SECONDARY EDUCATION, B.S. (BEHREND)

Begin Campus: Any Penn State Campus
End Campus: Erie

Program Description
Not all options are available at every campus. Contact the campus you are interested in attending to determine which options are offered.

The following teaching options are available for majors in Secondary Education: Biological Science, Chemistry, Earth and Space Science, English, Environmental Education, General Science, Mathematics, Physics, and Social Studies/Citizenship Education.

The Secondary Education major helps prepare students for middle school and/or high school teaching positions and for other employment in fields related to their content specialties.

Biological Science Teaching Option
Available at the following campuses: University Park
This option enables the graduate to meet all of the academic requirements for the Instructional I certificate for teaching at the secondary-school level, which is issued by the Pennsylvania Department of Education.

Chemistry Teaching Option
Available at the following campuses: University Park
This option enables the graduate to meet all of the academic requirements for the Instructional I certificate for teaching at the secondary-school level, which is issued by the Pennsylvania Department of Education.

Earth and Space Science Teaching Option
Available at the following campuses: University Park
This option enables the graduate to meet all of the academic requirements for the Instructional I certificate for teaching at the secondary-school level, which is issued by the Pennsylvania Department of Education.

English Teaching Option
Available at the following campuses: University Park
This option enables the graduate to meet all of the academic requirements for the Instructional I certificate for teaching at the secondary-school level, which is issued by the Pennsylvania Department of Education. A comparable program is also open to student outside the College of Education who desire certification.

Environmental Education Teaching Option
Available at the following campuses: University Park
This option enables the graduate to meet all of the academic requirements for a Pennsylvania teacher certification in Environmental Education when completed in conjunction with another secondary education teaching option (i.e., Biological Science Teaching option). The total number of credits required will depend primarily on that other option.

General Science Teaching Option
Available at the following campuses: University Park
This option enables the graduate to meet all of the academic requirements for the Instructional I certificate for teaching General Science at the secondary-school level, which is issued by the Pennsylvania Department of Education. This option may only be completed in conjunction with another secondary education option (e.g., Biology); the total number of credits required will depend primarily on that other option.

Mathematics Teaching Option
Available at the following campuses: Erie, University Park
This option enables the graduate to meet all of the academic requirements for the Instructional I certificate for teaching at the secondary-school level, which is issued by the Pennsylvania Department of Education.

Physics Teaching Option
Available at the following campuses: University Park
This option enables the graduate to meet all of the academic requirements for the Instructional I certificate for teaching at the secondary-school level, which is issued by the Pennsylvania Department of Education.

Social Studies Teaching Option
Available at the following campuses: University Park
This option enables the graduate to meet all of the academic requirements for the Instructional I certificate for teaching social studies at the secondary-school level, which is issued by the Pennsylvania Department of Education.

What is Secondary Education?
The Secondary Education (SECED) major prepares graduates to teach at the middle school or high school level (grades 7-12) in English, Mathematics, Social Studies (which includes history, geography, government, and the social sciences), or a science subject (Biology, Chemistry, Earth & Space Science, or Physics). The program combines on-campus course work with clinical experiences in schools; graduates are eligible to apply for teacher licensure through the Pennsylvania Department of Education.

You Might Like This Program If...
• You are committed to public service and working with young people, and you appreciate that effective teaching demands both mastery of subject matter knowledge and understanding learners and communities.
• In your subject-matter studies, you tend to find yourself asking: How do we know that? Is there a better way to describe it? What are we overlooking? How could I help others understand this too?

MORE INFORMATION ABOUT SECONDARY EDUCATION (https://ed.psu.edu/academics/departments/department-curriculum-and-instruction/undergraduate-teacher-education-pk-12/secondary-education-7-12/)
Entrance to Major
Baccalaureate degree candidates must meet the following requirements 1-3 by the end of their third semester:
1. A minimum cumulative grade point average of 3.00
2. Qualifying scores from the PECT PAPA for Reading, Writing and Mathematics
3. Documentation of at least 80 hours of volunteer or paid education work experience with learners of the age group the candidate plans to teach. Candidates for Secondary Education must document 40 of these hours with learners who come from backgrounds that are different from the candidate’s.

Requirements 4-9 must be met by the end of the fourth semester when students typically participate in the Entrance-to-Major process.
4. A grade of "C" or better in all specified courses.
5. Completion of an early field experience specified by the certification program.
6. Completion of a core of Education courses specified by the certification program.
7. Completion of additional credits as specified by the certification program.
8. Completion of at least 48 semester credit hours, including ENGL 15 or ENGL 30H, three credits of literature, and six credits of quantification.
9. Approval from the professional education adviser or the head of the pertinent certification program.

Degree Requirements
For the B.S. degree in Secondary Education with an option in Biological Science Teaching, a minimum of 126 credits is required; with an option in Chemistry Teaching, a minimum of 126 credits is required; with an option in Earth and Space Science Teaching, a minimum of 123 credits is required; with an option in English Teaching, a minimum of 126 credits is required; with an option in Environmental Education Teaching and a cohort option, a minimum of 123 credits is required; with an option in General Science Teaching and a cohort option, a minimum of 121 credits is required; with an option in Mathematics Teaching, a minimum of 132 credits is required; with an option in Physics Teaching, a minimum of 121 credits is required; with an option in Social Studies Teaching, a minimum of 129-132 credits is required. (See also Teacher Education Programs (https://ed.psu.edu/academics/teacher-testing-certification/)).

Requirements for the Major
A grade of C or better per course is required for teacher certification.

Common Requirements for the Major (All Options)
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescribed Courses: Require a grade of C or better for teacher certification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CI 280</td>
<td>Introduction to Teaching English Language Learners</td>
<td>3</td>
</tr>
<tr>
<td>CI 295</td>
<td>Introductory Field Experience for Teacher Preparation</td>
<td>2</td>
</tr>
<tr>
<td>CI 495C</td>
<td>Clinical Application of Instruction – Secondary Education</td>
<td>3</td>
</tr>
<tr>
<td>CI 495E</td>
<td>Practicum in Student Teaching – Secondary Education</td>
<td>15</td>
</tr>
<tr>
<td>EDPSY 14</td>
<td>Learning and Instruction – Secondary Education</td>
<td>3</td>
</tr>
<tr>
<td>PSYCH 100</td>
<td>Introductory Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SPLED 400</td>
<td>Inclusive Special Ed Foundations: Legal, Discipline, Collaboration, Assessment, and Management</td>
<td>4</td>
</tr>
<tr>
<td>SPLED 403B</td>
<td>Evidence-Based Methods for Teaching Secondary Students with Disabilities in Inclusive Settings</td>
<td>3</td>
</tr>
</tbody>
</table>

Additional Courses
Additional Courses: Require a grade of C or better for teacher certification
| PSYCH 412| Adolescence or HDFS 239: Adolescent Development       | 3       |

Supporting Courses and Related Areas
Supporting Courses and Related Areas: Require a grade of C or better for teacher certification
Select 3 credits of GH courses from Literature Selection | 3 |
Select 3 credits of the following: | 3 |
EDTHP 115: Education in American Society | 3 |
EDTHP 115A: Competing Rights: Issues in American Education | 3 |
3 credits at the 400 level of any EDTHP course | 3 |

Requirements for the Option
Requirements for the Option: Require a grade of C or better for teacher certification
Select an option | 38-66 |

Requirements for the Option
Biological Science Teaching Option (63-66 credits)
Available at the following campuses: University Park

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescribed Courses: Require a grade of C or better for teacher certification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 110</td>
<td>Biology: Basic Concepts and Biodiversity</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 220W</td>
<td>Biology: Populations and Communities</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 240W</td>
<td>Biology: Function and Development of Organisms</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 110</td>
<td>Chemical Principles I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 111</td>
<td>Experimental Chemistry I</td>
<td>1</td>
</tr>
</tbody>
</table>
### Chemistry Teaching Option (55-60 credits)

**Available at the following campuses: University Park**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 112</td>
<td>Chemical Principles II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 113</td>
<td>Experimental Chemistry II</td>
<td>1</td>
</tr>
<tr>
<td>MATH 140</td>
<td>Calculus With Analytic Geometry I</td>
<td>4</td>
</tr>
<tr>
<td>SCIED 411W</td>
<td>Teaching Secondary Science I</td>
<td>3</td>
</tr>
<tr>
<td>SCIED 412</td>
<td>Teaching Secondary Science II</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Additional Courses

**Additional Courses: Require a grade of C or better for teacher certification**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMB 251</td>
<td>Molecular and Cell Biology I</td>
<td>4-6</td>
</tr>
<tr>
<td>&amp; BMB 252</td>
<td>and Molecular and Cell Biology II</td>
<td></td>
</tr>
<tr>
<td>or BIOL 230W</td>
<td>Biology: Molecules and Cells</td>
<td></td>
</tr>
<tr>
<td>MATH 141 or 4 credits of 200-level STAT GQ courses</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Select one of the following:

- ANTH 21 Introductory Biological Anthropology (3-4)
- ANTH 460 Human Genetics
- BIOL 427 Evolution
- GEOSC 204 Geobiology
- GEOSC 424 Paleontology and Fossils

Select one of the following: 8

- PHYS 211 General Physics: Mechanics
- & PHYS 212 and General Physics: Electricity and Magnetism
- PHYS 250 Introductory Physics I
- & PHYS 251 and Introductory Physics II

Select 6 credits of the following: 6

- BMB 211 Elementary Biochemistry
- BMB 212 Elementary Biochemistry Laboratory
- BMB 401 General Biochemistry
- BMB 402 General Biochemistry
- CHEM 202 Fundamentals of Organic Chemistry I
- CHEM 203 Fundamentals of Organic Chemistry II
- CHEM 210 Organic Chemistry I
- CHEM 212 Organic Chemistry II
- CHEM 213 Laboratory in Organic Chemistry

#### Supporting Courses and Related Areas

**Supporting Courses and Related Areas: Require a grade of C or better for teacher certification**

Select 8 credits of 300-level or 400-level BIOL or biological fields 8

**Note 1:** Students may complete multiple science teaching options concurrently by completing all of each option's requirements. The six science teaching options are: Biology, Chemistry, Earth and Space Science, Environmental Education, General Science, and Physics.

**Note 2:** Red Cross certification in First Aid and CPR (or their equivalent) must be earned for science certification.

### Earth and Space Science Teaching Option (60-63 credits)

**Available at the following campuses: University Park**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 112</td>
<td>Chemical Principles II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 113</td>
<td>Experimental Chemistry II</td>
<td>1</td>
</tr>
<tr>
<td>MATH 140</td>
<td>Calculus With Analytic Geometry I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 141</td>
<td>Calculus with Analytic Geometry II</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 211</td>
<td>General Physics: Mechanics</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 212</td>
<td>General Physics: Electricity and Magnetism</td>
<td>4</td>
</tr>
<tr>
<td>SCIED 411W</td>
<td>Teaching Secondary Science I</td>
<td>3</td>
</tr>
<tr>
<td>SCIED 412</td>
<td>Teaching Secondary Science II</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Additional Courses

**Additional Courses: Require a grade of C or better for teacher certification**

Select one of the following: 6-8

- CHEM 202 Fundamentals of Organic Chemistry I
- & CHEM 203 and Fundamentals of Organic Chemistry II
- CHEM 210 Organic Chemistry I
- & CHEM 212 and Organic Chemistry II
- & CHEM 213 and Laboratory in Organic Chemistry

Select 9 credits from 400 level CHEM or related field 9

#### Supporting Courses and Related Areas

**Supporting Courses and Related Areas: Require a grade of C or better for teacher certification**

Select 6-9 credits in CHEM or chemistry-related fields at the 200 level or higher (e.g., BMB 211 and BMB 212, BMB 251, BMB 252, MICRB 251, FDSC 400, ANSC 301, NUTR 251, CHEM, CHE) 6-9

**Note 1:** Students may complete multiple science teaching options concurrently by completing all of each option's requirements. The six science teaching options are: Biology, Chemistry, Earth and Space Science, Environmental Education, General Science, and Physics.

**Note 2:** Red Cross certification in First Aid and CPR (or their equivalent) must be earned for science certification.
GEOSC 21 Earth and Life: Origin and Evolution 3-4
or GEOSC 204 Geobiology
Select one of the following: 8
PHYS 211 General Physics: Mechanics
& PHYS 212 and General Physics: Electricity and Magnetism
PHYS 250 Introductory Physics I
& PHYS 251 and Introductory Physics II
Select 3-4 credits from the following: 3-4
METEO 3 Weather Revealed: Introductory Meteorology
METEO 201 Introduction to Weather Analysis
METEO 300 Fundamentals of Atmospheric Science
Select 3-4 credits from the following: 3-4
BIOL 435 Ecology of Lakes and Streams
BIOL 482 Coastal Biology
GEOSC 40 The Sea Around Us
GEOSC 440 Marine Geology

Supporting Courses and Related Areas
Supporting Courses and Related Areas: Require a grade of C or better for teacher certification
Select 8 credits of 200-400 level from EARTH, GEOSC, METEO, ASTRO, other earth science field, or BIOL 427

Note 1: Students may complete multiple science teaching options concurrently by completing all of each option's requirements. The six science teaching options are: Biology, Chemistry, Earth and Space Science, Environmental Education, General Science, and Physics.

Note 2: Red Cross certification in First Aid and CPR (or their equivalent) must be earned for science certification.

English Teaching Option (40-42 credits)
Available at the following campuses: University Park
Note: Must complete at least 3 credits of IL and 3 credits of US Cultures selections.

Code | Title | Credits
--- | --- | ---
**Prescribed Courses**
Prescribed Courses: Require a grade of C or better for teacher certification
CI 492 Identities, Power and Perceptual Pedagogies in Teaching and Learning 3
LLED 411 Teaching Language Arts In Secondary Schools I 3
LLED 412W Teaching Language Arts in Secondary Schools II 3
LLED 420 Teaching Adolescent Literature and Literacy 3
LLED 421 Teaching Writing in Secondary Schools 3
LLED 422 Teaching the Young Adult Literature Workshop 3

**Additional Courses**
Additional Courses: Require a grade of C or better for teacher certification
Select 1-3 credits of Grammar from the following: 1-3
APLNG 484 Discourse-Functional Grammar
COMM 160 Basic News Writing Skills
Select 3 credits of Speech and Oral Performance from the following: 3
CAS 100 Effective Speech
CAS 280W Storytelling and Speaking
THEA 102 Fundamentals of Acting

Select 3 credits of Shakespeare from the following: 3
ENGL 129 Shakespeare
ENGL 405 Taking Shakespeare From Page to Stage
ENGL 440 Studies in Shakespeare
ENGL 444 Shakespeare
Select 6 credits of British and American Literature from the following: 6
ENGL 221 British Literature to 1798
ENGL 222 British Literature from 1798
ENGL 231 American Literature to 1865
ENGL 232 American Literature from 1865
Select 3 credits of Multicultural Literature in English from the following: 3
CMLIT/LTNST Latina/o Literature and Culture
ENGL/AMST Alternative Voices in American Literature
ENGL/AFAM African American Literature
ENGL/WMNST Women Writers
ENGL/AAS Asian American Literatures
ENGL/AMST/AMST 475 Black American Writers
ENGL/WMNST Reading Black, Reading Feminist
ENGL/AFAM American Novels I
ENGL/AFAM American Novels II
ENGL/AFAM African American Poetry
ENGL/WMNST Women Writers and Their Worlds
ENGL/WMNST American Women Writers
Select 3 credits of Nonprint Literature from the following: 3
AFAM/ENGL From Folk Shouts and Songs to Hip Hop Poetry
CMLIT 415 World Graphic Novels
COMM 150N The Art of the Cinema
COMM 250 Film History and Theory
COMM 411 Cultural Aspects of the Mass Media
ENGL 136 The Graphic Novel
THEA 100 The Art of the Theatre
THEA 105 Introduction to Theatre
Select 3 credits of Writing from the following: 3
ENGL 50 Introduction to Creative Writing
ENGL 212 Introduction to Fiction Writing
ENGL 213 Introduction to Poetry Writing
ENGL 214 Introduction to Creative Nonfiction Writing
ENGL 215 Introduction to Article Writing
Environmental Education Teaching Option (55-58 credits)

Available at the following campuses: University Park

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 110</td>
<td>Biology: Basic Concepts and Biodiversity</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 220W</td>
<td>Biology: Populations and Communities</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 101</td>
<td>Introductory Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>MATH 140</td>
<td>Calculus With Analytic Geometry I</td>
<td>4</td>
</tr>
<tr>
<td>SCIED 411W</td>
<td>Teaching Secondary Science I</td>
<td>3</td>
</tr>
<tr>
<td>SCIED 412</td>
<td>Teaching Secondary Science II</td>
<td>3</td>
</tr>
<tr>
<td>SCIED 457</td>
<td>Environmental Science Education</td>
<td>3</td>
</tr>
</tbody>
</table>

Additional Courses

Additional Courses: Require a grade of C or better for teacher certification

Select one of the following:

- CHEM 20 Environmental Chemistry & CHEM 21 and Environmental Chemistry Laboratory
- CHEM 110 Chemical Principles I & CHEM 111 and Experimental Chemistry I

Select at least 14 credits from the cohort Teaching option ¹

Supporting Courses and Related Areas

Supporting Courses and Related Areas: Require a grade of C or better for teacher certification

Select two courses (6-8 credits) in environmental law, economics, management and policy (e.g., ECON 428, ERM 411, ERM 412, ERM 413W, WFS 410, WFS 447W, WFS 463W)

Select 4 credits of an environmentally related course in Science Technology and Society (e.g., STS 100, STS 460)

Select at least 14 credits from the cohort Teaching option ¹

¹ This option may only be completed in conjunction with another secondary teaching option, such as the Biological Science Teaching option.

Note 1: Students may complete multiple science teaching options concurrently by completing all of each option's requirements. The six science teaching options are: Biology, Chemistry, Earth and Space Science, Environmental Education, General Science, and Physics. Options must be earned for science certification.

Note 2: Students may complete multiple science teaching options concurrently by completing all of each option's requirements. The six science teaching options are: Biology, Chemistry, Earth and Space Science, Environmental Education, General Science, and Physics. Options must be earned for science certification.

Note 3: Red Cross certification in First Aid and CPR (or their equivalent) must be earned for science certification.

Mathematics Teaching Option (57-59 credits)

Available at the following campuses: Erie, University Park

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 140</td>
<td>Calculus With Analytic Geometry I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 141</td>
<td>Calculus with Analytic Geometry II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 220</td>
<td>Matrices</td>
<td>2-3</td>
</tr>
<tr>
<td>MATH 310</td>
<td>Elementary Combinatorics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 311W</td>
<td>Concepts of Discrete Mathematics</td>
<td>3-4</td>
</tr>
<tr>
<td>MATH 312</td>
<td>Concepts of Real Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MATH 414</td>
<td>Introduction to Probability Theory</td>
<td>3</td>
</tr>
<tr>
<td>MATH 471</td>
<td>Geometry for Teachers</td>
<td>4</td>
</tr>
<tr>
<td>MTHTED 411</td>
<td>Teaching Secondary Mathematics I</td>
<td>3</td>
</tr>
<tr>
<td>MTHTED 412W</td>
<td>Teaching Secondary Mathematics II</td>
<td>3</td>
</tr>
<tr>
<td>MTHTED 427</td>
<td>Teaching Mathematics in Technology-Intensive Environments</td>
<td>3</td>
</tr>
</tbody>
</table>

General Science Teaching Option (38 credits)

Available at the following campuses: University Park

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 110</td>
<td>Biology: Basic Concepts and Biodiversity</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 110</td>
<td>Chemical Principles I</td>
<td>3</td>
</tr>
</tbody>
</table>

Additional Courses

Additional Courses: Require a grade of C or better for teacher certification

- CHEM 111 Experimental Chemistry I
- CHEM 112 Chemical Principles II
- CHEM 113 Experimental Chemistry II
- MATH 140 Calculus With Analytic Geometry I
- SCIED 411W Teaching Secondary Science I
- SCIED 412 Teaching Secondary Science II

Supporting Courses and Related Areas

Select one of the following:

- BIOL 220W Biology: Populations and Communities
- BIOL 230W Biology: Molecules and Cells
- BIOL 240W Biology: Function and Development of Organisms

Select one of the following:

- ECON 428, ERM 411, ERM 412, ERM 413W, WFS 410, WFS 447W, WFS 463W
- BIOL 220W Biology: Populations and Communities
- BIOL 230W Biology: Molecules and Cells
- BIOL 240W Biology: Function and Development of Organisms

¹ This option may only be completed in conjunction with another secondary teaching option, such as Biology.

Note 1: This option may only be completed in conjunction with another secondary teaching option, such as Biology.

Note 2: Students may complete multiple science teaching options concurrently by completing all of each option's requirements. The six science teaching options are: Biology, Chemistry, Earth and Space Science, Environmental Education, General Science, and Physics. Options must be earned for science certification.

Note 3: Red Cross certification in First Aid and CPR (or their equivalent) must be earned for science certification.
MATH 231 Calculus of Several Variables or MATH 230 Calculus and Vector Analysis 4
or MATH 232 and Integral Vector Calculus
MATH 435 Basic Abstract Algebra 3
or MATH 470 Algebra for Teachers
MATH 436 Linear Algebra 3
or MATH 441 Matrix Algebra
Select one of the following: 3
MATH 415 Introduction to Mathematical Statistics
STAT 401 Experimental Methods
3 credits of MTHED from program list
Supporting Courses and Related Areas
Supporting Courses and Related Areas: Require a grade of C or better
Select 6 credits from 400-level MATH or MTHED courses 6
Physics Teaching Option (55-62 credits)
Available at the following campuses: University Park
Code Title Credits
BIOL 110 Biology: Basic Concepts and Biodiversity 4
CHEM 110 Chemical Principles I 3
CHEM 111 Experimental Chemistry I 1
CHEM 112 Chemical Principles II 3
CHEM 113 Experimental Chemistry II 1
MATH 140 Calculus With Analytic Geometry I 4
MATH 141 Calculus With Analytic Geometry II 4
MATH 220 Matrices 2-3
PHYS 211 General Physics: Mechanics 4
PHYS 212 General Physics: Electricity and Magnetism 4
PHYS 213 General Physics: Fluids and Thermal Physics 2
PHYS 214 General Physics: Wave Motion and Quantum Physics 2
PHYS 237 Introduction to Modern Physics 3
PHYS 400 Intermediate Electricity and Magnetism 3
PHYS 419 Theoretical Mechanics 3
SCIED 411W Teaching Secondary Science I 3
SCIED 412 Teaching Secondary Science II 3
Additional Courses
Additional Courses: Require a grade of C or better for teacher certification
MATH 230 Calculus and Vector Analysis 2-4
or MATH 231 Calculus of Several Variables
MATH 250 Ordinary Differential Equations 3-4
or MATH 251 Ordinary and Partial Differential Equations
Select one of the following: 1-4
PHYS 402 Electronics for Scientists
PHYS 457 Experimental Physics
PHYS 458 Intermediate Optics
Science teaching options are: Biology, Chemistry, Earth and Space Science, Environmental Education, General Science, and Physics.
Note 2: Red Cross certification in First Aid and CPR (or their equivalent) must be earned for science certification.
Social Studies Teaching Option (57 credits)
Available at the following campuses: University Park
A grade of C or better per course is required for teacher certification.
Code Title Credits
Prescribed Courses
Prescribed Courses: Require a grade of C or better for teacher certification
ECON 104 Introductory Macroeconomic Analysis and Policy 3
GEOG 30N Environment and Society in a Changing World 3
HIST 20 American Civilization to 1877 3
HIST 21 American Civilization Since 1877 3
PLSC 1 American Politics: Principles, Processes and Powers 3
SSED 411 Teaching Secondary Social Studies I 3
SSED 412W Teaching Secondary Social Studies II 3
Additional Courses
Additional Courses: Require a grade of C or better for teacher certification
HIST 1 Western Civilization I 3
or HIST 10 World History to 1500
HIST 2 Western Civilization II 3
or HIST 11 World History since 1500
Select 9 credits of the following: 9
ANTH 45N Cultural Diversity: A Global Perspective
ECON 102 Introductory Microeconomic Analysis and Policy
GEOG 6N Maps and the Geospatial Revolution
PLSC 3 Comparing Politics around the Globe
PLSC 14 International Relations
SOC 1 Introductory Sociology
Supporting Courses and Related Areas
Supporting Courses and Related Areas: Require a grade of C or better for teacher certification
Select 6 credits of 400-level History 6
Select one concentration: 15
Citizenship Education
Select 6 credits of History at the 100-level or above
Select 3 credits of the following:
ANTH 45N Cultural Diversity: A Global Perspective
SOC 1 Introductory Sociology
Select 3 credits of the following:
ECON 102 Introductory Microeconomic Analysis and Policy
PLSC 3 Comparing Politics around the Globe
PLSC 14 International Relations
Select 3 credits of the following:
GEOG 6N Maps and the Geospatial Revolution
GEOG 10 Physical Geography: An Introduction
GEOG 20 Human Geography: An Introduction
Note 1: Students may complete multiple science teaching options concurrently by completing all of each option's requirements. The six
Civics and Government
PLSC 3 Comparing Politics around the Globe
PLSC 14 International Relations
Select 3 credits of the following:
PLSC 7N Contemporary Political Ideologies
PLSC 10 Scientific Study of Politics
PLSC 17N Introduction to Political Theory
Select 6 credits of 400-level Political Science

Classics and Ancient Studies
Select 3 credits from the following:
CAMS 1 Greek and Roman Literature
CAMS 4 Jewish and Christian Foundations
CAMS 5 Ancient Mediterranean Civilizations
Select 3 credits of 100-level Classics and Ancient Mediterranean Studies
Select 6 credits of 400-level Classics and Ancient Mediterranean Studies

Economics
ECON 102 Introductory Microeconomic Analysis and Policy
ECON 302 Intermediate Microeconomic Analysis
ECON 304 Intermediate Macroeconomic Analysis
Select 6 credits of 400-level Economics

Geography
Select 9 credits of Geography below the 400 level
Select 6 credits of 400-level Geography

Holocaust and Genocide Studies
HIST/JST 121 History of the Holocaust 1933-1945
Select 6 credits from the following:
CMLIT/ENGL/ JST 128N The Holocaust in Film and Literature
HIST/JST 143N History of Fascism and Nazism
HIST/JST 195 Genocide in Global perspectives: Twentieth Century and beyond
Select 6 credits from the following:
HIST/JST 426 Holocaust
HIST/JST/ WMNST 439 Women and the Holocaust
JST/PLSC 450H Genocide and Tyranny
ASIA/HIST 457/JST 474 Hiroshima & the Holocaust in History and Memory
JST/PHIL/ Rlst 478 Ethics After the Holocaust

Social Sciences
Select 9 credits of Anthropology, Psychology, and/or Sociology below the 400 level
Select 6 credits of 400-level Anthropology, Psychology, and/or Sociology

Note 1: Courses taken to meet Additional Courses and other Supporting Courses and Related Areas requirements cannot also be applied to the concentration. Different courses need to be selected for the concentration and Additional Courses and other Supporting Courses and Related Areas requirements.

General Education
Connecting career and curiosity, the General Education curriculum provides the opportunity for students to acquire transferable skills necessary to be successful in the future and to thrive while living in interconnected contexts. General Education aids students in developing intellectual curiosity, a strengthened ability to think, and a deeper sense of aesthetic appreciation. These are requirements for all baccalaureate students and are often partially incorporated into the requirements of a program. For additional information, see the General Education Requirements (https://bulletins.psu.edu/undergraduate/general-education/baccalaureate-degree-general-education-program/) section of the Bulletin and consult your academic adviser.

The keystone symbol appears next to the title of any course that is designated as a General Education course. Program requirements may also satisfy General Education requirements and vary for each program.

Foundations (grade of C or better is required.)
- Quantification (GQ): 6 credits
- Writing and Speaking (GWS): 9 credits

Knowledge Domains
- Arts (GA): 6 credits
- Health and Wellness (GHW): 3 credits
- Humanities (GH): 6 credits
- Social and Behavioral Sciences (GS): 6 credits
- Natural Sciences (GN): 9 credits

Integrative Studies (may also complete a Knowledge Domain requirement)
- Inter-Domain or Approved Linked Courses: 6 credits

University Degree Requirements
First Year Engagement
All students enrolled in a college or the Division of Undergraduate Studies at University Park, and the World Campus are required to take 1 to 3 credits of the First-Year Seminar, as specified by their college First-Year Engagement Plan.

Other Penn State colleges and campuses may require the First-Year Seminar; colleges and campuses that do not require a First-Year Seminar provide students with a first-year engagement experience.

First-year baccalaureate students entering Penn State should consult their academic adviser for these requirements.

Cultures Requirement
6 credits are required and may satisfy other requirements
- United States Cultures: 3 credits
- International Cultures: 3 credits

Writing Across the Curriculum
3 credits required from the college of graduation and likely prescribed as part of major requirements.

Total Minimum Credits
A minimum of 120 degree credits must be earned for a baccalaureate degree. The requirements for some programs may exceed 120 credits.
Students should consult with their college or department adviser for information on specific credit requirements.

Quality of Work
Candidates must complete the degree requirements for their major and earn at least a 2.00 grade-point average for all courses completed within their degree program.

Limitations on Source and Time for Credit Acquisition
The college dean or campus chancellor and program faculty may require up to 24 credits of course work in the major to be taken at the location or in the college or program where the degree is earned. Credit used toward degree programs may need to be earned from a particular source or within time constraints (see Senate Policy 83-80 (https://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#83-80)). For more information, check the Suggested Academic Plan for your intended program.

Academic Advising
The objectives of the university's academic advising program are to help advisees identify and achieve their academic goals, to promote their intellectual discovery, and to encourage students to take advantage of both in-and out-of class educational opportunities in order that they become self-directed learners and decision makers.

Both advisers and advisees share responsibility for making the advising relationship succeed. By encouraging their advisees to become engaged in their education, to meet their educational goals, and to develop the habit of learning, advisers assume a significant educational role. The advisee's unit of enrollment will provide each advisee with a primary academic adviser, the information needed to plan the chosen program of study, and referrals to other specialized resources.

READ SENATE POLICY 32-00: ADVISING POLICY (https://senate.psu.edu/policies-and-rules-for-undergraduate-students/32-00-advising-policy/)

Erie
Jodie Styers
Assistant Teaching Professor of Math Education
8 Prischak
Erie, PA 16563
814-898-6349
jls982@psu.edu

University Park
College of Education
Advising and Certification Center
228 Chambers Building
University Park, PA 16802
814-865-0488
ed@admissions.psu.edu

Suggested Academic Plan
The suggested academic plan(s) listed on this page are the plan(s) that are in effect during the 2022-23 academic year. To access previous years' suggested academic plans, please visit the archive (https://bulletins.psu.edu/undergraduate/archive/) to view the appropriate Undergraduate Bulletin edition (Note: the archive only contains suggested academic plans beginning with the 2018-19 edition of the Undergraduate Bulletin).

Mathematics Teaching Option: Secondary Education, B.S. at Erie Campus
The course series listed below provides only one of the many possible ways to move through this curriculum. The University may make changes in policies, procedures, educational offerings, and requirements at any time. This plan should be used in conjunction with your degree audit (accessible in LionPATH as either an Academic Requirements or What If report). Please consult with a Penn State academic adviser on a regular basis to develop and refine an academic plan that is appropriate for you.

First Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 140(^{*}#)</td>
<td>4</td>
<td>MATH 141(^{*}#)</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 15 or 30(^{H})#</td>
<td>3</td>
<td>MATH 220(^{{}}#)</td>
<td>2</td>
</tr>
<tr>
<td>CMPSC 121 or 101(^{W})</td>
<td>3</td>
<td>General Education (GN)(^{{}}#)</td>
<td>3</td>
</tr>
<tr>
<td>PSU 7</td>
<td>1</td>
<td>General Education (GA)(^{{}}#)</td>
<td>3</td>
</tr>
<tr>
<td>PSYCH 100(^{*}#)</td>
<td>3</td>
<td>General Education (GH) (See approved list below)(^{*}#)</td>
<td>3</td>
</tr>
<tr>
<td>General Education (GN)(^{{}}#)</td>
<td>3</td>
<td>General Education (GHW)(^{{}}#)</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Second Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS 100, 100A, or 100B(^{*})</td>
<td>3</td>
<td>STAT 401(^{{}}#)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 230(^{*})</td>
<td>4</td>
<td>MATH 310 or 436(^{{}}#)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 311W(^{*})</td>
<td>4</td>
<td>EDTHP 115A (Satisfies US Culture Requirement)(^{*}#)</td>
<td>3</td>
</tr>
<tr>
<td>STAT 301 or STAT 318(^{*})</td>
<td>3</td>
<td>CI 295(^{H})#</td>
<td>3</td>
</tr>
<tr>
<td>EDPSY 14(^{*})</td>
<td>3</td>
<td>ENGL 202A or 202B(^{{}}#)</td>
<td>3</td>
</tr>
<tr>
<td>CI 280(^{*}#)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Third Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 312(^{*})</td>
<td>3</td>
<td>MTHED 411(^{*})</td>
<td>3</td>
</tr>
<tr>
<td>MATH 435 or 427 and 428</td>
<td>3-4</td>
<td>MTHED 427(^{{}}#)</td>
<td>3</td>
</tr>
<tr>
<td>SPLED 400(^{*})</td>
<td>4</td>
<td>MATH 310 or 436(^{{}}#)</td>
<td>3</td>
</tr>
<tr>
<td>STAT 414 (or General Education Course (GA))(^{*}#)</td>
<td>3</td>
<td>SPLED 403B(^{*})</td>
<td>3</td>
</tr>
<tr>
<td>400-level MATH Selection(^{*})</td>
<td>3</td>
<td>PSYCH 412 or HDFS 239(^{*})</td>
<td>3</td>
</tr>
<tr>
<td>General Education (GH)(^{{}}#)</td>
<td>1.5</td>
<td>General Education (GN)(^{{}}#)</td>
<td>3</td>
</tr>
</tbody>
</table>

Fourth Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTHED 412W(^{*})</td>
<td>3</td>
<td>CI 495E(^{*})</td>
<td>15</td>
</tr>
<tr>
<td>STAT 414 (or General Education Course (GA))(^{*}#)</td>
<td>3</td>
<td>No additional coursework permitted during Student Teaching</td>
<td></td>
</tr>
<tr>
<td>400-level MATH Selection(^{*})</td>
<td>3</td>
<td>CI 495C</td>
<td>3</td>
</tr>
<tr>
<td>MATH 435 or 427 and 428</td>
<td>3-4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Total Credits 134-136 |

\(^{*}\) Course requires a grade of C or better for the major
\(^{H}\) Course requires a grade of C or better for General Education
\(^{#}\) Course is an Entrance to Major requirement
† Course satisfies General Education and degree requirement

University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy University Requirements (United States and International Cultures).

W, M, X, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

GWS, GQ, GHW, GN, GA, GH, and GS are abbreviations used to identify General Education program courses. General Education includes Foundations (GWS and GQ) and Knowledge Domains (GHW, GN, GA, GH, GS, and Integrative Studies). Foundations courses (GWS and GQ) require a grade of ‘C’ or better.

Integrative Studies courses are required for the General Education program. N is the suffix at the end of a course number used to designate an Inter-Domain course and Z is the suffix at the end of a course number used to designate a Linked course.

1 Prerequisite: satisfactory performance on the Math placement tests - i.e. placement beyond the level of MATH 22; or CHEM 101 and MATH 22 or MATH 41

Program Notes

1.) There are additional entrance to major requirements of PRAXIS Core Exam, 40-hour Work Experience, 3.0 GPA.
2.) Additional requirements must be met to be certified - please meet with adviser regularly.

Academic Advising Notes

1.) Students interested in dual majoring in MTHBC B.S. alongside SECBC B.S. should carefully select their General Education (GN) courses to fulfill math major requirements. Please meet with adviser to schedule.
2.) Several courses above are taught every other year:
   - the following are taught in fall of odd years: MATH 435, STAT 414, MATH 455, MATH 412
   - the following are taught in fall of even years: MATH 427, MATH 428, MATH 465, MATH 455
   - the following is taught in spring of odd years: MATH 436, MATH 421, MATH 449
   - the following is taught in spring of even years: MATH 310, MATH 456, MATH 429, MATH 482
3.) Must complete at least 3 credits of IL and 3 credit of US Cultures selections. EDTHP 115A satisfies US Cultures. Either the GA or Literature GH class can be chosen to satisfy the IL requirement.

Approved Literature (GH) Selection:

CMLIT 1, CMLIT 2, CMLIT 3, CMLIT 4, CMLIT 5, CMLIT 6, CMLIT 10, CMLIT 11, CMLIT 83S, CMLIT 100, CMLIT 101, CMLIT 105, CMLIT 106, CMLIT 107, CMLIT 108, CMLIT 110, CMLIT 111, CMLIT 120, CMLIT 141, CMLIT 153, ENGL 1, ENGL 2, ENGL 103, ENGL 104, ENGL 129, ENGL 132, ENGL 133, ENGL 134, ENGL 135, ENGL 139, ENGL 140, ENGL 145, ENGL 180, ENGL 182, ENGL 184, ENGL 185, ENGL 189, ENGL 191, ENGL 192, ENGL 194, ENGL 200, ENGL 201, ENGL 221, ENGL 222, ENGL 226, ENGL 231, ENGL 232, ENGL 233N, ENGL 240, ENGL 261, ENGL 262, ENGL 263, ENGL 265, ENGL 268, CAMS 1, CAMS 45
**Chemistry Pre-Education Option: Secondary Education, B.S. at Erie Campus**

The course series listed below provides only one of the many possible ways to move through this curriculum. The University may make changes in policies, procedures, educational offerings, and requirements at any time. This plan should be used in conjunction with your degree audit (accessible in LionPATH as either an Academic Requirements or What If report). Please consult with a Penn State academic adviser on a regular basis to develop and refine an academic plan that is appropriate for you.

### First Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>CHEM 110⁺⁺</td>
<td>3</td>
<td>CHEM 112⁺⁺</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CHEM 111⁺⁺</td>
<td>1</td>
<td>CHEM 113⁺⁺</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>MATH 140⁺⁺</td>
<td>4</td>
<td>MATH 141⁺⁺</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>ENGL 15 or 30H‡</td>
<td>3</td>
<td>PHYS 211⁺⁺</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>PSU 7</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>General Education Course (GHW)</td>
<td>1.5 General Education Course (GHW)</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General Education Course</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16.5</td>
</tr>
</tbody>
</table>

**Second Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>CHEM 210⁺</td>
<td>3</td>
<td>CHEM 212⁺</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CHEM 227⁺</td>
<td>4</td>
<td>CHEM 213⁺</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>PHYS 212⁺</td>
<td>4</td>
<td>ENGL 202C‡</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MATH 230⁺</td>
<td>4</td>
<td>MATH 250 or STAT 401⁺</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PSYCH 100⁺</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>General Education Course</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>

**Third Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>CHEM 450⁺</td>
<td>3</td>
<td>CHEM 452⁺</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CHEM 457⁺</td>
<td>1</td>
<td>CHEM 457⁺</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>CHEM 400⁺</td>
<td>1</td>
<td>CHEM 440⁺</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CHEM 472⁺</td>
<td>3</td>
<td>CHEM 441⁺</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>CHEM 316⁺</td>
<td>1</td>
<td>CHEM 494 or 496⁺</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>CAS 100A‡</td>
<td>3</td>
<td>EDPSY 14</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>PSYCH 212 or HDFS 129‡</td>
<td>3</td>
<td>CT 295</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Supporting Courses and Related Areas³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>

**Fourth Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>CHEM 413⁺</td>
<td>4</td>
<td>CHEM 431W⁺</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>CHEM 443⁺</td>
<td>1</td>
<td>CHEM 494 or 496⁺</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>CHEM 494 or 496⁺</td>
<td>1</td>
<td>CHEM 395‡</td>
<td>1-2</td>
</tr>
<tr>
<td></td>
<td>EDTHP 115</td>
<td>3</td>
<td>CHEM 400-Level Course⁺</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CI 295</td>
<td>1</td>
<td>General Education Course</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CHEM 400-Level Selection⁺</td>
<td>3 Supporting Courses and Related Areas</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13</td>
</tr>
</tbody>
</table>

**Total Credits 121-122**

* Course requires a grade of C or better for the major
‡ Course requires a grade of C or better for General Education
# Course is an Entrance to Major requirement
† Course satisfies General Education and degree requirement

### University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy University Requirements (United States and International Cultures).

W, M, X, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

GWS, GQ, GHW, GN, GA, GH, and GS are abbreviations used to identify General Education program courses. General Education includes Foundations (GWS and GQ) and Knowledge Domains (GHW, GN, GA, GH, GS, and Integrative Studies). Foundations courses (GWS and GQ) require a grade of ‘C’ or better.

Integrative Studies courses are required for the General Education program. N is the suffix at the end of a course number used to designate an Inter-Domain course and Z is the suffix at the end of a course number used to designate a Linked course.

### Program Notes:

1.) Students who have not met the admission requirement of two units of a foreign language must complete a college level-one foreign language within their first 60 credits.
2.) Scheduling patterns for courses not taught each semester: Some major requirement will be offered only once a year or every other year depending on demand:
- **Fall only courses include:** CHEM 210, CHEM 227, CHEM 316, CHEM 400, CHEM 413, CHEM 450, CHEM 472
- **Spring only courses include:** CHEM 212, CHEM 213, ,CHEM 431W, CHEM 440, CHEM 452

3.) All first-year baccalaureate degree candidates are required to complete, during the first academic year, a seminar course.
4.) 18 credits of supporting courses are required for the general option. There are a variety of courses you may choose from. The list given below is not completely inclusive. If there is a new course or a technical course you feel you would like to include under this selection, please speak with your Academic Adviser or the Academic Coordinator.

### Supporting Courses List

- EDSGN 100S
- BIOL 110 or higher
- CHNS 1, CHNS 2, CHNS 3
- CMPSC any course
- CMPEN any course
- FR 1, FR 2, FR 3
- GER 1, GER 2, GER 3
- MATH 200-level or higher
- MICRB 201 or MICRB 202
- PHYS 213, PHYS 214, PHYS 237, or any 400-level course
- PLET 206W or higher
- SPAN 1, SPAN 2, SPAN 3
- STAT 250 or higher

The following select courses can also be used as a supporting course under the designated CHMBC option.

### Pre-Education Supporting Course List
PSYCH 301W
PSYCH 253
PSYCH 256
PSYCH 445
PSYCH 412
PSYCH 416
PHIL 10

5.) **Non-approved courses** - Some courses are not appropriate for a chemistry major and will not count toward degree requirements. These courses include, but are not limited to, those listed below:

Non-approved Courses List
BISC 1, BISC 2, BISC 3
BMB 1
CAS 126
CHEM 1, CHEM 3, CHEM 20, CHEM 21, CHEM 101, CHEM 202, CHEM 203
CMPSC 100
ENGL 4, ENGL 5
MATH 1, MATH 2, MATH 4, MATH 37, MATH 38
PHYS 1, PHYS 150, PHYS 151, PHYS 250, PHYS 251
STAT 100
**General Science Pre-Certification Teaching Option: Secondary Education, B.S. at Erie Campus**

The course series listed below provides only one of the many possible ways to move through this curriculum. The University may make changes in policies, procedures, educational offerings, and requirements at any time. This plan should be used in conjunction with your degree audit (accessible in LionPATH as either an Academic Requirements or What If report). Please consult with a Penn State academic adviser on a regular basis to develop and refine an academic plan that is appropriate for you.

### First Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 110</td>
<td>3</td>
<td>CHEM 112</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 111</td>
<td>1</td>
<td>CHEM 113</td>
<td>1</td>
</tr>
<tr>
<td>MATH 140</td>
<td>4</td>
<td>MATH 141</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 15 or 30H</td>
<td>3</td>
<td>BIOL 110S</td>
<td>4</td>
</tr>
<tr>
<td>PSU 7</td>
<td>1</td>
<td>General Education Course</td>
<td>3</td>
</tr>
<tr>
<td>General Education Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Second Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS 100</td>
<td>3</td>
<td>GEOSC 2</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 220W or 230W</td>
<td>4</td>
<td>CMPSC 121</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 250 or 211</td>
<td>4</td>
<td>ASTRO 10</td>
<td>2</td>
</tr>
<tr>
<td>GEOSC 20</td>
<td>3</td>
<td>ASTRO 11</td>
<td>1</td>
</tr>
<tr>
<td>General Education Course (GHW)</td>
<td>1.5</td>
<td>PHYS 251 or 212*</td>
<td>4</td>
</tr>
<tr>
<td>General Education Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Third Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 213 or PHYS 214</td>
<td>2-3</td>
<td>World Language Level 2</td>
<td>4</td>
</tr>
<tr>
<td>Elective (if following PHYS 250/251 track)†</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Education Course</td>
<td>3</td>
<td>General Education Course (GHW)</td>
<td>1.5</td>
</tr>
<tr>
<td>ENGL 202A or 202B (or ENGL 202C or ENGL 202D)††</td>
<td>3</td>
<td>GEOSC 40</td>
<td>3</td>
</tr>
<tr>
<td>ASTRO 291 or GEOG 10</td>
<td>3</td>
<td>ASTRO 292</td>
<td>3</td>
</tr>
<tr>
<td>World Language Level 1</td>
<td>4</td>
<td>GEOSC 10</td>
<td>3</td>
</tr>
<tr>
<td>400-Level Course Science Supporting List*</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Fourth Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 250 or 200 (or MATH 230 or CMPSC 122)</td>
<td>3-4</td>
<td>400-Level Course Program List</td>
<td>3</td>
</tr>
<tr>
<td>400-Level Course Program List†</td>
<td>3</td>
<td>400-Level Course Program List</td>
<td>3</td>
</tr>
<tr>
<td>METEO 3†</td>
<td>3</td>
<td>GEOSC Course</td>
<td>3</td>
</tr>
<tr>
<td>400-Level Course Science Supporting List†</td>
<td>3</td>
<td>General Education Course†</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credits 124-126**

1. Course requires a grade of C or better for the major
2. Course requires a grade of C or better for General Education
3. Course is an Entrance to Major requirement
4. Course satisfies General Education and degree requirement

**University Requirements and General Education Notes:**

- US and IL are abbreviations used to designate courses that satisfy University Requirements (United States and International Cultures).
- W, M, X, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.
- GWS, GQ, GH, GN, GA, GS, and Integrative Studies. Foundations courses (GWS and GQ) require a grade of 'C' or better.

Integrative Studies courses are required for the General Education program. N is the suffix at the end of a course number used to designate an Inter-Domain course and Z is the suffix at the end of a course number used to designate a Linked course.

**Program Notes**

1. Students who have not met the admission requirement of two units of a high school world language must complete a college-level one world language within their first 60 credits.
2. Scheduling patterns for courses not taught each semester - some major requirements will be offered only once every every other year.
3. Fall only courses include: CMPSC 455, MATH 455, PHYS 402, PHYS 414
4. Spring only courses include: CMPSC 456, ME 428, MATH 456, PHYS 410, PHYS 420, PHYS 421W, PHYS 458

3. All first-year baccalaureate degree candidates are required to complete, during the first academic year, a seminar course
4. Students must earn at least a grade of C in each 300- and 400-level prescribed, additional, and supporting course
5. For Science Supporting Courses, students must select 18 credits, with at least 9 credits at the 400-level, in one of the areas: computer sciences, life sciences, mathematical sciences, or physical sciences.
6. Students must select 18-22 credits, with at least 6 credits at the 400-level, from the program list.
7. Students must complete at least 3 credits of a writing across the curriculum credits. Note that only one credit of each of the BIOL 220W, BIOL 230W, and BIOL 240W courses can be used to meet this requirement.

**Advising Notes**

**Program List Courses**

Students may select courses from nearly the entire range of the University's course offerings, excluding the following:

- BIOL 11, BIOL 12
- BISC 1, BISC 2, BISC 3, BISC 4
- BMB 1
- CAS 126
- CHEM 1, CHEM 3, CHEM 101, CHEM 108
CMPSC 1, CMPSC 100, CMPSC 110
ENGL 4, ENGL 5, ESL 4
LLED 5, LLED 10
MATH 1, MATH 2, MATH 3, MATH 4, MATH 21, MATH 26, MATH 30,
MATH 35, MATH 36, MATH 37, MATH 38, MATH 40, MATH 81, MATH 82,
MATH 83, MATH 110, MATH 111, MATH 200
MICRB 106, MICRB 107, MICRB 120, MICRB 121A, MICRB 121B,
MICRB 150, and MICRB 151x
PHYS 1, PHYS 150, PHYS 151, PHYS 126
STAT 100

Science Supporting Courses List
Computer Science include CENBD and CMPSC courses
Geosciences include GEOG, GEOSC, MATSC, and MATSE courses
Life Sciences include BIOL, BMB, and MICRB courses
Mathematical Sciences include MATH and STAT courses
Physical Sciences include ASTRO, CHEM, and PHYS courses
Earth and Space Pre-Certification Teaching Option: Secondary Education, B.S. at Erie Campus

The course series listed below provides only one of the many possible ways to move through this curriculum. The University may make changes in policies, procedures, educational offerings, and requirements at any time. This plan should be used in conjunction with your degree audit (accessible in LionPATH as either an Academic Requirements or What If report). Please consult with a Penn State academic adviser on a regular basis to develop and refine an academic plan that is appropriate for you.

### First Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 110 *#†</td>
<td>3</td>
<td>CHEM 112 *#†</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 111 *#†</td>
<td>1</td>
<td>CHEM 113 *†</td>
<td>1</td>
</tr>
<tr>
<td>MATH 140 *#†</td>
<td>4</td>
<td>MATH 141 *†</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 15 or 30H ‡</td>
<td>3</td>
<td>BIOL 110S *#†</td>
<td>4</td>
</tr>
<tr>
<td>PSU 7</td>
<td>1</td>
<td>General Education Course</td>
<td>3</td>
</tr>
<tr>
<td>General Education Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Second Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS 100 ‡</td>
<td>3</td>
<td>GEOSC 2</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 220W or 230W (or BIOL 240W)</td>
<td>4</td>
<td>CMPSC 121 *</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 250 or 211 *</td>
<td>4</td>
<td>ASTRO 10</td>
<td>2</td>
</tr>
<tr>
<td>GEOSC 20</td>
<td>3</td>
<td>ASTRO 11</td>
<td>1</td>
</tr>
<tr>
<td>General Education Course (GHW)</td>
<td>1.5</td>
<td>PHYS 251 or 212 *</td>
<td>4</td>
</tr>
<tr>
<td>General Education Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Third Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 213 or PHYS 214 or Elective (if following PHYS 250/251 track) †</td>
<td>2-3</td>
<td>World Language Level 2</td>
<td>4</td>
</tr>
<tr>
<td>General Education Course (GHW)</td>
<td>3</td>
<td>General Education Course</td>
<td>1.5</td>
</tr>
<tr>
<td>ENGL 202A or 202B (or ENGL 202C or ENGL 202D) ††</td>
<td>3</td>
<td>GEOSC 40</td>
<td>3</td>
</tr>
<tr>
<td>ASTRO 291 or GEOG 10</td>
<td>3</td>
<td>ASTRO 292</td>
<td>3</td>
</tr>
<tr>
<td>World Language Level 1</td>
<td>4</td>
<td>GEOSC 10</td>
<td>3</td>
</tr>
<tr>
<td>400-Level Course Science Supporting List *</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Fourth Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 250 or 200 (or MATH 230 or CMPSC 122)</td>
<td>3-4</td>
<td>400-Level Course Program List *</td>
<td>3</td>
</tr>
<tr>
<td>400-Level Course Program List *</td>
<td>3</td>
<td>400-Level Course Program List *</td>
<td>3</td>
</tr>
<tr>
<td>METEO ‡</td>
<td>3</td>
<td>GEOSC Course *</td>
<td>3</td>
</tr>
<tr>
<td>400-Level Course Science Supporting List *</td>
<td>3</td>
<td>General Education Course</td>
<td>3</td>
</tr>
</tbody>
</table>

### General Education Course Notes

- 3 GEOG, GEOSC, MATSC, MATSE Course (any level)
- Total Credits 124-126

### University Requirements and General Education Notes:

- Course requires a grade of C or better for the major
- Course requires a grade of C or better for General Education
- Course is an Entrance to Major requirement
- Course satisfies General Education and degree requirement

### Program Notes

1. Students who have not met the admission requirement of two units of a high school world language must complete a college level-one world language within their first 60 credits.
2. Scheduling patterns for courses not taught each semester - some major requirements will be offered only once every other year.
   - **Fall only courses include:** CMPSC 455, MATH 455, PHYS 402, PHYS 414
   - **Spring only courses include:** CMPSC 456, ME 428, MATH 456, PHYS 410, PHYS 420, PHYS 421W, PHYS 458
3. All first-year baccalaureate degree candidates are required to complete, during the first academic year, a seminar course
4. Students must earn at least a grade of C in each 300- and 400-level prescribed, additional, and supporting course
5. For Science Supporting Courses, students must select 18 credits, with at least 9 credits at the 400-level, in one of the areas: computer sciences, life sciences, mathematical sciences, or physical sciences.
6. Students must select 18-22 credits, with at least 6 credits at the 400-level, from the program list.
7. Students must complete at least 3 credits of a writing across the curriculum credits. Note that only one credit of each of the BIOL 220W, BIOL 230W, and BIOL 240W courses can be used to meet this requirement.

### Advising Notes

**Program List Courses**

Students may select courses from nearly the entire range of the University’s course offerings, excluding the following:

- BIOL 11, BIOL 12
- BISC 1, BISC 2, BISC 3, BISC 4
- BMB 1
- CAS 126
- CHEM 1, CHEM 3, CHEM 101, CHEM 108
Secondary Education, B.S. (Behrend)

**Science Supporting Courses List**
- Computer Science include CENBD and CMPSC courses
- Geosciences include GEOG, GEOSC, MATSC, and MATSE courses
- Life Sciences include BIOL, BMB, and MICRB courses
- Mathematical Sciences include MATH and STAT courses
- Physical Sciences include ASTRO, CHEM, and PHYS courses

**Career Paths**
Our graduates teach in public and private schools in Pennsylvania, elsewhere in the U.S., and around the world. Education is a profession, and all teachers are expected to continue studying and developing new skills throughout their careers. In most U.S. states, teacher certification is a multi-stage process, with graduate study beyond a bachelor's degree expected early in a teacher's career. Graduates of this program who work in public schools usually go on to earn a master's degree. Alumni who wish to continue educational studies at the graduate level through Penn State can do so at University Park and through the University's World Campus.

**Careers**
In addition to resources like the College's Advising and Certification Center and Penn State Career Services, the University hosts large education career fairs in both the fall and spring semesters, which bring recruiters to campus from throughout Pennsylvania and the United States.

**Accreditation**
The College of Education educator preparation program is currently NCATE accredited and is seeking accreditation by the Council for the Accreditation of Education Preparation (CAEP) in Spring 2019. CAEP advances excellence in educator preparation through evidence-based accreditation that assures quality and supports continuous improvement to strengthen P-12 student learning.

MORE INFORMATION ABOUT ACCREDITATION OF THE SECONDARY EDUCATION PROGRAM ([https://ed.psu.edu/about/accreditations/](https://ed.psu.edu/about/accreditations/))

**Contact**

**Erie**
SCHOOL OF SCIENCE
1 Prischak
4205 College Drive
Erie, PA 16563
814-898-6105
behrend-science@psu.edu

https://behrend.psu.edu/school-of-science (https://behrend.psu.edu/school-of-science/)

**University Park**
DEPARTMENT OF CURRICULUM AND INSTRUCTION
141 Chambers Building
University Park, PA 16802
814-865-1500
rmz101@psu.edu


**Professional Resources**
- National Council of Teachers of English (NCTE) ([https://ncte.org/](https://ncte.org/))
- National Council of Teachers of Mathematics (NCTM) ([https://www.nctm.org/](https://www.nctm.org/))
- National Science Teachers Association (NSTA) ([https://www.nsta.org/](https://www.nsta.org/))