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 or 202-994-6040

**REQUIREMENTS**

The following requirements must be fulfilled:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEM 1111</td>
<td>General Chemistry I ¹,²</td>
<td></td>
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<tr>
<td>or CHEM 1113</td>
<td>General Chemistry for Engineers</td>
<td></td>
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<tr>
<td>MATH 1231</td>
<td>Single-Variable Calculus I ¹</td>
<td></td>
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<tr>
<td>SEAS 1001</td>
<td>Engineering Orientation</td>
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<tr>
<td>UW 1020</td>
<td>University Writing ¹</td>
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**Second semester**

BISC 1112  Introductory Biology: The Biology of Organisms

BME 1020  Introduction to Biomedical Engineering ¹

CHEM 1112  General Chemistry II ¹,²

or an elective, which can be any course offered by GW.

MATH 1232  Single-Variable Calculus II ¹

PHYS 1025  University Physics I with Biological Applications ¹

**Third semester**

APSC 2113  Engineering Analysis I

BME 2810  Biomedical Engineering Seminar I

ECE 2110  Circuit Theory

MATH 2233  Multivariable Calculus ¹

PHYS 1026  University Physics II with Biological Applications ¹

**Fourth semester**

BME 2815  Biomedical Engineering Seminar II

ECE 2210  Circuits, Signals, and Systems

Programming elective ³

Restricted engineering elective ⁴

Restricted engineering elective ⁴

Humanities, social science, or non-technical elective ⁵

**Fifth semester**

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

Technical elective

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

Two technical electives

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

Technical elective

BME elective

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

Technical elective

Science elective

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

2. 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

3. One pair of programming electives selected from the following:

<table>
<thead>
<tr>
<th>Code</th>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CSCI 1111</td>
<td>Introduction to Software Development</td>
<td></td>
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<tr>
<td>or CSCI 1112</td>
<td>Algorithms and Data Structures</td>
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<tr>
<td>ECE 1120</td>
<td>C Programming for Electrical and Computer Engineering</td>
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</tr>
</tbody>
</table>

4. Two restricted engineering electives. Potential selections include:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>APSC 2057</td>
<td>Analytical Mechanics I</td>
<td></td>
</tr>
<tr>
<td>APSC 2058</td>
<td>Analytical Mechanics II</td>
<td></td>
</tr>
<tr>
<td>CE 2220</td>
<td>Introduction to the Mechanics of Solids</td>
<td></td>
</tr>
<tr>
<td>ECE 2115</td>
<td>Engineering Electronics</td>
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<tr>
<td>ECE 2140</td>
<td>Design of Logic Systems</td>
<td></td>
</tr>
<tr>
<td>ECE 3310</td>
<td>Introduction to Electromagnetics</td>
<td></td>
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<tr>
<td>MAE 2131</td>
<td>Thermodynamics</td>
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</tr>
</tbody>
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5. 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.

6. 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.

7. BME course taken at the 3000 or 4000 level.

8. One science elective selected from the following:

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</thead>
<tbody>
<tr>
<td>CHEM 3165</td>
<td>Biochemistry I</td>
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<tr>
<td>PHYS 3128</td>
<td>Biophysics: Microscopic Physics in the Life Sciences</td>
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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/)

Bachelor of Science with a Major in Biomedical Engineering (STEM)
• 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/)