

# PHYSICAL SCIENCE - B.S.E.

**College of Education Health and Human Services**  
 School of Teaching, Learning and Curriculum Studies  
 404 White Hall  
 Kent Campus  
 330-672-2580  
[www.kent.edu/ehhs/tlcs](http://www.kent.edu/ehhs/tlcs)

## Description

The Bachelor of Science in Education degree in Physical Science prepares students for teacher licensure in physics and chemistry, grades seven 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.

### Fully Offered At:

- Kent Campus

## Accreditation

National Council for Accreditation of Teacher Education

## 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.

**English Language Proficiency Requirements for International Students:** All international students must provide proof of English language proficiency (unless they meet specific exceptions) by earning a minimum 525 TOEFL score (71 on the Internet-based version), minimum 75 MELAB score, minimum 6.0 IELTS score or minimum 48 PTE Academic score, or by completing the ELS level 112 Intensive Program. For more information

on international admission, visit the Office of Global Education's admission website.

## Program Learning Outcomes

Graduates of this program will be able to:

1. Interrelate and interpret important concepts, ideas and applications in their fields of licensure; conduct scientific investigations.
2. Engage students effectively in studies of the history, philosophy and practice of science. They will be able to enable students to distinguish science from non-science, understand the evolution and practice of science as a human endeavor and critically analyze assertions made in the name of science.
3. Engage students both in studies of various methods of scientific inquiry and in active learning through scientific inquiry. They will be able to encourage students, individually and collaboratively, to observe, ask questions, design inquiries and collect and interpret data in order to develop concepts and relationships from empirical experiences.
4. Recognize that informed citizens must be prepared to make decisions and take action on contemporary science- and technology-related issues of interest to the general society. They will be able to require students to conduct inquiries into the factual basis of such issues and to assess possible actions and outcomes based upon their goals and values.
5. Create a community of diverse learners who construct meaning from their science experiences and possess a disposition for further exploration and learning. They will be able to use, and can justify, a variety of classroom arrangements, groupings, actions, strategies and methodologies.
6. Plan and implement an active, coherent, and effective curriculum that is consistent with the goals and recommendations of the National Science Education Standards. They will be able to begin with the end in mind and effectively incorporate contemporary practices and resources into their planning and teaching.
7. Relate their discipline to their local and regional communities, involving stakeholders and using the individual, institutional and natural resources of the community in their teaching. They will be able to actively engage students in science-related studies or activities related to locally important issues.
8. Construct and use effective assessment strategies to determine the backgrounds and achievements of learners and facilitate their intellectual, social and personal development. They will be able to assess students fairly and equitably and require that students engage in ongoing self-assessment.
9. Organize safe and effective learning environments that promote the success of students and the welfare of all living things. They will be able to require and promote knowledge and respect for safety, and oversee the welfare of all living things used in the classroom or found in the field.
10. Strive continuously to grow and change, personally and professionally, to meet the diverse needs of their students, school, community and profession. They will have a desire and disposition for growth and betterment.

## 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.

Destination Kent State: First Year Experience	1
Course is not required for students with 25 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
Writing-Intensive Course (WIC)	1 course
Students must earn a minimum C grade in the course.	
Upper-Division Requirement	39 (or 42)
Students must successfully complete 39 upper-division (numbered 30000 to 49999) credit hours to graduate. Students in a B.A. and/or B.S. degree in the College of Arts and Sciences must complete 42 upper-division credit hours.	
Total Credit Hour Requirement	120
Some bachelor's degrees require students to complete more than 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
<b>Total Credit Hours:</b>	<b>36-37</b>

## Program Requirements

### Major Requirements

Code	Title	Credit Hours
<b>Major Requirements (courses count in major GPA; min C grade required in all courses)</b>		
BSCI 10120	BIOLOGICAL FOUNDATIONS (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	2
CHEM 40567	PHYSICAL CHEMISTRY FOR LIFE SCIENCES	4

GEOG 31062	FUNDAMENTALS OF METEOROLOGY	3
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 32142	PRINCIPLES OF TEACHING ADOLESCENTS (WIC) (min C grade)	3
ADED 32277	TEACHING SCIENCE IN SECONDARY SCHOOLS (min C grade)	3
ADED 42277	TOPICS IN SECONDARY SCHOOL SCIENCE TEACHING (min C grade)	3
ADED 42292	FIELD WORK PRACTICUM (ELR) (min C grade)	3
ADED 42357	SECONDARY STUDENT TEACHING (ELR)	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 10097	DESTINATION KENT STATE: FIRST YEAR EXPERIENCE	1
Kent Core Composition (min C grade)		6
Kent Core Humanities and Fine Arts (minimum one from each)		6

Minimum Total Credit Hours: 132

## 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<sup>1</sup>; Praxis Core scores; and performance in English and communication studies coursework.

deadline may have to take additional coursework if the content, methods courses, program requirements, or licensure requirements have changed from the catalog in force.

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.

<sup>1</sup> 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 42357, 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

## 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 10097	DESTINATION KENT STATE: FIRST YEAR EXPERIENCE	1
Kent Core Requirement		3
Kent Core Requirement		3
Credit Hours		18

Semester Two		Credits
Requirement: Successful completion of Praxis Core Reading, Writing and Mathematics		
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		Credits
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		Credits
Requirement: minimum 2.750 overall GPA and minimum 2.600 major GPA		
BSCI 10120	BIOLOGICAL FOUNDATIONS (KBS) (KLAB)	4
MATH 12003	ANALYTIC GEOMETRY AND CALCULUS II	5
! PHY 23102	GENERAL UNIVERSITY PHYSICS II (KBS) (KLAB)	5
Kent Core Requirement		3
Credit Hours		17

Semester Five		Credits
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		Credits
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	2
PHY 21430	FRONTIERS IN ASTRONOMY (KBS)	3
PHY 30020	INTERMEDIATE PHYSICS LABORATORY (WIC)	2
PHY 36001	INTRODUCTORY MODERN PHYSICS	3

Credit Hours 17

Semester Seven		Credits
Requirements: minimum 2.750 overall GPA and minimum 2.600 major GPA		
! ADED 42277	TOPICS IN SECONDARY SCHOOL SCIENCE TEACHING	3
! ADED 42292	FIELD WORK PRACTICUM (ELR)	3
CHEM 40567	PHYSICAL CHEMISTRY FOR LIFE SCIENCES	4
GEOG 31062	FUNDAMENTALS OF METEOROLOGY	3
PHY 32511	ELECTRONICS	3-4
or	or APPLICATIONS OF MODERN PHYSICS	
PHY 36002		

Credit Hours 16

Semester Eight		Credits
Requirement: minimum 2.750 overall GPA and minimum 2.600 major GPA		
! ADED 42357	SECONDARY STUDENT TEACHING (ELR)	9
! ADED 49525	INQUIRY INTO PROFESSIONAL PRACTICE	3

Credit Hours 12

Minimum Total Credit Hours: 132