Science, B.S. (Capital)

Begin Campus: Any Penn State Campus

End Campus: Harrisburg

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 Science major is an interdisciplinary degree that aims to provide a broad, general education in science. The bachelor of science (B.S.) curriculum is designed specifically for students who have education goals relating to scientific theory and practice and who require a high degree of flexibility to obtain their educational objectives. After completing foundation courses in calculus, chemistry, physics, and the life sciences, students will select additional science courses from designated areas. A large number of supporting credits permit students to readily include significant breadth or specialization into their undergraduate curriculum. Some examples include minors in business, computer and information science, education, kinesiology, or other fields. The degree allows students throughout the Commonwealth to become familiar with both the theory and the practice of science. It can help prepare students for various careers in pharmaceutical, biotechnical, chemical, medical, and agricultural industries. The degree can also be tailored to meet the specific requirements of professional programs such as medical, dental, or pharmacy schools.

The Science major is an interdisciplinary degree that aims to provide a broad, general education in science. The bachelor of science (B.S.) curriculum is designed specifically for students who have education goals relating to scientific theory and practice and who require a high degree of flexibility to obtain their educational objectives. After completing foundation courses in calculus, chemistry, physics, and the life sciences, students will select additional science courses from designated areas. A large number of supporting credits permit students to readily include significant breadth or specialization into their undergraduate curriculum. Some examples include minors in business, computer and information science, education, kinesiology, or other fields. The degree allows students throughout the Commonwealth to become familiar with both the theory and the practice of science. It can help prepare students for various careers in pharmaceutical, biotechnical, chemical, medical, and agricultural industries. The degree can also be tailored to meet the specific requirements of professional programs such as medical, dental, or pharmacy schools.

General Science Option

Available at the following campuses: Altoona, Berks, Harrisburg, Scranton, University Park, York

The General Science option of the B.S. Science degree allows for the most flexibility.

Achievement in a more specialized set of goals can be met by selecting one of the other B.S. options offered:

Biological Sciences and Health Professions Option

Available at the following campuses: University Park

Legal Studies, Government Service, Public Policy Option

Available at the following campuses: University Park

Life Sciences Option

Available at the following campuses: Altoona, Berks, Harrisburg, Scranton, University Park, York

Mathematical Sciences Option

Available at the following campuses: Altoona

Physical Sciences Option

Available at the following campuses: Altoona

Not all of these options are available at all locations, and there are minor distinctions of the core curriculum at some locations, so see the Science program director at your College for further details.

Two-Year Preprofessional Preparation

The first two years of the Science major (62 credits) can meet the preprofessional needs of those interested in admission to some schools of pharmacy, physical therapy, optometry, nursing, and physician assistant training. Successful students can then transfer after two years of undergraduate study to the professional school to which they are admitted. Note, however, that no Penn State degree can be awarded after only two years (62 credits) of study in the Science major. Also, note that the abbreviated two-year curriculum alone does not prepare students for admission to professional schools of general medicine, veterinary medicine, or dental medicine. Consult with your college's health sciences professional adviser for additional information.

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 like learning by doing hands-on experiments.
- You are curious about the natural world and how science disciplines come together to explore and understand it.
- You are intrigued by science and desire a career in current and emerging interdisciplinary science disciplines, health professions, or melding science with law, policy or business.

Entrance to Major

In order to be eligible for entrance to the Science major, a student at any location must have:

1. attained at least a 2.00 cumulative grade-point average;
2. completed MATH 140 with a grade of C or better;
3. completed at least two of the following courses, BIOL 110; CHEM 110; PHYS 211 or PHYS 250, with a grade of C or better.

Degree Requirements

For the Bachelor of Science degree in Science, a minimum of 124 credits is required, with at least 15 credits at the 400 level:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education</td>
<td>45</td>
</tr>
<tr>
<td>Requirements for the Major</td>
<td>94</td>
</tr>
</tbody>
</table>
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.

**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 (http://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.

**Requirements for the Major**

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**
--- | --- | ---
CHEM 111 | Experimental Chemistry I | 1
CHEM 112 | Chemical Principles II | 3
CHEM 113 | Experimental Chemistry II | 1
MATH 141 | Calculus with Analytic Geometry I | 4
**Prescribed Courses: Require a grade of C Or better**
BIOL 110 | Biology: Basic Concepts and Biodiversity | 4
CHEM 110 | Chemical Principles I | 3
MATH 140 | Calculus With Analytic Geometry I | 4

**Requirements for the Option**

Select an option 74

**Requirements for the Option**

**General Science Option (74 credits)**

*Available at the following campuses: Altoona, Berks, Harrisburg, Scranton, University Park, York*

**Code** | **Title** | **Credits**
--- | --- | ---
Select 4 credits of the following: | | 4

- BIOL 129 | Mammalian Anatomy |
- BIOL 141 | Introductory Physiology |
& BIOL 142 | and Physiology Laboratory |
- BIOL 220W | Biology: Populations and Communities |
- BIOL 230W | Biology: Molecules and Cells |
- BIOL 240W | Biology: Function and Development of Organisms |

Select 3-4 credits of the following: 3-4

- STAT 200 | Elementary Statistics |
- STAT 250 | Introduction to Biostatistics |
- STAT 301 | Statistical Analysis I |
- STAT 401 | Experimental Methods |
Select 8-12 credits of the following: 8-12

PHYS 211 General Physics: Mechanics
& PHYS 212 and General Physics: Electricity and Magnetism
& PHYS 213 and General Physics: Fluids and Thermal Physics
& PHYS 214 and General Physics: Wave Motion and Quantum Physics

PHYS 250 Introductory Physics I
& PHYS 251 and Introductory Physics II

Supporting Courses and Related Areas
A maximum of 12 credits of Independent Study (296, 496) may be applied toward credits for graduation.

Select 21-26 credits from program list (Students may apply 6 credits of ROTC)

Select 3 credits from earth and mineral sciences 3
Select 3 credits in Global, Social, and Personal Awareness from department approved course list in consultation with adviser
Select 3 credits in Teamwork and Interpersonal Communication from department approved course list in consultation with adviser
Select 6 credits of 400-level courses 6

Supporting and Related Courses: Require a grade of C or better
Select 18 credits in life, mathematical, or physical sciences, with at least 9 credits at the 400 level 2,3

1 PHYS 211 and PHYS 250 require a grade of C or better.
2 Only the 9 credits at the 400 level require a grade of C or better.
3 Physical sciences include ASTRO, CHEM, PHYS; mathematical sciences include CMPSC, MATH, STAT; life sciences include BIOL, BIOTC, BMB, MICRB.

Biological Sciences and Health Professions Option (74 credits)
Available at the following campuses: University Park

Code Title Credits

Prescribed Courses
HPA 101 Introduction to Health Services Organization 3

Additional Courses
Select 4 credits of the following: 4
BIOL 129 Mammalian Anatomy
BIOL 220W Biology: Populations and Communities
BIOL 230W Biology: Molecules and Cells
BIOL 240W Biology: Function and Development of Organisms
BIOL 141 Introductory Physiology
& BIOL 142 and Physiology Laboratory

Select 3-4 credits of the following: 3-4
STAT 200 Elementary Statistics
STAT 250 Introduction to Biostatistics
STAT 301 Statistical Analysis I
STAT 401 Experimental Methods

Select 6-8 credits 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 3 credits of the following: 3
BIOL 222 Genetics

BIOL 322 Genetic Analysis
BMB 211 Elementary Biochemistry
BMB 251 Molecular and Cell Biology I
MICRB 201 Introductory Microbiology

Select 8-12 credits of the following: 8-12
PHYS 211 General Physics: Mechanics
& PHYS 212 and General Physics: Electricity and Magnetism
& PHYS 213 and General Physics: Fluids and Thermal Physics
& PHYS 214 and General Physics: Wave Motion and Quantum Physics

PHYS 250 Introductory Physics I
& PHYS 251 and Introductory Physics II

Supporting Courses and Related Areas
A maximum of 12 credits of Independent Study (296, 496) may be applied toward credits for graduation.

Select 15 credits from program list for Healthcare/ Medicine/Ethical Competencies 1
Select 10-17 credits from program list (Students may apply 6 credits of ROTC)
Select 3 credits in Global, Social, and Personal Awareness from department approved course list in consultation with adviser
Select 3 credits in Teamwork and Interpersonal Communication from department approved course list in consultation with adviser

Supporting Courses and Related Areas: Require a grade of C or better
Select 9 credits of 400-level BMB, BIOL, BIOTC, or MICRB courses 9

1 Six credits must be at the 400-level. Select from department approved course list in consultation with adviser.
2 PHYS 211 and PHYS 250 require a grade of C or better.

Legal Studies, Government Service, Public Policy Option (74 credits)
Available at the following campuses: University Park

Code Title Credits

Additional Courses
Select 4 credits of the following: 4
BIOL 129 Mammalian Anatomy
BIOL 141 Introductory Physiology
& BIOL 142 and Physiology Laboratory
BIOL 220W Biology: Populations and Communities
BIOL 230W Biology: Molecules and Cells
BIOL 240W Biology: Function and Development of Organisms

Select 3-4 credits of the following: 3-4
STAT 200 Elementary Statistics
STAT 250 Introduction to Biostatistics
STAT 301 Statistical Analysis I
STAT 401 Experimental Methods

Select 8-12 credits of the following: 8-12
PHYS 211 General Physics: Mechanics
& PHYS 212 and General Physics: Electricity and Magnetism
& PHYS 213 and General Physics: Fluids and Thermal Physics
& PHYS 214 and General Physics: Wave Motion and Quantum Physics

PHYS 250 Introductory Physics I
& PHYS 251 and Introductory Physics II

Supporting Courses and Related Areas
Select 12-17 credits from program list (Students may apply 6 credits of ROTC)

Select 18 credits from program list for Legal Studies, Government Service, Public Policy

Select 3 credits in Global, Social, and Personal Awareness from department approved course list in consultation with adviser

Select 3 credits in Teamwork and Interpersonal Communication from department approved course list in consultation with adviser

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

Select 18 credits in life, mathematical, or physical sciences, with at least 9 credits at the 400 level

1 PHYS 211 and PHYS 250 require a grade of C or better.

2 Six credits must be at the 400-level. Select from department approved course list in consultation with adviser.

3 Only the 9 credits at the 400-level require a grade of C or better.

4 Physical sciences include ASTRO, CHEM, PHYS; mathematical sciences include CMPSC, MATH, STAT; life sciences include BIOL, BIOTC, BMB, MICRB.

Life Science Option (74 credits)
Available at the following campuses: Altoona, Berks, Harrisburg, Scranton, University Park, York

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMPSC 101</td>
<td>Introduction to Programming</td>
<td>3</td>
</tr>
<tr>
<td>MATH 250</td>
<td>Ordinary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>STAT 250</td>
<td>Introduction to Biostatistics</td>
<td>3</td>
</tr>
<tr>
<td>BMB 211</td>
<td>Elementary Biochemistry</td>
<td>3</td>
</tr>
<tr>
<td>BMB 251</td>
<td>Molecular and Cell Biology I</td>
<td>3</td>
</tr>
<tr>
<td>MICRB 201</td>
<td>Introductory Microbiology</td>
<td>3</td>
</tr>
</tbody>
</table>

Select 6-8 credits of the following:

1 CHEM 202  | Fundamentals of Organic Chemistry I                | 3       |
2 CHEM 203  | and Fundamentals of Organic Chemistry II           | 3       |
3 CHEM 210  | Organic Chemistry I                                | 3       |
4 CHEM 212  | and Organic Chemistry II                           | 3       |
5 CHEM 213  | and Laboratory in Organic Chemistry                | 3       |

Select 8-12 credits of the following:

1 PHYS 211  | General Physics: Mechanics                         | 3       |
2 PHYS 212  | and General Physics: Electricity and Magnetism     | 3       |
3 PHYS 213  | and General Physics: Fluids and Thermal Physics    | 3       |
4 PHYS 214  | and General Physics: Wave Motion and Quantum Physics | 3       |

1 PHYS 250  | Introductory Physics I                             | 3       |
2 PHYS 251  | and Introductory Physics II                         | 3       |

Supporting Courses and Related Areas

A maximum of 12 credits of Independent Study (296, 496) may be applied toward credits for graduation.

Select 18-24 credits from program list (Students may apply 6 credits of ROTC)

Select 6 credits of 400-level courses

Select 3 credits in Global, Social, and Personal Awareness

Select 3 credits in Teamwork and Interpersonal Communication

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

Select 9 credits of 400-level CMPSC, CSE, MATH, or STAT courses

1 PHYS 211 and PHYS 250 require a grade of C or better.

Mathematical Science Option (74 credits)
Available at the following campuses: Altoona

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMPSC 122</td>
<td>Intermediate Programming</td>
<td>3</td>
</tr>
<tr>
<td>MATH 220</td>
<td>Matrices</td>
<td>2-3</td>
</tr>
</tbody>
</table>

Additional Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMPSC 360</td>
<td>Discrete Mathematics for Computer Science</td>
<td>3-4</td>
</tr>
<tr>
<td>MATH 311</td>
<td>W Concepts of Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 230</td>
<td>Calculus and Vector Analysis</td>
<td>4</td>
</tr>
<tr>
<td>MATH 251</td>
<td>Ordinary and Partial Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>STAT 301</td>
<td>Statistical Analysis I</td>
<td>3</td>
</tr>
<tr>
<td>STAT 318</td>
<td>Elementary Probability</td>
<td>3</td>
</tr>
</tbody>
</table>

Select 3 credits of the following:

1 BMB 211  | Elementary Biochemistry                             | 3       |
2 BMB 251  | Molecular and Cell Biology I                        | 3       |
3 MICRB 201| Introductory Microbiology                           | 3       |

Select 8-12 credits of the following:

1 PHYS 211  | General Physics: Mechanics                         | 3       |
2 PHYS 212  | and General Physics: Electricity and Magnetism     | 3       |
3 PHYS 213  | and General Physics: Fluids and Thermal Physics    | 3       |
4 PHYS 214  | and General Physics: Wave Motion and Quantum Physics | 3       |

1 PHYS 250  | Introductory Physics I                             | 3       |
2 PHYS 251  | and Introductory Physics II                         | 3       |

Supporting Courses and Related Areas

A maximum of 12 credits of Independent Study (296, 496) may be applied toward credits for graduation.

Select 18-24 credits from program list (Students may apply 6 credits of ROTC)

Select 6 credits of 400-level courses

Select 3 credits in Global, Social, and Personal Awareness

Select 3 credits in Teamwork and Interpersonal Communication

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

Select 9 credits of 400-level CMPSC, CSE, MATH, or STAT courses

1 PHYS 211 and PHYS 250 require a grade of C or better.

Physical Science Option (74 credits)
Available at the following campuses: Altoona

Select 3 credits in Global, Social, and Personal Awareness

Select 3 credits in Teamwork and Interpersonal Communication

Select 6 credits of 400-level courses

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

Select 9 credits of 400-level CMPSC, CSE, MATH, or STAT courses

1 PHYS 211 and PHYS 250 require a grade of C or better.
### Prescribed Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTRO 291</td>
<td>Astronomical Methods and the Solar System</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 212</td>
<td>General Physics: Electricity and Magnetism</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 213</td>
<td>General Physics: Fluids and Thermal Physics</td>
<td>2</td>
</tr>
<tr>
<td>PHYS 214</td>
<td>General Physics: Wave Motion and Quantum Physics</td>
<td>2</td>
</tr>
</tbody>
</table>

**Prescribed Courses: Require a grade of C or better**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 211</td>
<td>General Physics: Mechanics</td>
<td>4</td>
</tr>
</tbody>
</table>

### Additional Courses

Select 3 credits of the following:

- BMB 211 Elementary Biochemistry
- BMB 251 Molecular and Cell Biology I
- MICRB 201 Introductory Microbiology

Select 6-8 credits of the following:

- 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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 230</td>
<td>Calculus and Vector Analysis</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 251</td>
<td>Ordinary and Partial Differential Equations</td>
<td></td>
</tr>
</tbody>
</table>

Select 3 credits of the following:

- ASTRO 292 Astronomy of the Distant Universe
- EMCH 211 Statics
- ME 300 Engineering Thermodynamics I
- PHYS 237 Introduction to Modern Physics

### Supporting Courses and Related Areas

A maximum of 12 credits of Independent Study (296, 496) may be applied toward credits for graduation.

Select 20-22 credits from program list (Students may apply 6 credits of ROTC)

Select 6 credits of 400-level courses

Select 3 credits in Global, Social, and Personal Awareness

Select 3 credits in Teamwork and Interpersonal Communication

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

Select 9 credits of 400-level ASTRO, CHEM, or PHYS courses

### 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 (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/32-00-advising-policy)
**Suggested Academic Plan**

The suggested academic plan(s) listed on this page are the plan(s) that are in effect during the 2019-20 academic year. To access previous years’ suggested academic plans, please visit the archive (http://bulletins.psu.edu/undergraduate/archive) to view the appropriate Undergraduate Bulletin edition (Note: the archive only contain suggested academic plans beginning with the 2018-19 edition of the Undergraduate Bulletin).

**Harrisburg Campus**

**General Option**

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>ENGL 15†</td>
<td>3</td>
<td>General Education Course</td>
<td>3</td>
</tr>
<tr>
<td>MATH 140††</td>
<td>4</td>
<td>MATH 141†</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 110††</td>
<td>4</td>
<td>Life Sciences Approved Courses†</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 110††</td>
<td>3</td>
<td>CHEM 112†</td>
<td>3</td>
</tr>
<tr>
<td>Supporting/Elective Course (or General Education Course (GHW))</td>
<td>1-1.5</td>
<td>CHEM 111†</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Supporting/Elective Course or General Education Course (GHW)</td>
<td>1-1.5</td>
</tr>
<tr>
<td></td>
<td>15-15.5</td>
<td>16-16.5</td>
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</tbody>
</table>

### Second Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 113†</td>
<td>1</td>
<td>Life, Mathematical, or Physical Science course²</td>
<td>3-4</td>
</tr>
<tr>
<td>Life, Mathematical, or Physical Science course²</td>
<td>3-4</td>
<td>PHYS 250 or 211††</td>
<td>4</td>
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<tr>
<td>Life, Mathematical, or Physical Science course²</td>
<td>3-4</td>
<td>General Education Course</td>
<td>3</td>
</tr>
<tr>
<td>General Education Course</td>
<td>3</td>
<td>Earth and Mineral Science course³</td>
<td>3</td>
</tr>
<tr>
<td>CAS 100†</td>
<td>3</td>
<td>Global, Social and Personal Awareness course (from approved List 2)</td>
<td>3</td>
</tr>
<tr>
<td>Supporting/Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>16-18</td>
<td>16-17</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 251 or 212†</td>
<td>4</td>
<td>PHYS 213 or 214†</td>
<td>2</td>
</tr>
<tr>
<td>STAT 200, 250, 201, or STAT 401†</td>
<td>4</td>
<td>400 Level Life, Mathematical, or Physical Science course†</td>
<td>3-4</td>
</tr>
<tr>
<td>General Education Course</td>
<td>3</td>
<td>ENGL 202A, 202B, 202C, or 202D†</td>
<td>3</td>
</tr>
<tr>
<td>Teamwork and Interpersonal Communications course (from approved List 1)</td>
<td>3</td>
<td>General Education Course</td>
<td>3</td>
</tr>
<tr>
<td>Supporting/Elective Course</td>
<td>3</td>
<td>Supporting/Elective Course</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>14-15</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>400 Level Life, Mathematical, or Physical Science Course†</td>
<td>3-4</td>
<td>400-Level Supporting/Elective Course</td>
<td>3</td>
</tr>
<tr>
<td>General Education Course</td>
<td>3</td>
<td>Supporting/Elective Course or General Education Course (GHW)</td>
<td>3</td>
</tr>
<tr>
<td>Supporting/Elective Course or General Education Course (GHW)</td>
<td>1-1.5</td>
<td>Supporting/Elective Course</td>
<td>3</td>
</tr>
<tr>
<td>Supporting/Elective Course</td>
<td>3</td>
<td>Supporting Elective Course</td>
<td>3</td>
</tr>
<tr>
<td>Supporting/Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>16-17.5</td>
<td>15-16</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits 125-132.5

* 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
¹ Life Sciences Approved Courses
   - BIOL 220W - Biology: Populations and Communities (4)
   - BIOL 230W - Biology: Molecules and Cells (4)
   - BIOL 240W - Biology: Function and Development of Organism (4)
   - BIOL 129 - Mammalian Anatomy (4)
   - BIOL 141 - Introductory Physiology (3)
   - BIOL 142 - Physiology Laboratory (1)

² Life, Mathematical, or Physical Science Courses
³ Life Science
   - BMB
   - BIOL
   - BIOTC
   - MICRB

Mathematical Science
   - CMPSC, MATH, STAT

Physical Science: ASTR0, CHEM, PHYS
Earth and Mineral Science courses
- METEO
- MATSC
- EMSC
- EGEE
- EARTH
- GEOG
- GEOSC
- See http://www.ems.psu.edu/

PHYS 214 - General Physics: Wave Motion and Quantum Physics (only for PHYS 211 and PHYS 212 series) or supporting/Elective Course
400-Level Life, Mathematical, or Physical Science course
Life Science: BMB, BIOL, BIOTC, MICRB
Mathematical Science: CMPSC, MATH, STAT
Physical Science: ASTRO CHEM, PHYS

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:

- This outline is only a suggested recommended academic plan. There is considerable room for adjusting the necessary courses to fit your individual needs and goals. For example, a student may take CHEM 110 along with CHEM 111 during semester 1, in which case the student may then take CHEM 112 along with CHEM 113 during semester 2. Another example, a student could choose to take a world language course during other/earlier semesters, such as semester 1 and 2. Remember, most students only have to average about 16 credits per semester to graduate in four academic years (or eight semesters). The Science major requires a total of 124 credits.
- Do not overlook the opportunity for Independent Study/Research credit, Cooperative Education, or Study Abroad Opportunities.
- For the various supporting/elective courses each student is required to complete the major, one should consider completing a sequence of courses from the same department/program as opposed to completing all introductory courses from many different departments/programs. Students can even consider completing a minor in another academic discipline with the various supporting/elective courses and any 400 level course work needed.
- For additional information such as the Teamwork and Interpersonal Communications approved course list (List 1), Global, Social, and Personal Awareness approved course list (List 2), Supporting/elective

Program List and other FAQs please visit the following Web site www.science.psu.edu/sciencesbs.

Life Science Option
The course series listed below provides only one of the many possible ways to move through this curriculum. The University may change 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 Credits</th>
<th>Spring Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 110†</td>
<td>4 BIOL 220W, 230W, or 240W 4</td>
</tr>
<tr>
<td>CHEM 110†</td>
<td>3 CAS 100‡ 3</td>
</tr>
<tr>
<td>CHEM 111†</td>
<td>1 CHEM 112 or 113‡ 3</td>
</tr>
<tr>
<td>ENGL 16‡</td>
<td>3 MATH 141† 4</td>
</tr>
<tr>
<td>MATH 140+</td>
<td>4 General Education Course GHW 1.5</td>
</tr>
</tbody>
</table>

|                           | 15      | 15.5  |

Second Year

<table>
<thead>
<tr>
<th>Fall Credits</th>
<th>Spring Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 220W, 230W, or 240W‡</td>
<td>4 BIOL 220W, 230W, or 240W 4</td>
</tr>
<tr>
<td>CHEM 202 or 210</td>
<td>3 CHEM 203, 212, or 213 4</td>
</tr>
<tr>
<td>Teamwork and Interpersonal Communications Course (from Approved List 1) or Supporting Course</td>
<td>3 BMB 211, 251, or MICRB 201 3</td>
</tr>
<tr>
<td>Select from the following</td>
<td>4 Global, Social and Personal Awareness Course (from Approved List 2) or Supporting Course 3</td>
</tr>
<tr>
<td>General Education Course GHW</td>
<td>1.5</td>
</tr>
</tbody>
</table>

|                           | 15.5    | 14    |

Third Year

<table>
<thead>
<tr>
<th>Fall Credits</th>
<th>Spring Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 202C‡</td>
<td>3 PHY 251 or 212 4</td>
</tr>
<tr>
<td>PHYS 250 or 211*</td>
<td>4 Select 3 credits from 400 level Science courses 3</td>
</tr>
<tr>
<td>Supporting Course</td>
<td>3 General Education Course 3</td>
</tr>
<tr>
<td>General Education Course</td>
<td>3 General Education Course 3</td>
</tr>
<tr>
<td>General Education Course</td>
<td>3 Supporting Course 3</td>
</tr>
</tbody>
</table>

|                           | 16      | 16    |

Fourth Year

<table>
<thead>
<tr>
<th>Fall Credits</th>
<th>Spring Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>400-level Course Selection</td>
<td>3 400-level Course Selection 3</td>
</tr>
<tr>
<td>Select 3 credits from 400-level Science courses*</td>
<td>3 Select 3 credits from 400-level Science courses 3</td>
</tr>
<tr>
<td>PHYS 213 or 214</td>
<td>2 Supporting Course(s) 3-6</td>
</tr>
<tr>
<td>Supporting Course</td>
<td>3 General Education Course 3</td>
</tr>
<tr>
<td>General Education Course</td>
<td>3</td>
</tr>
</tbody>
</table>

|                           | 14      | 12-15  |

Total Credits 118-121
-careers and graduate programs. The solid foundation of science and
Penn State students with a BS in Science are prepared for a broad range
Careers
This program often leads to careers in all healthcare professions,
including physicians and physician assistants, dentists, optometrists,
and podiatrists; laboratory research associates; scientific product
representatives and science-based consulting.

Opportunities for Graduate Studies
Many graduates of the Science B.S. program choose to pursue graduate
studies (MS and PhD) in the natural sciences. Most often, students
gravitate to medically-related fields and life science sub-disciplines for
focused graduate training. Students in the legal studies and public policy
options may choose law school or master’s in public policy programs.

Professional Resources

- Association of American Medical Colleges (https://www.aamc.org)
- American Association of Colleges of Osteopathic Medicine (https://
www.aacom.org)
- American Dental Education Association (http://www.adea.org)
- Association of Schools and Colleges of Optometry (https://
optometricleducation.org)
- American Association of Colleges of Podiatric Medicine (http://
www.aacpm.org)
- American Academy of Physician Assistants (AAPA) (https://
www.aapa.org) Physician Assistant Education Association (http://
paeaoonline.org)

Contact

Harrisburg
SCHOOL OF SCIENCE, ENGINEERING, AND TECHNOLOGY
Science & Tech Building, TL 177
Middletown, PA 17057
717-948-4387
mrr53@psu.edu
https://harrisburg.psu.edu/science-engineering-technology/biology-
science/bachelor-science-biology

Abington
DIVISION OF SCIENCE & ENGINEERING
1600 Woodland Road
Abington, PA 19001
215-881-7492
epl1@psu.edu
http://abington.psu.edu/science

Altoona
DIVISION OF MATHEMATICS AND NATURAL SCIENCES
101 Elm Building
3000 Ivyside Park
Altoona, PA 16601
814-949-5496
epl1@psu.edu
http://altoona.psu.edu/academics/bachelors-degrees/science/request-
information
Berks
DIVISION OF SCIENCE
Luerssen Science Building
Reading, PA 19610
610-396-6185
ias1@psu.edu
http://berks.psu.edu/bs-science

Scranton
Dawson 207
Dunmore, PA 18512
570-963-2579
dah13@psu.edu
https://scranton.psu.edu/science-program

University Park
Science, B.S. Program
SCIENCE DEGREE
225B Ritenour Building
University Park, PA 16802
814-865-7620
ram29@psu.edu
http://science.psu.edu/sciencebs

University Park
Accelerated Science B.S./M.B.A. Program
SCIENCE B.A./M.B.A.
24 Ritenour Building
University Park, PA 16802
814-863-2011
dsb30@psu.edu
http://science.psu.edu/bsmba

York
1 Elias Science Building
York, PA 17403
717-718-6705
amv12@psu.edu
http://york.psu.edu/academics/baccalaureate/science