Bioengineering

Website (https://bioe.northeastern.edu/)

Abraham Joy, PhD
Professor and Chair
a.joy@northeastern.edu

The Department of Bioengineering is driven by the conviction that the interface of engineering and medicine will be one of the great intellectual adventures of the 21st century. To prepare students for this adventure, the department strives to create an atmosphere of innovation and creativity that fosters excellence in instruction and research. This foundation supports programs that drive forward the cutting edge of knowledge while establishing translational collaborations with clinical and industrial researchers.

Bioengineering is built on the recognition that engineering of biological systems, or tools that interface with living systems, requires a multidisciplinary approach considering mechanical, electrical, chemical, and materials processes. Students with backgrounds from biochemistry to computer science, and many fields in between, are attracted to bioengineering as a field with the potential to make a great impact on human health. The MS and PhD programs are designed to integrate students with very different backgrounds and provide them with the coursework and research experience that will take advantage of and build on their unique experiences.

Recognizing the breadth of disciplines that contribute to bioengineering, the MS program allows students to choose a concentration to develop deep expertise in an area of particular interest, selecting from biomechanics and mechanobiology; biomedical devices and bioimaging; molecular, cell, and tissue engineering; or systems, synthetic, and computational bioengineering. The MS program encourages individual research through an optional one-semester master's project or a master's project followed by a master's thesis.

The PhD program spans research areas for which the department has particular strengths. The PhD program in Boston specializes in biomechanics and mechanobiology; biomedical devices and bioimaging; molecular, cell, and tissue engineering; and systems, synthetic, and computational bioengineering. The PhD program at the Roux Institute in Portland specializes in artificial intelligence in translational healthcare. PhD coursework is designed to strengthen student backgrounds in the areas most relevant to their interests.

Mission of the Department

The mission of the Department of Bioengineering is the education of students in the fundamental principles and practice of bioengineering and, through basic and applied research, the creation of new knowledge at the interface of engineering and medicine to support development of new technologies for improvement of human health and healthcare.

Overview of Programs Offered

The Department of Bioengineering offers a Master of Science and a Doctor of Philosophy in Bioengineering. The MS degree is offered as a full-time or part-time program. The PhD degree program is only offered as a full-time program.

Candidates pursuing an MS or PhD are able to select thesis topics from a diverse range of faculty research. New graduate students may learn about ongoing research topics from individual faculty members, faculty websites, and bioengineering seminars.

Graduate Certificate Options

Students enrolled in an MS degree have the opportunity to also pursue one of the many engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (https://catalog.northeastern.edu/graduate/engineering/graduate-certificate-programs/).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering Leadership Program (https://catalog.northeastern.edu/graduate/gordon-institute/) in combination with the MS degree.

Programs

Doctor of Philosophy (PhD)

- Bioengineering (Boston) (https://catalog.northeastern.edu/graduate/engineering/bioengineering/bioengineering-bachelors-degree-entrance-phd/)
- Bioengineering (Portland) (https://catalog.northeastern.edu/graduate/engineering/bioengineering/bioengineering-bachelors-degree-entrance-phd-ptl/)
- Interdisciplinary Engineering (Boston) (https://catalog.northeastern.edu/graduate/engineering/interdisciplinary-phd/interdisciplinary-engineering-phd/)

Master of Science (MS)

- Artificial Intelligence, MS (Boston) (https://catalog.northeastern.edu/graduate/university-interdisciplinary-programs/artificial-intelligence-ms-bos/)
- Robotics, MS (Boston) (https://catalog.northeastern.edu/graduate/university-interdisciplinary-programs/robotics-ms-bos/)

Master of Science in Bioengineering (MSBioE)

- Bioengineering (Boston) (https://catalog.northeastern.edu/graduate/engineering/bioengineering/bioengineering-msbioe/)
- Bioengineering —Connect (Boston) (https://catalog.northeastern.edu/graduate/engineering/bioengineering/bioengineering-msbioe-connect-bos/)