

MINOR IN BIOMEDICAL ENGINEERING

The Biomedical Engineering Minor (BME) program requires a total of seven subjects selected from a series of categories as outlined below.

Programming and Computational Modeling Core

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|--------|---|---|
| 6.100A | Introduction to Computer Science Programming in Python | 6 |
| 6.100B | Introduction to Computational Thinking and Data Science | 6 |

Mathematics Core

Choose 12 units each from two of the following options: ¹ 24

Option A

18.03 Differential Equations

Option B

18.06 Linear Algebra

Option C

1.010A & 1.010B Probability: Concepts and Applications and Causal Inference for Data Analysis

6.3700 Introduction to Probability

9.07 Statistics for Brain and Cognitive Science

18.600 Probability and Random Variables

Human Physiology Core

Select one of the following: 12

6.4820[J] Quantitative and Clinical Physiology

7.20[J] Human Physiology ²

9.01 Introduction to Neuroscience

Biomedical Engineering and Applications

Select at least three of the following: ^{3,4} 30-36

1.063 Fluids and Diseases

1.088 Genomics and Evolution of Infectious Disease

1.089 Environmental Microbial Biogeochemistry

2.180 Biomolecular Feedback Systems

2.184 Biomechanics and Neural Control of Movement

2.74 Bio-inspired Robotics

2.750[J] Medical Device Design ²

3.052 Nanomechanics of Materials and Biomaterials ²

3.054 Cellular Solids: Structure, Properties, Applications ²

3.055[J] Biomaterials Science and Engineering ²

3.056[J] Materials Physics of Neural Interfaces

6.4800[J] Biomedical Imaging with MRI: From Technology to Computation Applications

6.4810[J] Cellular Neurophysiology and Computing

6.4820[J] Quantitative and Clinical Physiology

6.4900 Introduction to EECS via Medical Technology

6.8701[J] Computational Biology: Genomes, Networks, Evolution

6.8711[J] Computational Systems Biology: Deep Learning in the Life Sciences

7.33[J] Evolutionary Biology: Concepts, Models and Computation

9.17 Systems Neuroscience Laboratory ²

9.24 Disorders and Diseases of the Nervous System ²

9.26[J] Principles and Applications of Genetic Engineering for Biotechnology and Neuroscience ²

9.35 Perception

9.40 Introduction to Neural Computation ²

10.213 Chemical and Biological Engineering Thermodynamics

10.28 Chemical-Biological Engineering Laboratory

10.380[J] Viruses, Pandemics, and Immunity

10.424 Pharmaceutical Engineering

10.443 Future Medicine: Drug Delivery, Therapeutics, and Diagnostics ²

10.495 Molecular Design and Bioprocess Development of Immunotherapies ²

16.400 Human Systems Engineering

20.110[J] Thermodynamics of Biomolecular Systems

20.205[J] Principles and Applications of Genetic Engineering for Biotechnology and Neuroscience

20.230[J] Immunology

20.260 Computational Analysis of Biological Data

20.305[J] Principles of Synthetic Biology

20.309[J] Instrumentation and Measurement for Biological Systems

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| | |
|--------------------|---|
| 20.310[J] | Molecular, Cellular, and Tissue Biomechanics ² |
| 20.330[J] | Fields, Forces and Flows in Biological Systems |
| 20.BME | Undergraduate Research in Biomedical Engineering |
| Total Units | 78-84 |

A maximum of four subjects taken for the biomedical engineering minor can also count toward a major or another minor.

- ¹ Contact a minor advisor for additional 6–12 unit subjects that satisfy the requirement.
- ² Subject has prerequisites that are outside of the program.
- ³ At least one of the subjects must be taken outside the student's major. See the BME Minor website (<https://be.mit.edu/academic-programs/current-undergraduate/minor-programs/minor-program-biomedical-engineering>) for potential substitutions.
- ⁴ Approved biomedical engineering UROPs with sufficient medical focus carried out by students with junior or senior standing with prior approval may be substituted for up to 12 units.

Students should consult with their departmental BME minor advisor, preferably in sophomore year and no later than Add Date of spring term junior year, to choose a course of study, which must be approved in advance by the BME minor advisor. For the list of BME minor advisors and other information, please visit the Biological Engineering website (<http://be.mit.edu>) or contact the BE Academic Office, Room 16-267, 617-253-1712.