Yale ENGINEERING

Biomedical Engineering
Ph.D. Graduate Program
Admissions Information

Overview

Yale's PhD program in Biomedical Engineering offers opportunities in research and education at the forefront of healthcare innovation. Our program is driven by two interconnected missions: decoding the intricacies of human physiology and disease through advanced engineering methods, and pioneering transformative technologies for medical diagnosis, treatment, and prevention. PhD study in BME at Yale offers unique opportunities for students due to our close integration with the Yale School of Medicine–a critical collaboration that bridges the gap between engineering ingenuity and clinical insight. We foster an unparalleled environment where engineering breakthroughs directly inform and enhance medical practice.

PhD Curriculum

The core curricular and research areas of concentration in Yale Biomedical Engineering include Bioimaging and Biosensing, Biomechanics and Mechanobiology, Computational Modeling and Analysis, Biomolecular Engineering, Drug Delivery, and Systems Biology. Specific requirements of the PhD program include:

- Eight graduate courses–three required and five electives–enabling our curriculum to be tailored to each student's specific research interests.
- Two laboratory rotations (called "Special Investigations") that allow incoming students to experience different lab environments before choosing a PhD mentor.
- Two teaching fellowships that provide students with teaching experience. Support and training are available through Yale's Poorvu Center for Teaching and Learning.

Dissertation Research

Dissertation research is at the core of the PhD. When considering an application to our program, it is important that you identify one or more faculty members with whom you would like to work. The department web page lists faculty by their associated research areas. Ensuring a balance between our faculty's open research positions and the interests of our candidates is a very important consideration in the admissions decision. For this reason, an excellent candidate might not be admitted to our program because the candidate's research interests do not align with the areas in our program, or because none of the relevant faculty are accepting new graduate students

into their labs. Please review the web pages of department faculty to identify the research programs that are best aligned with your interests. You are welcome to contact faculty directly via email to discuss potential positions in their lab.

Graduate Student Funding

PhD candidates in BME have their tuition paid and receive a stipend of $50,777 (as of 25-26 AY). Funding comes from the University for the first year. Year 2 and beyond is funded by the PhD advisor, training grants at Yale (if available), or a graduate student's own fellowship (i.e., NSF GRFP).

Background of Successful Applicants

- Most admitted students have an undergraduate degree in engineering, biology, chemistry, physics, mathematics, computer science or a related field.
- The average GPA of accepted PhD students is 3.70 (4.0 maximum).
- Submission of GRE scores is not required for admission to the Yale BME PhD program. If the GRE is submitted (optional), the admissions committee will take it into consideration. Prior to 2022 when GREs were required, the average GREs of our accepted PhD students were 77th percentile verbal and 87th percentile quantitative.
- Either the TOEFL or IELTS is required for applicants with an undergraduate degree from a university where English is not the primary language of instruction, *even if the applicant has Master's degree from a university with English as the primary language of instruction*. Competitive applicants score at least 100 on the TOEFL test overall and a minimum of 26 on the TOEFL-Speaking test, or at least 7 on the IELTS.

How to Apply and Timing of the Admissions Process

If you would like to apply for our graduate program, please do so online. The deadline is December 15, 2025 to start the program in Fall 2026. You cannot apply to the MS program and the PhD program in the same year. There are no rolling admissions or options to start during the Spring semester.

Elements of a competitive application

- A clear explanation of your research interests that aligns with Yale's core areas of focus: Bioimaging and Biosensing, Biomechanics and Mechanobiology, Drug Delivery and Tissue Engineering, Computational Modeling and Analysis, and Systems Biology.

- *A list of specific faculty members with whom you would like to work and why*. Please note that listing many faculty members in the department whose research areas are not related is not recommended.
- Three letters of recommendation, with at least two from faculty or research scientists who have direct knowledge of your prior research experience.
- Please complete the BME Supplemental Form, which is part of the application, to indicate BME faculty and areas of interest to you.

Steps in the application review process

- Applications are reviewed at the end of December/early January.
- Candidates under consideration will receive a request for a phone/Zoom interview in mid-January from one or more faculty members.
- Information on acceptance will be sent out in mid to late February. We have an organized visit weekend where we host the accepted PhD students at the end of March.

Sample Course Curriculums

Required Courses for all PhD students

- BENG 5200: Physiological Systems
- BENG 5410: Physical and Chemical Basis of Biosensing
- ENAS 5000: Mathematical Models I or BENG 5849: Biomedical Data Analysis

Bioimaging and Biosensing Concentration Electives

- BENG 5415: Practical Applications of Bioimaging and Biosensing
- BENG 5420: Biophotonics
- BENG 5440: Fundamentals of Medical Imaging
- BENG 5450: Biomedical Image Processing and Analysis
- BENG 5482: Physics of Magnetic Resonance Spectroscopy In Vivo
- BENG 5485: Fundamentals of Neuroimaging
- BENG 4475: Computational Vision and Biological Perception

Biomechanics and Mechanobiology Concentration Electives

- MENG 5359: Neuromuscular Biomechanics
- BENG 5550: Vascular Mechanics
- BENG 5560: Molecular and Cellular Biomechanics
- BENG 5570: Computational Mechanics

Computational Modeling and Analysis Concentration Electives

- BENG 5823: Data and Clinical Decision-Making
- CPSC 5220: Deep Learning Theory and Applications
- CB&B 6340: Computational Methods for Informatics

Biomolecular Engineering and Systems Biology Concentration Electives

- PHYS 5610: Modeling Biological Systems I
- BENG 5611: BioMEMS and Biomedical Microdevices
- BENG 5690: Single Cell Biology, Technologies, and Analysis
- BENG 5630: Immunoengineering
- BENG 5724: Topics in Computational and Systems Biology
- BENG 5767: Systems Biology of Cell Signaling
- BENG 5350: Biomaterial-Tissue Interactions