

NEUROSCIENCE, BS

Degree: Bachelor of Science (BS)

Major: Neuroscience

Program Overview

Neuroscience is the study of the structure and function of the nervous system at the molecular, cellular, and systems levels, and of how the nervous system controls cognition, emotions, and behavior. The BS in Neuroscience provides both breadth and depth of understanding of these topics, and equips students to pursue multiple career paths. The field of neuroscience is both interdisciplinary and multidisciplinary, using concepts and methods from biology, biophysics, chemistry, cognitive science, computer science, engineering, physiology, and psychology. The BS in Neuroscience allows students who are interested in nervous system structure and function to explore this area from multiple perspectives. Two semesters of independent research are required (including the SAGES Capstone, BIOL 388S or NEUR 388S).

Advising

Faculty advisors are assigned to students at the time of major declaration. All students are required to meet with their departmental advisors at least once each semester to discuss their academic program, receive clearance for electronic course registration, and obtain approval for any drops, adds, or withdrawals. Please contact the undergraduate coordinator for the Department of Biology for information about major declaration.

Undergraduate Policies

For undergraduate policies and procedures, please review the Office of Undergraduate Studies section of the General Bulletin.

Accelerated Master's Programs

Undergraduate students may participate in accelerated programs toward graduate or professional degrees. For more information and details of the policies and procedures related to accelerated studies, please visit the Office of Undergraduate Studies section of the General Bulletin.

Program Requirements

Students seeking to complete this major and degree program must meet the general requirements for bachelor's degrees and the general requirements of the College of Arts and Sciences. Students completing this program as a secondary major while completing another undergraduate degree program do not need to satisfy the latter set of requirements.

Code	Title	Hours
Biology Core Courses		
BIOL 214	Genes, Evolution and Ecology	3
BIOL 214L	Genes, Evolution and Ecology Lab	1
BIOL 215	Cells and Proteins	3
BIOL 215L	Cells and Proteins Laboratory	1
BIOL 216	Development and Physiology	3
BIOL 216L	Development and Physiology Lab	1
Neuroscience Core Courses		

NEUR 166	Explorations in Neuroscience	1
NEUR 201	Fundamentals of Neuroscience I	3
NEUR 202	Fundamentals of Neuroscience II	3
Mathematics and Statistics Core Courses		
MATH 125	Math and Calculus Applications for Life, Managerial, and Social Sci I	4
or MATH 121	Calculus for Science and Engineering I	
MATH 126	Math and Calculus Applications for Life, Managerial, and Social Sci II	4
or MATH 122	Calculus for Science and Engineering II	
STAT 312	Basic Statistics for Engineering and Science	3
or STAT 313	Statistics for Experimenters	
Chemistry Core Courses		
CHEM 105	Principles of Chemistry I	3
CHEM 106	Principles of Chemistry II	3
CHEM 113	Principles of Chemistry Laboratory	2
CHEM 223	Introductory Organic Chemistry I	3
CHEM 224	Introductory Organic Chemistry II	3
CHEM 233	Introductory Organic Chemistry Laboratory I	2
Physics Core Courses		
PHYS 115	Introductory Physics I	4
or PHYS 121	General Physics I - Mechanics	
PHYS 116	Introductory Physics II	4
or PHYS 122	General Physics II - Electricity and Magnetism	
Computer Programming Core Course (choose one)		3
ENGR 131	Elementary Computer Programming	
CSDS 132	Programming in Java	
BIOL 321	Design and Analysis of Biological Experiments	
Neurobiology Core Course (choose two)		6
BIOL 322	Sensory Biology	
BIOL 358	Animal Behavior	
BIOL 373	Introduction to Neurobiology	
BIOL 374	Neurobiology of Behavior	
BIOL 381	Nervous System Development	
NEUR 301	Biological Mechanisms of Brain Disorders	
NEUR 303	Methods Neuroscience Research	
PSCL 350	Behavior Genetics	
Cellular/Molecular Biology Course (choose one)		3-4
BIOL 325	Cell Biology	
BIOL 326	Genetics	
BIOC 307	Introduction to Biochemistry: From Molecules To Medical Science	
CHEM 328	Introductory Biochemistry I	
Ecology/Evolutionary Biology Course (choose one)		3
BIOL 225	Evolution	
BIOL 351	Principles of Ecology	
Neuroscience Electives (choose a minimum of two courses; at least one must be non-BIOL)		6
BIOL 302	Human Learning and the Brain	
or COGS 322	Human Learning and the Brain	
BIOL 375	Brain Evolution and Function	
BIOL 378	Computational Neuroscience	

BIOL 385	Seminar on Biological Processes in Learning and Cognition	
CSDS 364	Computational Perception	
COGS 201	Human Cognition in Evolution and Development	
COGS 305	Social Cognition and the Brain	
COSI 305	Neuroscience of Communication and Communication Disorders	
COSI 357	Acquired Neurogenic Communication Disorders	
MATH 333	Mathematics and Brain	
MUHI 317	Music, Mind, and Medicine	
PHIL 311	Science of Ethics: The Neuroscience, Psychology, and Behavioral Economics of Morality	
PHIL 366	Brain, Mind and Consciousness: The Science and Philosophy of Mind	
PSCL 352	Physiological Psychology	
PSCL 379	Neurodevelopmental Disabilities	
Undergraduate Research (minimum 6 credits)		6
BIOL 388	Undergraduate Research	
	or NEUR 388 Undergraduate Research	
BIOL 388S	Undergraduate Research - SAGES Capstone	
	or NEUR 388S Undergraduate Research SAGES Capstone	
BIOL 390	Advanced Undergraduate Research	
	or NEUR 390 Advanced Undergraduate Research in Neuroscience	

Sample Plan of Study

First Year

Fall		Hours
SAGES First Seminar		4
MATH 125	Math and Calculus Applications for Life, Managerial, and Social Sci I	4
CHEM 105	Principles of Chemistry I	3
NEUR 166	Explorations in Neuroscience	1
BIOL 214	Genes, Evolution and Ecology	4
& 214L	and Genes, Evolution and Ecology Lab	
PHED Physical Education		0
Hours		16

Spring

SAGES University Seminar		3
MATH 126	Math and Calculus Applications for Life, Managerial, and Social Sci II	4
CHEM 106	Principles of Chemistry II	3
CHEM 113	Principles of Chemistry Laboratory	2
BIOL 215	Cells and Proteins	4
& 215L	and Cells and Proteins Laboratory	
PHED Physical Education		0
Hours		16

Second Year

Fall		
BIOL 216	Development and Physiology	4
& 216L	and Development and Physiology Lab	
CHEM 223	Introductory Organic Chemistry I	3
CHEM 233	Introductory Organic Chemistry Laboratory I	2

NEUR 201	Fundamentals of Neuroscience I	3
SAGES University Seminar		3
Hours		15

Spring

NEUR 202	Fundamentals of Neuroscience II	3
CHEM 223	Introductory Organic Chemistry I	3
GER Course		3
Cellular/Molecular Biology Elective or Ecology/Evolutionary Biology Elective		3
Open Elective		3
Hours		15

Third Year

Fall

Cellular/Molecular Biology Elective or Ecology/Evolutionary Biology Elective		3
BIOL 321	Design and Analysis of Biological Experiments	3
	or ENGR 131 Elementary Computer Programming	
PHYS 115	Introductory Physics I	4
Neurobiology Core or Elective Course		3
Open Elective or GER Course		3
Hours		16

Spring

Neurobiology Core or Elective Course		3
SAGES Departmental Seminar		3
PHYS 116	Introductory Physics II	4
ENGR 131	Elementary Computer Programming ¹	3
	or STAT 312 or Basic Statistics for Engineering and Science	
Open Elective or GER Course		3
Hours		16

Fourth Year

Fall

BIOL 388S	Undergraduate Research - SAGES	3
	or NEUR 388S Capstone	
	or Undergraduate Research SAGES Capstone	
Neuroscience Core or Elective Course		3
STAT 312	Basic Statistics for Engineering and Science ¹	3
Open Elective		3
Open Elective		3
Hours		15

Spring

BIOL 390	Advanced Undergraduate Research	3
	or NEUR 390 or Advanced Undergraduate Research in Neuroscience	
Neuroscience Core or Elective Course		3
Open Elective		3
Open Elective		3
Open Elective		3
Hours		15
Total Hours		124

¹ Open Elective can be taken to meet this requirement.