

NEUROSCIENCE - B.S.

College of Sciences and Humanities
Department of Biological Sciences
Department of Psychological Sciences
www.kent.edu/neuroscience/bs

About This Program

The Neuroscience degree 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

Examples of Possible Careers and Salaries*

Biological scientists, all other

- 2.2% slower than the average
- 44,700 number of jobs
- \$85,290 potential earnings

Biological technicians

- 4.9% about as fast as the average
- 87,500 number of jobs
- \$46,340 potential earnings

Medical scientists, except epidemiologists

- 6.1% faster than the average
- 138,300 number of jobs
- \$91,510 potential earnings

Healthcare support workers, all other

- 6.9% faster than the average
- 96,900 number of jobs
- \$39,530 potential earnings

Health information technologists, medical registrars, surgical assistants, and healthcare practitioners and technical workers, all other

- 7.9% faster than the average
- 59,400 number of jobs
- \$51,840 potential earnings

* Source of occupation titles and labor data comes from the U.S. Bureau of Labor Statistics' Occupational Outlook Handbook. Data comprises projected percent change in employment over the next 10 years; nation-wide employment numbers; and the yearly median wage at which half of the workers in the occupation earned more than that amount and half earned less.

Admission Requirements

The university affirmatively strives to provide educational opportunities and access to students with varied backgrounds, those with special talents and adult students.

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 proficiency of the English language (unless they meet specific exceptions) through the submission of an English language proficiency test score or by completing English language classes at Kent State's English as a Second Language Center before entering their program. For more information, visit the admissions website for international students.

Former Students: Former Kent State students who have not attended another institution since Kent State and were not academically dismissed will complete the re-enrollment process through the Financial, Billing and Enrollment Center. Former students who attended another college or university since leaving Kent State must apply for admissions as a transfer or post-undergraduate student.

Transfer Students: Students who attended an educational institution after graduating from high school or earning their GED must apply as transfer students. For more information, visit the admissions website for transfer students.

Admission policies for undergraduate students may be found in the University Catalog's Academic Policies.

Students may be required to meet certain criteria to progress in their program. Any progression requirements will be listed on the program's Coursework tab

Program Requirements

Major Requirements

Code	Title	Credit Hours
Major Requirements (courses count in major GPA)		
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) ¹	1
or PSYC 41901	WRITING IN PSYCHOLOGY (WIC)	
or PSYC 41980	RESEARCH WRITING IN PSYCHOLOGY (WIC)	
CHEM 10062	GENERAL CHEMISTRY I LABORATORY (KBS) (KLAB)	1
CHEM 10063	GENERAL CHEMISTRY II LABORATORY (KBS) (KLAB)	1
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 (KSS)	3
PSYC 21621	QUANTITATIVE METHODS IN PSYCHOLOGY I	3
PSYC 31574	RESEARCH METHODS IN PSYCHOLOGY (ELR)	3
Biology Electives, choose from the following:		6
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) ¹	
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	
Psychology Electives, choose from the following:		6
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 47387	NEUROPSYCHOPHARMACOLOGY	
Neuroscience Elective, choose from the following:		2
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) ¹	
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) ²	
NEUR 40195	SPECIAL TOPICS IN NEUROSCIENCE	
NEUR 40196	INDIVIDUAL INVESTIGATION IN NEUROSCIENCE ²	
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 47387	NEUROPSYCHOPHARMACOLOGY	
Additional Requirements (courses do not count in major GPA)		
UC 10001	FLASHES 101	1
Foreign Language (see Foreign Language College Requirement below)		8
American Civic Literacy Requirement ³		3
Kent Core Composition		6
Kent Core Humanities and Fine Arts (minimum one course from each) ³		6-9
General Elective (total credit hours depends on earning 120 credit hours, including 39 upper-division credit hours)		2
Additional Requirements or Concentration		
Choose from the following:		46
Additional Requirements for Students Not Declaring a Concentration		
Pre-Medicine/Pre-Podiatry Concentration		
Minimum Total Credit Hours:		120

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

² A maximum 6 credit hours of NEUR 40192 and NEUR 40196 combined may be applied toward major requirements.

³ If students complete the American Civic Literacy requirement by taking HIST 12061, the course will apply to the Kent Core Humanities category. If they complete it with POL 10101, the course will apply to the Kent Core Social Sciences category or general electives.

Additional Requirements for Students Not Declaring a Concentration

Code	Title	Credit Hours
Major Requirements (courses count in major GPA)		
Neuroscience Electives, choose from the list in the major		13
General Chemistry Electives, choose from the following:		8
CHEM 10058 & CHEM 10059	GENERAL CHEMISTRY FOR LIFE SCIENCES I (KBS) and GENERAL CHEMISTRY FOR LIFE SCIENCES II	

CHEM 10060 & CHEM 10061	GENERAL CHEMISTRY I (KBS) and GENERAL CHEMISTRY II (KBS)	
Additional Requirements (courses do not count in major GPA)		
Kent Core Mathematics and Critical Reasoning		3
Kent Core Social Sciences (must be from two disciplines) ¹		0-3
Kent Core Additional		3
General Electives		19
Minimum Total Credit Hours:		46

¹ If students complete the American Civic Literacy requirement by taking HIST 12061, the course will apply to the Kent Core Humanities category. If they complete it with POL 10101, the course will apply to the Kent Core Social Sciences category.

Pre-Medicine/Pre-Podiatry Concentration Requirements

Code	Title	Credit Hours
Concentration Requirements (courses count in major GPA)		
BSCI 30130 or BSCI 40430	HUMAN PHYSIOLOGY ANIMAL PHYSIOLOGY	3
CHEM 10060	GENERAL CHEMISTRY I (KBS)	4
CHEM 10061	GENERAL CHEMISTRY II (KBS)	4
CHEM 30284 or CHEM 40245	INTRODUCTORY BIOLOGICAL CHEMISTRY BIOCHEMICAL FOUNDATIONS OF MEDICINE	4
CHEM 30475	ORGANIC CHEMISTRY LABORATORY I (ELR)	1
CHEM 30476	ORGANIC CHEMISTRY LABORATORY II	1
CHEM 30481	ORGANIC CHEMISTRY I	4
CHEM 30482	ORGANIC CHEMISTRY II	4
MATH 11022	TRIGONOMETRY (KMCR)	3
MATH 12002	ANALYTIC GEOMETRY AND CALCULUS I (KMCR)	5
PHY 13001 & PHY 13021 or PHY 23101	GENERAL COLLEGE PHYSICS I (KBS) and GENERAL COLLEGE PHYSICS LABORATORY I (KBS) (KLAB) GENERAL UNIVERSITY PHYSICS I (KBS) (KLAB)	5
PHY 13002 & PHY 13022 or PHY 23102	GENERAL COLLEGE PHYSICS II (KBS) and GENERAL COLLEGE PHYSICS LABORATORY II (KBS) (KLAB) GENERAL UNIVERSITY PHYSICS II (KBS) (KLAB)	5
SOC 12050	INTRODUCTION TO SOCIOLOGY (KSS)	3
Additional Requirements (courses do not count in major GPA)		
General Elective ¹		0-3
Minimum Total Credit Hours:		46

¹ If students complete the American Civic Literacy requirement by taking HIST 12061, the course will apply to the Kent Core Humanities category. If they complete it with POL 10101, the course will apply toward general electives.

Graduation Requirements

Minimum Major GPA	Minimum Overall GPA
2.000	2.000

Foreign Language College Requirement, B.A.

Students pursuing the Bachelor of Arts degree in the College of Sciences and Humanities must complete the following:

1. Elementary I and II of any language (or equivalent) **and**
2. One of the following options:
 - a. Intermediate I and II of the same language
 - b. Elementary I and II of a second language
 - c. Any combination of two courses from the following list:
 - i. Intermediate I of the same language
 - ii. One to two college-level course(s) completed outside the United States
 - iii. Courses: ARAB 21401, ASL 19401, CHIN 25421, MCLS 10001, MCLS 20001, MCLS 20091, MCLS 21417, MCLS 21420, MCLS 22217, MCLS 28403, MCLS 28404

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 courses. This may be accomplished in one of three ways:

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
3. Demonstrating language proficiency comparable to Elementary II of a foreign language

Certain programs may require specific languages, limit the languages from which a student may choose or require coursework through Intermediate II. Students who plan to pursue graduate study may need a particular language proficiency.

Roadmaps Neuroscience Major (No Concentration)

This roadmap is a recommended semester-by-semester plan of study for this program. Students will work with their advisor to develop a sequence based on their academic goals and history. 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 10062	GENERAL CHEMISTRY I LABORATORY (KBS) (KLAB)	1
NEUR 10100	SEMINAR IN NEUROSCIENCE	1
UC 10001	FLASHES 101	1
General Chemistry Elective		4
Kent Core Requirement		3
Credit Hours		14

Semester Two		Credits
BSCI 30140	CELL BIOLOGY	4
CHEM 10063	GENERAL CHEMISTRY II LABORATORY (KBS) (KLAB)	1
PSYC 11762	GENERAL PSYCHOLOGY (KSS)	3
General Chemistry Elective		4
Kent Core Requirement		3
Credit Hours		15

Semester Three		Credits
BSCI 30156	ELEMENTS OF GENETICS	3
NEUR 30100	NEUROSCIENCE I	3
PSYC 21621	QUANTITATIVE METHODS IN PSYCHOLOGY I	3
Foreign Language Requirement		4

American Civic Literacy Requirement	3
Credit Hours	16
Semester Four	
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
Credit Hours	14
Semester Five	
Biology and/or Neuroscience and/or Psychology Electives	9
Kent Core Requirement	3
Kent Core Requirement	3
Credit Hours	15
Semester Six	
BSCI 40600 WRITING IN THE BIOLOGICAL SCIENCES (WIC) or PSYC 41901 or RESEARCH WRITING IN PSYCHOLOGY or PSYC 41980 (WIC)	1
Biology and/or Neuroscience and/or Psychology Electives	9
Kent Core Requirement	3
Kent Core Requirement	3
Credit Hours	16
Semester Seven	
Biology and/or Neuroscience and/or Psychology Electives	6
General Electives	9
Credit Hours	15
Semester Eight	
Biology and/or Neuroscience and/or Psychology Elective	3
General Electives	12
Credit Hours	15
Minimum Total Credit Hours:	120

Pre-Medicine/Pre-Podiatry Concentration

This roadmap is a recommended semester-by-semester plan of study for this program. Students will work with their advisor to develop a sequence based on their academic goals and history. 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
NEUR 10100 SEMINAR IN NEUROSCIENCE		1
UC 10001 FLASHES 101		1
Kent Core Requirement		3
Credit Hours		14
Semester Two		
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 (KSS)		3
Kent Core Requirement		3
Credit Hours		15

Semester Three		
BSCI 30156 ELEMENTS OF GENETICS		3
CHEM 30475 ORGANIC CHEMISTRY LABORATORY I (ELR)		1
CHEM 30481 ORGANIC CHEMISTRY I		4
NEUR 30100 NEUROSCIENCE I		3
PSYC 21621 QUANTITATIVE METHODS IN PSYCHOLOGY I		3
American Civic Literacy Requirement		3
Credit Hours		17
Semester Four		
CHEM 30476 ORGANIC CHEMISTRY LABORATORY II		1
CHEM 30482 ORGANIC CHEMISTRY II		4
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
Credit Hours		15
Semester Five		
BSCI 30130 HUMAN PHYSIOLOGY or BSCI 40430 or ANIMAL PHYSIOLOGY		3
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
SOC 12050 INTRODUCTION TO SOCIOLOGY (KSS)		3
Credit Hours		16
Semester Six		
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
Biology and/or Neuroscience and/or Psychology Electives		5
Credit Hours		14
Semester Seven		
BSCI 40600 WRITING IN THE BIOLOGICAL SCIENCES (WIC) or PSYC 41901 or RESEARCH WRITING IN PSYCHOLOGY or PSYC 41980 (WIC)		1
Biology and/or Neuroscience and/or Psychology Electives		6
Foreign Language		4
Kent Core Requirement		3
Credit Hours		14
Semester Eight		
Biology and/or Neuroscience and/or Psychology Elective		3
Foreign Language		4
Kent Core Requirement		3
Kent Core Requirement or General Elective		3
General Elective		2
Credit Hours		15
Minimum Total Credit Hours:		120

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.	
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 (KCOMP)	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
Total Credit Hours:	36-37

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.

Program Policies

Foreign Language Requirements

In general, students may elect any foreign language taught through the Department of Modern and Classical Language Studies. However, certain majors, concentrations and minors require specific languages or limit the languages from which students may choose. In addition, students who plan to pursue graduate study may need particular languages for that study. In such cases, students should seek the advice of the appropriate department before selecting a language.

Progress Toward Fulfillment

College of Sciences and Humanities students are encouraged to begin meeting the foreign language requirement as early as possible in their program to ensure timely degree completion.

Mandatory Outcomes Assessment

In addition to the other General Requirements of the college, candidates for an undergraduate degree in the College of Sciences and Humanities are required, as a condition of graduation, to participate in an outcomes assessment. These outcomes assessments are conducted by each undergraduate degree program in the College of Sciences and Humanities.

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.