

MINOR IN NEUROSCIENCE

Program Learning Outcomes for the Minor in Neuroscience

Upon completing the minor in Neuroscience, students will be able to:

1. Demonstrate knowledge of the key issues, questions, and perspectives that define contemporary neuroscience.
2. Understand neuroscience as an interdisciplinary field and demonstrate the ability to draw on, and synthesize, key findings and concepts in the sciences, humanities and/or engineering in both the evaluation of existing theories and in the formulation and solution of new problems in neuroscience.

Requirements for the Minor in Neuroscience

Students pursuing the minor in Neuroscience must complete:

- A minimum of 6 courses (18 credit hours) to satisfy minor requirements.
- A minimum of 3 courses (9 credit hours) taken at the 300-level or above.
- A maximum of 2 courses (6 credit hours) from study abroad or transfer credit. For additional program guidelines regarding transfer credit, see the [Policies](#) (p. 2) tab.
- A minimum of 2 courses (6 credit hours) of the Elective Requirements should be completed for the minor only (not shared or double-counted with another major).
- The requirements for one area of specialization (see below for areas of specialization). The Neuroscience minor offers two areas of specialization:
 - [Humanities and Social Sciences](#) (p. 1): represents cognitive and behavioral approaches to neuroscience, **or**
 - [Natural Sciences and Engineering](#) (p. 1): represents genetics, cellular/molecular, bioengineering, computation, and systems-level investigations.

The courses listed below satisfy the requirements for this minor. In certain instances, courses not on this official list may be substituted upon approval of the minor's academic advisor or, where applicable, the Program Director. (Course substitutions must be formally applied and entered into Degree Works by the minor'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 Minor in Neuroscience		18

Minor Requirements

Code	Title	Credit Hours
Core Requirement		
NEUR 380 / PSYC 380	FUNDAMENTAL NEUROSCIENCE SYSTEMS	3

Area of Specialization

Select 1 from the following Areas of Specialization (see Areas of Specialization below): 15

Humanities and Social Sciences

Natural Sciences and Engineering

Total Credit Hours 18

Areas of Specialization

Area of Specialization: Humanities and Social Sciences

Students must complete a total of 5 courses (15 credit hours total) as listed below to satisfy the requirements for the Humanities and Social Sciences area of specialization.

Code	Title	Credit Hours
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Required Course

NEUR 362 / PSYC 362	COGNITIVE NEUROSCIENCE: EXPLORING THE LIVING BRAIN	3
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Elective Requirements^{1,2}

Select a minimum of 3 courses (9 credit hours) from the Humanities and Social Sciences area of specialization (see below for course lists) 9

Select at least 1 course (3 credit hours) from the Natural Sciences and Engineering area of specialization to provide breadth in the field of Neuroscience (see below for course lists)³ 3

Total Credit Hours 15

Footnotes and Additional Information

¹ At least 2 of the electives should be completed for the minor only (not shared or double-counted with another major).

² No more than 3 credit hours for research (NEUR 310) may be used to satisfy elective requirements for this specialization. NEUR 310 may be taken twice (one instance may count toward the Area of Specialization, one instance may count as breadth.)

³ BIOS 385 may be used to fulfill this requirement.

Area of Specialization: Natural Sciences and Engineering

Students must complete 5 courses (15 credit hours) as listed below to satisfy the requirements for the Natural Sciences and Engineering area of specialization.

Code	Title	Credit Hours
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Required Course

BIOS 385	CELLULAR AND MOLECULAR MECHANISMS OF THE NEURON	3
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Elective Requirements^{1,2}

Select a minimum of 3 courses (9 credit hours) from the Natural Sciences and Engineering area of specialization (see below for course lists) 9

Select at least 1 course (3 credit hours) from the Humanities and Social Sciences area of specialization to provide breadth in the field of Neuroscience (see below for course lists)³ 3

Total Credit Hours 15

Footnotes and Additional Information

¹ At least 2 of the electives should be completed for the minor only (not shared or double-counted with another major).

² No more than 3 credit hours for research (NEUR 310) may be used to satisfy elective requirements for this specialization. NEUR 310 may be taken twice (one instance may count toward the Area of Specialization, one instance may count as breadth.)

³ NEUR 362/PSYC 362 may be used to fulfill this requirement.

Course Lists to Satisfy Requirements

Humanities and Social Sciences ²

All students must complete at least 1 course (such that at least 3 credit hours are completed) from the Humanities and Social Sciences Electives. Students pursuing the Humanities and Social Sciences area of specialization must take 2 additional courses (6 credit hours) from the following list, for a minimum of 3 courses (9 credit hours must be reached with a combination of all courses).

Code	Title	Credit Hours
<i>Select at least 1 course (minimum of 3 credit hours) from the following:</i>		
BIOS 128	BRAINSTEM - TEACHING STEM THROUGH NEUROSCIENCE ¹	1
CSCI 340	METHODS OF COGNITIVE SCIENCE	3
KINE 419	MOVEMENT DISORDERS	3
NEUR 411 / LING 411	LANGUAGE AND THE BRAIN	3
PHIL 130	THE SCIENCES OF THE MIND	3
PHIL 230	HUMAN MINDS	3
PHIL 231	ANIMAL MINDS	3
PHIL 330	PHILOSOPHY OF MIND	3
PHIL 345	THEORY OF KNOWLEDGE	3
PHIL 431	ADVANCED TOPICS IN THE SCIENCES OF THE MIND	3
PSYC 308	MEMORY	3
PSYC 310	PSYCHOLOGY OF AGING	3
PSYC 311	VISUAL COGNITION	3
PSYC 354	INTRODUCTION TO SOCIAL AND AFFECTIVE NEUROSCIENCE	3
PSYC 366	METHODS IN SOCIAL COGNITIVE AND AFFECTIVE NEUROSCIENCE	3
PSYC 375	NEUROPSYCHOLOGY OF LANGUAGE AND MEMORY	3
PSYC 432	BRAIN AND BEHAVIOR	3
PSYC 487	FUNCTIONAL HUMAN NEUROANATOMY	3

Footnotes and Additional Information

¹ Students must complete a minimum of three semesters (3 credit hours total) of BIOS 128 to use this course as an elective requirement.

² **Please note:** some courses on this list may be offered by schools other than Humanities or Social Sciences, however, they will fulfill the Humanities and Social Sciences course category in the Neuroscience minor.

Natural Sciences and Engineering ²

All students must complete at least 1 course (such that at least 3 credit hours are completed) from the Natural Sciences and Engineering Electives. Students pursuing the Natural Sciences and Engineering area of specialization must take 2 additional courses (6 credit hours) from the

following list, for a minimum of 3 courses (9 credit hours must be reached with a combination of all courses).

Code	Title	Credit Hours
<i>Select at least 1 course (minimum of 3 credit hours) from the following:</i>		
BIOS 315	EXPERIMENTAL PHYSIOLOGY	1
BIOS 321	ANIMAL BEHAVIOR	3
BIOS 417	EXPERIMENTAL CELL AND MOLECULAR NEUROSCIENCE	1
BIOS 441 / NEUR 441	MOLECULAR MEMBRANE BIOLOGY	3
BIOS 442	MOLECULES, MEMORY AND MODEL ANIMALS: METHODS IN BEHAVIORAL NEUROSCIENCE	3
BIOS 443	DEVELOPMENTAL NEUROBIOLOGY	3
BIOS 449	ADVANCED CELL AND MOLECULAR NEUROSCIENCE	3
BIOE 422	GENE THERAPY	3
BIOE 492	SENSORY NEUROENGINEERING	3
COMP 440 / ELEC 440	ARTIFICIAL INTELLIGENCE	4
ELEC 435	NEURAL INTERFACE ENGINEERING LABORATORY	3
ELEC 475	LEARNING FROM SENSOR DATA	3
NEUR 310	INDEPENDENT RESEARCH FOR NEUROSCIENCE UNDERGRADUATES ¹	1-4
NEUR 383 / BIOE 380 / ELEC 380	INTRODUCTION TO NEUROENGINEERING: MEASURING AND MANIPULATING NEURAL ACTIVITY	3
NEUR 415 / CMOR 415 / ELEC 488	THEORETICAL NEUROSCIENCE: FROM CELLS TO LEARNING SYSTEMS	3
NEUR 416 / CMOR 416 / ELEC 489	NEURAL COMPUTATION	3
PSYC 430	COMPUTATIONAL MODELING OF COGNITIVE PROCESSES	3

Footnotes and Additional Information

¹ No more than 3 credit hours for research (NEUR 310) may be used to satisfy elective requirements for this specialization. NEUR 310 may be taken twice (one instance may count toward the Area of Specialization, one instance may count as breadth.)

² **Please note:** some courses on this list may be offered by schools other than Natural Sciences or Engineering, however, they will fulfill the Natural Sciences and Engineering course category in the Neuroscience minor.

Policies for the Minor in Neuroscience Program Restrictions and Exclusions

Students pursuing minor in Neuroscience should be aware of the following program restrictions:

- As noted in [Majors, Minors, and Certificates \(https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/\)](https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/), i.) students may declare their intent to pursue a minor

only after they have first declared a major, and ii.) students may not major and minor in the same subject.

Transfer Credit

For Rice University's policy regarding transfer credit, see [Transfer Credit \(https://ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit/\)](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 \(https://oaa.rice.edu/advising-network/transfer-credit-advisors/\)](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 minor in Neuroscience should be aware of the following program-specific 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 the minor.

Additional Information

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

Opportunities for the Minor 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 minor in Neuroscience have a 3 credit hour limit for applying research courses to the NEUR minor requirements.

Additional Information

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