

# BACHELOR OF ARTS (BA) DEGREE WITH A MAJOR IN NEUROSCIENCE

## Program Learning Outcomes for the BA Degree with a Major in Neuroscience

Upon completing the BA degree with a major in Neuroscience, students will be able to:

1. Demonstrate knowledge of the biological basis for brain and neuron function and experimental strategies that led to our current understanding of brain and neuron function.
2. Demonstrate knowledge of the key issues, questions, and perspectives that define systems neuroscience.
3. Demonstrate the ability to analyze and interpret neuro-scientific data.
4. Understand multiple experimental methods to measure and manipulate brain activity.
5. Demonstrate how to apply the modern scientific method, including designing and executing experiments, and collecting, analyzing, and interpreting meaningful data.

## Requirements for the BA Degree with a Major in Neuroscience

For general university requirements, see [Graduation Requirements \(https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/\)](https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/). Students pursuing the BA degree with a major in Neuroscience must complete:

- A minimum of 23 courses (62-69 credit hours, depending on course selection) to satisfy major requirements.
- A minimum of 120 credit hours to satisfy degree requirements.
- A minimum of 10 courses (26-30 credit hours) taken at the 300-level or above.
- A maximum of 2 courses (6 credit hours) from study abroad or transfer credit **after** matriculation at Rice may be applied towards specific major requirements. For additional departmental guidelines regarding transfer credit, see the [Policies](#) (p. 2) tab.

The courses listed below satisfy the requirements for this major. In certain instances, courses not on this official list may be substituted upon approval of the major's academic advisor or, where applicable, the department's Director of Undergraduate Studies. (Course substitutions must be formally applied and entered into Degree Works by the major's [Official Certifier \(https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/\)](https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/).) Students and their academic advisors should identify and clearly document the courses to be taken.

### Summary

Code	Title	Credit Hours
Total Credit Hours Required for the Major in Neuroscience		62-69
Total Credit Hours Required for the BA Degree with a Major in Neuroscience		120

### Degree Requirements

Code	Title	Credit Hours
<b>Foundation Courses</b> <sup>1</sup>		
BIOS 201	INTRODUCTORY BIOLOGY I	3
CHEM 121	GENERAL CHEMISTRY I	3
or CHEM 111	AP/OTH CREDIT IN GENERAL CHEMISTRY I	
CHEM 123	GENERAL CHEMISTRY LABORATORY I	1
or CHEM 113	AP/OTH CREDIT IN GENERAL CHEMISTRY LAB I	
CHEM 122	GENERAL CHEMISTRY II	3
or CHEM 112	AP/OTH CREDIT IN GENERAL CHEMISTRY II	
CHEM 124	GENERAL CHEMISTRY LABORATORY II	1
or CHEM 114	AP/OTH CREDIT IN GENERAL CHEMISTRY LAB II	
CMOR 220	INTRODUCTION TO ENGINEERING COMPUTATION	3
or COMP 140	COMPUTATIONAL THINKING	
MATH 101	SINGLE VARIABLE CALCULUS I	3
or MATH 105	AP/OTH CREDIT IN CALCULUS I	
MATH 102	SINGLE VARIABLE CALCULUS II	3
or MATH 106	AP/OTH CREDIT IN CALCULUS II	
PHYS 125	GENERAL PHYSICS (WITH LAB)	4
PHYS 126	GENERAL PHYSICS II (WITH LAB)	4
PSYC 203	INTRODUCTION TO COGNITIVE PSYCHOLOGY	3
<i>Select 1 course from the following:</i>		3 or 4
STAT 305	INTRODUCTION TO STATISTICS FOR BIOSCIENCES	
STAT 310 / ECON 307	PROBABILITY AND STATISTICS	
STAT 315 / DSCI 301	PROBABILITY AND STATISTICS FOR DATA SCIENCE	
<b>Core Requirements</b>		
BIOS 385	CELLULAR AND MOLECULAR MECHANISMS OF THE NEURON	3
NEUR 362 / PSYC 362	COGNITIVE NEUROSCIENCE: EXPLORING THE LIVING BRAIN	3
NEUR 380 / PSYC 380	FUNDAMENTAL NEUROSCIENCE SYSTEMS	3
NEUR 383 / BIOE 380 / ELEC 380	INTRODUCTION TO NEUROENGINEERING: MEASURING AND MANIPULATING NEURAL ACTIVITY	3
<b>Project-Based Laboratory Courses</b>		
BIOS 212	INTERMEDIATE EXPERIMENTAL CELLULAR AND MOLECULAR NEUROSCIENCE	2
<i>Select a minimum of 2 courses (minimum of 2 credit hours) from the following:</i>		2-7
BIOS 315	EXPERIMENTAL PHYSIOLOGY	
BIOS 417	EXPERIMENTAL CELL AND MOLECULAR NEUROSCIENCE	
NEUR 310	INDEPENDENT RESEARCH FOR NEUROSCIENCE UNDERGRADUATES <sup>2</sup>	
PSYC 366	METHODS IN SOCIAL COGNITIVE AND AFFECTIVE NEUROSCIENCE	

PSYC 487	FUNCTIONAL HUMAN NEUROANATOMY	
<b>Elective Requirements</b>		
Select a minimum of 4 courses (minimum of 12 credit hours) from the following:		12-13
BIOE 422	GENE THERAPY	
BIOE 492	SENSORY NEUROENGINEERING	
BIOS 128	BRAINSTEM - TEACHING STEM THROUGH NEUROSCIENCE <sup>3</sup>	
BIOS 321	ANIMAL BEHAVIOR	
BIOS 442	MOLECULES, MEMORY AND MODEL ANIMALS: METHODS IN BEHAVIORAL NEUROSCIENCE	
BIOS 443	DEVELOPMENTAL NEUROBIOLOGY	
BIOS 449	ADVANCED CELL AND MOLECULAR NEUROSCIENCE	
COMP 440 / ELEC 440	ARTIFICIAL INTELLIGENCE	
ELEC 475	LEARNING FROM SENSOR DATA	
KINE 419	MOVEMENT DISORDERS	
NEUR 310	INDEPENDENT RESEARCH FOR NEUROSCIENCE UNDERGRADUATES <sup>2</sup>	
NEUR 411 / LING 411	NEUROLINGUISTICS	
NEUR 415 / CMOR 415 / ELEC 488	THEORETICAL NEUROSCIENCE: FROM CELLS TO LEARNING SYSTEMS	
NEUR 416 / CMOR 416 / ELEC 489	NEURAL COMPUTATION	
NEUR 441 / BIOS 441	MOLECULAR MEMBRANE BIOLOGY	
PHIL 130	THE SCIENCES OF THE MIND	
PHIL 231	ANIMAL MINDS	
PHIL 330	PHILOSOPHY OF MIND	
PHIL 345	THEORY OF KNOWLEDGE	
PHIL 431	ADVANCED TOPICS IN THE SCIENCES OF THE MIND	
PSYC 308	MEMORY	
PSYC 310	PSYCHOLOGY OF AGING	
PSYC 311	VISUAL COGNITION	
PSYC 354	INTRODUCTION TO SOCIAL AND AFFECTIVE NEUROSCIENCE	
PSYC 375	NEUROPSYCHOLOGY OF LANGUAGE AND MEMORY	
PSYC 430	COMPUTATIONAL MODELING OF COGNITIVE PROCESSES	
PSYC 432	BRAIN AND BEHAVIOR	
<b>Total Credit Hours Required for the Major in Neuroscience</b>		<b>62-69</b>
Additional Credit Hours to Complete Degree Requirements*		20-27
University Graduation Requirements ( <a href="https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/">https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/</a> ) <sup>*</sup>		31
<b>Total Credit Hours</b>		<b>120</b>

## Footnotes and Additional Information

- \* **Note:** University Graduation Requirements include 31 credit hours, comprised of Distribution Requirements (Groups I, II, and III), FWIS, and LPAP coursework. In some instances, courses satisfying FWIS or distribution requirements may additionally meet other requirements, such as the Analyzing Diversity (AD) requirement, or some of the student's declared major, minor, or certificate requirements. Additional Credit Hours to Complete Degree Requirements include general electives, coursework completed as upper-level, residency (hours taken at Rice), and/or any other additional academic program requirements.
- <sup>1</sup> **Permissible substitutions:** MATH 111 and MATH 112 may be substituted for MATH 101 or MATH 105; PHYS 101 and PHYS 103 or PHYS 111 may be substituted for PHYS 125; PHYS 102 and PHYS 104 or PHYS 112 may be substituted for PHYS 126. The Neuroscience program has determined that credit awarded for PHYS 141 *CONCEPTS IN PHYSICS I* and credit awarded for PHYS 142 *CONCEPTS IN PHYSICS II* are not eligible for meeting the requirements of the Neuroscience major.
- <sup>2</sup> NEUR 310 can be repeated and counted as an elective if a student has chosen NEUR 310 to count as a Project-Based Laboratory Course. It can only be repeated as an elective once for credit towards the major. If taken as a Project-Based Laboratory or as an Elective, NEUR 310 must be taken for at least 3 credit hours.
- <sup>3</sup> Students must complete a minimum of three semesters (3 credit hours total) of BIOS 128 to use this course as an Elective Requirement.

## Policies for the BA Degree with a Major in Neuroscience

### Program Restrictions and Exclusions

Students pursuing the BA Degree with a Major in Neuroscience should be aware of the following program restrictions:

- As noted in Majors, Minors, and Certificates (<https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/>), under *Declaring Majors, Minors and Certificates*, students may not obtain both a BA and a BS in the same major. Students pursuing the BA Degree with a Major in Neuroscience may not additionally pursue the BS Degree with a Major in Neuroscience.
- As noted in Majors, Minors, and Certificates (<https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/>), students may not major and minor in the same subject.

### Transfer Credit

For Rice University's policy regarding transfer credit, see Transfer Credit (<https://ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit/>). Some departments and programs have additional restrictions on transfer credit. Requests for transfer credit must be approved for Rice equivalency by the designated transfer credit advisor for the appropriate academic department offering the Rice equivalent course (corresponding to the subject code of the course content). The Office of Academic Advising maintains the university's official list of transfer credit advisors (<https://oaa.rice.edu/advising-network/transfer-credit-advisors/>) on their website: <https://oaa.rice.edu>. Students are encouraged to meet with the applicable transfer credit advisor as well as their academic program director when considering transfer credit possibilities.

## Program Transfer Credit Guidelines

Students pursuing the major in Neuroscience should be aware of the following program transfer credit guideline:

- No more than 2 courses (6 credit hours) of transfer credit from U.S. or international universities of similar standing as Rice may apply towards specific major requirements **after** matriculation at Rice.

## Additional Information

For additional information, please see the Neuroscience website: <https://neuroscience.rice.edu/>.

## Opportunities for the BA Degree with a Major in Neuroscience

### Academic Honors

The university recognizes academic excellence achieved over an undergraduate's academic history at Rice. For information on university honors, please see [Latin Honors \(https://ga.rice.edu/undergraduate-students/honors-distinctions/university/\)](https://ga.rice.edu/undergraduate-students/honors-distinctions/university/) (*summa cum laude*, *magna cum laude*, and *cum laude*) and [Distinction in Research and Creative Work \(https://ga.rice.edu/undergraduate-students/honors-distinctions/university/\)](https://ga.rice.edu/undergraduate-students/honors-distinctions/university/). Some departments have department-specific Honors awards or designations.

### Research in Neuroscience

Research is highly encouraged for all neuroscience programs, and many opportunities are available for independent research at Rice and other institutions of the Texas Medical Center. Students can receive course credit for independent research through the course NEUR 310.

**Please Note:** Students pursuing the major in Neuroscience may repeat NEUR 310 for credit once as an elective for the major.

### Additional Information

For additional information, please see the Neuroscience website: <https://neuroscience.rice.edu/>.