

BACHELOR OF SCIENCE WITH A MAJOR IN PHYSICS (STEM)

The bachelor of science in physics program trains students for careers as practicing physicists or for graduate-level education. The program also prepares students for professional environments that require scientific thinking, critical thinking, and problem-solving skills.

The BS program has a stronger focus on computer science and mathematics, as well as more physics courses, than the BA in physics program (<https://physics.columbian.gwu.edu/ba-physics/>). In both the BS and BA curricula, students take a capstone course (<https://physics.columbian.gwu.edu/bs-physics/#capstone>). In the BS, students also complete a required 3-credit undergraduate research course (<https://physics.columbian.gwu.edu/undergraduate-research-courses/>) in biophysics, nuclear physics, or astrophysics.

This is a STEM designated program.

Visit the program website (<https://physics.columbian.gwu.edu/bs-physics/>) for additional information.

ADMISSIONS

For information about the admission process, including deadlines, visit the Office of Undergraduate Admissions website (<https://undergraduate.admissions.gwu.edu/>). Applications can be submitted via the Common Application (<https://go.gwu.edu/commonapp/>).

Supporting documents not submitted online should be mailed to:

Office of Undergraduate Admissions
The George Washington University
800 21st St NW Suite 100
Washington, DC 20052

For questions visit undergraduate.admissions.gwu.edu/contact-us (<http://undergraduate.admissions.gwu.edu/contact-us/>).

REQUIREMENTS

The following requirements must be fulfilled:

The general requirements stated under Columbian College of Arts and Sciences, Undergraduate Programs (<https://bulletin.gwu.edu/arts-sciences/#degreeregulationstext>).

Program-specific curriculum:

| Code | Title | Credits |
|-----------------------------------|---|---------|
| Required | | |
| Introductory courses (26 credits) | | |
| CSCI 1012 | Introduction to Programming with Python | |

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| or MAE 1117 | Introduction to Engineering Computations |
| PHYS 1021 | University Physics I |
| or PHYS 1025 | University Physics I with Biological Applications |
| PHYS 1022 | University Physics II |
| or PHYS 1026 | University Physics II with Biological Applications |
| PHYS 2023 | Modern Physics |
| MATH 1231 | Single-Variable Calculus I |
| MATH 1232 | Single-Variable Calculus II |
| MATH 2233 | Multivariable Calculus |
| MATH 2184 | Linear Algebra I |
| Advanced courses (46 credits) | |
| MATH 3342 | Ordinary Differential Equations |
| PHYS 2151W | Intermediate Laboratory I: Techniques and Methods |
| PHYS 2152 | Intermediate Laboratory II: Instrumentation |
| PHYS 3100 | Math Methods for Physics |
| PHYS 3161 | Mechanics |
| PHYS 3164 | Thermal and Statistical Physics |
| PHYS 3165 | Electromagnetic Theory I |
| PHYS 3166 | Electromagnetic Theory II |
| PHYS 3167 | Principles of Quantum Physics |
| PHYS 3181 | Computational Physics |
| PHYS 4195W | Physics Capstone |
| PHYS 4196 | Undergraduate Research in Biophysics |
| or PHYS 4197 | Undergraduate Research in Nuclear Physics |
| or ASTR 4195 | Undergraduate Research in Astrophysics |
| PHYS 4200 | Physics Symposium |

Electives

Three courses (9 credits) in Physics (PHYS) numbered 3000 or above and/or Astronomy (ASTR) numbered 2000 or above.

GENERAL EDUCATION

In addition to the University General Education Requirement (<https://bulletin.gwu.edu/university-regulations/general-education/>), undergraduate students in Columbian College must

complete a further, College-specific general education curriculum—Perspective, Analysis, Communication (G-PAC) (<https://bulletin.gwu.edu/arts-sciences/gpac/>) as well as the course CCAS 1001 First-Year Experience. Together with the University General Education Requirement, G-PAC engages students in active intellectual inquiry across the liberal arts. Students achieve a set of learning outcomes that enhance their analytical skills, develop their communication competencies, and invite them to participate as responsible citizens who are attentive to issues of culture, diversity, and privilege.

Coursework (<https://bulletin.gwu.edu/university-regulations/general-education/#generaleducationtext>) **for the University General Education Requirement is distributed as follows:**

- One course in critical thinking in the humanities.
- Two courses in critical thinking, quantitative reasoning, or scientific reasoning in the social sciences.
- One course that has an approved oral communication component.
- One course in quantitative reasoning (must be in mathematics or statistics).
- One course in scientific reasoning (must be in natural and/or physical laboratory sciences).
- UW 1020 (<https://bulletin.gwu.edu/search/?P=UW%201020>) University Writing (4 credits).
- After successful completion of UW 1020, 6 credits distributed over at least two writing in the discipline (WID) courses taken in separate semesters. WID courses are designated by a "W" appended to the course number.

Coursework for the CCAS G-PAC requirement is distributed as follows:

- Arts—one approved arts course that involves the study or creation of artwork based on an understanding or interpretation of artistic traditions or knowledge of art in a contemporary context.
- Global or cross-cultural perspective—one approved course that analyzes the ways in which institutions, practices, and problems transcend national and regional boundaries.
- Local or civic engagement—one approved course that develops the values, ethics, disciplines, and commitment to pursue responsible public action.
- Natural or physical science—one additional approved laboratory course that employs the process of scientific inquiry (in addition to the one course in this category required by the University General Education Requirement).
- Humanities—one additional approved humanities course that involves critical thinking skills (in addition to the one course in this category required by the University General Education Requirement).
- CCAS 1001 First-Year Experience

Certain courses are approved to fulfill GPAC requirements in more than one category.

Courses taken in fulfillment of G-PAC requirements may also be counted toward majors or minors. Transfer courses taken prior to, but not after, admission to George Washington University may count toward the University General Education Requirement and G-PAC, if those transfer courses are equivalent to GW courses that have been approved by the University and the College.

Lists of approved courses in the above categories are included on each undergraduate major's (<https://bulletin.gwu.edu/arts-sciences/#majorstext>) page in this Bulletin.

SPECIAL HONORS

In addition to the general requirements stated under University Regulations, in order to be considered for graduation with Special Honors, a student must submit for departmental approval an honors thesis based on a two-semester research project. In addition, the student must have a cumulative grade-point average of at least 3.5 in physics courses and 3.5 overall.