INTERDISCIPLINARY DEGREES

Graduate Directors in Engineering: Ian Gravagne 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 and 3322
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)
Cross-listed as EGR 5396, ELC 5396, ME 5396
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.