

SCIENCE, 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.

This interdisciplinary major provides a broad, general education in science. The B.S. degree major includes options in General Science and Environmental Studies, and in Earth and Space Science Pre-certification and General Science Pre-certification for teaching. The curriculum is designed for students who have educational goals not readily met by one of the science majors or for those who require a high degree of flexibility to attain their educational objectives. After completing foundation courses in calculus, chemistry, computer science, the life sciences, and physics, students select additional science courses from designated areas. A large number of supporting credits will permit students to include a minor or course sequences in business, education, technical writing, or other fields.

What is Science?

The Science major provides a broad and interdisciplinary foundation in the natural sciences. The Science BS program uses the principles of chemistry, physics, and life sciences to understand how these integrate over general areas including biological sciences and health professions, public policy, and science research and development.

You Might Like This Program If...

- You are curious about the intersections of the physical, chemical, geological, and biological worlds.
- You enjoy theoretical study, hands-on laboratory learning, fieldwork, and scientific investigation.
- You are looking for a broad science education with significant flexibility.
- You know that you'd like to pursue graduate education in an interdisciplinary science such as meteorology or oceanography.
- You envision yourself teaching general science or earth and space science to middle or high school students.

Entrance to Major

In order to be eligible for entrance to this major, a student must:

1. attain at least a C (2.00) cumulative grade-point average for all courses taken at the University; and
2. have third-semester classification (<http://www.registrar.psu.edu/enrollment/semester-classification.cfm>).

READ SENATE POLICY 37-30: ENTRANCE TO AND CHANGES IN MAJOR PROGRAMS OF STUDY (<https://senate.psu.edu/policies-and-rules-for-undergraduate-students/37-00-entrance-to-a-college-or-major/>)

Degree Requirements

For the Bachelor of Science degree in Science, a minimum of 120 credits is required, with at least 15 credits at the 400 level:

Requirement	Credits
General Education	45
Electives	0-1
Requirements for the Major	89-90

15 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 9 credits of GN courses; 6 credits of GQ courses.

Per Senate Policy 83.80.5, the college dean or campus chancellor and program faculty may require up to 24 credits of coursework in the major to be taken at the location or in the college or program where the degree is earned.

Requirements for the Major

Each student must earn at least a grade of C in each 300- and 400-level prescribed, additional, and supporting course.

To graduate, a student enrolled in the major must earn a grade of C or better in each course designated by the major as a C-required course, as specified by Senate Policy 82-44 (<http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#82-44>).

Common Requirements for the Major (All Options)

Code	Title	Credits
Prescribed Courses		
CHEM 111	Experimental Chemistry I	1
CHEM 112	Chemical Principles II	3
CHEM 113	Experimental Chemistry II	1
CMPSC 121	Introduction to Programming Techniques	3
MATH 141	Calculus with Analytic Geometry II	4
<i>Prescribed Courses: Require a grade of C or better</i>		
BIOL 110	Biology: Basic Concepts and Biodiversity	4
CHEM 110	Chemical Principles I	3
MATH 140	Calculus With Analytic Geometry I	4
Additional Courses		
Select one of the following sequences:		8-10
<i>Sequence A</i>		
PHYS 211	General Physics: Mechanics (requires a grade of C or better)	
PHYS 212	General Physics: Electricity and Magnetism	
PHYS 213	General Physics: Fluids and Thermal Physics	
	or PHYS 214 General Physics: Wave Motion and Quantum Physics	
<i>Sequence B</i>		
PHYS 250	Introductory Physics I (requires a grade of C or better)	
PHYS 251	Introductory Physics II	
Select one of the following:		4
BIOL 220W	Biology: Populations and Communities	
BIOL 230W	Biology: Molecules and Cells	
BIOL 240W	Biology: Function and Development of Organisms	
Supporting Courses and Related Areas		
Select 8 credits in a foreign language ¹		8
Requirements for the Option		
Select an option		43-46

¹ Proficiency demonstrated by examination or coursework to the level of the second semester; if fewer than 8 credits are needed to reach the required proficiency, students choose selections from program list to total 8 credits.

Requirements for the Option

A maximum of 8 credits of Research (494), Internship (495), or Independent Study (296, 496) may be applied toward credits for graduation in all options.

General Science Option (43-46 credits)

Code	Title	Credits
Additional Courses		
Select one of the following:		3-4
CMPS 122	Intermediate Programming	
MATH 230	Calculus and Vector Analysis	
MATH 250	Ordinary Differential Equations	
STAT 200	Elementary Statistics	
Supporting Courses and Related Areas		
Select 3 credits from geosciences ¹		3
Select 18 credits (at least 9 credits at the 400 level) in one of the following areas: computer sciences, life sciences, mathematical sciences, or physical sciences ¹		18
Select 18-22 credits (at least 6 credits at the 400 level) from program list ²		18-22

¹ Computer sciences include CENBD and CMPSC; geosciences include GEOG, GEOSC, MATSC, MATSE; life sciences include BIOL, BMB, MICRB; mathematical sciences include MATH and STAT; physical sciences include ASTRO, CHEM, PHYS.

² Students may apply 6 credits of basic ROTC.

Environmental Studies Option (43-46 credits)

Code	Title	Credits
Prescribed Courses		
GEOG 160	Mapping Our Changing World	3
GEOG 161	Applied Geographic Information Systems	1
<i>Prescribed Courses: Require a grade of C or better</i>		
BIOL 402W	Biological Experimental Design	3
Additional Courses		
CHEM 202 or CHEM 227	Fundamentals of Organic Chemistry I Analytical Chemistry	3-4
STAT 200 or STAT 250	Elementary Statistics Introduction to Biostatistics	3-4
Select one of the following:		3-4
BIOL 220W	Biology: Populations and Communities	
BIOL 230W	Biology: Molecules and Cells	
BIOL 240W	Biology: Function and Development of Organisms	
MICRB 201	Introductory Microbiology	
Supporting Courses and Related Areas		
Select 6 credits from geosciences ^{1,2}		6
Select 9-16 credits from Environmental Studies option program list with at least 6 credits with ECON, ECNS, PLSC, or POLSC designations and at least 5-7 credits at the 400 level ³		9-16

Select 2-4 credits of 400-level research, internship, field school, or studies abroad ⁴

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

Select 6 credits of 400-level courses in computer sciences, life sciences, mathematical sciences, or physical sciences ¹

¹ Computer sciences include CENBD and CMPSC; geosciences include GEOG, GEOSC, MATSC, MATSE; life sciences include BIOL, BMB, MICRB; mathematical sciences include MATH and STAT; physical sciences include ASTRO, CHEM, PHYS.

² In addition to courses used to satisfy the prescribed courses requirement.

³ Students may apply 6 credits of basic ROTC.

⁴ A student in this major must complete at least 15 credits of 400-level courses and 3 credits of W courses in prescribed, additional, or supporting courses from one of the areas: computer science, life sciences, mathematical sciences, or physical sciences.

Earth and Space Science Pre-Certification Option (43-46 credits)

This option is designed to prepare students in pre-certification for teaching earth and space science.

Code	Title	Credits
Prescribed Courses		
ASTRO 10	Elementary Astronomy	2
ASTRO 11	Elementary Astronomy Laboratory	1
GEOSC 2	Historical Geology	3
GEOSC 20	Planet Earth	3
GEOSC 40	The Sea Around Us	3
METE 3	Weather Revealed: Introductory Meteorology	3
Additional Courses		
Select two of the following:		6
ASTRO 291	Astronomical Methods and the Solar System	
ASTRO 292	Astronomy of the Distant Universe	
GEOG 10	Physical Geography: An Introduction	
GEOSC 10	Geology of the National Parks	

Supporting Courses and Related Areas

Select 6 credits from the geosciences ^{1,2}

Select at least 6 credits at the 400 level in one of the following areas: computer sciences, life sciences, mathematical sciences, or physical sciences ¹

Select 10-13 credits (at least 6-9 credits at the 400 level) from the program list ^{3,4}

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

Select at least 6 credits at the 400 level in one of the following areas: computer sciences, life sciences, mathematical sciences, or physical sciences

¹ Computer sciences include CENBD and CMPSC; geosciences include GEOG, GEOSC, MATSC, MATSE; life sciences include BIOL, BMB, MICRB; mathematical sciences include MATH and STAT; physical sciences include ASTRO, CHEM, PHYS.

² In addition to courses used to satisfy the prescribed courses requirement.

³ A student in this major must complete at least 15 credits of 400-level courses and 3 credits of W courses in prescribed, additional, or supporting courses from one of the areas: computer science, life sciences, mathematical sciences, or physical sciences.

⁴ Students may apply 6 credits of basic ROTC.

General Science Pre-Certification Option (43-46 credits)

This option is designed to prepare students in pre-certification for teaching general science.

Code	Title	Credits
Prescribed Courses		
ASTRO 10	Elementary Astronomy	2
ASTRO 11	Elementary Astronomy Laboratory	1
BIOL 230W	Biology: Molecules and Cells	4
GEOSC 2	Historical Geology	3
GEOSC 20	Planet Earth	3
GEOSC 40	The Sea Around Us	3
METEO 3	Weather Revealed: Introductory Meteorology	3
Additional Courses		
BIOL 220W	Biology: Populations and Communities	4
or BIOL 240W	Biology: Function and Development of Organisms	
Select one of the following:		3-4
CMPSC 122	Intermediate Programming	
MATH 230	Calculus and Vector Analysis	
MATH 250	Ordinary Differential Equations	
STAT 200	Elementary Statistics	

Supporting Courses and Related Areas

Select 10-14 credits (at least 6-9 credits at the 400 level) from the 10-14 program list ^{2,3}

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

Select at least 6 credits at the 400 level in one of the following areas: 6
computer sciences, life sciences, mathematical sciences, or physical sciences ¹

¹ Computer sciences include CENBD and CMPSC; geosciences include GEOG, GEOSC, MATSC, MATSE; life sciences include BIOL, BMB, MICRB; mathematical sciences include MATH and STAT; physical sciences include ASTRO, CHEM, PHYS.

² A student in this major must complete at least 15 credits of 400-level courses and 3 credits of W courses in prescribed, additional, or supporting courses from one of the areas: computer science, life sciences, mathematical sciences, or physical sciences.

³ Students may apply 6 credits of basic ROTC.

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 (<http://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.

Program Learning Objectives

- Produce graduates who are well versed in a broad range of topics in the sciences, humanities, and the arts and have a concentration in one of the sciences.
- Produce graduates who possess the necessary scientific knowledge and skills to further their education in graduate school and/or to pursue productive professional careers in the private, state, or federal sectors.
- Produce graduates who can demonstrate application of higher-level learning skills in critical thinking and problem solving as applied to science issues.
- Produce graduates who can effectively apply the principles of the traditional scientific method in modern inter-disciplinary scientific inquiry.
- Produce graduates who will be able to utilize the inter-disciplinary research literature to analyze and synthesize science issues and socio-economic and political implications.
- Produce graduates who can demonstrate success working in interdisciplinary project teams and as independent scholars.
- Produce graduates who can communicate the results of literature, field or lab based research/inquiry in written and spoken formats suitable to specific target audiences.

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

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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*).

Environmental Studies Option: Science, 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

Fall	Credits Spring	Credits
CHEM 110 ^{*#†}	3 CHEM 112 ^{*†}	3
CHEM 111 ^{*#†}	1 CHEM 113 ^{*†}	1
MATH 140 ^{*#†}	4 MATH 141 ^{*†}	4
ENGL 15 or 30H [‡]	3 BIOL 110S ^{*#†}	4
PSU 7	1 General Education Course	3
General Education Course	3	
	15	15

Second Year

Fall	Credits Spring	Credits
PHYS 211 or 250	4 CAS 100 [‡]	3
BIOL 220W (or BIOL 230W or BIOL 240W)	4 CMPSC 121 [*]	3
GEOG, GEOSC, MATSC, or MATSE Course (any level)	3 PHYS 212 or 251 [*]	4
World Language Level 1	4 General Education Course (GHW)	1.5
GEOG 160	3 World Language Level 2	4
GEOG 161	1	
	19	15.5

Third Year

Fall	Credits Spring	Credits
PHYS 213 (or PHYS 214 (if following PHYS 211/212 track))	2 Science Course Supporting List [*]	3
World Language Level 1	4 Environmental Course Program List [*]	3
ENGL 202A (or ENGL 202B, or ENGL 202C, or ENGL 202D)	3 General Education Course	3
Environmental Course (Program List)	3 General Education Course	3
General Education Course	3 CHEM 202 or 227 [*]	3-4
BIOL 220W (or BIOL 230W or BIOL 240W)	4	
	19	15-16

Fourth Year

Fall	Credits Spring	Credits
STAT 200 or 250 (or MATH 230 or CMPSC 122)	3-4 Environmental Course Program List [*]	3
GEOG, GEOSC, MATSC, OR MATSE Course (any level) [*]	3 General Education Course	3
400-level Environmental Course Program List [*]	3 400-level Environmental Course Program List [*]	3

Research, Internship, Field School or Study Abroad	3 General Education Course (GHW) BIOL 402*	1.5 3
12-13		13.5

Total Credits 124-126

- * 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 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
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

General Science Option: Science, 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

Fall	Credits Spring	Credits
CHEM 110 ^{*#†}	3 CHEM 112 ^{*†}	3
CHEM 111 ^{*#†}	1 CHEM 113 ^{*†}	1
MATH 140 ^{*#†}	4 MATH 141 ^{*†}	4
ENGL 15 or 30H [‡]	3 BIOL 110S ^{*#†}	4
PSU 7	1 General Education Course	3
General Education Course	3	
	15	15

Second Year

Fall	Credits Spring	Credits
CAS 100 [‡]	3 CMPSC 121 [*]	3
PHYS 211 or 250	4 PHYS 212 or 251 [*]	4
BIOL 220W (or BIOL 230W or BIOL 240W)	4 General Education Course	3
GEOG, GEOSC, MATSC, or MATSE Course (any level)	3 General Education Course	3
General Education Course (GHW)	1.5 Science Course Supporting List	3
	15.5	16

Third Year

Fall	Credits Spring	Credits
PHYS 213 (or PHYS 214 (if following PHYS 211/212 track))	2 Science Course Supporting List [*]	3
World Language Level 1	4 400-level Science Course Supporting List [*]	3
ENGL 202A (or ENGL 202B, or ENGL 202C, or ENGL 202D)	3 General Education Course	3
Science Course Supporting List	3 General Education Course (GHW)	1.5
General Education Course	3 World Language Level 2	4
	15	14.5

Fourth Year

Fall	Credits Spring	Credits
STAT 200 or 250 (or MATH 230 or CMPSC 122) [*]	3-4 Course Program List [*]	3
Science 400-level Course Supporting List [*]	3 Course Program List [*]	3
Course Program List [*]	3 400-level Course Program List [*]	3
Course Program List [*]	3 400-level Course Program List [*]	3

Course Program List	3 Science 400-level Course Supporting List [*]	3
	15-16	15

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 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

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

General Science Pre-Certification Teaching Option: Science, 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

Fall	Credits	Spring	Credits
CHEM 110 ^{*#†}	3	CHEM 112 ^{*#†}	3
CHEM 111 ^{#†}	1	CHEM 113 ^{*†}	1
MATH 140 ^{*#†}	4	MATH 141 ^{*†}	4
ENGL 15 or 30H [†]	3	BIOL 110S ^{*#†}	4
PSU 7	1	General Education Course	3
General Education Course	3		
	15		15

Second Year

Fall	Credits	Spring	Credits
CAS 100 [†]	3	GEOSC 2	3
BIOL 220W or 230W (or BIOL 240W)	4	CMPSC 121 [*]	3
PHYS 250 or 211 [*]	4	ASTRO 10	2
GEOSC 20	3	ASTRO 11	1
General Education Course (GHW)	1.5	PHYS 251 or 212 [*]	4
		General Education Course	3
	15.5		16

Third Year

Fall	Credits	Spring	Credits
PHYS 213 or PHYS 214 or Elective (if following PHYS 250/251 track) [†]	2-3	World Language Level 2	4
General Education Course	3	General Education Course (GHW)	1.5
ENGL 202A or 202B (or ENGL 202C or ENGL 202D) ^{††}	3	GEOSC 40	3
ASTRO 291 or GEOG 10	3	ASTRO 292	3
World Language Level 1	4	GEOSC 10	3
		400-Level Course Science Supporting List [*]	3
	15-16		17.5

Fourth Year

Fall	Credits	Spring	Credits
STAT 250 or 200 (or MATH 230 or CMPSC 122)	3-4	400-Level Course Program List [*]	3
400-Level Course Program List [*]	3	400-Level Course Program List [*]	3
METEO 3 [†]	3	GEOSC Course [*]	3
400-Level Course Science Supporting List [*]	3	General Education Course [†]	3

General Education Course	3	GEOG, GEOSC, MATSC, MATSE Course (any level)	3
	15-16		15

Total Credits 124-126

- * 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 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

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: Science, 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

Fall	Credits	Spring	Credits
CHEM 110 ^{*#†}	3	CHEM 112 ^{*#†}	3
CHEM 111 ^{#†}	1	CHEM 113 ^{*†}	1
MATH 140 ^{*#†}	4	MATH 141 ^{*†}	4
ENGL 15 or 30H [†]	3	BIOL 110S ^{*#†}	4
PSU 7	1	General Education Course [†]	3
General Education Course [†]	3		
	15		15

Second Year

Fall	Credits	Spring	Credits
CAS 100 [‡]	3	GEOSC 2	3
BIOL 220W or 230W (or BIOL 240W)	4	CMPSC 121 [*]	3
PHYS 250 or 211 [*]	4	ASTRO 10	2
GEOSC 20	3	ASTRO 11	1
General Education Course (GHW) [†]	1.5	PHYS 251 or 212 [*]	4
		General Education Course ^{*†}	3
	15.5		16

Third Year

Fall	Credits	Spring	Credits
PHYS 213 or PHYS 214 or Elective (if following PHYS 250/251 track) [†]	2-3	World Language Level 2	4
General Education Course [†]	3	General Education Course (GHW) ^{*†}	1.5
ENGL 202A or 202B (or ENGL 202C or ENGL 202D) ^{††}	3	GEOSC 40	3
ASTRO 291 or GEOG 10	3	ASTRO 292	3
World Language Level 1	4	GEOSC 10	3
		400-Level Course (Science Supporting List) [*]	3
	15-16		17.5

Fourth Year

Fall	Credits	Spring	Credits
STAT 250 or 200 (or MATH 230 or CMPSC 122)	3-4	400-Level Course (Program List) [*]	3
400-Level Course (Program List) [*]	3	400-Level Course (Program List) [*]	3
METEO 3 [†]	3	GEOSC Course [*]	3
400-Level Course (Science Supporting List) [*]	3	General Education Course [†]	3

General Education Course [†]	3	GEOG, GEOSC, MATSC, MATSE Course (any level)	3
	15-16		15

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MICRB 106, MICRB 107, MICRB 120, MICRB 121A, MICRB 121B,

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PHYS 1, PHYS 150, PHYS 151, PHYS 126

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Mathematical Sciences include MATH and STAT courses

Physical Sciences include ASTRO, CHEM, and PHYS courses

- Geological Society of America (<https://www.geosociety.org/>)

- American Physical Society (<https://www.aps.org/>)

Contact

Erie

SCHOOL OF SCIENCE

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<http://behrend.psu.edu/school-of-science> (<http://behrend.psu.edu/school-of-science/>)

Career Paths

To help you achieve your career goals, you can specialize your Science studies by pursuing one of four options within the degree program:

Environmental Studies, General Science, General Science Education Precertification, and Earth and Space Science Education Precertification.

Penn State Behrend has a comprehensive support system to help you identify and achieve your goals for college and beyond. Meet with your academic adviser often and take advantage of the services offered by the Academic and Career Planning Center beginning in your first semester.

Careers

Your career options are limited only by your imagination, talent, and perseverance. A STEM undergraduate degree such as the B.S. in Science is a very useful foundation for a wide array of possible careers and for many interdisciplinary graduate school programs. Penn State Behrend Science graduates include pharmacists, educational consultants, optometrists, environmental specialists, field engineers, science teachers, analytical research chemists, field biologists, lab managers, and physicians.

MORE INFORMATION ABOUT POTENTIAL CAREER OPTIONS FOR GRADUATES OF THE SCIENCE PROGRAM (<http://behrend.psu.edu/school-of-science/academic-programs-1/science-bs/>)

Opportunities for Graduate Studies

Science can be a foundational major for graduate study in any branch of the physical, chemical, or biological sciences, or for graduate education in preparation for a career as a physician, veterinarian, physician assistant, or other health care professional.

MORE INFORMATION ABOUT OPPORTUNITIES FOR GRADUATE STUDIES (<http://behrend.psu.edu/school-of-science/academic-programs-1/science-bs/>)

Professional Resources

- American Association for the Advancement of Science (<https://www.aaas.org/>)
- National Science Teachers Association (<http://www.nsta.org/>)
- American Chemical Society (<https://www.acs.org/content/acs/en.html>)
- Mathematical Association of America (<https://www.maa.org/>)
- Association for Environmental Studies and Sciences (<https://www.aessonline.org/>)