

# Behavioral Neuroscience, BS

The behavioral neuroscience curriculum focuses on the biological bases underlying behavior under normal and pathological states. The program combines the disciplines of biology and psychology with a strong background in basic physical sciences and mathematics to understand how the behavior of humans and animals is controlled by physiological systems. Students gain a solid foundation in the anatomical and functional specializations of the brain and neural mechanisms from neurons to circuits to networks. Students then choose from a range of advanced electives, including those that make up the behavioral neuroscience core, to delve deeply into diverse specializations and current topics in the field.

*Note:* Due to overlap in course content, double majoring in behavioral neuroscience with any of the following majors is not permitted: psychology, biology, cell and molecular biology, or biochemistry.

## Program Requirements

Complete all courses listed below unless otherwise indicated. Also complete any corequisite labs, recitations, clinicals, or tools courses where specified and complete any additional courses needed beyond specific college and major requirements to satisfy graduation credit requirements.

## Universitywide Requirements

All undergraduate students are required to complete the Universitywide Requirements (<http://catalog.northeastern.edu/undergraduate/university-academics/university-wide-requirements/>).

## NUpath Requirements

All undergraduate students are required to complete the NUpath Requirements (<http://catalog.northeastern.edu/undergraduate/university-academics/nupath/>).

## Behavioral Neuroscience Core Requirements

Code	Title	Hours
Complete five of the following courses. At least three must be numbered in the 4000–5999 range:		20-21
BIOL 3403	Animal Behavior	
BIOL 3415	Current Topics in Behavioral Neuroscience	
BIOL 3601	Neural Systems and Behavior	
BIOL 3605	Developmental Neurobiology	
BIOL 4705	Neurobiology of Cognitive Decline	
BIOL 4709	Neurobiology of Learning and Memory	
BIOL 5587	Comparative Neurobiology	
or BIOL 3405	Neurobiology	
BIOL 5595	Cell and Molecular Neuroscience	
BIOL 5601	Multidisciplinary Approaches in Motor Control	
PSYC 3506	Neuropsychology of Fear	
PSYC 3508	Behavioral Endocrinology	
PSYC 3510	Brain, Behavior, and Immunity	
PSYC 4510	Psychopharmacology	
PSYC 4512	Neuropsychology	
PSYC 4514	Clinical Neuroscience	
PSYC 4570	Behavioral Genetics	
PT 5410 and PT 5411	Functional Human Neuroanatomy and Lab for PT 5410	
One course may be a research or experiential course:		
BIOL 4991	Research	
BIOL 4994	Internship	
BIOL 4970	Junior/Senior Honors Project 1	
BIOL 4971	Junior/Senior Honors Project 2	
BNSC 4994	Internship	
BNSC 4970	Junior/Senior Honors Project 1	
BNSC 4971	Junior/Senior Honors Project 2	
PSYC 4540	Quantitative Topics in Psychology and Behavioral Neuroscience	
PSYC 4550	Basic Principles of Magnetic Resonance Physics and Applications in Neuroscience	

PSYC 4624	Laboratory in Affective Science
PSYC 4626	Laboratory in Life-Span Emotional Development
PSYC 4991	Directed Study Research
PSYC 4994	Internship in Psychology
PSYC 4965	Undergraduate Teaching Experience
PSYC 4970	Junior/Senior Honors Project 1
PSYC 4971	Junior/Senior Honors Project 2

## Behavioral Neuroscience Advanced Courses

Code	Title	Hours
<b>Psychology Elective</b>		
An additional behavioral neuroscience core course may be used to fulfill this requirement.		
Complete one of the following:		
		4
PSYC 3404	Developmental Psychology	
PSYC 3406	Clinical Psychology and Mental Health	
PSYC 3450	Learning and Motivation	
PSYC 3451	Learning Principles and Behavior Analysis	
PSYC 3452	Sensation and Perception	
PSYC 3464	Psychology of Language	
PSYC 3466	Cognition	
PSYC 4524	Cognitive Development	
<b>Biology Elective</b>		
Complete one of the following:		
		4-5
BIOL 3401	Comparative Vertebrate Anatomy	
BIOL 3409	Current Topics in Biology	
BIOL 3411	Current Topics in Cell and Molecular Biology	
BIOL 3421 and BIOL 3422	Microbiology and Lab for BIOL 3421	
BIOL 3603	Mammalian Systems Physiology	
BIOL 3611 and BIOL 3612	Biochemistry and Lab for BIOL 3611	
BIOL 4707	Cell and Molecular Biology	
BIOL 5543	Stem Cells and Regeneration	
BIOL 5569	Advanced Microbiology	
BIOL 5573	Medical Microbiology	
BIOL 5581	Biological Imaging	
BIOL 5591	Advanced Genomics	
BIOL 5593	Cell and Molecular Biology of Aging	
<b>Capstone Course</b>		
Complete one of the following:		
		4
BIOL 4701	Biology Capstone	
PSYC 4654 to PSYC 4678		

## Behavioral Neuroscience Major Requirements

Code	Title	Hours
<b>Foundation Courses</b>		
BNSC 1000	Behavioral Neuroscience at Northeastern	1
PSYC 1101	Foundations of Psychology	4
PSYC 3458	Biological Psychology	4
PSYC 3200	Clinical Neuroanatomy	4
BIOL 1107 and BIOL 1108	Foundations of Biology and Lab for BIOL 1107	5
BIOL 2299	Inquiries in Biological Sciences	4
BIOL 2301 and BIOL 2302	Genetics and Molecular Biology and Lab for BIOL 2301	5

BIOL 2309	Biology Project Lab	4
Complete one of the following. Students who receive transfer credit for the Advanced Placement Statistics exam may complete the 1 SH PSYC 2315 course (requires department permission).		4-5
ENVR 2500 and ENVR 2501	Biostatistics and Lab for ENVR 2500	
PSYC 2320	Statistics in Psychological Research	
<b>Breadth Courses</b>		
MATH 1251 or MATH 1241	Calculus and Differential Equations for Biology 1 Calculus 1	4
CHEM 1161 and CHEM 1162	General Chemistry for Science Majors and Lab for CHEM 1161	5
CHEM 2311 and CHEM 2312	Organic Chemistry 1 and Lab for CHEM 2311	5
CHEM 2313 and CHEM 2314	Organic Chemistry 2 and Lab for CHEM 2313	5
Complete one of the following:		5
DS 2000 and DS 2001	Programming with Data and Data Science Programming Practicum	
PHYS 1145 and PHYS 1146	Physics for Life Sciences 1 and Lab for PHYS 1145	
PHYS 1151 and PHYS 1152 and PHYS 1153	Physics for Engineering 1 and Lab for PHYS 1151 and Interactive Learning Seminar for PHYS 1151	
PHYS 1161 and PHYS 1162 and PHYS 1163	Physics 1 and Lab for PHYS 1161 and Recitation for PHYS 1161	
PHYS 1171 and PHYS 1172 and PHYS 1173	Physics 1 for Bioscience and Bioengineering and Lab for PHYS 1171 and Interactive Learning Seminar for PHYS 1171	

### Behavioral Neuroscience Major Credit/GPA Requirement

Complete 90 semester hours in the major with a minimum 2.000 GPA.

Due to overlap in course content, double majoring in behavioral neuroscience with any of the following majors is not permitted: psychology, biology, cell and molecular biology, or biochemistry.

### Program Requirement

132 total semester hours required

### Plan of Study

#### Four Years, Two Co-ops in Summer 2/Fall

Year 1							
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
BNSC 1000		1 ENGW 1111		4 BIOL 2301 and BIOL 2302		5 Vacation	0
MATH 1251	4	PSYC 3458	4	Adv PSYC elective	4		
PSYC 1101	4	BIOL 2299	4				
BIOL 1107 and BIOL 1108	5	CHEM 2311 and CHEM 2312	5				
CHEM 1161 and CHEM 1162 and CHEM 1163	5						
	19		17		9		0
Year 2							
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
PSYC 3200	4	BIOL 2309	4	PSYC 2320	4	Co-op	0
CHEM 2313 and CHEM 2314	5	DS 2000 and DS 2001	4	Elective	4		

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BNS core course 1	4	BNS core course 2	4				
Elective	4	Elective	4				
		EESC 2000	1				
	17		17		8		0
<b>Year 3</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>	<b>Summer 1</b>	<b>Hours</b>	<b>Summer 2</b>	<b>Hours</b>
Co-op	0	Adv BIOL elective	5	ENGW 3307	4	Co-op	0
		BNS core course 3	4	Elective	4		
		BNS core course 4	4				
		Elective	4				
	0		17		8		0
<b>Year 4</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>				
Co-op	0	BNS core course 5	4				
Elective (online)	4	Capstone	4				
		Elective	4				
		Elective	4				
	4		16				

Total Hours: 132

**Five Years, Three Co-ops in Spring/Summer 1**

<b>Year 1</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>	<b>Summer 1</b>	<b>Hours</b>	<b>Summer 2</b>	<b>Hours</b>
BNSC 1000	1	ENGW 1111	4	Vacation	0	Vacation	0
MATH 1251	4	PSYC 3458	4				
PSYC 1101	4	BIOL 2299	4				
BIOL 1107 and BIOL 1108	5	Elective	4				
CHEM 1161 and CHEM 1162 and CHEM 1163	5						
	19		16		0		0
<b>Year 2</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>	<b>Summer 1</b>	<b>Hours</b>	<b>Summer 2</b>	<b>Hours</b>
BIOL 2301 and BIOL 2302	5	Co-op	0	Co-op	0	CHEM 2313 and CHEM 2314	5
CHEM 2311 and CHEM 2312	5					PSYC 2320	4
PSYC 3200	4						
Elective	4						
EESC 2000	1						
	19		0		0		9
<b>Year 3</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>	<b>Summer 1</b>	<b>Hours</b>	<b>Summer 2</b>	<b>Hours</b>
BIOL 2309	4	Co-op	0	Co-op	0	Vacation	0
BNS core course 1	4						
Adv PSYC elective	4						
Elective	4						
	16		0		0		0
<b>Year 4</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>	<b>Summer 1</b>	<b>Hours</b>	<b>Summer 2</b>	<b>Hours</b>
DS 2000 and DS 2001	4	Co-op	0	Co-op	0	Elective	4

BNS core course 2	4			
BNS core course 3	4			
Elective	4			
	16	0	0	4

<b>Year 5</b>				
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>	
BNS core course 4	4	BNS core course 5	4	
Adv BIOL elective	5	Capstone course	4	
ENGW 3307	4	Elective	4	
Elective	4	Elective	4	
	17		16	

Total Hours: 132