

# BACHELOR OF SCIENCE WITH A MAJOR IN BIOMEDICAL ENGINEERING (STEM)

GW's bachelor of science in biomedical engineering program is an innovative field that takes advantage of the unique combination of resources and opportunities through connections with GW's School of Medicine and Health Sciences and the George Washington University Hospital. The program also has well-developed relationships with biotech industries and world-class laboratories in the DC metropolitan area. Biomedical engineering students can choose from a broad range of disciplines such as biomechanics, electrical engineering, physiology, biology, and biotechnology. Students graduate well-prepared with what they learn in the classroom as well as in specialty laboratories, internships, and the program's design seminar. Whether their career aspirations are to be a doctor, researcher, or clinician, or to work as a business partner to develop related technologies, the biomedical engineering degree prepares its students for the future.

## Double major

SEAS and non-SEAS students interested in pursuing the BS in biomedical engineering as a double major should see Double Major under SEAS Regulations (<http://bulletin.gwu.edu/engineering-applied-science/#seasregulationstext>) in this Bulletin.

This is a STEM designated program.

Visit the program website (<http://www.bme.seas.gwu.edu/programs-degrees/>) for additional information.

## ADMISSIONS

For more information on the admission process, please visit the Office of Undergraduate Admissions website. Applications may be submitted via the Common Application.

Supporting documents not submitted online should be mailed to:  
Office of Undergraduate Admissions  
The George Washington University  
800 21st Street NW, Suite 100  
Washington DC 20052

Contact for questions:  
[gwadm@gwu.edu](mailto:gwadm@gwu.edu) or 202-994-6040

## REQUIREMENTS

The following requirements must be fulfilled:

Code	Title	Credits
<b>First semester</b>		
BISC 1111	Introductory Biology: Cells and Molecules	
BME 1010	Introduction to Biomedical Engineering	

CHEM 1111	General Chemistry I <sup>1,2</sup>
or CHEM 1113	General Chemistry for Engineers
MATH 1231	Single-Variable Calculus I <sup>1</sup>
SEAS 1001	Engineering Orientation
UW 1020	University Writing <sup>1</sup>
<b>Second semester</b>	
BISC 1112	Introductory Biology: The Biology of Organisms
BME 1020	Introduction to Biomedical Engineering <sup>1</sup>
CHEM 1112	General Chemistry II <sup>1,2</sup>
	or an elective, which can be any course offered by GW.
MATH 1232	Single-Variable Calculus II <sup>1</sup>
PHYS 1025	University Physics I with Biological Applications <sup>1</sup>
<b>Third semester</b>	
APSC 2113	Engineering Analysis I
BME 2810	Biomedical Engineering Seminar I
ECE 2110	Circuit Theory
MATH 2233	Multivariable Calculus <sup>1</sup>
PHYS 1026	University Physics II with Biological Applications <sup>1</sup>
<b>Fourth semester</b>	
BME 2815	Biomedical Engineering Seminar II
ECE 2210	Circuits, Signals, and Systems
	Programming elective I <sup>3</sup>
	Restricted engineering elective <sup>4</sup>
	Restricted engineering elective <sup>4</sup>
	Humanities, social science, or non-technical elective <sup>5</sup>
<b>Fifth semester</b>	
BME 3820	Engineering Analysis of Neural, Muscular, and Cardiovascular Physiology
BME 3825	Medical Measurement Laboratory
BME 4820	Anatomy and Physiology for Engineers
ECE 3220	Introduction to Digital Signal Processing

Programming elective II<sup>3</sup>

Technical elective<sup>6</sup>

BME 3910 Capstone Design Preparation

### Sixth semester

APSC 3115 Engineering Analysis III

BME 3915W Biomedical Engineering Capstone Project Lab I

Two Humanities, social science, or non-technical electives<sup>5</sup>

Two technical electives<sup>6</sup>

### Seventh semester

BME 4920W Biomedical Engineering Capstone Project Lab II

PHYS 3127 Biophysics: Macroscopic Physics in the Life Sciences

Humanities, social science, or non-technical elective<sup>5</sup>

Technical elective<sup>6</sup>

BME elective<sup>7</sup>

### Eighth semester

BME 4925W Biomedical Engineering Capstone Project Lab III

PHIL 2135 Ethics in Business and the Professions

Humanities, social science, or non-technical elective<sup>5</sup>

Technical elective<sup>6</sup>

Science elective<sup>8</sup>

<sup>1</sup>Course satisfies the University General Education Requirement (<http://bulletin.gwu.edu/university-regulations/general-education/>) in math, science, and writing.

<sup>2</sup>Students take either CHEM 1111 in the first semester and CHEM 1112 in the second semester; or CHEM 1113 in the first semester and an elective in the second semester

<sup>3</sup>One pair of programming electives selected from the following:

Code	Title	Credits
CSCI 1111	Introduction to Software Development	
or CSCI 1112	Algorithms and Data Structures	
ECE 1120	C Programming for Electrical and Computer Engineering	

or ECE 1125 Data Structures and Algorithms for ECE

MAE 1117 Introduction to Engineering Computations

or MAE 2117 Engineering Computations

<sup>4</sup>Two restricted engineering electives. Potential selections include:

Code	Title	Credits
APSC 2057	Analytical Mechanics I	
APSC 2058	Analytical Mechanics II	
CE 2220	Introduction to the Mechanics of Solids	
ECE 2115	Engineering Electronics	
ECE 2140	Design of Logic Systems	
ECE 3310	Introduction to Electromagnetics	
MAE 2131	Thermodynamics	

<sup>5</sup>At least two social and behavioral sciences courses must be selected from the University General Education Requirement list (<http://bulletin.gwu.edu/university-regulations/general-education/>); the remaining course must be selected from either the University General Education Requirement list or the SEAS Humanities, Social Science, and Non-Technical Elective Requirement list (<https://www.seas.gwu.edu/humanities-and-social-science-requirement/>). At least one humanities course must be selected from the University General Education Requirement list; the remaining two courses must be selected from either the University General Education Requirement list or the SEAS General Education Requirement list.

<sup>6</sup>All technical electives must be approved by the academic advisor and must include at least three courses approved by the advisor as having engineering content.

<sup>7</sup>BME course taken at the 3000 or 4000 level.

<sup>8</sup>One science elective selected from the following:

Code	Title	Credits
CHEM 3165	Biochemistry I	
PHYS 3128	Biophysics: Microscopic Physics in the Life Sciences	

## COMBINED PROGRAMS

### Combined programs

- Dual Bachelor of Science with a major in biomedical engineering and Master of Science in the field of biomedical engineering (<http://bulletin.gwu.edu/engineering-applied-science/>)

biomedical-engineering/combined-bs-ms-biomedical-engineering/)

- Dual Bachelor of Science with a major in biomedical engineering and Master of Science in the field of computer science (<http://bulletin.gwu.edu/engineering-applied-science/biomedical-engineering/combined-bs-biomedical-engineering-ms-computer-science/>)