BACHELOR OF SCIENCE WITH A MAJOR IN COGNITIVE NEUROSCIENCE (STEM)

GW’s innovative bachelor of science in cognitive neuroscience program allows students to gain fluency in cognitive neuroscience, develop their analytical thinking, and refine their ability to present compelling scientific arguments in both written and oral form.

In the classroom, neuroscience students learn the fundamental theories, methods, and results involved in neurobiology, cognitive neuroscience, and the study of complex behavior. High-achieving students often assist in undergraduate research (https://psychology.columbian.gwu.edu/undergraduate-student-research/), external internships, and honors (https://psychology.columbian.gwu.edu/undergraduate-student-resources/) seminars in special topics.

This is a STEM designated program.

Visit the program website (https://psychology.columbian.gwu.edu/) 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/#degreeregulationtext).

Program-specific curriculum:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BISC 1112</td>
<td>Introductory Biology: The Biology of Organisms</td>
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<tr>
<td>MATH 1220</td>
<td>Calculus with Precalculus I</td>
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<td>or MATH 1231</td>
<td>Single-Variable Calculus I</td>
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<tr>
<td>MATH 1221</td>
<td>Calculus with Precalculus II</td>
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<td>Two courses (6 credits) in analytical methods selected from the following:</td>
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<tr>
<td>CSCI 1011</td>
<td>Introduction to Programming with Java</td>
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<tr>
<td>CSCI 1012</td>
<td>Introduction to Programming with Python</td>
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<tr>
<td>DATS 1001</td>
<td>Data Science for All</td>
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<tr>
<td>PUBH 3201</td>
<td>Introduction to Bioinformatics</td>
<td></td>
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<tr>
<td>STAT 1127</td>
<td>Statistics for the Biological Sciences</td>
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<td>Three gateway courses (9 to 10 credits) that introduce core concepts, selected from the following:</td>
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<tr>
<td>ANAT 2160</td>
<td>Human Functional Neuroanatomy</td>
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<tr>
<td>ANTH 1005</td>
<td>The Biological Bases of Human Behavior</td>
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<tr>
<td>BISC 2320</td>
<td>Neural Circuits and Behavior</td>
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<tr>
<td>PHIL 1153</td>
<td>The Meaning of Mind</td>
<td></td>
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<tr>
<td>PHIL 2045</td>
<td>Introduction to Logic</td>
<td></td>
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<tr>
<td>PSYC 2014</td>
<td>Cognitive Psychology</td>
<td></td>
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<tr>
<td>PSYC 2015</td>
<td>Biological Psychology</td>
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<tr>
<td>SLHS 2106</td>
<td>Neural Substrates of Speech, Language, and Hearing</td>
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<tr>
<td>SLHS 2131</td>
<td>Language Acquisition and Development</td>
<td></td>
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<tr>
<td>SLHS 2135</td>
<td>Language: Structure, Meaning, and Use</td>
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<td>Six intermediate content courses (18 credits), which must include two courses from cellular/molecular/systems neuroscience group and four from the cognitive science/cognitive neuroscience group:</td>
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<tr>
<td>Cellular/molecular/systems neuroscience</td>
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<td>ANTH 3413</td>
<td>Evolution of the Human Brain</td>
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<td>BISC 2220</td>
<td>Developmental Neurobiology</td>
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<td>BISC 3320</td>
<td>Human Neurobiology</td>
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<tr>
<td>PSYC 3181</td>
<td>Introduction to Psychopharmacology</td>
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<tr>
<td>Cognitive science/cognitive neuroscience</td>
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<tr>
<td>ANTH 3503</td>
<td>Psychological Anthropology</td>
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PHIL 3121 Symbolic Logic
PHIL 3153 Mind, Brain, and Artificial Intelligence
PSYC 3115 Developmental Psychopathology
PSYC 3118 Neuropsychology
PSYC 3119 Cognitive Science in the District
PSYC 3120 Neuroscience of Consciousness
PSYC 3121 Memory and Cognition
PSYC 3122 The Cognitive Neuroscience
PSYC 3124 Visual Perception
PSYC 3127 Social and Affective Neuroscience
PSYC 3128 Health Psychology
PSYC 3180 Seminar in Cognitive Science
SLHS 3116 Brain and Language
SLHS 3117 Hearing and Perception
SLHS 3132 Literacy
SLHS 3133 Autism

One research/laboratory experience (3 to 4 credits) in the Biology (BISC), Psychological and Brain Sciences (PSYC), or supervised internships/independent research projects taken for course credit in PSYC or Speech, Language, and Hearing Sciences (SLHS) departments:

BISC 2452 & BISC 2453 Animal Behavior and Animal Behavior Laboratory
PSYC 4106W Research Lab in Sensation and Perception
PSYC 4107W Research Lab in Cognitive Neuroscience
PSYC 3591 Supervised Research Internship
PSYC 4591 Independent Research
SLHS 4196 Independent Study (taken for at least 3 credits)

Four advanced content courses (12 to 16 credits) selected from the following:

ANTH 3401 Human Functional Anatomy
ANTH 3402 Human Evolutionary Anatomy
ANTH 3412 Hominin Evolution
or ANTH 3412W Hominin Evolution

Bachelor of Science with a Major in Cognitive Neuroscience (STEM)
In addition to the University General Education Requirement (https://bulletin.gwu.edu/university-regulations/general-education/#generaleducationtext), 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

1 CSCI 1012 is recommended but not required to fulfill this requirement.

2 If a student wishes to take a Statistics course to fulfill this requirement, STAT 1127 is recommended but an equivalent STAT course may be substituted.

3 The research/laboratory experience requirement can also be fulfilled by taking any of the independent research courses offered by the associated departments. Courses that can be taken to fulfill the requirement are listed in the advanced content section with the footnote. All courses so noted can be taken multiple times and each enrollment can be applied to either the advanced content or the research experience requirement. Note that each independent research course can be applied to either the lab or the elective requirement and not to both at the same time.

4 These courses could have GPA requirements and require the permission of the instructor. Students should contact the relevant departments for more information. Each course must be taken for a total of at least 3 credits to count toward the requirement.

**GENERAL EDUCATION**

In addition to the University General Education Requirement (https://bulletin.gwu.edu/university-regulations/general-education/#generaleducationtext), 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

1 CSCI 1012 is recommended but not required to fulfill this requirement.

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4 These courses could have GPA requirements and require the permission of the instructor. Students should contact the relevant departments for more information. Each course must be taken for a total of at least 3 credits to count toward the requirement.
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.