

MSOE Biomedical Engineering Program Goals

Biomedical engineering is a demanding engineering discipline where students are responsible for learning and developing the skills necessary to perform and advance within the career of their choosing. The biomedical engineering program at MSOE is responsible for providing the academic environment and curriculum in which its students can develop and learn these skills. Therefore, in accordance with the mission of the university, MSOE will provide the students with the education that will allow the students to:

Develop general education skills that society commonly expects of persons holding a baccalaureate degree, and to recognize the need to include service to society in their career plans. Service to society includes service to the engineering profession and to the many social, charitable and civic organizations.

Possess the skills required to function as an entry-level engineer as defined by the Fundamentals of Engineering examination. Possess the skills required to meet the minimum requirements to function as an entry-level biomedical engineer in the areas of medical instrumentation, biomaterials, biomechanics, biomedical signal processing and medical imaging.

Recognize the ethical, legal and social issues involved in the practice of engineering and/or biomedical engineering.

Develop personal and professional skills that allow them to function as productive members of an engineering design team. Professional skills include an understanding of common industrial practices that will allow them to excel in industrial and laboratory environments.

Receive current information relative to the many career options open to engineering graduates. These options include continuing education to professional schools, graduate schools (both full-time and part-time) and employment options in industry, health care, engineering consulting and government. Further, each student will recognize the need for lifelong learning and the many ways in which such learning can take place.

MSOE Biomedical Engineering Program Objectives

Prior to graduation, each biomedical engineering student must demonstrate:

1. An ability to apply knowledge of mathematics. This includes calculus, differential equations, statistics, vector analysis and matrix analysis.
2. An ability to apply knowledge of physics, chemistry, biology and physiology.
3. An ability to apply knowledge of engineering science across the range of engineering topics.
4. An ability to solve problems at the interface of engineering, medicine and biology.
5. An ability to design and conduct experiments, as well as to analyze and interpret data involving both living and non-living systems.
6. An ability to design a system, component or process to meet desired needs including the need to address the problems associated with the interaction between living and non-living materials and systems.
7. An ability to function on multi-disciplinary teams as demonstrated by participation in an 11-quarter Biomedical Engineering Design experience.
8. An ability to identify, analyze and solve engineering problems involving living systems.
9. An understanding of professional and ethical responsibility including the special requirements imposed on engineering solutions applied to living systems.
10. An ability to communicate effectively with co-workers or as part of a team.
11. The broad education necessary to understand the impact of engineering solutions in a global and societal context with special consideration given to health care issues.
12. An ability to engage in lifelong learning.
13. Knowledge of contemporary social issues.
14. The ability to use the techniques, skills and modern engineering tools necessary for engineering practice.