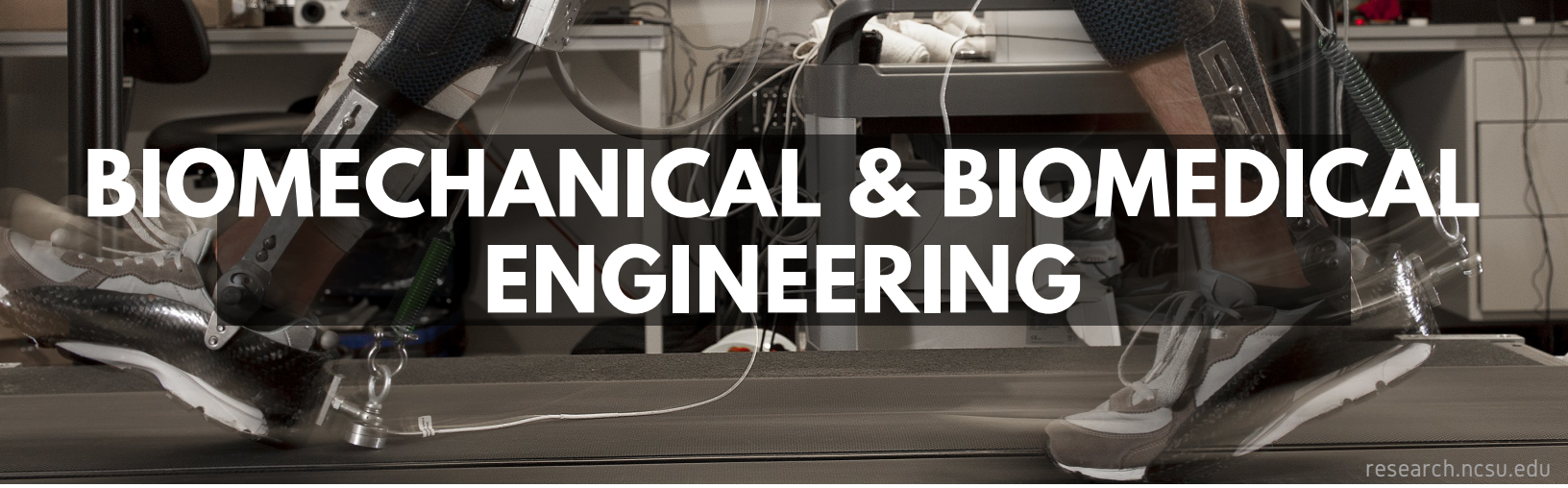

BIOMECHANICAL & BIOMEDICAL ENGINEERING

Track Description

This track involves the application of Mechanical Engineering knowledge, skills, and principles to the conception, design, development, analysis and operation of biomechanical systems, including: artificial organs and prostheses; bioinstrumentation and measurements; bioheat transfer; biomaterials; biomechanics; bioprocess engineering; cellular mechanics; design and control of biological systems; and physiological systems.

Industry Applicability

This certificate program area is appropriate to prepare mechanical engineers for jobs in industry that deal with one or more of the following:

- -Biofluid Systems
- -Bioheat Transfer
- -Bioinstrumentation
- -Biomaterials
- -Biomechanics
- -Ultrasonics
- -Biomedical Optics
- -Biosignal Analysis
- -Cellular Biomechanics
- -Computational Modeling
- -Medical Robotics
- -Rehabilitation Engineering

Faculty Mentors

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Organizations & Societies

ASME, BMES, SB3C, e-NABLE

Available Courses*

ME 350R: Robot Mechanism Design
ME 354: Introduction to Biomechanical Engineering
ME 354M: Biomechanics of Human Movement
ME 371D: Medical Device Design & Manufacturing
ME 379M: Tissue Microenvironments - Fabrication, Transport, & Mechanics
ME 377K: Projects in Mechanical Engineering (recommended for students interested in graduate school)

** Other relevant coursework outside ME such as BME, ASE, EE, ChE, subject to mentor and instructor approval

For course descriptions visit the University Catalog.
* Please contact faculty mentors to petition other courses.
** Recommended for students interested in graduate school.

The University of Texas at Austin
Walker Department of Mechanical Engineering
Cockrell School of Engineering

Selected Examples

1. Biomechanics: This sub-field deals with the human body's movements. Engineers who specialize in biomechanics focus on designing and developing products that aid with motion within the body. Examples include sports biomechanics such as determining optimal training conditions for athletes, prosthetics and gait analysis for footwear design.

2. Orthopedic Bioengineering: Orthopedic bioengineers design and develop products that deal with the bones, muscles, joints, and ligaments. These products mainly comprise of implants that assist with movement. The implants may work in conjunction with the surrounding tissues, or they may completely replace certain bones, muscles, joints, or ligaments.

3. Medical Devices and Bioinstrumentation: This sub-field involves designing and developing tools and equipment that are used to diagnose and treat diseases. Some of these devices are simple and low-cost disposable devices such as syringes and band-aids. On the other extreme, some of these technologies are advanced electronic devices that function cooperatively with a computer such as implantable cardiac pace makers and surgical robots.