

# B.S. IN NEUROSCIENCE

<https://neuroscience.as.miami.edu/>

## Overview

- Students must earn a minimum grade of C- in any course that is to count toward the neuroscience major.
- Students may repeat no more than two courses for the neuroscience major in which they received a D or an F.
- New freshmen and current students must have a minimum 1360 SAT, 30 ACT, or 3.5 combined, UM, and neuroscience GPA after 24 completed credit hours at UM to declare the neuroscience major. Note: At least 7 of these 24 credit hours must be in the BIL, CHM, or MTH courses required of the major and/or the degree.
- New internal transfer students will be added to the NEU waitlist if they have a minimum 3.5 GPA and have completed at least five credit hours in the required BIL or CHM courses for the major.
- Students are strongly advised not to continue with the neuroscience major if they have less than a 2.8 neuroscience GPA after 15 completed credit hours in the neuroscience major.
- Students must earn a minimum 2.6 neuroscience GPA and a minimum of 130 credits to graduate with the neuroscience major.

## Notes

- There are limited seats in the neuroscience major so students may be required to join a waitlist before they are able to declare.
- Neuroscience majors are required to complete 130 total credit hours to complete their B.S. degree.
- The neuroscience major can only be declared as a first major for students who are enrolled in the College of Arts and Sciences.
- AP Credit for Statistics (i.e., PSY 292) cannot count toward the neuroscience major.
- Students who declare the neuroscience major after they transfer credit for PSY 292 or complete PSY 292 at UM can use PSY 292 as a substitute for PSY 291.
- Students must complete at least half of their credits required for the neuroscience major in residence, including all 300, 400, and 500 level courses.
- Students may take NEU 580/581 as electives in the neuroscience major. However, both courses must be taken in sequential semesters and the senior honors thesis approved in order to graduate with honors.
- Only 6 NEU credit hours at the 300, 400, and 500 level may be taken through a UM Study Abroad Program with prior written approval.

## Curriculum Requirements

Code	Title	Credit Hours
<b>MAJOR REQUIREMENTS</b>		
<b>Core Courses</b>		
BIL 150	General Biology	4
BIL 160	Evolution and Biodiversity	4
BIL 151	General Biology Laboratory	1
BIL 161	Evolution and Biodiversity Laboratory	1
BIL 250	Genetics	3
BIL 255	Cellular and Molecular Biology	3
BIL 268	Neurobiology	3
NEU 190	Faculty Overview of Research and Undergraduate Mentoring (FORUM)	1
NEU 342	Neural Mechanisms of Disease	3
NEU 403	Neuroscience laboratory	4
NEU 465	Cellular and Molecular Neuroscience	3
Select one of the following:		3
NEU 420	Neurogenetics	
NEU 440	Neural Mechanisms of Psychiatric Disorders	
NEU 468	Developmental Neuroscience.	
PSY 110	Introduction to Psychology	3
PSY 290	Introduction to Research Methods	3
PSY 291	Introduction to Biobehavioral Statistics	3
or PSY 292	Introduction to Biobehavioral Statistics Section B	

PSY 390	Intermediate Research Methods and Biobehavioral Statistics	3
PSY 425	Psychobiology	3
Select one additional BIL, NEU, BMB or MIC elective of the following: <sup>1</sup>		3
BIL 330	Ecology	
BIL 360	Comparative Physiology	
BIL 365	Endocrinology	
BIL 441	Animal Behavior	
BIL 455	Developmental Biology	
BIL 511	Advanced Biostatistics	
BIL 520	Evolution	
BIL 568	Evolution and development of Nervous Systems	
BMB 401	Biochemistry for the Biomedical Sciences	
MIC 301 & MIC 304	Introduction to Microbes and the Immune System and Introduction to Microbes and the Immune System (Lab)	
NEU 420	Neurogenetics	
NEU 440	Neural Mechanisms of Psychiatric Disorders	
NEU 468	Developmental Neuroscience.	
NEU 580	Senior Honors in Neuroscience I	
Select one additional BIL, PSY, NEU, BMB or MIC elective of the following: <sup>1</sup>		3
BIL 330	Ecology	
BIL 360	Comparative Physiology	
BIL 365	Endocrinology	
BIL 441	Animal Behavior	
BIL 455	Developmental Biology	
BIL 511	Advanced Biostatistics	
BIL 520	Evolution	
BIL 568	Evolution and development of Nervous Systems	
BMB 401	Biochemistry for the Biomedical Sciences	
MIC 301 & MIC 304	Introduction to Microbes and the Immune System and Introduction to Microbes and the Immune System (Lab)	
NEU 420	Neurogenetics	
NEU 440	Neural Mechanisms of Psychiatric Disorders	
NEU 468	Developmental Neuroscience.	
NEU 581	Senior Honors in Neuroscience II	
PSY 240	Psychopathology	
PSY 320	Psychology of Drugs and Behavior	
PSY 345	Child Psychopathology	
PSY 391	Tests and Measurements	
PSY 426	Health Psychology	
PSY 491	Advanced Biobehavioral Statistics	
<b>Auxiliary Courses</b>		
CHM sequences:		16
Chemistry for the Biosciences:		
CHM 121 & CHM 113	Principles of Chemistry and Chemistry Laboratory I	
CHM 221 & CHM 205	Introduction to Structure and Dynamics and Chemical Dynamics Laboratory	
CHM 222 & CHM 206	Organic Reactions and Synthesis and Organic Reactions and Synthesis Laboratory	

Select one of the following PHY sequences:		10-11
<b>College Physics:</b>		
PHY 101 & PHY 106	College Physics I and Physics Laboratory 1	
PHY 102 & PHY 108	College Physics II and Physics Laboratory 2	
<b>University Physics:</b>		
PHY 221	University Physics I	
PHY 222 & PHY 224	University Physics II and University Physics II Lab	
PHY 223 & PHY 225	University Physics III and University Physics III Lab	
<b>PRISM Physics:</b>		
PHY 211 & PHY 106	University Physics I for PRISM and Physics Laboratory 1	
PHY 212 & PHY 108	University Physics II for PRISM and Physics Laboratory 2	
<b>University Physics for the Sciences:</b>		
PHY 201 & PHY 106	University Physics I for the Sciences and Physics Laboratory 1	
PHY 202 & PHY 108	University Physics II for the Sciences and Physics Laboratory 2	
<b>GENERAL EDUCATION REQUIREMENTS</b>		
<b>Written Communication Skills:</b>		
WRS 105	First-Year Writing I	3
WRS 106	First-Year Writing II	3
or ENG 106	Writing About Literature and Culture	
or WRS 107	First-Year Writing II: STEM	
<b>Quantitative Skills:</b>		
MTH 161	Calculus I	4
<b>Areas of Knowledge:</b>		
Arts & Humanities Cognate		9
People & Society Cognate		9
STEM Cognate (9 credits) (fulfilled through the major)		
<b>ADDITIONAL DEGREE REQUIREMENTS</b>		
<b>Mathematics:</b>		
MTH 162	Calculus II	4
Minor <sup>2</sup>		9-15
Foreign Language in 200 level or above		3
Electives		6
<b>Total Credit Hours</b>		<b>130</b>

<sup>1</sup> Note: NEU courses cannot double count for a BIL elective and another required course within the neuroscience major.

<sup>2</sup> All neuroscience majors must complete a minor in Biochemistry, Chemistry, Computer Science, Engineering, Geological Sciences, Marine Science, Mathematics, Microbiology and Immunology, or Physics.  
Neuroscience majors may not earn majors or minors in Biology or Psychology.

## Suggested Plan of Study

First Year		
Fall		Credit Hours
WRS 105	First-Year Writing I	3
MTH 161	Calculus I	4
BIL 150	General Biology	4

BIL 151 (Lab)		1
Foreign Language		3
<b>Credit Hours</b>		<b>15</b>
<b>Spring</b>		
NEU 190	Faculty Overview of Research and Undergraduate Mentoring (FORUM)	1
WRS 107	First-Year Writing II: STEM	3
MTH 162	Calculus II	4
BIL 160	Evolution and Biodiversity	4
BIL 161 (Lab)		1
Elective		3
<b>Credit Hours</b>		<b>16</b>
<b>Second Year</b>		
<b>Fall</b>		
CHM 121	Principles of Chemistry	4
CHM 113 (Lab)		1
PSY 110	Introduction to Psychology	3
NEU 280	Research Projects I	3
A&H Cognate		3
<b>Credit Hours</b>		<b>14</b>
<b>Spring</b>		
CHM 221	Introduction to Structure and Dynamics	4
CHM 205	Chemical Dynamics Laboratory	1
PSY 290	Introduction to Research Methods	3
PSY 291	Introduction to Biobehavioral Statistics	3
NEU 380	Research Projects II	3
A&H Cognate		3
<b>Credit Hours</b>		<b>17</b>
<b>Third Year</b>		
<b>Fall</b>		
CHM 222	Organic Reactions and Synthesis	4
CHM 206	Organic Reactions and Synthesis Laboratory	2
PHY 101	College Physics I	4
PHY 106 (Lab)		1
PSY 390 (W)		3
A&H Cognate		3
<b>Credit Hours</b>		<b>17</b>
<b>Spring</b>		
BIL Elective		3
PHY 102	College Physics II	4
PHY 108 (Lab)		1
BIL 268	Neurobiology	3
P&S Cognate		3
Elective		3
<b>Credit Hours</b>		<b>17</b>
<b>Fourth Year</b>		
<b>Fall</b>		
BIL 255	Cellular and Molecular Biology	3
NEU 342	Neural Mechanisms of Disease	3
NEU 580	Senior Honors in Neuroscience I	3
PSY 425	Psychobiology	3
PSY Elective		3

P&S Cognate		3
<b>Credit Hours</b>		<b>18</b>
<b>Spring</b>		
NEU Elective		3
NEU 403 (W)		3
BIL 250	Genetics	3
NEU 581	Senior Honors in Neuroscience II	3
P&S Cognate		3
NEU 465	Cellular and Molecular Neuroscience	3
<b>Credit Hours</b>		<b>18</b>
<b>Total Credit Hours</b>		<b>132</b>

## Mission

In accordance with the goals of the University of Miami, the mission of the interdisciplinary undergraduate neuroscience major is to foster the acquisition of knowledge and skills utilized by the neural and bio-behavioral sciences. In order to achieve these goals, the Neuroscience Program seeks a balance among several academic endeavors, including basic scientific research, applied research, undergraduate teaching, graduate teaching, professional training and development, and service to the community.

In pursuing these activities, the major seeks to attract and retain the highest quality faculty and students, foster respect for differences among people, nurture curiosity, and insist upon high standards of thought, study, and communication that should characterize the ethical, educated person.

## Goals

The major seeks to provide undergraduate students with exposure to and a fundamental understanding of the neural and bio-behavioral sciences. It seeks to deliver an integrative educational experience by promoting interactions among faculty, graduate students, and undergraduate students in basic scientific inquiry, advising, mentoring, and community outreach.

## Student Learning Outcomes

- Students will develop a fundamental knowledge base in neuroscience as a scientific discipline.
- Students will develop research and quantitative skills through core coursework and/or supervised laboratory experiences.
- Students will develop oral and written communication skills related to the science of neuroscience.