SCIENCE, B.S. (UNIVERSITY COLLEGE)

Begin Campus: Any Penn State Campus

End Campus: York, Scranton

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 (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.

Common Requirements for the Major (All Options)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 111</td>
<td>Experimental Chemistry I</td>
<td>1</td>
</tr>
<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 141</td>
<td>Calculus with Analytic Geometry II</td>
<td>4</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>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>
<tr>
<td>MATH 140</td>
<td>Calculus With Analytic Geometry I</td>
<td>4</td>
</tr>
</tbody>
</table>

Requirements for the Option
Select an option
Requirements for the Option
General Science Option (74 credits)
Available at the following campuses: Abington, Altoona, Berks, Harrisburg, Scranton, University Park, York

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
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</tbody>
</table>

Select 4 credits of the following:

BIOL 129 Mammalian Anatomy
BIOL 141 Introduction to Human 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:

STAT 200 Elementary Statistics
STAT 250 Introduction to Biostatistics
STAT 301

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

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

Select 10-17 credits from program list (Students may apply 6 credits toward credits for graduation.)

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 toward credits for graduation.)

Select 3 credits from earth and mineral sciences
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

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

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 |
<table>
<thead>
<tr>
<th></th>
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</tbody>
</table>

Prescribed Courses
HPA 101 Introduction to Health Services Organization 3

Additional Courses
Select 4 credits of the following:

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 Introduction to Human Physiology
& BIOL 142 and Physiology Laboratory

Select 3-4 credits of the following:

STAT 200 Elementary Statistics
STAT 250 Introduction to Biostatistics
STAT 301

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

Select 3 credits of the following:

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:

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
Select 10-17 credits from program list (Students may apply 6 credits toward credits for graduation.)

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

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 |
<table>
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<tr>
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<tbody>
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</tbody>
</table>

Prescribed Courses
HPA 101 Introduction to Health Services Organization 3

Additional Courses
Select 4 credits of the following:

BIOL 129 Mammalian Anatomy

Select 3-4 credits of the following:

STAT 200 Elementary Statistics
STAT 250 Introduction to Biostatistics
STAT 301

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

Select 3 credits of the following:

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:

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
Select 10-17 credits from program list (Students may apply 6 credits toward credits for graduation.)

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

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.
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 141 &amp; BIOL 142</td>
<td>Introduction to Human Physiology and Physiology Laboratory</td>
<td></td>
</tr>
<tr>
<td>BIOL 220W</td>
<td>Biology: Populations and Communities</td>
<td></td>
</tr>
<tr>
<td>BIOL 230W</td>
<td>Biology: Molecules and Cells</td>
<td></td>
</tr>
<tr>
<td>BIOL 240W</td>
<td>Biology: Function and Development of Organisms</td>
<td></td>
</tr>
<tr>
<td>STAT 200</td>
<td>Elementary Statistics</td>
<td></td>
</tr>
<tr>
<td>STAT 250</td>
<td>Introduction to Biostatistics</td>
<td></td>
</tr>
<tr>
<td>STAT 301</td>
<td>Experimental Methods</td>
<td></td>
</tr>
<tr>
<td>PHYS 211 &amp; PHYS 212</td>
<td>General Physics: Mechanics and General Physics: Electricity and Magnetism</td>
<td>8-12</td>
</tr>
<tr>
<td>PHYS 213 &amp; PHYS 214</td>
<td>and General Physics: Fluids and Thermal Physics</td>
<td></td>
</tr>
<tr>
<td>PHYS 250 &amp; PHYS 251</td>
<td>Introductory Physics I and Introductory Physics II</td>
<td></td>
</tr>
</tbody>
</table>

**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 6 credits of 400-level courses

Select 9 credits at the 400 level require a grade of C or better.

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

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

Select 6 credits of 400-level courses

**Mathematical Science Option (74 credits)**

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

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<thead>
<tr>
<th>Code</th>
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</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>
<tr>
<td>CMPSC 360</td>
<td>Discrete Mathematics for Computer Science</td>
<td>3-4</td>
</tr>
<tr>
<td>MATH 230</td>
<td>Calculus and Vector Analysis</td>
<td>4</td>
</tr>
<tr>
<td>STAT 301</td>
<td>or STAT 318 Elementary Probability</td>
<td>3</td>
</tr>
<tr>
<td>MICRB 201</td>
<td>Introductory Microbiology</td>
<td></td>
</tr>
</tbody>
</table>

**Additional Courses**

Select 4 credits of the following:

Select 3 credits of the following:

Select 3 credits of the following:

Select 3 credits of the following:

**Select 8-12 credits of the following:**
**PHYS 250** and **PHYS 251**

**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 6 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
    - **MATH 230** Calculus and Vector Analysis
    - **MATH 251** Ordinary and Partial Differential Equations
- 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: Require a grade of C or better**

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

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**Physical 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><strong>ASTRO 291</strong></td>
<td>Astronomical Methods and the Solar System</td>
<td>3</td>
</tr>
<tr>
<td><strong>PHYS 212</strong></td>
<td>General Physics: Electricity and Magnetism</td>
<td>4</td>
</tr>
<tr>
<td><strong>PHYS 213</strong></td>
<td>General Physics: Fluids and Thermal Physics</td>
<td>2</td>
</tr>
<tr>
<td><strong>PHYS 214</strong></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**

- **PHYS 211** General Physics: Mechanics

**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
  - **MATH 230** Calculus and Vector Analysis
  - **MATH 251** Ordinary and Partial Differential Equations
- 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