

# Neuroscience: Systems, Behavior and Plasticity BS

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## Overview

Neuroscience is a rapidly growing field that is making great advances in understanding behavior and cognitive functions, as well as advancing treatments for psychiatric, neurodegenerative and neurological disorders. It encompasses a broad domain that ranges from molecular genetics and neural development, to brain processes involved in cognition and emotion, to mechanisms and consequences of neurodegenerative disease. The field of neuroscience also includes mathematical and physical principles involved in modeling neural systems and in brain imaging.

The **Bachelor of Science in Neuroscience: Systems, Behavior and Plasticity**, offered by the Neuroscience Program within the Department of Psychology and Neuroscience, is designed to teach students to explore neural and brain function at multiple levels. The curriculum is customizable and flexible to ensure students get a well-rounded academic experience to prepare for graduate school, professional school (e.g., medical school, occupational therapy school, etc.), and entering the workforce.

The degree includes 52-54 required credits: 25 credits in Neuroscience, 6-8 credits in electives on neuroscience topics from a variety of participating departments, and 21 credits of co-requisite courses in Biology, Chemistry and Psychology. Students majoring in Neuroscience are strongly encouraged to participate in hands-on research by taking Independent Study courses as part of their elective credits for the major. Independent Study opportunities are offered in many of the laboratories of the more than 130 neuroscientist faculty members within the various colleges and schools participating in Temple University's Neuroscience Program.

**Campus Location:** Main

**Program Code:** LA-NSCI-BS

## Curricular Overlap Policy

Because of overlap in coursework, students pursuing the BS in Neuroscience: Systems, Behavior and Plasticity cannot complete the Cognitive Neuroscience minor offered by the Department of Psychology and Neuroscience.

## Combining the Major in Neuroscience with Major or Minor Programs in Psychology

Students who choose to double-major in Neuroscience and Psychology may count the following courses towards both majors without taking replacement coursework:

- PSY 1001 Introduction to Psychology
- PSY 1003 Statistics for Psychology
- NSCI 3096 Conducting Neuroscience Research
- BIOL 1012 General Biology II
- CHEM 1031 General Chemistry I and CHEM 1033 General Chemistry Laboratory I
- CHEM 1032 General Chemistry II and CHEM 1034 General Chemistry Laboratory II

For students who major in Neuroscience and minor in Psychology, the following courses may count towards both programs without taking replacement coursework:

- PSY 1001 Introduction to Psychology
- PSY 1003 Statistics for Psychology
- NSCI 3096 Conducting Neuroscience Research

## Distinction in Major

Majors in Neuroscience: Systems, Behavior and Plasticity have the opportunity to be awarded departmental distinction upon graduation. Graduating with distinction can be achieved by maintaining a GPA of 3.0 or better in all neuroscience courses, completing two semesters of *Independent Study in Neuroscience* (NSCI 4182 and NSCI 4282) with an A- or better, and successfully completing a neuroscience research project based on the independent study work and described in a research paper and poster presented to Neuroscience Program faculty and students. Learn more about graduating with distinction.

## Accelerated +1 Bachelor of Science/Master of Science Program

The accelerated +1 Bachelor of Science / Master of Science in Neuroscience: Systems, Behavior and Plasticity program offers outstanding Temple University Neuroscience: Systems, Behavior and Plasticity majors the opportunity to earn both the BS and MS in Neuroscience: Systems, Behavior and Plasticity in just 5 years. Admission to the program is highly selective. The program is designed to provide a research-intensive experience, advanced coursework and professional development to students who intend to pursue doctoral studies in any of the academic Neuroscience disciplines.

The accelerated +1 program consists of a maximum of 113 semester hours of undergraduate coursework, a maximum of 10 semester hours of graduate coursework to count towards both the undergraduate and the graduate degrees, and an additional 20 semester hours of graduate coursework as a graduate student. Upon successful completion of the fourth year, students will receive a BS in Neuroscience: Systems, Behavior and Plasticity, using 10 credits of graduate coursework, if they have met all other degree requirements. At the end of the contiguous fifth year, students will receive a MS in Neuroscience: Systems, Behavior and Plasticity.

Students apply to the +1 program in the spring semester of the junior year after completing a minimum of 72 undergraduate credits. Additionally, students must have a faculty sponsor who has agreed to mentor the student's master's project research during the four-semester program.

## Career Options

Many high-level career options within and outside of the field of neuroscience are open to students with this major. This is a popular major with students aiming for professional careers in the health sciences such as in medicine, dentistry, pharmacy, physical and occupational therapy, and veterinary science. Students interested in graduate school in biology, chemistry, communications science, neuroscience or psychology are also likely to find this major attractive. Learn more about career options.

## Student Organizations

Neuroscience majors are encouraged to get involved in various organizations outside the classroom. Learn more about the Nu Rho Psi Honor Society and the Undergraduate Neuroscience Society.

## Contact Information

Neuroscience Program Office  
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Learn more about the Bachelor of Science in Neuroscience: Systems, Behavior and Plasticity.

*These requirements are for students who matriculated in academic year 2023-2024. Students who matriculated prior to fall 2023 should refer to the Archives to view the requirements for their Bulletin year.*

## Summary of Degree Requirements

### University Requirements

- MATH 0701 (4 s.h.) and/or ENG 0701 (4 s.h.), if required by placement testing.
- All Temple students must take a minimum of two writing-intensive courses as part of the major. The specific courses required for this major are NSCI 3096 and NSCI 4197.
- Students must complete requirements of the General Education (GenEd) Program. See the General Education section of the *Undergraduate Bulletin* for more details.

### College of Liberal Arts Requirements

- Completion of a minimum of 123 credits, including:
  - 90 credits in CLA/CST courses;
  - 45 credits of which must be at the upper level (numbered 2000-4999).
    - For **Social Science majors**, 6 upper level credits (numbered 2000-4999) must be taken in Humanities Subject Areas: Arabic, Chinese, English, French, German, Greek (Ancient), Greek and Roman Classics, Hebrew, Hindi, Italian, Japanese, Latin, Philosophy, Religion, Russian, and Spanish in the College of Liberal Arts, Art History in the Tyler School of Art and Architecture, or any department in the College of Science and Technology.
- A minimum GPA of 2.0, cumulatively, in CLA/CST coursework, and in the major.
- **Professional Development Requirement**
  - All students in the College of Liberal Arts are required to take a 1 credit seminar in professional development. NSCI 1002 Careers in Neuroscience, PSY 1002 Careers in Psychology or CLA 1002 Professional Development for Liberal Arts Majors would be an appropriate course option for this major. Other courses that fulfill this requirement may be found on the CLA College Requirements page. Only one course in this category may count towards graduation.
- Only courses in which a student receives a grade of at least C- can satisfy GenEd, major, or minor requirements.
- Note: For Neuroscience majors, there is no CLA Foreign Language/Global Studies Requirement because it is a Bachelor of Science program. However, students are strongly encouraged to take the third level of a foreign language as it is the minimum required for election to the prestigious honor society *Phi Beta Kappa*. (Taking the course does not guarantee admission but not taking it guarantees exclusion.)

**General Electives** are typically one-third of a student's program of study and can be focused on a second major, a minor, or towards some other personal enrichment or professional goals. See an academic advisor for assistance in developing an academic plan for these courses.

## Major Requirements (52-54 credits)

Code	Title	Credit Hours
<b>Required Courses</b>		
BIOL 1012	General Biology II	4
CHEM 1031 & CHEM 1033	General Chemistry I and General Chemistry Laboratory I	4
CHEM 1032 & CHEM 1034	General Chemistry II and General Chemistry Laboratory II	4
PSY 1001	Introduction to Psychology	3
PSY 1003	Statistics for Psychology	3
NSCI 1051	Fundamentals of Neuroscience	3
NSCI 2001	Functional Neuroanatomy	3
NSCI 2121	Development/Plasticity/Repair	3
NSCI 2122	Cellular Neuroscience	3
NSCI 2222	The Neurobiology of Disease	3
NSCI 3087	Techniques in Neuroscience	3
NSCI 3096	Conducting Neuroscience Research	3
NSCI 4197	Capstone in Neuroscience	4
<b>Foundations Courses:</b>		
Select one of the following:		3
PSY 2501	Foundations of Behavioral Neuroscience	
PSY 2502	Foundations of Cognitive Neuroscience	
<b>Electives</b>		
Select two of the following:		6-8
Any course(s) in NSCI numbered 3000-4999 not used for another requirement		
CSCD 3235	Human Neuroscience	
CSCD 3382	Independent Study in Communication Sciences	
PHIL 2144	Introduction to the Philosophy of Mind	
PSY 3306	Neuroscience of Development and Aging	
PSY 3561	Psychopharmacology	
PSY 3566	Neurobiology of Learning and Memory	
PSY 4182	Independent Study in Cognitive Neuroscience I	
PSY 4282	Independent Study in Cognitive Neuroscience II	
BIOL 3082	Independent Research II	
BIOL 3204	Cell Structure and Function	
BIOL 3352	Systems Neuroscience	
BIOL 3354	Neural Basis of Animal Behavior	
BIOL 3356	Organization and Development of the Nervous System	
CHEM 3881	Cooperative Research	
CHEM 4107	Drug Analysis	
PHYS 3301	Electricity and Magnetism	
<b>Total Credit Hours</b>		<b>52-54</b>

Students should check prerequisites for all courses.

## Suggested Academic Plan

### Bachelor of Science in Neuroscience: Systems, Behavior and Plasticity

#### Suggested Plan for New Students Starting in the 2023-2024 Academic Year

Year 1		Credit Hours
<b>Fall</b>		
ENG 0802	Analytical Reading and Writing	4
or ENG 0812	or Analytical Reading and Writing: ESL	
or ENG 0902	or Honors Writing About Literature	
GenEd Quantitative Literacy Course <sup>GQ</sup>		4
GenEd Breadth Course		3
GenEd Breadth Course		3
<b>Credit Hours</b>		<b>14</b>
<b>Spring</b>		
IH 0851	Intellectual Heritage I: The Good Life	3
or IH 0951	or Honors Intellectual Heritage I: The Good Life	
GenEd Breadth Course		3
NSCI 1051	Fundamentals of Neuroscience	3
PSY 1001	Introduction to Psychology	3
BIOL 1012	General Biology II	4
<b>Credit Hours</b>		<b>16</b>
<b>Year 2</b>		
<b>Fall</b>		
NSCI 2001	Functional Neuroanatomy	3
IH 0852	Intellectual Heritage II: The Common Good	3
or IH 0952	or Honors Intellectual Heritage II: The Common Good	
GenEd Breadth Course		3
CLA/CST 0800-4999 Elective		3
One 0800-4999 Elective in Any School or College		3
<b>Credit Hours</b>		<b>15</b>
<b>Spring</b>		
CLA 1002	Professional Development for Liberal Arts Majors <sup>1</sup>	1
GenEd Breadth Course		3
CLA/CST 2000+ Elective		3
PSY 1003	Statistics for Psychology	3
One 0800-4999 Elective in Any School or College		3
CLA/CST 0800-4999 Elective		2
<b>Credit Hours</b>		<b>15</b>
<b>Year 3</b>		
<b>Fall</b>		
CLA/CST 2000+ Humanities/CST Course		3
NSCI 3096	Conducting Neuroscience Research	3
CHEM 1031	General Chemistry I	4
& CHEM 1033	and General Chemistry Laboratory I <sup>2</sup>	
NSCI 2121	Development/Plasticity/Repair	3
One 0800-4999 Elective in Any School or College		3
<b>Credit Hours</b>		<b>16</b>
<b>Spring</b>		
CLA/CST 2000+ Humanities/CST Course		3
CHEM 1032	General Chemistry II	4
& CHEM 1034	and General Chemistry Laboratory II <sup>2</sup>	
NSCI 2122	Cellular Neuroscience	3
NSCI 2222	The Neurobiology of Disease	3

Select one of the following:		3
PSY 2501	Foundations of Behavioral Neuroscience	
PSY 2502	Foundations of Cognitive Neuroscience	
<b>Credit Hours</b>		<b>16</b>
<b>Year 4</b>		
<b>Fall</b>		
NSCI 3087	Techniques in Neuroscience	3
One 2000+ Elective From the Approved List		3
CLA/CST 0800-4999 Elective		3
CLA/CST 0800-4999 Elective		3
One 0800-4999 Elective in Any School or College		3
<b>Credit Hours</b>		<b>15</b>
<b>Spring</b>		
NSCI 4197	Capstone in Neuroscience	4
One 2000+ Elective From the Approved List		4
CLA/CST 2000+ Elective		3
CLA/CST 2000+ Elective		3
One 0800-4999 Elective in Any School or College		2
<b>Credit Hours</b>		<b>16</b>
<b>Total Credit Hours</b>		<b>123</b>

1

Students may substitute NSCI 1002 or PSY 1002 for this requirement.

2

CHEM 1031/CHEM 1033 and CHEM 1032/CHEM 1034 fulfill the GenEd Science & Technology requirement. Prerequisite for CHEM 1031 is MATH 1021 with a C or better or placement into MATH 1022.