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

• Program Coordinator: 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. For more information, visit the admissions website for international students.

### Program Requirements

**Code** | **Title** | **Credit Hours**
--- | --- | ---
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)**

**Code** | **Title** | **Credit Hours**
--- | --- | ---
ADED 20000 | TOPICS IN SOCIAL JUSTICE IN TEACHING AND LEARNING (min C grade) | 3
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 42392 | 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) | 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, 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

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<tr>
<th>Minimum Major GPA</th>
<th>Minimum Overall GPA</th>
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<td>2.600</td>
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### 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.
2. 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.
3. All required content courses are completed for each major.
4. 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
- 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 INSTRUCTIONAL TECHNOLOGY 3
- PHIL 11001 INTRODUCTION TO PHILOSOPHY (DIVD) (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

Credit Hours 12

Semester Seven
- Requirement: 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 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/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
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.