BIOMEDICAL ENGINEERING DUAL DEGREE PROGRAMS

The Bachelor of Science in Biomedical Engineering has five dual degree pathways, each of which provide depth in a traditional area of engineering and breadth in biomedical engineering knowledge and applications. The coursework in these five dual degree pathways is designed to support biomedical engineering, and to satisfy the curricular requirements of one of five traditional engineering degrees as administered by partner engineering departments:

1. Biomedical Engineering, B.S. combined with Chemical and Biological Engineering, B.S. (https://catalog.colostate.edu/general-catalog/colleges/engineering/biomedical-chemical-engineering/chemical-biological-dual-degree-program/)
2. Biomedical Engineering, B.S. combined with Computer Engineering, B.S. (https://catalog.colostate.edu/general-catalog/colleges/engineering/biomedical-chemical-engineering/computer-dual-degree-program/)
3. Biomedical Engineering, B.S. combined with Electrical Engineering, B.S., Electrical Engineering Concentration (https://catalog.colostate.edu/general-catalog/colleges/engineering/biomedical-chemical-engineering/electrical-dual-degree-program/)
4. Biomedical Engineering, B.S. combined with Electrical Engineering, B.S., Lasers and Optical Engineering Concentration (https://catalog.colostate.edu/general-catalog/colleges/engineering/biomedical-chemical-engineering/electrical-lasers-optical-concentration-dual-degree-program/)
5. Biomedical Engineering, B.S. combined with Mechanical Engineering, B.S. (https://catalog.colostate.edu/general-catalog/colleges/engineering/biomedical-chemical-engineering/mechanical-dual-degree-program/)

Each BME pathway requires a minimum of 157-158 credit hours of coursework, depending on the selected pathway, nominally distributed over five years.

In the first two years, students take introductory biomedical engineering courses as well as foundational math, science, and engineering courses. The third year and fourth years solidify expertise in the traditional engineering major while building strength in biomedical engineering, life and physical sciences courses. The following years allow students to build a more thorough understanding of biomedical engineering, and their studies culminate in a Senior Design project in the fifth year that provides hands-on experience with an interdisciplinary team of peers. This combination of practical application and traditional academic rigor support the breadth and depth of this fairly unique program, and provides excellent preparation and market value for graduates' next steps in industry, academia, or research.

The Bachelor of Science in Biomedical Engineering at Colorado State University is accredited by the Accreditation Board for Engineering and Technology (ABET). It was first accredited in 2016, and this accreditation is retroactive for all prior graduates of the B.S. in biomedical engineering program. The partner majors include electrical engineering (EE), chemical and biological engineering (CBE), and mechanical engineering (MECH) and these three degree programs are accredited by the Engineering Accreditation Commission of ABET. Click here for more information on ABET accreditation requirements. (https://www.abet.org/accreditation/)

Learning Objectives

The educational objectives of the Biomedical Engineering programs are to prepare our students to:

1. Demonstrate high professional, social, and ethical standards while examining and addressing the global impact of technology to improve quality of life in society and environment
2. Apply broad and deep knowledge, practical experiences, and creativity to solving problems at the interface of engineering and the life sciences as individuals and team members
3. Use their multidisciplinary background to foster communication and collaboration across professional and disciplinary boundaries
4. Recognize and expand the scope of their knowledge, continue self-directed learning, and identify and create professional opportunities for themselves and others

Successful graduates in Biomedical Engineering will have the ability to:

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. Communicate effectively with a range of audiences
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. Function effectively on a multidisciplinary team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. Acquire and apply new knowledge as needed, using appropriate learning strategies
8. Apply principles of engineering, biology, human physiology, chemistry, calculus-based physics, mathematics (through differential equations), and statistics;
9. Solve bio/biomedical engineering problems, including those associated with the interaction between living and non-living systems;
10. Analyze, model, design, and realize bio/biomedical engineering devices, systems, components, or processes; and
11. Make measurements on and interpret data from living systems

Potential Occupations

Biomedical engineering applies engineering principles to medicine and improving quality of life for humans and animals. Biomedical engineers work in a variety of settings. Some biomedical engineers spend their days in the lab, researching new devices and systems that solve medical and health care-related problems. Others might work in clinical settings, run biomedical-focused enterprises, design/manufacture new therapies or diagnostics, assist medical facilities with engineering equipment, processes and/or systems, or engage in regulatory affairs or patent law. Our graduates are well prepared for careers in research, education, or industry.