NEURAL SCIENCE (BS)

Department Website (http://as.nyu.edu/cns/)

NYSED: 92353 **HEGIS:** 0425.00 **CIP.** 26.1501

Program Description

Neural science spans multiple disciplines for studying the function of the brain. Experimental approaches in neural science vary from analyses of molecular and cellular mechanisms in nerve cells and groups of nerve cells to behavioral and psychological studies of whole organisms. Theoretical tools include mathematical and computational modeling approaches that have proved useful in other areas of science. Experimental questions include issues related to biophysical and neurochemical mechanisms within single nerve cells, functional neural circuits consisting of small numbers of neurons, the behavior of large systems of neurons, and the relationship between the activity of elements of the nervous system and the behavior of organisms.

The Center for Neural Science confers the BS degree in Neural Science (there is no BA degree for this major, nor is there a minor).

Honors Program

Students are eligible to apply for honors (https://as.nyu.edu/departments/cns/UndergraduateProgram/Honors.html) once they have declared the major in Neural Science. They must maintain both a major and an overall GPA of 3.65.

The honors program requires 6 credits over and above the requirements of the standard Neural Science major. In the fall semester of senior year, students seeking honors must complete NEURL-UA 301 Honors Seminar (2 credits). They must also take one laboratory course: either NEURL-UA 211 Cellular & Molecular Neurobiology Lab (offered only in the fall; 4 credits) or NEURL-UA 221 Behavioral & Integrative Neuroscience Lab (offered only in the spring; 4 credits). Admittance to the seminar and laboratory courses is assured and required only for students in the honors track. These courses do not double-count toward the neural science electives required for the major.

In the spring of senior year, students must present a paper at the College's annual Undergraduate Research Conference and the department's Undergraduate Research Conference. They also submit an honors thesis for review by their faculty sponsor and the director of undergraduate studies.

Admissions

New York University's Office of Undergraduate Admissions supports the application process for all undergraduate programs at NYU. For additional information about undergraduate admissions, including application requirements, see How to Apply (https://www.nyu.edu/admissions/undergraduate-admissions/how-to-apply.html).

Program Requirements

The Neural Science major comprises fifteen courses (63 credits) completed with a grade of C or better (courses graded Pass/Fail do not count). Prehealth students must take, in addition to the requirements below, BIOL-UA 123 Principles of Biology Laboratory, PHYS-UA 11 General Physics I, CHEM-UA 225 Organic Chemistry I & Laboratory, CHEM-UA 226 Organic Chemistry II & Laboratory, CHEM-UA 881 Biochemistry I, and

other recommended courses. These courses are not required for the major in Neural Science.

Course	Title	Credits
General Education Requirements		
First-Year Seminar		4
EXPOS-UA 1	Writing as Inquiry	4
Foreign Language [1]		16
Texts and Ideas		4
Cultures and Contexts		4
Societies and the Social Sciences		4
Expressive Culture		4
Major Requirements		
Neural Science Courses		
NEURL-UA 100	Introduction to Neural Science (see note below)	4
NEURL-UA 210	Cellular & Molecular Neurobiology	4
NEURL-UA 220	Behavioral and Integrative Neuroscience	4
Select three elective courses in neural science [2]		12
Other Courses		
CHEM-UA 125 & CHEM-UA 126	General Chemistry I & Laboratory and General Chemistry II & Laboratory	10
BIOL-UA 11	Principles of Biology I	4
BIOL-UA 12	Principles of Biology II	4
BIOL-UA 21	Molecular and Cell Biology I	4
PHYS-UA 12	General Physics II [3]	5
MATH-UA 121	Calculus I	4
Select one approved statistics course [4]		4
Select one approved upper-level course in either psychology or biology [5]		4
Electives		
Other Elective Credits		25
Total Credits		**128**

[1] The foreign language requirement is satisfied upon successful completion through the Intermediate level of a language. This may be accomplished in fewer than 16 credits, but those credits must then be completed as elective credit.

[2] May include most NEURL-UA 3xx courses, as well as LING-UA 43 Neural Bases of Language or UGPH-GU 22 Introduction to Neuroethics. Select courses in Shanghai and Abu Dhabi can also count. Please check with a major adviser to confirm.

[3] PHYS-UA 11 General Physics I, or credit for AP Physics C (Mechanics), is a prerequisite for General Physics II. Exceptions may be made on a case-by-case basis by the Department of Physics. Students are not automatically permitted to take PHYS-UA 12 General Physics II before/without PHYS-UA 11 General Physics I.

[4] Approved options for this requirement: an AP Statistics score of 4 or higher; PSYCH-UA 10 Statistics for The Behavioral Sciences; PSYCH-UA 11 Statistics and Data Analysis for Research in Psychology; MATH-UA 333 Theory of Probability; MATH-UA 334 Mathematical Statistics; and BIOL-UA 45 Biostatistics and Human Genetics. NEURL-UA 302 Special Topics in Neural Science, when offered as Introduction to Neural Data Analysis, may count either as a neural science elective requirement or toward the statistics requirement (not both). Students may petition to substitute other statistics courses on a case by case basis. DS-UA 111 Principles of Data Science I and any Quantitative

Reasoning course in the College Core Curriculum are not acceptable substitutions for this requirement.

5 Approved courses for this requirement include:
PSYCH-UA 22 Perception, PSYCH-UA 44 Lab in Perception , PSYCH-UA 29 Cognition , PSYCH-UA 46 Lab in Cognition and Perception, PSYCH-UA 59 First Language Acquisition, PSYCH-UA 60 Illusions to Inference, PSYCH-UA 79 Experiments in Beauty BIOL-UA 25 Physiology, BIOL-UA 26 Developmental Biology, BIOL-UA 30 Genetics, BIOL-UA 50 Immunology, MATH-UA 251 Intro to Math Modeling, MATH-UA 255 Mathematics and Biology, BIOL-GA 1045 Protein Biochemistry, and CHEM-UA 881 Biochemistry I (most prehealth students choose one of the last two courses). PSYCH-UA 9025 Cognitive Neuroscience does not count. Many of these courses have additional prerequisites beyond the requirements of the Neural Science major; students must check these as early as possible.

Note: NEURL-UA 100 Introduction to Neural Science is offered only in the spring term. Students may take it as early as their first year if they are well-prepared and their schedules permit it, but taking it in the spring of their sophomore year does not endanger their ability to complete this major and graduate within a total of four years.

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
BIOL-UA 11	Principles of Biology I	4
CHEM-UA 125	General Chemistry I & Laboratory	5
MATH-UA 121	Calculus I	4
First-Year Seminar		4
	Credits	**17**
2nd Semester/Term		
BIOL-UA 12	Principles of Biology II	4
CHEM-UA 126	General Chemistry II & Laboratory	5
NEURL-UA 100	Introduction to Neural Science	4
EXPOS-UA 1	Writing as Inquiry	4
	Credits	**17**
3rd Semester/Term		
BIOL-UA 21	Molecular and Cell Biology I	4
NEURL-UA 210	Cellular & Molecular Neurobiology	4
Texts and Ideas		4
Foreign Language		4
	Credits	**16**
4th Semester/Term		
NEURL-UA 220	Behavioral and Integrative Neuroscience	4
Upper Level Biology or Psychology Elective		4
Cultures and Contexts		4
Foreign Language		4
	Credits	**16**
5th Semester/Term		
PHYS-UA 11	General Physics I	5
NEURL-UA 302	Special Topics in Neural Science (Major Elective: 1 of 3)	4
Expressive Culture		4
Foreign Language		4
	Credits	**17**
6th Semester/Term		
PHYS-UA 12	General Physics II	5
NEURL-UA 302	Special Topics in Neural Science (Major Elective: 2 of 3)	4
Societies and the Social Sciences		4
Foreign Language		4
	Credits	**17**
7th Semester/Term		
NEURL-UA 302	Special Topics in Neural Science (Major Elective: 3 of 3)	4
Elective		4
Elective		4
Elective		4
	Credits	**16**
8th Semester/Term		
Elective		4
Elective		4
Elective		4
	Credits	**12**
	Total Credits	**128**

Learning Outcomes

Upon completion of program requirements, students are expected to have acquired:

1. Foundational knowledge in the field of neural science, including molecular, cellular, developmental, systems, cognitive, behavioral, and computational approaches to understanding the brain.
2. The ability to conduct and utilize research.
3. Skills in critical reading, quantitative analysis, clear writing, and verbal presentation.

Policies
Program Policies

Students should meet with a Neural Science adviser as early in their NYU career as possible (freshman year is recommended) and check in regularly to make sure they are on track.

Students must earn a least a C in all courses that count toward the Neural Science major (or are prerequisites for major courses) except for NEURL-UA 100 Introduction to Neural Science, in which they must earn at least a B- to declare the major.

NEURL-UA 100 Introduction to Neural Science can only be taken once. It cannot be repeated. All other courses can be repeated following CAS's repeat policies.

We do not accept AP or other exam scores as a replacement for BIOL-UA 11 Principles of Biology I. Students must have taken Biology I at NYU, or, if they took it at another university, that transfer course must appear in their Albert account and they must have email documentation that the Department of Biology approved the transfer course as equivalent.

Transfer courses may not exceed one-half of the required coursework for the major. Transfer students must contact a Neural Science advisor as soon as they are admitted to the program for evaluation of their transfer credits. Courses in Calculus, Biology, Chemistry, Physics, and Psychology must be evaluated by the appropriate departments.

The major requires General Physics II. General Physics I is the prerequisite for General Physics II; the only automatic exception is for students who have AP Physics C Mechanics credit. All other students must meet with the instructor for General Physics II for evaluation of their ability to go straight into this course. The Physics faculty can refuse permission to anyone they believe is unqualified for this exemption.

NYU Policies

University-wide policies can be found on the New York University Policy pages (https://bulletins.nyu.edu/nyu/policies/).

College of Arts and Science Policies

A full list of relevant academic policies can be found on the CAS Academic Policies page (https://bulletins.nyu.edu/undergraduate/arts-science/academic-policies/).