

# Cognitive and Behavioral Neuroscience Major

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## About

The major in Cognitive and Behavioral Neuroscience (CBN) provides an intensive course of study focused on brain-behavior relationships, ranging from genetic to whole brain contributions to behavior and mental processes. The program is excellent preparation for a variety of careers focusing on research and/or practice in neuroscience, medicine, allied health fields, and psychology, as well as for more general careers in areas such as public policy and education.

**Program:** [Psychological and Brain Sciences](#)

**Type:** Bachelor of Science

## PRIMARY MAJOR (122 credits)

Students are accepted into Villanova University as declared CBN majors. Therefore, prospective students who are interested in the major should select the CBN program when applying to the University. Students who have already entered Villanova may appeal directly to the Department of Psychological and Brain Sciences for special permission into the major.

## Required Major Courses (65 credits)

### Program Notes:

- PSY 2900 is a topics course and the topic must be approved for it to count as a CBN elective. The following topics have been approved: “Drugs & Behavior”, “Emotion”, “Neuroethics”. Other topics do not count without approval.
- BIO 4950 is a topics course and the topic must be approved for it to count as a CBN elective. The following topic has been approved: “Sex, Brains & Behavior. Other topics do not count without approval.
- PSY 5900 is an independent research course and can count as a CBN elective only with pre-approval

<b>Course</b>	<b>Title</b>	<b>Credits</b>
CHM 1151	General Chemistry I	4
CHM 1103	General Chemistry Lab I	1
CHM 1152	General Chemistry II	4
CHM 1104	General Chemistry Lab II	1
BIO 2105	General Biology I	4
BIO 2106	General Biology II	4
BIO 3351	Genetics	4
	MAT 1312 or MAT 1500	4
	MAT 1314 or MAT 1505	3-4
	PSY 1000 or PSY 1001 for CBN	3
PSY 2000	Intro Statistics	3
PSY 2050	Research Methods in Psy.	3
PSY 4200	Biopsychology	3
PSY 4500	Cognitive Psychology	3
CBN 4000	Cell & Behavioral Neuroscience	3
CBN 4100	Cognitive Neuroscience	3
	CBN 5000 or CBN 6002	3
	CBN Approved Elective	12

## Core Curriculum Requirements (27 credits)

Biochemistry Majors meet the following core requirements in the major and therefore are omitted from the summary below:

- Core Math (3 cr)
- Social Sciences (6 cr)
- Natural Science (8 cr)

<b>Course</b>	<b>Title</b>	<b>Credits</b>
ACS 1000	Ancients	3
ACS 1001	Moderns	3
THL 1000	Faith, Reason, and Culture	3
PHI 1000	Knowledge, Reality, Self	3
ETH 2050	The Good Life:Eth & Cont Prob	3
	Literature and Writing Seminar (1 course)	3
	History (1 course)	3
	Fine Arts (1 course)	3
	Upper-Level Theology (1 course)	3
	Language Requirement	
	Diversity Requirement (2 courses)	

## Free Elective Requirement (30 credits)

Students with a Cognitive & Behavioral Neuroscience primary major have thirty (30) required free elective credits.

## Degree Credit Summary

- **Major Credits:** 65 credits
- **Core Credits:** 27 credits
- **Free Electives Credits:** 30 credits
- **Total Required Credits:** 122 Credits

*Note: The above credit totals are based on the minimum number of required credits in each degree area. The minimum number of required credits in each area listed above must be met. Credits taken beyond the required minimum for one area may not be applied to another area.*

## SECONDARY MAJOR

Students who declare Cognitive & Behavioral Neuroscience as a **secondary major** must complete the Required Major Courses to achieve this major. Students are able to count any eligible course taken in their primary major, the core curriculum, minors, concentrations, or free electives toward these requirements.

## Category Descriptions

### MAT 1312 or MAT 1500

Credits: 4

#### **Biochemistry Majors:**

MAT 1312 may only count toward the requirements of the biochemistry major with permission of the program director.

#### **CBN Majors:**

- MAT 1312 and MAT 1314 must be taken as a sequence.
- MAT 1500 and MAT 1505 must be taken as a sequence.

<b>Course</b>	<b>Title</b>	<b>Credits</b>
MAT 1312	Biocalculus	4
MAT 1500	Calculus I	4

### MAT 1314 or MAT 1505

Credits: 3-4

- MAT 1312 and MAT 1314 must be taken as a sequence.
- MAT 1500 and MAT 1505 must be taken as a sequence.

<b>Course</b>	<b>Title</b>	<b>Credits</b>
MAT 1314	Modeling for the Life Sciences	3
MAT 1505	Calculus II	4

### PSY 1000 or PSY 1001 for CBN

Credits: 3

- PSY 1001 is recommended by the department.

<b>Course</b>	<b>Title</b>	<b>Credits</b>
PSY 1000	General Psychology	3
PSY 1001	Intro to Brain and Behavior	3

### CBN 5000 or CBN 6002

Credits: 3

<b>Course</b>	<b>Title</b>	<b>Credits</b>
CBN 5000	Seminar in Neuroscience	3
CBN 6002	Thesis Research II	3

### CBN Approved Elective

Credits: 12

CBN students are required to take four elective courses. Although the electives are organized into four categories, there is no requirement to use this organization when selecting electives. Students can choose to concentrate in a particular area by taking electives from one category or they can sample broadly across any or all categories.

Notes:

- Students should consult individual courses via the courses tool to determine pre-requisites.
- The 1-credit lab is optional when taking BIO 4251 and CHM 4611.
- BIO 4950 courses offered are available in the Master Schedule accessible through MyNova but must be approved by the CBN program.
  - Already pre-approved as CBN elective: “Sex, Brains & Behavior”
- CHM 4621 is recommended for Chemistry and Biochemistry majors.
- PSY 2900 courses offered are available in the Master Schedule accessible through MyNova but must be approved by the CBN program.
- There is restriction such that no more than 2 courses (6 credits) of the CBN elective requirement may come from: PSY 5900, CBN 5900, CBN 6001, CBN 6002.
- Any course with the Cognitive and Behavioral Neuroscience attribute (CBN) may also count toward fulfilling the electives requirement.

## Category 1 - Behavioral/Psychological Science

<b>Course</b>	<b>Title</b>	<b>Credits</b>
PSY 3200	Human Development	3
PSY 3300	Perception	3
PSY 3500	Psych of Personality	3
PSY 3600	Social Psychology	3
PSY 3700	Psychopathology	3
PSY 3800	Clinical Psychology	3
PSY 4600	Animal Learning & Cognition	3

## Category 2 - Biological/Life Science

<b>Course</b>	<b>Title</b>	<b>Credits</b>
BIO 3015	Animal Behavior	4
BIO 3055	Human Physiology	4
BIO 4205	Cell Biology	4
BIO 4251	Endocrine Physiol/Pharmacology	3
BIO 4285	Developmental Biology	4
BIO 4305	Evolution	4
BIO 4505	Molecular Biology	4
BIO 4605	Neurobiology	4
BIO 4950	Advanced Topics in Biology	3
CHM 4611	Survey of Biochemistry	3
CHM 4621	Biochemistry I: Structure	3

## Category 3 - Cognitive Science

<b>Course</b>	<b>Title</b>	<b>Credits</b>
PHI 4610	Philosophy of Mind	3
CGS 5900	Cognitive Science Seminar	3
CGS 5910	Psychology of Language	3
CSC 4500	Artificial Intelligence	3
CSC 4510	Machine Learn&Theory&Evolution	3

## Category 4 - Special Topics & Research

- CBN 6002 generally counts as the required capstone course and NOT as an elective. It may count as an elective only if CBN 5000 is taken as the required capstone option.
- Courses above the 5000-level require approval from the department for enrollment.

<b>Course</b>	<b>Title</b>	<b>Credits</b>
CBN 2900	Topics in Cog & Behav Neuro	3
CBN 5900	Undergraduate Research in CBN	3
PSY 5900	Independent Research Project	3
CBN 6001	Thesis Research I	3
CBN 6002	Thesis Research II	3