PHYSICAL SCIENCE - B.S.E.

College of Education Health and Human Services
School of Teaching, Learning and Curriculum Studies
www.kent.edu/ehhs/tlcs

About This Program

With the Physical Science B.S.E. program, you'll gain a solid foundation in the fundamental principles of physics, chemistry, and earth science. This program offers hands-on learning experiences, research opportunities and expert faculty guidance to help you succeed. Read more...

Contact Information

- **Kristine E. Pytash, Ph.D.** | kpytash@kent.edu | 330-672-0641
- Speak with an Advisor
- Chat with an Admissions Counselor

Program Delivery

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

Examples of Possible Careers*

Agricultural sciences teachers, postsecondary

- 2.1% slower than the average
- 11,400 number of jobs
- $90,340 potential earnings

Atmospheric, earth, marine, and space sciences teachers, postsecondary

- 1.9% slower than the average
- 13,100 number of jobs
- $94,520 potential earnings

Biological science teachers, postsecondary

- 9.3% much faster than the average
- 64,700 number of jobs
- $85,600 potential earnings

Chemistry teachers, postsecondary

- 4.3% about as fast as the average
- 26,400 number of jobs
- $80,400 potential earnings

Education teachers, postsecondary

- 4.8% about as fast as the average
- 77,300 number of jobs
- $65,440 potential earnings

Environmental science teachers, postsecondary

- 3.7% about as fast as the average
- 7,600 number of jobs
- $84,740 potential earnings

Forestry and conservation science teachers, postsecondary

- 2.2% slower than the average
- 2,100 number of jobs
- $87,400 potential earnings

Middle school teachers, except special and career/technical education

- 3.6% about as fast as the average
- 627,100 number of jobs
- $60,810 potential earnings

Physics teachers, postsecondary

- 4.4% about as fast as the average
- 17,100 number of jobs
- $90,400 potential earnings

Secondary school teachers, except special and career/technical education

- 3.8% about as fast as the average
- 1,050,800 number of jobs
- $62,870 potential earnings

Accreditation

Council for the Accreditation of Educator Preparation

* 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

Admission to this major is selective. Admission to the college does not guarantee admission to a major and/or admission to professional coursework for a selective admission program. To be admitted directly into a teacher education program, it is required that new freshmen have a 2.750 high school GPA. Students who do not meet the GPA requirement at the time of admission for this major will be admitted to the EHHS General non-degree program until which time they have established a Kent State GPA of 2.750. They may then submit a change of program to declare this major.

Current Kent State and Transfer Students: Active Kent State students who wish to change their major must have attempted a minimum 12 credit hours at Kent State and meet all admission criteria listed above to be admitted. Students who have not attempted 12 credit hours at Kent State will be evaluated for admission based on their high school GPA for new students or transfer GPA for transfer students. Transfer students who have not attempted 12 credit hours of college-level coursework at

Kent State and/or other institutions will be evaluated based on both their high school GPA and college GPA.

International Students: All international students must provide proof of English language proficiency (unless they meet specific exceptions to waive) by earning a minimum 71 TOEFL iBT score, minimum 6.0 IELTS score, minimum 47 PTE score or minimum 100 DET score, or by completing the ELS level 112 Intensive English Program. For more information on international admission visit the admissions website for international students.

Program Requirements

Major Requirements

Code	Title	Credit Hours
Major Requirements (courses count in major GPA; min C grade required in all courses)		
BSCI 10120	BIOLOGICAL FOUNDATIONS (ELR) (KBS) (KLAB)	4
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
CHEM 20481	BASIC ORGANIC CHEMISTRY I	4
CHEM 30105	ANALYTICAL CHEMISTRY I	3
CHEM 30284	INTRODUCTORY BIOLOGICAL CHEMISTRY	4
CHEM 30301	INORGANIC CHEMISTRY I	3
CHEM 40567	PHYSICAL CHEMISTRY FOR LIFE SCIENCES	4
PHY 21430	FRONTIERS IN ASTRONOMY (KBS)	3
PHY 23101	GENERAL UNIVERSITY PHYSICS I (KBS) (KLAB)	5
PHY 23102	GENERAL UNIVERSITY PHYSICS II (KBS) (KLAB)	5
PHY 30020	INTERMEDIATE PHYSICS LABORATORY (WIC)	2
PHY 36001	INTRODUCTORY MODERN PHYSICS	3
PHY 32511	ELECTRONICS	3-4
or PHY 36002	APPLICATIONS OF MODERN PHYSICS	
Additional Requirements (courses do not count in major GPA)		
ADED 20000	TOPICS IN SOCIAL JUSTICE IN TEACHING AND LEARNING (min C grade) [1]	3
ADED 32142	PRINCIPLES OF TEACHING ADOLESCENTS (WIC) (min C grade) [1]	3
ADED 32277	TEACHING SCIENCE IN SECONDARY SCHOOLS (min C grade) [1]	3
ADED 42277	TOPICS IN SECONDARY SCHOOL SCIENCE TEACHING (min C grade)	3
ADED 42292	FIELD WORK PRACTICUM (ELR) (min C grade) [1]	3
ADED 42392	SECONDARY STUDENT TEACHING (ELR) [1]	9
ADED 49525	INQUIRY INTO PROFESSIONAL PRACTICE (min C grade)	3
CI 47330	READING AND WRITING IN ADOLESCENCE/ ADULTHOOD (min C grade)	3
CULT 29535	EDUCATION IN A DEMOCRATIC SOCIETY (min C grade)	3
EPSY 29525	EDUCATIONAL PSYCHOLOGY (min C grade)	3
ETEC 39525	EDUCATIONAL TECHNOLOGY (min C grade)	3
MATH 11010	ALGEBRA FOR CALCULUS (KMCR)	3
MATH 11022	TRIGONOMETRY (KMCR)	3
MATH 12002	ANALYTIC GEOMETRY AND CALCULUS I (KMCR)	5
MATH 12003	ANALYTIC GEOMETRY AND CALCULUS II (min C grade)	5
PHIL 11001	INTRODUCTION TO PHILOSOPHY (DIVG) (KHUM)	3
PSYC 11762	GENERAL PSYCHOLOGY (DIVD) (KSS)	3
SOC 12050	INTRODUCTION TO SOCIOLOGY (DIVD) (KSS)	3
SPED 23000	INTRODUCTION TO EXCEPTIONALITIES (DIVD) (min C grade)	3
UC 10001	FLASHES 101	1
Kent Core Composition (min C grade)		6
Kent Core Humanities and Fine Arts (minimum one course from each)		6
Minimum Total Credit Hours:		**133**

[1] Teacher candidates are only permitted to repeat a field experience course once. Please see Repeating Field Experience Courses in Teacher Education Programs policy for details.

Progression Requirements

Students seeking admission to this program must meet all professional requirements for admission to advanced study. To be admitted to the program, students must display evidence of the following:

- Adequate communication skills
- Sound content area knowledge (language arts, mathematics, science or social studies)
- Basic understanding of the teaching profession
- Basic understanding of adolescents
- Dispositions aligned with the conceptual framework of the College of Education, Health and Human Services, including being open-minded, flexible, caring and responsible.

Faculty will select the most qualified applicants based on an interview, letters of recommendation, GPA[1], and performance in English coursework.

Applicants must have experience working with young adults in a supervisory capacity, such as tutoring, camp counseling, volunteer work or related experience. Students should contact the College of Education, Health, and Human Services' Vacca Office of Student Services, 304 White Hall, during the first year of study to inquire about the procedures and criteria associated with admission to advanced study.

[1] Undergraduate students who have not completed a minimum of 12 Kent State University credit hours will be evaluated for advanced study and professional phase based on their high school GPA for new freshmen or transfer GPA for transfer students.

Graduation Requirements

Minimum Major GPA	Minimum Overall GPA
2.600	2.750

Dual Majors/Dual Degrees

Students seeking to declare an additional teacher education major in the B.S.E. degree (double major) or in a different degree (dual degree) may have the double major/dual degree approved as long as the following requirements are met:

1. Approval is received from the academic unit administrating each major. A program of study for those interested in pursuing a double major must be approved in writing by faculty from each major area prior to admission to advanced study.
2. All required content courses are completed for each major
3. All required methods courses are completed for each major.
4. Separate practicum and inquiry courses are completed for each major as listed below:
   a. ADED 42292 (or the equivalent required by the major outside the college)
   b. ADED 49525 (or the equivalent required by the major outside the college)
5. Students who have two majors from among the following only need to take ADED 42392, consisting of a 16-week classroom experience involving both subject areas: Life Sciences, Earth Science, Physical Sciences, Integrated Science, Integrated Mathematics, Life Science/Chemistry, Integrated Social Studies and/or Integrated Language Arts.
6. Students who have a second major not included in the list above (#5) will have their student teaching requirements determined by faculty from both program areas at the time the program of study is developed, with a minimum 16 weeks spent in the classroom.

Licensure information

Candidates seeking Ohio licensure are required to pass specific assessments in order to apply for licensure. See Ohio Department of Education-Educator Preparation website for more information on assessments specific to licensure type. Taking and passing the licensure tests prior to graduation is encouraged but not required.

Students must apply for State of Ohio Licensure (defined by completion of all licensure program requirements) within 12 months of program completion. After 12 months, applicants must meet State approved program/licensure requirements that are in effect at the time of application. This means that students who apply after the 12 month deadline may have to take additional coursework if the content, methods courses, program requirements, or licensure requirements have changed from the catalog in force.

Roadmap

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
	CHEM 10060	GENERAL CHEMISTRY I (KBS)	4
	CHEM 10062	GENERAL CHEMISTRY I LABORATORY (KBS) (KLAB)	1
	MATH 11010	ALGEBRA FOR CALCULUS (KMCR)	3
	PSYC 11762	GENERAL PSYCHOLOGY (DIVD) (KSS)	3
	UC 10001	FLASHES 101	1
	Kent Core Requirement		3
	Kent Core Requirement		3
		Credit Hours	**18**
	Semester Two		
	CHEM 10061	GENERAL CHEMISTRY II (KBS)	4
	CHEM 10063	GENERAL CHEMISTRY II LABORATORY (KBS) (KLAB)	1
!	CULT 29535	EDUCATION IN A DEMOCRATIC SOCIETY	3
	MATH 11022	TRIGONOMETRY (KMCR)	3
	SOC 12050	INTRODUCTION TO SOCIOLOGY (DIVD) (KSS)	3
	Kent Core Requirement		3
		Credit Hours	**17**
	Semester Three		
	Requirement: minimum overall 2.750 GPA by end of term and minimum C grade and 2.600 major GPA		
	CHEM 20481	BASIC ORGANIC CHEMISTRY I	4
	EPSY 29525	EDUCATIONAL PSYCHOLOGY	3
!	MATH 12002	ANALYTIC GEOMETRY AND CALCULUS I (KMCR)	5
!	PHY 23101	GENERAL UNIVERSITY PHYSICS I (KBS) (KLAB)	5
		Credit Hours	**17**
	Semester Four		
	Requirement: minimum 2.750 overall GPA and minimum 2.600 major GPA		
	ADED 20000	TOPICS IN SOCIAL JUSTICE IN TEACHING AND LEARNING	3
	MATH 12003	ANALYTIC GEOMETRY AND CALCULUS II	5
!	PHY 23102	GENERAL UNIVERSITY PHYSICS II (KBS) (KLAB)	5
	Kent Core Requirement		3
		Credit Hours	**16**
	Semester Five		
	Requirement: minimum 2.750 overall GPA and minimum 2.600 major GPA		
!	ADED 32142	PRINCIPLES OF TEACHING ADOLESCENTS (WIC)	3
	CHEM 30105	ANALYTICAL CHEMISTRY I	3
	CI 47330	READING AND WRITING IN ADOLESCENCE/ ADULTHOOD	3
	ETEC 39525	EDUCATIONAL TECHNOLOGY	3
	PHIL 11001	INTRODUCTION TO PHILOSOPHY (DIVG) (KHUM)	3
	SPED 23000	INTRODUCTION TO EXCEPTIONALITIES (DIVD)	3
		Credit Hours	**18**
	Semester Six		
	Requirement: minimum 2.750 overall GPA and minimum 2.600 major GPA		
	ADED 32277	TEACHING SCIENCE IN SECONDARY SCHOOLS	3
	CHEM 30284	INTRODUCTORY BIOLOGICAL CHEMISTRY	4
	CHEM 30301	INORGANIC CHEMISTRY I	3
	PHY 21430	FRONTIERS IN ASTRONOMY (KBS)	3
	PHY 30020	INTERMEDIATE PHYSICS LABORATORY (WIC)	2
	PHY 36001	INTRODUCTORY MODERN PHYSICS	3
		Credit Hours	**18**
	Semester Seven		
	Requirements: minimum 2.750 overall GPA and minimum 2.600 major GPA		
!	ADED 42277	TOPICS IN SECONDARY SCHOOL SCIENCE TEACHING	3
	BSCI 10120	BIOLOGICAL FOUNDATIONS (ELR) (KBS) (KLAB)	4
!	ADED 42292	FIELD WORK PRACTICUM (ELR)	3
	CHEM 40567	PHYSICAL CHEMISTRY FOR LIFE SCIENCES	4
	PHY 32511 or PHY 36002	ELECTRONICS or APPLICATIONS OF MODERN PHYSICS	3-4
		Credit Hours	**17**
	Semester Eight		
	Requirement: minimum 2.750 overall GPA and minimum 2.600 major GPA		
!	ADED 42392	SECONDARY STUDENT TEACHING (ELR)	9
!	ADED 49525	INQUIRY INTO PROFESSIONAL PRACTICE	3
		Credit Hours	**12**
		Minimum Total Credit Hours:	**133**

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
Total Credit Hours:	**36-37**

Program Learning Outcomes

Graduates of this program will be able to:

1. Plan multiple lessons using a variety of inquiry approaches that demonstrate their knowledge and understanding of how to engage all students in learning science.
2. Plan a learning environment and learning experiences for all students that demonstrate chemical safety, safety procedures, and the ethical treatment of living organisms within their licensure area.
3. Plan fair and equitable assessment strategies to analyze student learning and to evaluate if the science learning goals are met.

Full Description

The Bachelor of Science in Education degree in Physical Science prepares students for teacher licensure in physics and chemistry, grades 7 to 12. Students take a broad range of science-content courses in biology and geology and specialize in physics and chemistry content. Students in the Physical Science major complete most of their content coursework during their first three years, and then begin their methods coursework during the spring of their third year. During the final year of the program, students complete remaining content courses, science teaching methods courses and a year-long placement in a local school district, which concludes with 13 weeks of student teaching in the spring. Physical Science students are encouraged to meet with their faculty advisor early in their program because many courses must be sequenced carefully.

Students are required to complete Bureau of Criminal Investigation and Identification (BCII) and Federal Bureau of Investigation (FBI) background checks.

Professional Licensure Disclosure

This program is designed to prepare students to sit for applicable licensure or certification in Ohio. If you plan to pursue licensure or certification in a state other than Ohio, please review state educational requirements for licensure or certification and contact information for state licensing boards at Kent State's website for professional licensure disclosure.