

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 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 pre professional 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.

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:

Requirement	Credits
General Education	45
Requirements for the Major	94

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

15 of these 45 credits are included in the Requirements for the Major.

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

This includes 15 credits of General Education courses: 9 credits of GN courses; 6 credits of GQ courses.

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
MATH 141	Calculus with Analytic Geometry II	4
<i>Prescribed Courses: Require a grade of C or better</i>		
CHEM 110	Chemical Principles I	3
MATH 140	Calculus With Analytic Geometry I	4
BIOL 110	Biology: Basic Concepts and Biodiversity	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
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 & BIOL 142	Introductory Physiology 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 8-12 credits of the following:		8-12
PHYS 211 & PHYS 212 & PHYS 213 & PHYS 214	General Physics: Mechanics and General Physics: Electricity and Magnetism and General Physics: Fluids and Thermal Physics and General Physics: Wave Motion and Quantum Physics ¹	
PHYS 250 & PHYS 251	Introductory Physics I and Introductory Physics II ¹	
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 credit \leq 21-26 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		3
Select 3 credits in Teamwork and Interpersonal Communication from department approved course list in consultation with adviser		3
Select 6 credits of 400-level courses		6
<i>Supporting and Related Courses: Require a grade of C or better</i>		
Select 18 credits in life, mathematical, or physical sciences, with at least 9 credits at the 400 level ^{2,3}		18

- 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 & BIOL 142	Introductory Physiology 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 210 & CHEM 212 & CHEM 213	Organic Chemistry I and Organic Chemistry II and Laboratory in Organic Chemistry	
CHEM 202 & CHEM 203	Fundamentals of Organic Chemistry I and Fundamentals of Organic Chemistry II	
Select 3 credits of the following:		3
BMB 211	Elementary Biochemistry	
BMB 251	Molecular and Cell Biology I	
MICRB 201	Introductory Microbiology	
BIOL 222	Genetics	
BIOL 322	Genetic Analysis	
Select 8-12 credits of the following:		8-12
PHYS 211 & PHYS 212 & PHYS 213 & PHYS 214	General Physics: Mechanics and General Physics: Electricity and Magnetism and General Physics: Fluids and Thermal Physics and General Physics: Wave Motion and Quantum Physics ²	
PHYS 250 & PHYS 251	Introductory Physics I and Introductory Physics II ²	
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		15
Select 10-17 credits from program list (Students may apply 6 credits of ROTC)		10-17
Select 3 credits in Global, Social, and Personal Awareness from department approved course list in consultation with adviser		3
Select 3 credits in Teamwork and Interpersonal Communication from department approved course list in consultation with adviser		3

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 220W	Biology: Populations and Communities	
BIOL 230W	Biology: Molecules and Cells	
BIOL 240W	Biology: Function and Development of Organisms	
BIOL 141 & BIOL 142	Introductory Physiology 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 8-12 credits of the following:		8-12
PHYS 211 & PHYS 212 & PHYS 213 & PHYS 214	General Physics: Mechanics and General Physics: Electricity and Magnetism and General Physics: Fluids and Thermal Physics and General Physics: Wave Motion and Quantum Physics ¹	
PHYS 250 & PHYS 251	Introductory Physics I and Introductory Physics II ¹	
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 ²		18
Select 3 credits in Global, Social, and Personal Awareness from department approved course list in consultation with adviser		3
Select 3 credits in Teamwork and Interpersonal Communication from department approved course list in consultation with adviser		3
<i>Supporting Courses and Related Areas: Require a grade of C or better</i>		
Select 18 credits in life, mathematical, or physical sciences, with at least 9 credits at the 400 level ^{3,4}		18
Life Science Option (74 credits)		
<i>Available at the following campuses: Altoona, Berks, Harrisburg, Scranton, University Park, York</i>		

- 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.

Code	Title	Credits
Additional Courses		
Select 4 credits of the following:		4
BIOL 220W	Biology: Populations and Communities	
BIOL 230W	Biology: Molecules and Cells	
BIOL 240W	Biology: Function and Development of Organisms	
Select 3 credits of the following:		3
CMPSC 101	Introduction to C++ Programming	
MATH 250	Ordinary Differential Equations	
STAT 250	Introduction to Biostatistics	
Select 3 credits of the following:		3
BMB 211	Elementary Biochemistry	
BMB 251	Molecular and Cell Biology I	
MICRB 201	Introductory Microbiology	
Select 6-8 credits of the following:		6-8
CHEM 202 & CHEM 203	Fundamentals of Organic Chemistry I and Fundamentals of Organic Chemistry II	
CHEM 210 & CHEM 212 & CHEM 213	Organic Chemistry I and Organic Chemistry II and Laboratory in Organic Chemistry	
Select 8-12 credits of the following:		8-12
PHYS 211 & PHYS 212 & PHYS 213 & PHYS 214	General Physics: Mechanics and General Physics: Electricity and Magnetism and General Physics: Fluids and Thermal Physics and General Physics: Wave Motion and Quantum Physics ¹	
PHYS 250 & PHYS 251	Introductory Physics I and Introductory Physics II ¹	

Supporting Courses and Related Areas

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

Select 23-29 credits from program list (Students may apply 6 credits of ROTC)

Select 3 credits in Global, Social, and Personal Awareness	3
Select 3 credits in Teamwork and Interpersonal Communication	3
Select 6 credits of 400-level courses	6

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

Mathematical Science Option (74 credits)

Available at the following campuses: Altoona

Code	Title	Credits
Prescribed Courses		
CMPSC 122	Intermediate Programming	3
MATH 220	Matrices	2-3
Additional Courses		
Select 3 credits of the following:		3
BMB 211	Elementary Biochemistry	
BMB 251	Molecular and Cell Biology I	
MICRB 201	Introductory Microbiology	
Select 3 credits of the following:		3
CMPSC 121	Introduction to Programming Techniques	

CMPSC 201	Programming for Engineers with C++	
Additional Courses		
Select 4 credits of the following:		4
MATH 230 or MATH 251	Calculus and Vector Analysis Ordinary and Partial Differential Equations	
CMPSC 360 or MATH 311W	Discrete Mathematics for Computer Science Concepts of Discrete Mathematics	3-4
STAT 301 or STAT 318	Statistical Analysis I Elementary Probability	3
Select 8-12 credits of the following:		8-12
PHYS 211 & PHYS 212 & PHYS 213 & PHYS 214	General Physics: Mechanics and General Physics: Electricity and Magnetism and General Physics: Fluids and Thermal Physics and General Physics: Wave Motion and Quantum Physics ¹	
PHYS 250 & PHYS 251	Introductory Physics I and Introductory Physics II ¹	

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	6
Select 3 credits in Global, Social, and Personal Awareness	3
Select 3 credits in Teamwork and Interpersonal Communication	3
<i>Supporting Courses and Related Areas: Require a grade of C or better</i>	
Select 9 credits of 400-level CMPSC, CSE, MATH, or STAT courses	9

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

Physical Science Option (74 credits)

Available at the following campuses: Altoona

Code	Title	Credits
Prescribed Courses		
ASTRO 291	Astronomical Methods and the Solar System	3
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
<i>Prescribed Courses: Require a grade of C or better</i>		
PHYS 211	General Physics: Mechanics	4
Additional Courses		
Select 3 credits of the following:		3
BMB 211	Elementary Biochemistry	
BMB 251	Molecular and Cell Biology I	
MICRB 201	Introductory Microbiology	
Select 6-8 credits of the following:		6-8
CHEM 202 & CHEM 203	Fundamentals of Organic Chemistry I and Fundamentals of Organic Chemistry II	
CHEM 210 & CHEM 212 & CHEM 213	Organic Chemistry I and Organic Chemistry II and Laboratory in Organic Chemistry	
MATH 230 or MATH 251	Calculus and Vector Analysis Ordinary and Partial Differential Equations	4
Select 3 credits of the following:		3

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	6
Select 3 credits in Global, Social, and Personal Awareness	3
Select 3 credits in Teamwork and Interpersonal Communication	3

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

Select 9 credits of 400-level ASTRO, CHEM, or PHYS courses	9
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Accelerated Science B.S./M.B.A. Program (SCBUS_BS)

Students must begin and complete the Accelerated Science B.S./M.B.A. Program at the University Park campus.

Students admitted to this special cooperative program between the Eberly College of Science and The Smeal College of Business will be able to combine a Bachelor of Science degree in the Science major, with a Master of Business Administration degree. Highly motivated students, who enter the University with a sufficient number and proper distribution of AP credits, will have the opportunity to complete the requirements for both programs within five years.

What is the Accelerated Science B.S./M.B.A. Program?

The Accelerated Science B.S./M.B.A. Program is designed to educate the leaders in scientific industry, by providing students with a rigorous science background and undergraduate degree along with a graduate degree in business administration.

You Might Like This Program If...

- You love studying science, but don't necessarily want a career in a laboratory.
- You enjoy coursework in multiple science disciplines and in business.
- You aspire to leadership roles.
- You enjoy working with others on a daily basis.
- You want the opportunity to move into a leadership role early in your career.

Program Requirements

The B.S. degree in the Science major General Science option, will be conferred upon satisfactory completion of:

1. The first semester of course work in The Smeal College of Business M.B.A. program (i.e., a minimum of 12 graduate credits).
2. A minimum of 112 acceptable undergraduate credits, which must include:

Code	Title	Credits
General Education		
Complete 24 credits ¹		24
Additional Requirements		

Complete the University's First-Year Seminar, United States Cultures, International Cultures, and Writing Across the Curriculum requirements ²		
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
CMPSC 203	Introduction to Spreadsheets and Databases	4
MATH 140	Calculus With Analytic Geometry I	4
MATH 141	Calculus with Analytic Geometry II	4
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 from either Set A or Set B:		8-12
<i>Set A:</i>		
PHYS 211	General Physics: Mechanics	
PHYS 212	General Physics: Electricity and Magnetism	
PHYS 213	General Physics: Fluids and Thermal Physics	
PHYS 214	General Physics: Wave Motion and Quantum Physics	
<i>Set B:</i>		
PHYS 250	Introductory Physics I	
PHYS 251	Introductory Physics II	
Select 3 life science credits of the following:		3
BMB 211	Elementary Biochemistry	
BMB 251	Molecular and Cell Biology I	
MICRB 201	Introductory Microbiology	
Select 14 additional credits of course work from the Eberly College of Science, with at least 9 credits at the 400 level ³		14
Demonstration of second semester proficiency in a single foreign language		0-8
SC 295	Science Co-op Work Experience I ⁴	1-3
SC 395	Science Co-op Work Experience II ⁴	1-3
SC 495	Science Co-op Work Experience III ⁴	1-3
ECON 102	Introductory Microeconomic Analysis and Policy	3
ECON 104	Introductory Macroeconomic Analysis and Policy	3
ACCTG 211	Financial and Managerial Accounting for Decision Making	4
Select supporting courses and related areas selected from the program list		4-23

¹ The University's General Education requirements in the areas of Writing and Speaking (9), Health and Physical Activity (3), Arts (6), Humanities (6). The University's General Education requirements in the areas of Quantification, Natural Sciences, and Social and Behavioral Sciences will be satisfied by course work listed under headings "c" and "f".)

² These requirements may be double counted in order to satisfy other requirements in the program.

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

⁴ Students must complete three Eberly College of Science Cooperative Education experiences, including at least one experience which is a full semester in length.

Career Paths

Graduates with a B.S. in Science and a Master's degree in Business Administration have successfully established careers in the science and business industries. Graduates of this unique integrated undergraduate-graduate program (IUG) are equipped to step into leadership roles instead of the more common entry-level positions of their peers. This accelerates the careers of our graduates, which leads to greater impact and higher earning potential over a lifetime.

Careers

Graduates of the B.S./M.B.A. program have pursued careers in a number of industries including, but not limited to the following:

- Consulting
- Finance
- Healthcare
- Manufacturing
- Marketing
- Medical Devices
- Pharmaceuticals
- Technology

MORE INFORMATION (<http://science.psu.edu/bsmba/program-information/potential-employers>)

Opportunities for Graduate Studies

For more information on the M.B.A curriculum, please visit the Smeal College of Business website (<https://mba.smeal.psu.edu>).

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 need 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>)

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Suggested Academic Plan

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

Fall	Credits Spring	Credits
ENGL 15 [‡]	3 General Education Course	3
MATH 140 ^{*†}	4 MATH 141 [†]	4
BIOL 110 ^{*†}	4 Life Sciences Approved Courses ¹	4
CHEM 110 ^{*†}	3 CHEM 112 [†]	3
Supporting Elective Course or General Education Course (GHW)	1-1.5 CHEM 111 [†]	1
	Supporting/Elective Course or General Education Course (GHW)	1-1.5
	15-15.5	16-16.5

Second Year

Fall	Credits Spring	Credits
CHEM 113 [†]	1 Life, Mathematical, or Physical Science course ²	3-4
Life, Mathematical, or Physical Science course ²	3-4 PHYS 250 or 211 ^{*†}	4
Life, Mathematical, or Physical Science course ²	3-4 General Education Course	3
General Education Course	3 Earth and Mineral Science course ³	3
CAS 100 [‡]	3 Global, Social and Personal Awareness course (from approved List 2)	3
Supporting/Elective Course	3	
	16-18	16-17

Third Year

Fall	Credits Spring	Credits
PHYS 251 or 212 [†]	4 PHYS 213 or 214 ^{†4}	2
STAT 200 (or STAT 250, or STAT 201, or 401) [†]	4 400 Level Life, Mathematical, or Physical Science course [*]	3-4
General Education Course	3 ENGL 202A, 202B, 202C, or 202D [‡]	3
Teamwork and Interpersonal Communications course (from approved List 1)	3 General Education Course	3
Supporting/Elective Course	3 Supporting/Elective Course	3
	17	14-15

Fourth Year

Fall	Credits Spring	Credits
400 Level Life, Mathematical, or Physical Science Course [*]	3-4 400-Level Life, Mathematical, or Physical Science Course [*]	3-4
400 Level Supporting/Elective Course	3 400-Level Supporting/Elective Course	3
General Education Course	3 Supporting/Elective Course or General Education Course (GHW)	3
Supporting/Elective Course or General Education Course (GHW)	1-1.5 Supporting/Elective Course	3
Supporting/Elective Course	3 Supporting Elective Course	3
Supporting/Elective Course	3	
	16-17.5	15-16

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

Life Science

- BMB
- BIOL
- BIOTC
- MICRB

Mathematical Science

- CMPSC, MATH, STAT

Physical Science: ASTRO, CHEM, PHYS

³

Earth and Mineral Science courses

- METEO
- MATSC
- EMSC
- EGEE
- EARTH
- GEOG
- GEOSC
- See <http://www.ems.psu.edu/>

- 4 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 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
BIOL 110 ^{**†}	4 BIOL 220W, 230W, or 240W	4
CHEM 110 ^{**†}	3 CAS 100 [‡]	3
CHEM 111 [†]	1 CHEM 112 or 113 [†]	3
ENGL 15 [‡]	3 MATH 141 [†]	4
MATH 140 ^{**†}	4 General Education Course (GHW)	1.5
	15	15.5

Second Year

Fall	Credits Spring	Credits
BIOL 220W, 230W, or 240W [†]	4 BIOL 220W, 230W, or 240W	4
CHEM 202 or 210	3 CHEM 203, 212, or 213	4
World Language level 1 or Supporting Course	4 BMB 211, 251, or MICRB 201	3
Select from the following	4 World Language level 2/ Supporting Course	4
General Education Course (GHW)	1.5	
	16.5	15

Third Year

Fall	Credits Spring	Credits
ENGL 202C [‡]	3 PHYS 251 or 212	4
PHYS 250 or 211 [*]	4 Select 3 credits from 400 level Science courses [*]	3
Supporting Course	3 General Education Course	3
General Education Course	3 General Education Course	3
General Education Course	3 Supporting Course	3
	16	16

Fourth Year

Fall	Credits Spring	Credits
400-level Course Selection	3 400-level Course Selection	3
Select 3 credits from 400-level Science courses [*]	3 Select 3 credits from 400-level Science courses [*]	3
PHYS 213 or 214	2 Supporting Course(s)	3-6
Supporting Course	3 General Education Course	3
General Education Course	3	
	14	12-15

Total Credits 120-123

* 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 BIOL 220W - Biology: Populations and Communities
For BIOL 220W, BIOL 230W or BIOL 240W to count as a Writing Across the Curriculum requirement, this course must be completed.
BIOL 230W - Biology: Molecules and Cells
For BIOL 220W, BIOL 230W or BIOL 240W to count as a Writing Across the Curriculum requirement this course must be completed.
BIOL 240W - Biology: Function and Development of Organisms
For BIOL 220W, BIOL 230W or BIOL 240W to count as a Writing Across the Curriculum requirement this course must be completed.

² Select from the Following:

- CMPSC 121 - Introduction to Programming Techniques
- MATH 230 - Calculus and Vector Analysis
- MATH 250 - Ordinary Differential Equations
- STAT 200 - Elementary Statistics
- BMB 211 - Elementary Biochemistry
- BMB 251 - Molecular and Cell Biology
- MICRB 201 - Introductory Microbiology, Students are strongly recommended to schedule MICRB 202 with MICRB 201
- PHYS 250 - Introductory Physics, select from either PHYS 250 and 251 or PHYS 211, 212, 213 and 214
- PHYS 211 - General Physics: Mechanics, select from either PHYS 250 and 251 or PHYS 211, 212, 213 and 214
- PHYS 212 - General Physics: Electricity and Magnetism, select from either PHYS 250 and 251 or PHYS 211, 212, 213 and 214
- PHYS 251 - Introductory Physics II, select from either PHYS 250 and 251 or PHYS 211, 212, 213 and 214
- Select 3 credits from 400-level Science courses, select from BMB, BIOL, BIOTC, MICRB
- PHYS 213 - General Physics: Fluids and Thermal Physics, select from either PHYS 250 and 251 or PHYS 211, 212, 213 and 214
- PHYS 214 - General Physics: Wave Motion and Quantum Physics, select from either PHYS 250 and 251 or PHYS 211, 212, 213 and 214

University Requirements and General Education Notes:

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Career Paths

Penn State students with a BS in Science are prepared for a broad range of careers and graduate programs. The solid foundation of science and math prepares students to think critically and scientifically in a range of industries and professions.

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://optometriceducation.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://paeonline.org>)

Contact

Harrisburg

SCHOOL OF SCIENCE, ENGINEERING, AND TECHNOLOGY
Science & Tech Building, 177 TL
Middletown, PA 17057
717-948-6358
tlh46@psu.edu

<http://harrisburg.psu.edu/science-engineering-technology/biology-science/bachelor-science-science>

Abington

DIVISION OF SCIENCE & ENGINEERING
1600 Woodland Road
Abington, PA 19001
215-881-7492
epi1@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

211 Dawson Building
Dunmore, PA 18512
570-963-2529
mih10@psu.edu

<http://worthingtonscranton.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

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<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>