

# Bioengineering Graduate Program

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## Bioengineering

The bioengineering program prepares students to become leading researchers, educators, and entrepreneurs. The program provides knowledge breadth in engineering and the biological sciences and knowledge depth in the student's area of research interest. The program offers the Master of Science and Doctor of Philosophy degrees in bioengineering and the M.D./Ph.D. combined degree in conjunction with the KU School of Medicine (<http://medicine.kumc.edu/>). Students have access to innovative research and educational facilities on KU's Lawrence and KU Medical Center campuses. The student selects from 6 tracks:

1. Bioimaging
2. Computational bioengineering
3. Biomaterials and tissue engineering
4. Biomechanics and neural engineering
5. Biomedical product design and development
6. Biomolecular engineering

The student, in consultation with his or her advisor and advisory committee, develops a Plan of Study and a research program to satisfy degree requirements.

The program's goals are:

1. To give students an in-depth understanding of mathematics, engineering principles, physics, chemistry, physiology, and modern biology.
2. To train students to apply basic sciences to biological problems using engineering principles.
3. To train students to do bioengineering research and solve problems related to the design and development of diagnostic and therapeutic technologies that improve human health.
4. To train students to apply bioengineering research to commercially viable technologies.

Bioengineering research projects typically focus on 1 of 2 broad categories:

1. The development of fundamental scientific knowledge.
2. The development and application of materials, devices, and systems with the goal of improving biological processes, systems, and health care.

Bioengineering students are often involved in measurements, analysis, modeling, computations, design, and development. The program prepares students for careers in industry, academia, health care settings, or government.

## Financial Aid

Once admitted, students become eligible for financial aid. Graduate students in the bioengineering program are often supported through research assistantships, teaching assistantships, or fellowships (e.g., the Madison and Lila Self Fellowship). Research assistantships are arranged by the student and faculty advisor with assistance from the Bioengineering Director if needed. Teaching assistantships are assigned by the

Bioengineering Director. Highly qualified applicants are considered for additional support and fellowships. For more information about external and other KU funding options, please visit <https://graduate.ku.edu/funding> (<https://graduate.ku.edu/funding/>).

## Courses

### **BIOE 800. Bioengineering Colloquium. 0.5-1 Hours.**

A colloquium series featuring speakers from industry, government, other universities, research centers and research organizations of the university campus presenting talks on various topics related to bioengineering. LEC.

### **BIOE 801. Responsible Conduct of Research in Engineering. 1 Hour.**

Lectures and discussion on ethical issues in the conduct of a scientific career, with emphasis on practical topics of special importance in bioengineering. Topics include the nature of ethics, the roles of the scientist as a reviewer, entrepreneur, employer and teacher, research ethics in the laboratory, social responsibility and research ethics regulation. (Same as ME 801.) Prerequisite: Permission of instructor. LEC.

### **BIOE 802. Bioengineering Internship. 1-6 Hours.**

An approved bioengineering industrial or clinical internship. The student is supervised by a preceptor at the internship site. Biweekly reports and a final report detailing work performed are filed with the course instructor. Prerequisite: Permission of instructor. INT.

### **BIOE 860. Advanced Bioengineering Problems. 1-3 Hours.**

An analytical or experimental study of problems or subjects of immediate interest to a student and faculty member and which is intended to develop students capability for independent research or application of engineering science and technology. Maximum credit toward any degree is three hours unless waived in writing by the academic director. Prerequisite: Consent of instructor. IND.

### **BIOE 899. Independent Investigation. 1-6 Hours.**

An original and independent research or design investigation involving analytical, experimental and/or modeling methodology applied to solve a bioengineering problem as a part of the degree requirements for the Master of Science. Graded on a satisfactory progress/limited progress/no progress basis. THE.

### **BIOE 999. Independent Investigation. 1-12 Hours.**

An original and independent research or design investigation involving analytical, experimental and/or modeling methodology applied to solve a bioengineering problem as a part of the degree requirements for the Doctor of Philosophy. Graded on a satisfactory progress/limited progress/no progress basis. THE.