

# NEUROSCIENCE - B.S.

## College of Arts and Sciences

Department of Biological Sciences

Department of Psychological Sciences

<https://www.kent.edu/neuroscience/bs>

## About This Program

The Bachelor of Science in Neuroscience combines biology, chemistry, psychology and other disciplines to provide you with a comprehensive understanding of the nervous system. Together with our Neuroscience faculty, you will gain the advanced skills and knowledge needed to pursue careers in health professions, research or science communication. Read more...

## Contact Information

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- Speak with an Advisor
- Chat with an Admissions Counselor

## Program Delivery

- **Delivery:**
  - In person
- **Location:**
  - Kent Campus

## Admission Requirements

The university affirmatively strives to provide educational opportunities and access to students with varied backgrounds, those with special talents and adult students who graduated from high school three or more years ago.

**First-Year Students on the Kent Campus:** First-year admission policy on the Kent Campus is selective. Admission decisions are based upon cumulative grade point average, strength of high school college preparatory curriculum and grade trends. Students not admissible to the Kent Campus may be administratively referred to one of the seven regional campuses to begin their college coursework. For more information, visit the admissions website for first-year students.

**First-Year Students on the Regional Campuses:** First-year admission to Kent State's campuses at Ashtabula, East Liverpool, Geauga, Salem, Stark, Trumbull and Tuscarawas, as well as the Twinsburg Academic Center, is open to anyone with a high school diploma or its equivalent. For more information on admissions, contact the Regional Campuses admissions offices.

**International Students:** All international students must provide proof of English language proficiency unless they meet specific exceptions. For more information, visit the admissions website for international students.

**Transfer Students:** Students who have attended any other educational institution after graduating from high school must apply as undergraduate transfer students. For more information, visit the admissions website for transfer students.

**Former Students:** Former Kent State students or graduates who have not attended another college or university since Kent State may complete the reenrollment or reinstatement form on the University Registrar's website.

Admission policies for undergraduate students may be found in the University Catalog.

Some programs may require that students meet certain requirements before progressing through the program. For programs with progression requirements, the information is shown on the Coursework tab.

## Program Requirements

### Major Requirements

Code	Title	Credit Hours
<b>Major Requirements (courses count in major GPA)</b>		
BSCI 10120	BIOLOGICAL FOUNDATIONS (ELR) (KBS) (KLAB)	4
BSCI 30140	CELL BIOLOGY	4
BSCI 30156	ELEMENTS OF GENETICS	3
BSCI 40600	WRITING IN THE BIOLOGICAL SCIENCES (WIC) <sup>1</sup>	1
or PSYC 41901	WRITING IN PSYCHOLOGY (WIC)	
or PSYC 41980	RESEARCH WRITING IN PSYCHOLOGY (WIC)	
CHEM 10060	GENERAL CHEMISTRY I (KBS)	4
CHEM 10061	GENERAL CHEMISTRY II (KBS)	4
CHEM 10062	GENERAL CHEMISTRY I LABORATORY (KBS) (KLAB)	1
CHEM 10063	GENERAL CHEMISTRY II LABORATORY (KBS) (KLAB)	1
MATH 11010	ALGEBRA FOR CALCULUS (KMCR)	3
NEUR 10100	SEMINAR IN NEUROSCIENCE	1
NEUR 30100	NEUROSCIENCE I	3
NEUR 30200	NEUROSCIENCE II	3
NEUR 30300	EXPERIMENTAL METHODS IN NEUROSCIENCE	1
PSYC 11762	GENERAL PSYCHOLOGY (DIVD) (KSS)	3
PSYC 21621	QUANTITATIVE METHODS IN PSYCHOLOGY I	3
PSYC 31574	RESEARCH METHODS IN PSYCHOLOGY (ELR)	3
Neuroscience Electives, choose from the following:		14
BSCI 40147	DEVELOPMENTAL NEUROBIOLOGY	
BSCI 40151	MECHANISMS OF DISEASE: OBESITY AND RELATED METABOLIC DISEASES	
BSCI 40152	MOLECULAR MECHANISMS OF DISEASE: NEUROLOGICAL DISORDERS	
BSCI 40157	NEUROBIOLOGY OF DRUG ADDICTION	
BSCI 40158	MOLECULAR BIOLOGY	
BSCI 40159	MOLECULAR BIOLOGY LABORATORY (ELR) (WIC)	
BSCI 40431	NEUROENDOCRINOLOGY	
BSCI 40432	ENDOCRINOLOGY	
BSCI 40450	BIOLOGICAL CLOCKS	
BSCI 40460	ADVANCED HUMAN PHYSIOLOGY	
BSCI 40462	ADVANCED HUMAN PHYSIOLOGY: READINGS AND CASE STUDIES	
BSCI 40515	ANIMAL BEHAVIOR	
BSCI 40519	HORMONES AND BEHAVIOR	
NEUR 40192	INTERNSHIP IN NEUROSCIENCE (ELR) <sup>2</sup>	
NEUR 40195	SPECIAL TOPICS IN NEUROSCIENCE	
NEUR 40196	INDIVIDUAL INVESTIGATION IN NEUROSCIENCE <sup>3</sup>	
PSYC 31634	ANIMAL COGNITION	

PSYC 40111	PSYCHOPATHOLOGY	
PSYC 40383	INTRODUCTION TO CLINICAL PSYCHOLOGY	
PSYC 40446	COGNITIVE NEUROSCIENCE	
PSYC 41043	BASIC LEARNING PROCESSES	
PSYC 41364	DRUGS AND BEHAVIOR	
PSYC 43001	CLINICAL NEUROANATOMY	
PSYC 43002	CURRENT TECHNIQUES IN BEHAVIORAL NEUROSCIENCE	
PSYC 43003	NEURAL MECHANISMS OF LEARNING AND MEMORY	
PSYC 47387	NEUROPSYCHOPHARMACOLOGY	
<b>Additional Requirements (courses do not count in major GPA)</b>		
UC 10001	FLASHES 101	1
Foreign Language (see Foreign Language College Requirement below)		8
Kent Core Composition		6
Kent Core Humanities and Fine Arts (minimum one course from each)		9
<b>Additional Requirements or Concentration</b>		
Choose from the following:		40
Additional Requirements for Students Not Declaring a Concentration		
Pre-Medicine/Pre-Podiatry Concentration		
<b>Minimum Total Credit Hours:</b>		<b>120</b>

<sup>1</sup> A minimum C grade must be earned to fulfill the writing-intensive requirement.

<sup>2</sup> Maximum 6 credit hours of NEUR 40192 may be applied toward major requirements.

<sup>3</sup> Maximum 6 credit hours of NEUR 40196 may be applied toward major requirements.

## Additional Requirements for Students Not Declaring a Concentration

Code	Title	Credit Hours
<b>Major Requirements (courses count in major GPA)</b>		
Neuroscience Electives, choose from the list in the major		13
<b>Additional Requirements (courses do not count in major GPA)</b>		
Kent Core Social Sciences (must be from two disciplines)		3
General Electives (total credit hours depends on earning 120 credit hours, including 39 upper-division credit hours)		24
<b>Minimum Total Credit Hours:</b>		<b>40</b>

## Pre-Medicine/Pre-Podiatry Concentration Requirements

Code	Title	Credit Hours
<b>Concentration Requirements (courses count in major GPA)</b>		
BSCI 30130	HUMAN PHYSIOLOGY	3
or BSCI 40430	ANIMAL PHYSIOLOGY	
BSCI 30171	GENERAL MICROBIOLOGY	4
CHEM 30284	INTRODUCTORY BIOLOGICAL CHEMISTRY	4
or CHEM 40245	BIOCHEMICAL FOUNDATIONS OF MEDICINE	
CHEM 30475	ORGANIC CHEMISTRY LABORATORY I (ELR)	1
CHEM 30476	ORGANIC CHEMISTRY LABORATORY II	1
CHEM 30481	ORGANIC CHEMISTRY I	3
CHEM 30482	ORGANIC CHEMISTRY II	3
MATH 11022	TRIGONOMETRY (KMCR)	3
MATH 12002	ANALYTIC GEOMETRY AND CALCULUS I (KMCR)	5

PHY 13001	GENERAL COLLEGE PHYSICS I (KBS)	5
& PHY 13021	and GENERAL COLLEGE PHYSICS LABORATORY I (KBS) (KLAB)	
or PHY 23101	GENERAL UNIVERSITY PHYSICS I (KBS) (KLAB)	
PHY 13002	GENERAL COLLEGE PHYSICS II (KBS)	5
& PHY 13022	and GENERAL COLLEGE PHYSICS LABORATORY II (KBS) (KLAB)	
or PHY 23102	GENERAL UNIVERSITY PHYSICS II (KBS) (KLAB)	
SOC 12050	INTRODUCTION TO SOCIOLOGY (DIVD) (KSS)	3
<b>Minimum Total Credit Hours:</b>		<b>40</b>

## Graduation Requirements

Minimum Major GPA	Minimum Overall GPA
2.000	2.000

## Foreign Language College Requirement, B.S.

- Students pursuing the Bachelor of Science degree in the College of Arts and Sciences must complete 8 credit hours of foreign language.<sup>1</sup>
- The Bachelor of Science in Medical Laboratory Science is exempt from this requirement.<sup>2</sup>
- Minimum Elementary I and II of the same language

<sup>1</sup> All students with prior foreign language experience should take the foreign language placement test to determine the appropriate level at which to start. Some students may start beyond the Elementary I level and will complete the requirement with fewer credit hours and fewer courses. This may be accomplished by (1) passing a course beyond Elementary I through Intermediate II level; (2) receiving credit through one of the alternative credit programs offered by Kent State University; or (3) demonstrating language proficiency comparable to Elementary II of a foreign language. When students complete the requirement with fewer than 8 credit hours and two courses, they will complete remaining credit hours with general electives.

<sup>2</sup> The Bachelor of Science in Medical Laboratory Science exemption exists under another college policy (Three-Plus-One Programs).

## Roadmaps

### Neuroscience Major (No Concentration)

This roadmap is a recommended semester-by-semester plan of study for this major. However, courses designated as critical (!) must be completed in the semester listed to ensure a timely graduation.

Semester One		Credits
BSCI 10120	BIOLOGICAL FOUNDATIONS (ELR) (KBS) (KLAB)	4
CHEM 10060	GENERAL CHEMISTRY I (KBS)	4
CHEM 10062	GENERAL CHEMISTRY I LABORATORY (KBS) (KLAB)	1
MATH 11010	ALGEBRA FOR CALCULUS (KMCR)	3
NEUR 10100	SEMINAR IN NEUROSCIENCE	1
UC 10001	FLASHES 101	1
<b>Credit Hours</b>		<b>14</b>
Semester Two		Credits
BSCI 30140	CELL BIOLOGY	4
CHEM 10061	GENERAL CHEMISTRY II (KBS)	4
CHEM 10063	GENERAL CHEMISTRY II LABORATORY (KBS) (KLAB)	1
PSYC 11762	GENERAL PSYCHOLOGY (DIVD) (KSS)	3

Kent Core Requirement	3
<b>Credit Hours</b>	<b>15</b>
<b>Semester Three</b>	
BSCI 30156 ELEMENTS OF GENETICS	3
NEUR 30100 NEUROSCIENCE I	3
PSYC 21621 QUANTITATIVE METHODS IN PSYCHOLOGY I	3
Foreign Language Requirement	4
Kent Core Requirement	3
<b>Credit Hours</b>	<b>16</b>
<b>Semester Four</b>	
NEUR 30200 NEUROSCIENCE II	3
NEUR 30300 EXPERIMENTAL METHODS IN NEUROSCIENCE	1
PSYC 31574 RESEARCH METHODS IN PSYCHOLOGY (ELR)	3
Foreign Language Requirement	4
Kent Core Requirement	3
<b>Credit Hours</b>	<b>14</b>
<b>Semester Five</b>	
Neuroscience Electives	9
Kent Core Requirement	3
Kent Core Requirement	3
<b>Credit Hours</b>	<b>15</b>
<b>Semester Six</b>	
BSCI 40600 WRITING IN THE BIOLOGICAL SCIENCES (WIC) or PSYC 41901 or RESEARCH WRITING IN PSYCHOLOGY or PSYC 41980 (WIC)	1
Neuroscience Electives	9
Kent Core Requirement	3
General Elective	3
<b>Credit Hours</b>	<b>16</b>
<b>Semester Seven</b>	
Neuroscience Electives	6
General Electives	9
<b>Credit Hours</b>	<b>15</b>
<b>Semester Eight</b>	
Neuroscience Elective	3
General Electives	12
<b>Credit Hours</b>	<b>15</b>
<b>Minimum Total Credit Hours:</b>	<b>120</b>

### Pre-Medicine/Pre-Podiatry Concentration

This roadmap is a recommended semester-by-semester plan of study for this major. However, courses designated as critical (!) must be completed in the semester listed to ensure a timely graduation.

<b>Semester One</b>		<b>Credits</b>
BSCI 10120 BIOLOGICAL FOUNDATIONS (ELR) (KBS) (KLAB)		4
CHEM 10060 GENERAL CHEMISTRY I (KBS)		4
CHEM 10062 GENERAL CHEMISTRY I LABORATORY (KBS) (KLAB)		1
MATH 11010 ALGEBRA FOR CALCULUS (KMCR)		3
NEUR 10100 SEMINAR IN NEUROSCIENCE		1
UC 10001 FLASHES 101		1
<b>Credit Hours</b>		<b>14</b>
<b>Semester Two</b>		
BSCI 30140 CELL BIOLOGY		4
CHEM 10061 GENERAL CHEMISTRY II (KBS)		4

CHEM 10063 GENERAL CHEMISTRY II LABORATORY (KBS) (KLAB)		1
PSYC 11762 GENERAL PSYCHOLOGY (DIVD) (KSS)		3
Kent Core Requirement		3
<b>Credit Hours</b>		<b>15</b>
<b>Semester Three</b>		
BSCI 30156 ELEMENTS OF GENETICS		3
CHEM 30475 ORGANIC CHEMISTRY LABORATORY I (ELR)		1
CHEM 30481 ORGANIC CHEMISTRY I		3
NEUR 30100 NEUROSCIENCE I		3
PSYC 21621 QUANTITATIVE METHODS IN PSYCHOLOGY I		3
Kent Core Requirement		3
<b>Credit Hours</b>		<b>16</b>
<b>Semester Four</b>		
CHEM 30476 ORGANIC CHEMISTRY LABORATORY II		1
CHEM 30482 ORGANIC CHEMISTRY II		3
MATH 11022 TRIGONOMETRY (KMCR)		3
NEUR 30200 NEUROSCIENCE II		3
NEUR 30300 EXPERIMENTAL METHODS IN NEUROSCIENCE		1
PSYC 31574 RESEARCH METHODS IN PSYCHOLOGY (ELR)		3
SOC 12050 INTRODUCTION TO SOCIOLOGY (DIVD) (KSS)		3
<b>Credit Hours</b>		<b>17</b>
<b>Semester Five</b>		
BSCI 30130 HUMAN PHYSIOLOGY or BSCI 40430 or ANIMAL PHYSIOLOGY		3
BSCI 30171 GENERAL MICROBIOLOGY		4
MATH 12002 ANALYTIC GEOMETRY AND CALCULUS I (KMCR)		5
PHY 13001 GENERAL COLLEGE PHYSICS I (KBS) & PHY 13021 and GENERAL COLLEGE PHYSICS LABORATORY I (KBS) (KLAB) or PHY 23101 or GENERAL UNIVERSITY PHYSICS I (KBS) (KLAB)		5
<b>Credit Hours</b>		<b>17</b>
<b>Semester Six</b>		
CHEM 30284 INTRODUCTORY BIOLOGICAL CHEMISTRY or CHEM 40245 or BIOCHEMICAL FOUNDATIONS OF MEDICINE		4
PHY 13002 GENERAL COLLEGE PHYSICS II (KBS) & PHY 13022 and GENERAL COLLEGE PHYSICS LABORATORY II (KBS) (KLAB) or PHY 23102 or GENERAL UNIVERSITY PHYSICS II (KBS) (KLAB)		5
Neuroscience Electives		5
<b>Credit Hours</b>		<b>14</b>
<b>Semester Seven</b>		
BSCI 40600 WRITING IN THE BIOLOGICAL SCIENCES (WIC) or PSYC 41901 or RESEARCH WRITING IN PSYCHOLOGY or PSYC 41980 (WIC)		1
Neuroscience Electives		6
Foreign Language		4
Kent Core Requirement		3
<b>Credit Hours</b>		<b>14</b>
<b>Semester Eight</b>		
Neuroscience Elective		3
Foreign Language		4
Kent Core Requirement		3

Kent Core Requirement	3
<b>Credit Hours</b>	<b>13</b>
<b>Minimum Total Credit Hours:</b>	<b>120</b>

## University Requirements

All students in a bachelor's degree program at Kent State University must complete the following university requirements for graduation.

**NOTE:** University requirements may be fulfilled in this program by specific course requirements. Please see Program Requirements for details.

Flashes 101 (UC 10001)	1 credit hour
Course is not required for students with 30+ transfer credits (excluding College Credit Plus) or age 21+ at time of admission.	
Diversity Domestic/Global (DIVD/DIVG)	2 courses
Students must successfully complete one domestic and one global course, of which one must be from the Kent Core.	
Experiential Learning Requirement (ELR)	varies
Students must successfully complete one course or approved experience.	
Kent Core (see table below)	36-37 credit hours
Writing-Intensive Course (WIC)	1 course
Students must earn a minimum C grade in the course.	
Upper-Division Requirement	39 credit hours
Students must successfully complete 39 upper-division (numbered 30000 to 49999) credit hours to graduate.	
Total Credit Hour Requirement	120 credit hours

## Kent Core Requirements

Kent Core Composition (KCMP)	6
Kent Core Mathematics and Critical Reasoning (KMCR)	3
Kent Core Humanities and Fine Arts (KHUM/KFA) (min one course each)	9
Kent Core Social Sciences (KSS) (must be from two disciplines)	6
Kent Core Basic Sciences (KBS/KLAB) (must include one laboratory)	6-7
Kent Core Additional (KADL)	6
<b>Total Credit Hours:</b>	<b>36-37</b>

## Program Learning Outcomes

Graduates of this program will be able to:

1. Understand fundamental principles of neuroscience.
2. Acquire fundamental hands-on research skills necessary for laboratory investigations into central nervous system function.
3. Understand proper experimental design, data analysis and communication of research results.
4. Gain greater knowledge and appreciation of the role neuroscience plays in societal issues, such as those related to neurological disorders, mental health, medicine and human and animal behavior.

## Full Description

The Bachelor of Science degree in Neuroscience offers a broad-based and hands-on study of the mechanisms of brain function from the cell and molecular level through cognition and behavior. This major is for

students interested in medicine, other health professions, research and graduate studies in biology, neuroscience and psychology. The major also prepares students for careers in industries, including biotechnology, pharmaceuticals, research administration and policy, science communication, teaching and other science-related businesses.

The Neuroscience major includes the following optional concentration:

- The **Pre-Medicine/Pre-Podiatry** concentration provides the courses necessary for admission to advanced degree programs in healthcare and biomedical science professions.