

# Biomedical Engineering Specialization

*Master of Engineering (M.E.)*

*Develop your practical skills and knowledge to succeed with this foundation in biomedical engineering*



## Overview

Biomedical engineering lies at the intersection of biomedical challenges and engineering solutions. This course-work-only, professional degree provides a transdisciplinary focus on improving health, fighting disease and aiding persons with disabilities, and is uniquely positioned to offer educational strengths in engineering, the sciences, and animal and human medicine. Students gain a foundation in biomedical engineering, and the distance delivery of the degree provides the flexibility working professionals and non-traditional students need when pursuing an advanced degree.

With our Master of Engineering in Biomedical Engineering, you will cover concepts in:

- Structure and function of biomaterials
- Material issues in mechanical design
- Design and data analysis

## Specific Admission Requirements

- B.S. in engineering, life sciences, or natural sciences from a regionally accredited institution
- GPA of 3.0 or higher in engineering or life science courses
- Calculus 1, 2, and 3
- Ordinary differential equations
- Physics 1 and 2 (calculus-based preferred)
- At least one semester of life science (biology, physiology, etc.)
- Strong GRE scores (although there are not absolute minimum scores required, the department looks for an 1100 combined score on the quantitative and verbal sections, and a 4.5 on the analytical section)

## Program Completion Requirements

- A minimum of 30 semester credits
- Your program of study must be approved by an advisor prior to completing 15 credits toward the degree

## Time Frame

Program duration may vary based on previous course work, intensity of study, and course availability. Summer courses are not required.

## Contact Us

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## For more information

[www.online.colostate.edu/degrees/biomedical-engineering/](http://www.online.colostate.edu/degrees/biomedical-engineering/)



# Degree Requirements and Curriculum

- 7 credits of core courses, 12 credits of foundation courses, at least 8 credits of depth courses, and 3 credits in the breadth area
- 24 semester credits must be earned at Colorado State University, 21 of which must be earned after formal admission
- 24 credits earned at CSU must be at the graduate level (500-level or above), excluding independent study, research, internship, or practicum credits
- 15 credits of biomedical engineering (BIOM) courses

## **The curriculum is divided into four categories:**

- Core and Foundation Courses – develop a foundation in biomedical engineering.
- Depth Courses – gain more knowledge in a particular interest area.
- Breadth Courses – focus on advanced and applied mathematics.
- Courses that are currently offered via distance delivery, or will be soon, are listed below.

## **Core (7 credits required)**

- BIOM 570 – Bioengineering (3 cr. - Spring)
- BMS 500 – Mammalian Physiology I (4 cr. - expected Fall 11) OR BMS 300 – Principles of Human Physiology (4 cr. - Fall, Spring, or Summer)

## **Foundation (12 credits required)**

- BIOM 531 – Materials Engineering (3 cr. - Spring)
- BIOM 532 – Material Issues in Mechanical Design (3 cr. - Fall)
- BIOM 543 – Membranes for Biotechnology and Biomedicine (3 cr.) (Offered every other year; next semester offered is Spring 11)
- BIOM 573 – Structure and Function of Biomaterials (3 cr. - Spring)
- BIOM 525 – Cell/Tissue Engineering (3 cr.) (Offered every other year; next semester offered is Spring 12)

## **Breadth (3 credits required)**

- STAT 511 – Design and Data Analysis for Researchers I (4 cr. - Fall) OR STAT 512 – Design and Data Analysis for Researchers II (4 cr. - Spring) OR BIOM 545 - Partial Differential Equations I (3 cr.)

## **Depth (Minimum of 8 credits required)**

- ECE 512 – Digital Signal Processing (3 cr.)
- MECH 530 – Advanced Composite Materials (3 cr. - Fall)
- BIOM 532 – Material Issues in Mechanical Design (3 cr. - Fall)

**Biomedical Engineering was named by CNNMoney.com as one of the top 15 most lucrative college degrees in 2009. This is according to the average starting offers for graduates with this degree.**



## **Career Opportunities**

- With the online Master of Engineering in Biomedical Engineering, students learn cutting-edge technology from faculty on the forefront of biomedical research. This advanced training will update your skill sets, improve your daily work practices, and lead to advancement opportunities.
- Trained biomedical engineers use their expertise in engineering, biology, and medicine to develop and apply cross-disciplinary skills to solve complex problems and improve health care technology, from diagnostics to treatment.

## **Who should earn this degree?**

- Individuals pursuing professional development opportunities in the engineering, medical, or veterinary fields, as well as in research laboratories.