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

This Bulletin covers the degree requirements for students matriculating in the current academic year. Students who matriculated before the current year can find their requirements in the relevant archived Bulletin (https://bulletin.gwu.edu/archives/).

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		
11 to 14 credits in introductory natural science courses, including 8 credits in biological sciences and 3 or 6 credits in mathematics.		
BISC 1111	Introductory Biology: Cells and Molecules	
BISC 1112	Introductory Biology: The Biology of Organisms	
MATH 1220 & MATH 1221	Calculus with Precalculus I and Calculus with Precalculus II	
or MATH 1231	Single-Variable Calculus I	
Two courses (6 credits) in analytical methods selected from the following:		
CSCI 1011	Introduction to Programming with Java	
CSCI 1012	Introduction to Programming with Python [1]	
DATS 1001	Data Science for All	
PUBH 3201	Introduction to Bioinformatics	
STAT 1127	Statistics for the Biological Sciences [2]	
Three gateway courses (9 to 10 credits) that introduce core concepts, selected from the following:		
ANAT 2160	Human Functional Neuroanatomy	
ANTH 1005	The Biological Bases of Human Behavior	
BISC 2320	Neural Circuits and Behavior	
PHIL 1153	The Meaning of Mind	
PHIL 2045	Introduction to Logic	
PSYC 2014	Cognitive Psychology	
PSYC 2015	Biological Psychology	
SLHS 2106	Neural Substrates of Speech, Language, and Hearing	
SLHS 2131	Language Acquisition and Development	
SLHS 2135	Language: Structure, Meaning, and Use	
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:		
Cellular/molecular/systems neuroscience		
ANTH 3413	Evolution of the Human Brain	

BISC 2220	Developmental Neurobiology
BISC 3320	Human Neurobiology
PSYC 3181	Introduction to Psychopharmacology
Cognitive science/cognitive neuroscience	
ANTH 3503	Psychological Anthropology
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: [3]	
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
ANTH 3491	Topics in Biological Anthropology [4]
ANTH 3501	Anthropology of Development
ANTH 3601	Language, Culture, and Cognition
ANTH 3603	Psycholinguistics
ANTH 3691	Special Topics in Linguistic Anthropology [4]
ANTH 3995	Undergraduate Research [4]
BISC 3165	Biochemistry I
BISC 3166	Biochemistry II
BISC 3209	Molecular Biology
BISC 3320	Human Neurobiology
BISC 4132	Advanced Cellular-Molecular Biology
BISC 4171	Undergraduate Research [4]
or BISC 4171W	Undergraduate Research
BISC 4172	[4]
or BISC 4172W	Research Internship and Writing in Biology
CHEM 2151 & CHEM 2153	Organic Chemistry I and Organic Chemistry Laboratory I
CHEM 2152 & CHEM 2154	Organic Chemistry II and Organic Chemistry Laboratory II
CHEM 4195	Undergraduate Research [4]
PHIL 3121	Symbolic Logic
PHIL 3151	Philosophy of Science
or PHIL 3151W	Philosophy and Science
PHIL 3152	Theory of Knowledge
PHIL 3153	Mind, Brain, and Artificial Intelligence
PHIL 3251	Philosophy of Biology
PHIL 4196	Topics in Theory of Knowledge [4]
PHIL 4199	Readings and Research [4]

or PHIL 4199W	Readings and Research
PSYC 3116	Brain and Language
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 3180	Seminar in Cognitive Science
PSYC 3198	Current Research Issues [4]
PSYC 3199	Current Topics in Psychology [4]
PSYC 3591	Supervised Research Internship [4]
PSYC 4106W	Research Lab in Sensation and Perception
PSYC 4107W	Research Lab in Cognitive Neuroscience
PSYC 4591	Independent Research [4]
PSYC 4997	Honors Seminar
PUBH 3201	Introduction to Bioinformatics
SLHS 3117	Hearing and Perception
SLHS 3132	Literacy
SLHS 3133	Autism
SLHS 4196	Independent Study [4]
STAT 3119	Design and Analysis of Experiments

[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 [4]. 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/), undergraduate students in Columbian College must complete a further, College-specific general education curriculum —Perspective, Analysis, Communication (G-PAC) (https://advising.columbian.gwu.edu/general-education-curriculum-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 University Writing
- After successful completion of UW 1020, 6 credits distributed over at least two different Writing in the Disciplines (WID) courses taken in separate semesters (summer counts as one semester). 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 can also be counted toward majors or minors. Transfer courses taken prior to, but not after, admission to George Washington University can 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.