction to the interdisciplinary nature and broad scope of biomedical engineering. Topics covered will include biomechanics, biomaterials, biosensors, biomedical instrumentation, bioinformatics, prosthetic devices, and other biomedical engineering areas.

BME 5375 Biomechanical Computer Modeling (3)
Pre-requisite(s): Graduate standing in Engineering
An investigation into the methods of computer modeling and simulation for the study of human musculoskeletal biomechanics.

BME 5376 Medical Device Design and Evaluation (3)
Project-based introduction to medical device design and evaluation. Topics include: clinical needs finding, design criteria generation, basic anatomy, design evaluation, prototyping, regulatory process, intellectual property, and validation process. Students work in teams on real medical problems and serve on committees to provide guidance for the project teams on either intellectual property or regulatory standards.

BME 5390 Research Methods and Project Formulation (3)
Cross-listed as EGR 5390, ELC 5390
See ELC 5390 for course information.

BME 5396 Special Topics in Engineering (3)
See EGR 5396 for course information.

BME 5397 Special Projects in Engineering (3)
Cross-listed as EGR 5397, ELC 5397, ME 5397
See EGR 5397 for course information.

BME 5V99 Master's Thesis (1-6)
Students completing a master's program with a thesis must complete six hours of BME 5V99.