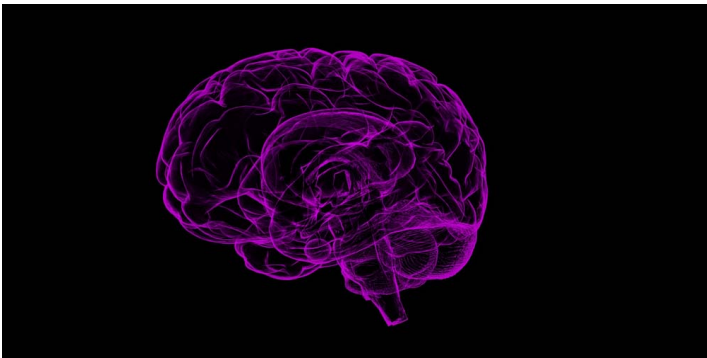


# NEUROSCIENCE (BS)



This program was approved for students entering the university in the Summer 2023–Spring 2024 catalog year. For more information about catalog year, go to Catalog Year Information (<http://catalog.louisville.edu/undergraduate/university-wide-unit-specific-policies/catalog-year/>).

### Bachelor of Science in Neuroscience

Unit: College of Arts and Sciences (<http://www.louisville.edu/a-s/>)  
Department: Psychological and Brain Sciences (<http://louisville.edu/psychology/>); Anatomical Sciences and Neurobiology (<http://louisville.edu/medicine/departments/anatomy/>)  
Academic Plan Code(s): NEURBS

## Program Information

The Bachelor of Science in Neuroscience (BS in Neuroscience) is an interdisciplinary degree with a STEM+Health focus. The program trains students to critically assess and analyze ideas and concepts from the diverse disciplines that contribute to the field of neuroscience. Students achieve an in-depth understanding of nervous system function, from the molecular level to the cognitive sciences, and become familiar with the techniques used to measure nervous system function from the cellular level to the whole brain.

Graduates of this program are poised for careers in a wide variety of areas, including neuroscience and health-related fields, the social sciences, and the biological sciences. This program also prepares students for advanced-degree study in graduate school and professional degree programs.

Completion of this degree requires work to be submitted for the department's Learning Outcomes Measurement. For details, contact the department.

## Degree Summary

Code	Title	Hours
General Education Requirements ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> ) <sup>1</sup>		31
College/School Requirements		13-15
Program/Major Requirements <sup>1</sup>		33
Supporting Coursework		42-44
<b>Minimum Total Hours</b>		<b>121</b>

<sup>1</sup> Some credit hours from the General Education Requirements may be satisfied by courses defined by the program, in which case additional

electives will be required to complete the minimum hours for the degree.

Specific coursework information can be found on the Degree Requirements tab.

## Accelerated BS Neuroscience/MS Experimental Psychology

Neuroscience majors who are considering pursuing a master's degree (MS) in Experimental Psychology can speed up the process by applying some of their undergraduate credit hours toward a master's degree. Students accepted into the accelerated BS Neuroscience/MS Experimental Psychology take three graduate courses (9 credit hours) as an undergraduate that apply toward both the bachelor's degree and the eventual master's degree.

Interested students must apply to the program by December 1 of their junior year. Applicants must have completed PSYC 201, PSYC 301, PSYC 302, and PSYC 491 prior to application. Applicants must have a minimum overall GPA of 3.0 and maintain a GPA of greater than 2.5 during their enrollment in the BS/MS program.

## Admission Requirements

- Requirements for admission to the BS in Neuroscience:
- a. Complete PSYC 201 or (equivalent) and PSYC 305, earning a grade of C or higher.
  - b. Complete Statistics Requirement (PSYC 301 or BIOL 350), earning a grade of C or higher. Completion of MATH 180 or MATH 205 is required for the degree. For admission to the major, students must have completed the necessary math coursework, or have a math placement score, to satisfy the prerequisites to enroll in MATH 180 or MATH 205.
  - c. Have an overall cumulative GPA of at least 2.5 (no grades of C-minus or lower in core or supporting coursework may be counted toward requirements for the major).
  - d. Have completed at least 30 hours of degree-applicable credit.

The Change Major Request form can be found under the Academic Progress tile on ULink.

## General Education

Code	Title	Hours
General Education Requirements ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> ) <sup>*</sup>		31
The following courses are required by the program and can satisfy the respective General Education Requirement:		
PSYC 201	Introduction to Psychology - SB ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	
BIOL 240	Unity of Life - S ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	
CHEM 201	General Chemistry I - S ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	

CHEM 207	Introduction to Chemical Analysis I - SL ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )
MATH 180	Elements of Calculus - QR ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )
or MATH 205	Calculus I - QR ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )

\*All degrees require the completion of the University-wide General Education Program (link provided above). Some General Education requirements may be met in the requirements for the major or supporting coursework, in which case additional electives may be required to complete the minimum hours for the degree.

## College/School Requirements

Code	Title	Hours
<b>Arts &amp; Sciences Requirements</b>		
GEN 100	Student Success Center First Year Experience	1
or GEN 101	Arts & Sciences First Year Experience	
Foreign Language <sup>1</sup>		6-8
Electives in Humanities or Social Sciences at 300+level <sup>2</sup>		6
WR - two approved courses at the 300 level or above <sup>3</sup>		
<b>Minimum Total Hours</b>		<b>13-15</b>

## Program/Major Requirements

Code	Title	Hours
<b>Program Coursework</b>		
PSYC 201	Introduction to Psychology - SB ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3
PSYC 301	Introduction to Social Statistics	3
or BIOL 350	Biostatistics	
PSYC 302	Research Methods for Psychology	3
PSYC 305	Brain and Behavior	3
PSYC 331	Sensation and Perception	3
BIOL 329	Cellular and Molecular Biology	3
PSYC 355	Neuroscience	3
PSYC 382	Cognitive Neuroscience	3
BIOL 465	Principles of Physiology	3
or BE 354	Anatomy and Physiology	
ASNB 502	Fundamentals of Neuroscience	3
One of the following:		3
ASNB 514	Molecular Neuroscience - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	
ASNB 517	Seminar on Developmental Neurobiology - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	
ASNB 530	Origin of Mammalian Sensory Systems and Comparative Neurobiology - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	

ASNB 566	Synaptic Organization of the Central Nervous System - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )
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**Minimum Total Hours 33**

Code	Title	Hours
<b>Supporting Courses</b>		
BIOL 240	Unity of Life - S ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3
BIOL 241	Unity of Life Lab - SL ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	1
BIOL 242	Diversity of Life - S ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3
BIOL 243	Diversity of Life Lab - SL ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	1
MATH 180	Elements of Calculus - QR ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	4
or MATH 205	Calculus I - QR ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	
CHEM 201	General Chemistry I - S ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3
CHEM 202	General Chemistry II - S ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3
CHEM 207	Introduction to Chemical Analysis I - SL ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	1
CHEM 208	Introduction to Chemical Analysis II - SL ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	1
CHEM 209	Introduction to Chemical Analysis III	1
PHYS 221	Fundamentals of Physics I - S ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3
PHYS 222	Fundamentals of Physics II - S ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3
PHYS 223	Fundamentals of Physics Lab I - SL ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	1
PHYS 224	Fundamentals of Physics Laboratory II - SL ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	1
<b>Electives <sup>4</sup></b>		<b>13-15</b>
<b>Suggested Electives <sup>6</sup></b>		
BIOL 330	Genetics and Molecular Biology	
BIOL 331	Genetics and Molecular Biology: Laboratory	
BIOL 415	Biology of the Cell - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> ), WR ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> ) <sup>5</sup>	

BIOL 511	Behavioral Endocrinology - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> ), WR ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> ) <sup>5</sup>
BIOL 540	Metabolic Biochemistry
CHEM 341	Organic Chemistry I
CHEM 343	Organic Chemistry Laboratory I
CHEM 342	Organic Chemistry II
CHEM 344	Organic Chemistry Laboratory II
CHEM 545	Biochemistry I
PHIL 360	Technology and Human Values - AH ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )
PHIL 536	Philosophy of Science
PHIL 358	Mind and Brain: Introduction to Cognitive Science
PHIL 580	Foundations of Bioethics
PHIL 581	Current Controversies in Health Care Ethics
PSYC 307	Cognitive Processes
PSYC 306	Life Span Developmental Psychology
PSYC 308	Foundations of Psychopathology
PSYC 445	Special Topics in Neuroscience - WR ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )

**Minimum Total Hours** **42-44**

Code	Title	Hours
Minimum Total Degree Hours		121-123

At least 50 of the total minimum hours required must be at the 300 level or above.

Students who wish to double major in the BS in Neuroscience and the BS in Psychology degrees must complete 18 credit hours toward the Psychology (PSYC) degree that do not count towards meeting the Neuroscience (NS) degree requirements. These 18 credits must include the following courses: PSYC 306, PSYC 307 and PSYC 308. If these courses are taken as electives for the NS degree, additional PSYC courses must be taken in their place. Students must also complete one PSYC CUE course and one NS CUE course. For elective courses that can count toward either degree, the student must specify whether each course will count for NS or for PSYC.

Code	Title	Hours
<b>Culminating Undergraduate Experience (Graduation Requirement)</b>		

Requirement fulfilled by completing one of the following:

PSYC 492	Undergraduate Psychology Research - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )
or ASNB 492 Undergraduate Neuroscience Research - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	
PSYC 495	Honors Psychology Research
or ASNB 495 Honors Neuroscience Research	

PSYC 496	Honors Psychology Thesis - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> ), WR ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )
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or ASNB 496 Honors Neuroscience Thesis - CUE (<http://catalog.louisville.edu/undergraduate/general-education-requirements/>), WR (<http://catalog.louisville.edu/undergraduate/general-education-requirements/>)

ASNB 514	Molecular Neuroscience - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )
ASNB 517	Seminar on Developmental Neurobiology - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )
ASNB 530	Origin of Mammalian Sensory Systems and Comparative Neurobiology - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )
ASNB 566	Synaptic Organization of the Central Nervous System - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )

<sup>1</sup> Completion of the second semester of a single foreign language; hours will vary depending on the language taken

<sup>2</sup> In addition to courses counted toward General Education

<sup>3</sup> May be incorporated into other degree requirements

<sup>4</sup> Students who satisfy General Education Requirements by courses defined by the program will require additional electives to complete the minimum hours for the degree.

<sup>5</sup> Does not satisfy CUE requirement for the Neuroscience BS

<sup>6</sup> Students may select any courses they wish to fulfill the elective credits; however, the faculty suggest that students consider taking electives from the provided list as these courses are aligned with training in the discipline or may be required to fulfill preparation for certain degree paths (such as completing the typical pre-med requirements).

## Flight Plan

Year 1		
Fall		Hours
GEN 101	Arts & Sciences First Year Experience	1
ENGL 101	Introduction to College Writing - WC ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3
PSYC 201	Introduction to Psychology - SB ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3
BIOL 240	Unity of Life - S ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3
BIOL 241	Unity of Life Lab - SL ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	1
CHEM 201	General Chemistry I - S ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3
CHEM 207	Introduction to Chemical Analysis I - SL ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	1
CHEM 208	Introduction to Chemical Analysis II - SL ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	1

Hours

16

<b>Spring</b>			300+ Elective Elective in Humanities or Social Sciences	3
ENGL 102	Intermediate College Writing - WC ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3	<b>Hours</b>	<b>15-16</b>
BIOL 242	Diversity of Life - S ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3	<b>Year 4</b>	
BIOL 243	Diversity of Life Lab - SL ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	1	<b>Fall</b>	
CHEM 202	General Chemistry II - S ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3	300+ WR Elective	3
CHEM 209	Introduction to Chemical Analysis III	1	300+ Elective Elective in Humanities or Social Sciences	3
PSYC 305	Brain and Behavior	3	300+ Elective (Consider ASNB 530 as one option)	6
<b>Hours</b>		<b>14</b>	Elective	3
<b>Year 2</b>			<b>Hours</b>	<b>15</b>
<b>Fall</b>			<b>Spring</b>	
BIOL 329	Cellular and Molecular Biology	3	300+ WR Elective	3
PHYS 221	Fundamentals of Physics I - S ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3	300+ Elective	3
PHYS 223	Fundamentals of Physics Lab I - SL ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	1	300+ Elective	3
PSYC 355	Neuroscience	3	Elective	5
General Education: Cardinal Core Oral Communication – OC		3	<b>Hours</b>	<b>14</b>
MATH 180 or MATH 205	Elements of Calculus - QR ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> ) or Calculus I - QR ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3	<b>Minimum Total Hours</b>	<b>121-123</b>
<b>Hours</b>		<b>16</b>		
<b>Spring</b>				
BIOL 465 or BE 354	Principles of Physiology or Anatomy and Physiology	3		
PHYS 222	Fundamentals of Physics II - S ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3		
PHYS 224	Fundamentals of Physics Laboratory II - SL ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	1		
PSYC 301 or BIOL 350	Introduction to Social Statistics or Biostatistics	3		
General Education: Cardinal Core Arts & Humanities – AH <sup>1</sup>		3		
Elective		3		
<b>Hours</b>		<b>16</b>		
<b>Year 3</b>				
<b>Fall</b>				
ASNB 502	Fundamentals of Neuroscience	3		
PSYC 302	Research Methods for Psychology	3		
PSYC 331	Sensation and Perception	3		
PSYC 382	Cognitive Neuroscience	3		
Foreign Language		3-4		
<b>Hours</b>		<b>15-16</b>		
<b>Spring</b>				
Select one of the following:		3		
ASNB 517	Seminar on Developmental Neurobiology - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )			
ASNB 530	Origin of Mammalian Sensory Systems and Comparative Neurobiology - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )			
ASNB 566	Synaptic Organization of the Central Nervous System - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )			
Foreign Language		3-4		
General Education: Cardinal Core Arts & Humanities – AH <sup>1</sup>		3		
General Education: Cardinal Core Historical Perspective – SBH <sup>1</sup>		3		

<sup>1</sup> At least two of the courses selected to satisfy these General Education/Cardinal Core requirements must also satisfy Diversity requirements (at last once course/3 credits each of U.S./D1 and Global/D2 Diversity coursework).