

# SCIENCE, B.S. (SCIENCE)

**Begin Campus:** Any Penn State Campus

**End Campus:** University Park

## Program Description

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:** Abington, 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:** Abington, Berks, Harrisburg, Scranton, York

## Mathematical Sciences Option

**Available at the following campuses:** Abington

## Physical Sciences Option

**Available at the following campuses:**

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.

## 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:

| Requirement                | Credits |
|----------------------------|---------|
| General Education          | 45      |
| Requirements for the Major | 94      |

**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.**

## 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 (<https://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 |
|---|--|---------|
| <b>Prescribed Courses</b>                                 |  |         |
| 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> |  |         |
| BIOL 110  | Biology: Basic Concepts and Biodiversity | 4       |
| CHEM 110  | Chemical Principles I                    | 3       |
| MATH 140  | Calculus With Analytic Geometry I        | 4       |
| <b>Requirements for the Option</b>                        |  |         |
| Select an option  |  | 74      |

### Requirements for the Option General Science Option (74 credits)

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

| Code                                      | Title   | Credits |
|---|---|---------|
| <b>Additional Courses</b>                 |   |         |
| Select 4 credits of the following:        |   | 4       |
| BIOL 129                                  | Mammalian Anatomy   |         |
| BIOL 141 & BIOL 142                       | Introduction to Human Physiology 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                                  |   |         |
| 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 <sup>1</sup> |         |
| PHYS 250 & PHYS 251                       | Introductory Physics I and Introductory Physics II <sup>1</sup>   |         |

### 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\$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 <sup>2,3</sup>         | 18 |

<sup>1</sup> PHYS 211 and PHYS 250 require a grade of C or better.

<sup>2</sup> Only the 9 credits at the 400 level require a grade of C or better.

<sup>3</sup> 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 |
|---|---|---------|
| <b>Prescribed Courses</b>                 |   |         |
| HPA 101                                   | Introduction to Health Services Organization  | 3       |
| <b>Additional Courses</b>                 |   |         |
| 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                       | Introduction to Human Physiology and Physiology Laboratory  |         |
| Select 3-4 credits of the following:      |   | 3-4     |
| STAT 200                                  | Elementary Statistics   |         |
| STAT 250                                  | Introduction to Biostatistics   |         |
| STAT 301                                  |   |         |
| STAT 401                                  | Experimental Methods  |         |
| 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 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 & 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 <sup>2</sup> |         |
| PHYS 250 & PHYS 251                       | Introductory Physics I and Introductory Physics II <sup>2</sup>   |         |

### 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 <sup>1</sup> 15

Select 10-17 credits from program list (Students may apply 6 credits of ROTC) 0-17

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

<sup>1</sup> Six credits must be at the 400-level. Select from department approved course list in consultation with adviser.

<sup>2</sup> 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 |
|---|---|---------|
| <b>Additional Courses</b>                 |   |         |
| Select 4 credits of the following:        |   | 4       |
| BIOL 129                                  | Mammalian Anatomy   |         |
| BIOL 141 & BIOL 142                       | Introduction to Human Physiology 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                                  |   |         |
| 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 <sup>1</sup> |         |
| PHYS 250 & PHYS 251                       | Introductory Physics I and Introductory Physics II <sup>1</sup>   |         |

### Supporting Courses and Related Areas

Select 12-17 credits from program list (Students may apply 6 credits of ROTC) 2-17

Select 18 credits from program list for Legal Studies, Government Service, Public Policy <sup>2</sup> 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

*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 <sup>3,4</sup> 18

<sup>1</sup> PHYS 211 and PHYS 250 require a grade of C or better.

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

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

<sup>4</sup> 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: Abington, Berks, Harrisburg, Scranton, York*

| Code                                      | Title   | Credits |
|---|---|---------|
| <b>Additional Courses</b>                 |   |         |
| 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 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 <sup>1</sup> |         |
| PHYS 250 & PHYS 251                       | Introductory Physics I and Introductory Physics II <sup>1</sup>   |         |

### 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) 23-29

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

<sup>1</sup> PHYS 211 and PHYS 250 require a grade of C or better.

### Mathematical Science Option (74 credits)

*Available at the following campuses: Abington*

| Code   | Title                                     | Credits |
|--|---|---------|
| <b>Prescribed Courses</b>  |   |         |
| CMPSC 122  | Intermediate Programming                  | 3       |
| MATH 220   | Matrices                                  | 2-3     |
| <b>Additional Courses</b>  |   |         |
| CMPSC 360  | Discrete Mathematics for Computer Science | 3-4     |
| or MATH 311W Concepts of Discrete Mathematics                                |   |         |
| MATH 230   | Calculus and Vector Analysis              | 4       |
| or MATH 251 Ordinary and Partial Differential Equations                      |   |         |
| STAT 301   |   | 3       |
| or STAT 318 Elementary Probability   |   |         |
| 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++        |         |
| CMPSC 202  |   |         |
| 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 <sup>1</sup> |   |         |
| PHYS 250   | Introductory Physics I                    |         |
| & PHYS 251 and Introductory Physics II <sup>1</sup>                          |   |         |

#### 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

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

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

<sup>1</sup> PHYS 211 and PHYS 250 require a grade of C or better.

#### Physical Science Option (74 credits)

*Available at the following campuses: Currently not available at any campus location*

| Code  | Title  | Credits |
|---|--|---------|
| <b>Prescribed Courses</b>                                 |  |         |
| 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       |
| <b>Additional Courses</b>                                 |  |         |
| 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  | Calculus and Vector Analysis   | 4   |
| or MATH 251 Ordinary and Partial Differential Equations |  |     |
| 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

### 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 and Inter-Domain courses do not meet this requirement.)

- Quantification (GQ): 6 credits
- Writing and Speaking (GWS): 9 credits

#### Breadth in the Knowledge Domains (Inter-Domain courses do not meet this requirement.)

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



## Integrative Studies

- **Inter-Domain Courses (Inter-Domain):** 6 credits

## Exploration

- **GN**, may be completed with Inter-Domain courses: 3 credits
- **GA, GH, GN, GS, Inter-Domain courses.** This may include 3 credits of World Language course work beyond the 12th credit level or the requirements for the student's degree program, whichever is higher: 6 credits

## University Degree Requirements

### First Year Engagement

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

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

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

### Cultures Requirement

6 credits are required and may satisfy other requirements

- United States Cultures: 3 credits
- International Cultures: 3 credits

### Writing Across the Curriculum

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

### Total Minimum Credits

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

### Quality of Work

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

### Limitations on Source and Time for Credit Acquisition

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

## Program Learning Objectives

- **Knowledge Application:** Graduates will be able to apply scientific concepts across disciplines.
- **Scientific Process:** Graduates will be able to perform the process of science.
- **Quantitative Reasoning:** Graduates will be able to interpret scientific data using quantitative reasoning skills.

- **Communication:** Graduates will be able to explain scientific concepts through written and verbal communication.
- **Ethical Reasoning:** Graduates will be able to apply ethical reasoning to scientific problems.

## Academic Advising

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

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

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

### University Park

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## Suggested Academic Plan

The suggested academic plan(s) listed on this page are the plan(s) that are in effect during the 2023-24 academic year. To access previous years' suggested academic plans, please visit the archive (<https://bulletins.psu.edu/undergraduate/archive/>) to view the appropriate Undergraduate Bulletin edition (*Note: the archive only contains suggested academic plans beginning with the 2018-19 edition of the Undergraduate Bulletin*).

### General Option: Science, B.S. at University Park Campus

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

#### First Year

| Fall                                 | Credits Spring  | Credits   |
|--------------------------------------|---|-----------|
| BIOL 110 <sup>*#†</sup>              | 4 BIOL 230W (Consult with an adviser for alternative options) | 4         |
| CHEM 110 <sup>*#†</sup>              | 3 CHEM 112 <sup>†</sup>                                       | 3         |
| CHEM 111 <sup>†</sup>                | 1 CHEM 113 <sup>†</sup>                                       | 1         |
| ENGL 15, 30H, or ESL 15 <sup>†</sup> | 3 MATH 141 <sup>††</sup>                                      | 4         |
| MATH 140 or 140B <sup>*†#†</sup>     | 4 General Education Course                                    | 3         |
| PSU 16                               | 1   |           |
|                                      | <b>16</b>   | <b>15</b> |

#### Second Year

| Fall  | Credits Spring  | Credits   |
|---|---|-----------|
| CAS 100, CAS 100A, CAS 100B, or CAS 100C <sup>†</sup>   | 3 PHYS 251 or 212   | 4         |
| PHYS 250 or 211 <sup>*#</sup>   | 4 Life, Mathematical, or Physical Science Course (consult with an academic adviser for options) | 3         |
| Life, Mathematical, or Physical Science Course (consult with an academic adviser for options) | 3 Teamwork and Interpersonal Communication Course (from Department List)                        | 3         |
| General Education Course  | 3 General Education Course  | 3         |
| Supporting course (consult with an academic adviser for options)                              | 3 Supporting course (consult with an academic adviser for options)                              | 3         |
|   | <b>16</b>   | <b>16</b> |

#### Third Year

| Fall  | Credits Spring  | Credits   |
|---|---|-----------|
| ENGL 202C, 202A, 202B, or 202D <sup>†</sup>   | 3 400-level Life, Mathematical, or Physical Science Course <sup>*</sup> | 3         |
| PHYS 213 (or Supporting Course)   | 2 Earth and Mineral Science Course (from Department List)               | 3         |
| PHYS 214 (or Supporting Course)   | 2 General Education Course  | 3         |
| Life, Mathematical, or Physical Science Course (consult with an academic adviser for options) | 3 General Education Course  | 3         |
| STAT 250 (consult with an adviser for options)  | 3 Supporting course (consult with an academic adviser for options)      | 3         |
| Global, Social, and Personal Awareness Course (from Department List)                          | 3   |           |
|   | <b>16</b>   | <b>15</b> |

#### Fourth Year

| Fall  | Credits Spring  | Credits   |
|---|---|-----------|
| 400-level Life, Mathematical, or Physical Science Course <sup>*</sup> | 3 400-level Life, Mathematical, or Physical Science Course <sup>*</sup> | 3         |
| 400-level Supporting Course   | 3 400-level Supporting Course   | 3         |
| General Education Course  | 3 General Education Course  | 3         |
| Supporting course (consult with an academic adviser for options)      | 3 Supporting course (consult with an academic adviser for options)      | 3         |
| Supporting course (consult with an academic adviser for options)      | 3 Supporting course (consult with an academic adviser for options)      | 3         |
|   | <b>15</b>   | <b>15</b> |

#### Total Credits 124

\* Course requires a grade of C or better for the major

‡ Course requires a grade of C or better for General Education

# Course is an Entrance to Major requirement

† Course satisfies General Education and degree requirement

#### University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity 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.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of 'C' or better.

All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and

ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student's program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C. Each course is 3 credits.

# Course required with a C or better to enter the Science major are: MATH 140; and two out of the three of BIOL 110, CHEM 110, and either PHYS 250 or PHYS 211

Course can be taken from the following Departments for Mathematical, or Physical Science Course: LIFE (BIOL, BIOTC, BMB, MICRB); Mathematical (CMPSC, MATH, STAT); and Physical (ASTRO, CHEM, PHYS).

## General Option (ALEKS Placement in MATH 22): Science, B.S. at University Park Campus

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

### First Year

| Fall             | Credits Spring      | Credits   |
|------------------|---------------------|-----------|
| BIOL 110         | 4 BIOL 230W or 240W | 4         |
| GA/GH/GS/GHA/GHW | 3 STAT 200          | 4         |
| ENGL 15          | 3 MATH 26           | 3         |
| MATH 22          | 3 GA/GH/GS/GHA/GHW  | 3         |
| PSU 16           | 1                   |           |
|                  | <b>14</b>           | <b>14</b> |

### Second Year

| Fall                   | Credits Spring  | Credits   |
|------------------------|---|-----------|
| CHEM 110<br>& CHEM 111 | 4 CHEM 112<br>& CHEM 113  | 4         |
| MATH 140               | 4 MATH 141  | 4         |
| PHYS 250               | 4 PHYS 251  | 4         |
| CAS 100                | 3 GA/GH/GS/GHA/GHW  | 3         |
| GA/GH/GS/GHA/GHW       | 3 Teamwork and Interpersonal<br>Communication Course<br>(Department List) | 3         |
|                        | <b>18</b>   | <b>18</b> |

### Third Year

| Fall  | Credits Spring                                   | Credits   |
|---|--|-----------|
| ENGL 202  | 3 College of Earth and Mineral<br>Science Course | 3         |
| Life, Math, or Physical<br>Science Course                         | 3 GA/GH/GS/GHA/GHW                               | 3         |
| Global, Social, Personal<br>Awareness Course<br>(Department List) | 3 Supporting Course                              | 3         |
| Supporting Course   | 3 Life, Math, or Physical<br>Science Course      | 3         |
| Supporting Course   | 3 Life, Math, or Physical<br>Science Course      | 3         |
|   | <b>15</b>  | <b>15</b> |

### Fourth Year

| Fall   | Credits Spring                                 | Credits   |
|--|--|-----------|
| 400-Level Life, Math, or<br>Physical Science | 3 400-Level Life, Math, or<br>Physical Science | 3         |
| 400-Level Supporting Course                  | 3 400-Level Life, Math, or<br>Physical Science | 3         |
| GA/GH/GS/GHA/GHW                             | 3 400-Level Supporting Course                  | 3         |
| Supporting Course                            | 3 GA/GH/GS/GHA/GHW                             | 3         |
| Supporting Course                            | 3 Supporting Course                            | 3         |
|  | <b>15</b>                                      | <b>15</b> |

**Total Credits 124**

\* Course requires a grade of C or better for the major

‡ Course requires a grade of C or better for General Education

# Course is an Entrance to Major requirement

† Course satisfies General Education and degree requirement

### University Requirements and General Education Notes:

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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.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of 'C' or better.

All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student's program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C. Each course is 3 credits.



## General Option: Science, B.S. at Commonwealth Campuses

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 <sup>**†</sup>              | 4 CHEM 112 <sup>†</sup>         | 3         |
| CHEM 110 <sup>**†</sup>              | 3 CHEM 113 <sup>†</sup>         | 1         |
| CHEM 111 <sup>†</sup>                | 1 MATH 141 <sup>††</sup>        | 4         |
| ENGL 15, 30H, or ESL 15 <sup>‡</sup> | 3 PHYS 250 or 211 <sup>*#</sup> | 4         |
| MATH 140 or 140B <sup>*††</sup>      | 4 General Education Course      | 3         |
| PSU 16                               | 1                               |           |
|                                      | <b>16</b>                       | <b>15</b> |

### Second Year

| Fall  | Credits Spring  | Credits   |
|---|---|-----------|
| BIOL 230W (consult with an adviser for alternative options)                                   | 4 PHYS 213 (or supporting course)   | 2         |
| CAS 100, CAS 100A, CAS 100B, or CAS 100C <sup>‡</sup>   | 3 PHYS 214 (or supporting course)   | 2         |
| PHYS 251 or 212   | 4 Life, Mathematical, or Physical Science Course (consult with an academic adviser for options) | 3         |
| Life, Mathematical, or Physical Science Course (consult with an academic adviser for options) | 3 Teamwork and Interpersonal Communication Course (from Department List)                        | 3         |
| General Education Course (GHW)  | 1.5 General Education Course  | 3         |
|   | Life, Mathematical, or Physical Science Course (consult with an academic adviser for options)   | 3         |
|   | <b>15.5</b>   | <b>16</b> |

### Third Year

| Fall   | Credits Spring  | Credits |
|--|---|---------|
| Life, Mathematical, or Physical Science Course (consult with an academic adviser for options) <sup>†</sup> | 3 400-level Life, Mathematical, or Physical Science Course <sup>*</sup> | 3       |
| ENGL 202C, 202A, 202B, or 202D <sup>‡</sup>  | 3 Earth and Mineral Science Course (from Department List)               | 3       |
| STAT 250 (consult with an academic adviser for alternative options)  | 3 General Education Course  | 3       |
| Global, Social, and Personal Awareness Course (from Department List)                                       | 3 General Education Course (GHW)  | 1.5     |

|                          |  |             |
|--------------------------|--|-------------|
| General Education Course | 3 Supporting course (consult with an academic adviser for options) | 3           |
|                          | Supporting course (consult with an academic adviser for options)   | 3           |
|                          | <b>15</b>  | <b>16.5</b> |

### Fourth Year

| Fall  | Credits Spring  | Credits   |
|---|---|-----------|
| 400-level Life, Mathematical, or Physical Science Course <sup>*</sup> | 3 400-level Life, Mathematical, or Physical Science Course <sup>*</sup> | 3         |
| 400-level Supporting Course   | 3 400-level Supporting Course   | 3         |
| General Education Course  | 3 General Education Course  | 3         |
| Supporting course (consult with an academic adviser for options)      | 3 Supporting course (consult with an academic adviser for options)      | 3         |
| Supporting course (consult with an academic adviser for options)      | 3 Supporting course (consult with an academic adviser for options)      | 3         |
|   | <b>15</b>   | <b>15</b> |

### Total Credits 124

\* Course requires a grade of C or better for the major

‡ Course requires a grade of C or better for General Education

# Course is an Entrance to Major requirement

† Course satisfies General Education and degree requirement

### University Requirements and General Education Notes:

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

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General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of 'C' or better.

Course required with a C or better to enter the Science major are: MATH 140; and two out of the three of BIOL 110, CHEM 110, and either PHYS 250 or PHYS 211

Course can be taken from the following Departments for Mathematical, or Physical Science Course: LIFE (BIOL, BIOTC, BMB, MICRB); Mathematical (CMPSC, MATH, STAT); and Physical (ASTRO, CHEM, PHYS).

## Legal Studies, Government Service, Public Policy Option: Science, B.S. at University Park Campus

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

### First Year

| Fall                                 | Credits   | Spring  | Credits   |
|--------------------------------------|-----------|---|-----------|
| BIOL 110 <sup>**†</sup>              | 4         | BIOL 230W (consult with an adviser for alternative options) | 4         |
| CHEM 110 <sup>**†</sup>              | 3         | CHEM 112 <sup>†</sup>                                       | 3         |
| CHEM 111 <sup>†</sup>                | 1         | CHEM 113 <sup>†</sup>                                       | 1         |
| ENGL 15, 30H, or ESL 15 <sup>†</sup> | 3         | MATH 141 or 141B <sup>††</sup>                              | 4         |
| MATH 140 <sup>*†#†</sup>             | 4         | General Education Course                                    | 3         |
| PSU 16                               | 1         |   |           |
|                                      | <b>16</b> |   | <b>15</b> |

### Second Year

| Fall   | Credits   | Spring   | Credits   |
|--|-----------|--|-----------|
| CAS 100, CAS 100A, CAS 100B, or CAS 100C <sup>†</sup>                          | 3         | PHYS 251 or 212  | 4         |
| PHYS 250 or 211 <sup>*#</sup>  | 4         | Life, Mathematical, or Physical Science Course <sup>^</sup>                    | 3         |
| Life, Mathematical, or Physical Science Course                                 | 3         | Legal Studies, Government Service, Public Policy Course (from Department List) | 3         |
| Legal Studies, Government Service, Public Policy Course (from Department List) | 3         | General Education Course   | 3         |
| General Education Course   | 3         | Supporting course (consult with an academic adviser for options)               | 3         |
|  | <b>16</b> |  | <b>16</b> |

### Third Year

| Fall   | Credits   | Spring   | Credits   |
|--|-----------|--|-----------|
| ENGL 202C, 202A, 202B, or 202D <sup>†</sup>                                    | 3         | 400-level Life, Mathematical, or Physical Science Course <sup>*</sup>          | 3         |
| PHYS 213 (or supporting course)  | 2         | Legal Studies, Government Service, Public Policy Course (from Department List) | 3         |
| PHYS 214 (or supporting course)  | 2         | Teamwork and Interpersonal Communication Course (from Department List)         | 3         |
| Life, Mathematical, or Physical Science Course                                 | 3         | General Education Course   | 3         |
| STAT 250 (consult with an adviser for alternative options)                     | 3         | Supporting course (consult with an academic adviser for options)               | 3         |
| Legal Studies, Government Service, Public Policy Course (from Department List) | 3         |  |           |
|  | <b>16</b> |  | <b>15</b> |

### Fourth Year

| Fall   | Credits   | Spring   | Credits   |
|--|-----------|--|-----------|
| 400-level Life, Mathematical, or Physical Science Course <sup>*</sup>                    | 3         | 400-level Life, Mathematical, or Physical Science Course <sup>*</sup>                    | 3         |
| 400-level Legal Studies, Government Service, Public Policy Course (from Department List) | 3         | 400-level Legal Studies, Government Service, Public Policy Course (from Department List) | 3         |
| Global, Social, and Personal Awareness Course (from Department List)                     | 3         | General Education Course   | 3         |
| General Education Course   | 3         | General Education Course   | 3         |
| Supporting course (consult with an academic adviser for options)                         | 3         | Supporting course (consult with an academic adviser for options)                         | 3         |
|  | <b>15</b> |  | <b>15</b> |

### Total Credits 124

\* Course requires a grade of C or better for the major

‡ Course requires a grade of C or better for General Education

# Course is an Entrance to Major requirement

† Course satisfies General Education and degree requirement

### University Requirements and General Education Notes:

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General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of 'C' or better.

All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student's program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C. Each course is 3 credits.

Course required with a C or better to enter the Science major are: MATH 140; and two out of the three of BIOL 110, CHEM 110, and either PHYS 250 or PHYS 211

Course can be taken from the following Departments for Mathematical, or Physical Science Course: LIFE (BIOL, BIOTC, BMB, MICRB); Mathematical (CMPSC, MATH, STAT); and Physical (ASTRO, CHEM, PHYS).

## Legal Studies, Government Service, Public Policy Option (ALEKS Placement in MATH 22): Science, B.S. at University Park Campus

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

### First Year

| Fall                                 | Credits Spring  | Credits   |
|--------------------------------------|---|-----------|
| BIOL 110 <sup>*#†</sup>              | 4 BIOL 230W (consult with an adviser for alternative options) | 4         |
| ENGL 15, 30H, or ESL 15 <sup>‡</sup> | 3 CAS 100, CAS 100A, CAS 100B, or CAS 100C <sup>‡</sup>       | 3         |
| General Education Course             | 3 CHEM 110 <sup>*#†</sup>                                     | 3         |
| MATH 22                              | 3 CHEM 111 <sup>†</sup>                                       | 1         |
| PSU 16                               | 1 MATH 26   | 3         |
|                                      | <b>14</b>   | <b>14</b> |

### Second Year

| Fall   | Credits Spring   | Credits   |
|--|--|-----------|
| CHEM 112 <sup>†</sup>  | 3 General Education Course   | 3         |
| CHEM 113 <sup>†</sup>  | 1 Life, Mathematical, or Physical Science Course <sup>^</sup>                    | 3         |
| General Education Course   | 3 Legal Studies, Government Service, Public Policy Course (from Department List) | 3         |
| Life, Mathematical, or Physical Science Course                                 | 3 MATH 141B or 141 <sup>††</sup>   | 4         |
| Legal Studies, Government Service, Public Policy Course (from Department List) | 3 Supporting course (consult with an academic adviser for options)               | 3         |
| MATH 140B or 140 <sup>*†#†</sup>   | 4  |           |
|  | <b>17</b>  | <b>16</b> |

### Third Year

| Fall   | Credits Spring   | Credits   |
|--|--|-----------|
| ENGL 202C, 202A, 202B, or 202D <sup>‡</sup>                                    | 3 400-level Life, Mathematical, or Physical Science Course <sup>*</sup>          | 3         |
| Life, Mathematical, or Physical Science Course                                 | 3 Legal Studies, Government Service, Public Policy Course (from Department List) | 3         |
| Legal Studies, Government Service, Public Policy Course (from Department List) | 3 Teamwork and Interpersonal Communication Course (from Department List)         | 3         |
| PHYS 250 or 211 <sup>*#</sup>  | 4 General Education Course   | 3         |
| STAT 250 (consult with an adviser for alternative options)                     | 3 PHYS 251 or 212  | 4         |
|  | <b>16</b>  | <b>16</b> |

### Fourth Year

| Fall  | Credits Spring  | Credits |
|---|---|---------|
| 400-level Life, Mathematical, or Physical Science Course <sup>*</sup> | 3 400-level Life, Mathematical, or Physical Science Course <sup>*</sup> | 3       |

|  |  |           |
|--|--|-----------|
| 400-level Legal Studies, Government Service, Public Policy Course (from Department List) | 3 400-level Legal Studies, Government Service, Public Policy Course (from Department List) | 3         |
| Global, Social, and Personal Awareness Course (from Department List)                     | 3 General Education Course   | 3         |
| General Education Course   | 3 General Education Course   | 3         |
| PHYS 213 (or Supporting Course)  | 2 Supporting course (consult with an academic adviser for options)                         | 3         |
| PHYS 214 (or Supporting Course)  | 2  |           |
|  | <b>16</b>  | <b>15</b> |

### Total Credits 124

\* Course requires a grade of C or better for the major

‡ Course requires a grade of C or better for General Education

# Course is an Entrance to Major requirement

† Course satisfies General Education and degree requirement

### University Requirements and General Education Notes:

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All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student's program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C. Each course is 3 credits.

## Legal Studies, Government Service, Public Policy Option: Science, B.S. at Commonwealth Campuses

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### First Year

| Fall                                 | Credits Spring                  | Credits   |
|--------------------------------------|---------------------------------|-----------|
| BIOL 110 <sup>**†</sup>              | 4 CHEM 112 <sup>†</sup>         | 3         |
| CHEM 110 <sup>**†</sup>              | 3 CHEM 113 <sup>†</sup>         | 1         |
| CHEM 111 <sup>†</sup>                | 1 MATH 141 <sup>††</sup>        | 4         |
| ENGL 15, 30H, or ESL 15 <sup>‡</sup> | 3 PHYS 250 or 211 <sup>*#</sup> | 4         |
| MATH 140 <sup>*†#†</sup>             | 4 General Education Course      | 3         |
| PSU 16                               | 1                               |           |
|                                      | <b>16</b>                       | <b>15</b> |

### Second Year

| Fall  | Credits Spring   | Credits   |
|---|--|-----------|
| BIOL 230W (consult with an adviser for alternative options) | 4 PHYS 213 (or Supporting Course)  | 2         |
| CAS 100, CAS 100A, CAS 100B, or CAS 100C <sup>‡</sup>       | 3 PHYS 214 (or Supporting Course)  | 2         |
| PHYS 251 or 212   | 4 Life, Mathematical, or Physical Science Course                                   | 3         |
| Life, Mathematical, or Physical Science Course              | 3 Legal Studies, Government Service, Public Policy Course (from Department List)   | 3         |
| General Education Course (GHW)                              | 1.5 Legal Studies, Government Service, Public Policy Course (from Department List) | 3         |
|   | General Education Course   | 3         |
|   | <b>15.5</b>  | <b>16</b> |

### Third Year

| Fall   | Credits Spring   | Credits     |
|--|--|-------------|
| ENGL 202C, 202A, 202B, or 202D <sup>‡</sup>                                    | 3 400-level Life, Mathematical, or Physical Science Course <sup>*</sup>          | 3           |
| Life, Mathematical, or Physical Science Course                                 | 3 Legal Studies, Government Service, Public Policy Course (from Department List) | 3           |
| STAT 250 (consult with an adviser for alternative options)                     | 3 Teamwork and Interpersonal Communication Course (from Department List)         | 3           |
| Legal Studies, Government Service, Public Policy Course (from Department List) | 3 General Education Course   | 3           |
| General Education Course   | 3 General Education Course (GHW)   | 1.5         |
|  | Supporting Course  | 3           |
|  | <b>15</b>  | <b>16.5</b> |

### Fourth Year

| Fall   | Credits Spring   | Credits   |
|--|--|-----------|
| 400-level Life, Mathematical, or Physical Science Course <sup>*</sup>                    | 3 400-level Life, Mathematical, or Physical Science Course <sup>*</sup>                    | 3         |
| 400-level Legal Studies, Government Service, Public Policy Course (from Department List) | 3 400-level Legal Studies, Government Service, Public Policy Course (from Department List) | 3         |
| Global, Social, and Personal Awareness Course (from Department List)                     | 3 General Education Course   | 3         |
| General Education Course   | 3 Supporting course (consult with an academic adviser for options)                         | 3         |
| Supporting course (consult with an academic adviser for options)                         | 3 Supporting course (consult with an academic adviser for options)                         | 3         |
|  | <b>15</b>  | <b>15</b> |

### Total Credits 124

\* Course requires a grade of C or better for the major

‡ Course requires a grade of C or better for General Education

# Course is an Entrance to Major requirement

† Course satisfies General Education and degree requirement

### University Requirements and General Education Notes:

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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.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of 'C' or better.

Course required with a C or better to enter the Science major are: MATH 140; and two out of the three of BIOL 110, CHEM 110, and either PHYS 250 or PHYS 211

Course can be taken from the following Departments for Mathematical, or Physical Science Course: LIFE (BIOL, BIOTC, BMB, MICRB); Mathematical (CMPSC, MATH, STAT); and Physical (ASTRO, CHEM, PHYS).

## Biological Science and Health Professions Option: Science, B.S. at University Park Campus

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

### First Year

| Fall                                 | Credits Spring  | Credits   |
|--------------------------------------|---|-----------|
| BIOL 110 <sup>**†</sup>              | 4 BIOL 230W (consult with an adviser for alternative options) | 4         |
| CHEM 110 <sup>**†</sup>              | 3 CHEM 112 <sup>†</sup>                                       | 3         |
| CHEM 111 <sup>†</sup>                | 1 CHEM 113 <sup>†</sup>                                       | 1         |
| ENGL 15, 30H, or ESL 15 <sup>†</sup> | 3 MATH 141B or 141 <sup>††</sup>                              | 4         |
| MATH 140B or 140 <sup>††</sup>       | 4 General Education Course                                    | 3         |
| PSU 16                               | 1   |           |
|                                      | <b>16</b>   | <b>15</b> |

### Second Year

| Fall  | Credits Spring   | Credits   |
|---|--|-----------|
| CHEM 210 or 202   | 3 CHEM 212 or 203  | 3         |
| HPA 101   | 3 PHYS 250 or 211 <sup>**</sup>  | 4         |
| MICRB 201 (consult with an adviser for alternative options) | 3 Healthcare/Medicine/Ethical Competencies Course (from Department List) | 3         |
| STAT 250 (consult with an adviser for alternative options)  | 3 Teamwork and Interpersonal Communication Course (from Department List) | 3         |
| General Education Course                                    | 3 General Education Course   | 3         |
|   | <b>15</b>  | <b>16</b> |

### Third Year

| Fall   | Credits Spring   | Credits   |
|--|--|-----------|
| CHEM 213W (or Supporting Course)                                       | 2 ENGL 202C, 202A, 202B, or 202D <sup>‡</sup>                            | 3         |
| PHYS 251 or 212  | 4 PHYS 213 (or Supporting Course)  | 2         |
| Healthcare/Medicine/Ethical Competencies Course (from Department List) | 3 PHYS 214 (or Supporting Course)  | 2         |
| Global, Social, and Personal Awareness Course (from Department List)   | 3 400-level Life Science: BIOL, BIOTC, BMB, or MICRB <sup>*</sup>        | 3         |
| General Education Course   | 3 Healthcare/Medicine/Ethical Competencies Course (from Department List) | 3         |
|  | General Education Course   | 3         |
|  | <b>15</b>  | <b>16</b> |

### Fourth Year

| Fall  | Credits Spring  | Credits |
|---|---|---------|
| CAS 100, CAS 100A, CAS 100B, or CAS 100C <sup>‡</sup> | 3 400-level Life Science: BIOL, BIOTC, BMB, or MICRB <sup>*</sup> | 3       |

|  |  |           |
|--|--|-----------|
| 400-level Life Science: BIOL, BIOTC, BMB, or MICRB <sup>*</sup>                  | 3 400-level Healthcare/Medicine/Ethical Competencies Course (from Department List) | 3         |
| 400-level Healthcare/Medicine/Ethical Competencies Course (from Department List) | 3 General Education Course   | 3         |
| General Education Course   | 3 Supporting course (consult with an academic adviser for options)                 | 3         |
| Supporting course (consult with an academic adviser for options)                 | 3 Supporting course (consult with an academic adviser for options)                 | 3         |
| Supporting course (consult with an academic adviser for options)                 | 1  |           |
|  | <b>16</b>  | <b>15</b> |

### Total Credits 124

\* Course requires a grade of C or better for the major

‡ Course requires a grade of C or better for General Education

# Course is an Entrance to Major requirement

† Course satisfies General Education and degree requirement

### University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity 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.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of 'C' or better.

All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student's program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C. Each course is 3 credits.

Courses required with a C or better to enter the Science major are: MATH 140; and two out of the three of BIOL 110, CHEM 110, and either PHYS 250 or PHYS 211.

Students intending to enter a health professional school should consult with an academic adviser on which organic chemistry sequence is appropriate.



## Biological Science and Health Professions Option (ALEKS Placement in MATH 22): Science, B.S. at University Park Campus

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

### First Year

| Fall                                 | Credits Spring  | Credits   |
|--------------------------------------|---|-----------|
| BIOL 110 <sup>**†</sup>              | 4 BIOL 230W (consult with an adviser for alternative options) | 4         |
| ENGL 15, 30H, or ESL 15 <sup>‡</sup> | 3 CAS 100, CAS 100A, CAS 100B, or CAS 100C <sup>‡</sup>       | 3         |
| General Education Course             | 3 CHEM 110 <sup>**†</sup>                                     | 3         |
| MATH 22                              | 3 CHEM 111 <sup>†</sup>                                       | 1         |
| PSU 16                               | 1 MATH 26   | 3         |
|                                      | <b>14</b>   | <b>14</b> |

### Second Year

| Fall  | Credits Spring   | Credits   |
|---|--|-----------|
| CHEM 112 <sup>†</sup>                                       | 3 CHEM 113 <sup>†</sup>  | 1         |
| General Education Course                                    | 3 General Education Course   | 3         |
| HPA 101   | 3 Healthcare/Medicine/Ethical Competencies Course (from Department List) | 3         |
| MICRB 201 (consult with an adviser for alternative options) | 3 MATH 141B or 141 <sup>††</sup>   | 4         |
| MATH 140B or 140 <sup>*††</sup>                             | 4 STAT 250 (consult with an adviser for alternative options)             | 3         |
|   | Teamwork and Interpersonal Communication Course (from Department List)   | 3         |
|   | <b>16</b>  | <b>17</b> |

### Third Year

| Fall   | Credits Spring   | Credits   |
|--|--|-----------|
| CHEM 210 or 202  | 3 400-level Life Science: BIOL, BIOTC, BMB, or MICRB <sup>*</sup>        | 3         |
| ENGL 202C, 202A, 202B, or 202D <sup>‡</sup>                          | 3 CHEM 212 or 203  | 3         |
| General Education Course   | 3 General Education Course   | 3         |
| Global, Social, and Personal Awareness Course (from Department List) | 3 Healthcare/Medicine/Ethical Competencies Course (from Department List) | 3         |
| PHYS 250 or 211 <sup>*#</sup>  | 4 PHYS 251 or 212  | 4         |
|  | <b>16</b>  | <b>16</b> |

### Fourth Year

| Fall  | Credits Spring  | Credits |
|---|---|---------|
| 400-level Life Science: BIOL, BIOTC, BMB, or MICRB <sup>*</sup> | 3 400-level Life Science: BIOL, BIOTC, BMB, or MICRB <sup>*</sup> | 3       |

|  |  |           |
|--|--|-----------|
| 400-level Healthcare/Medicine/Ethical Competencies Course (from Department List) | 3 400-level Healthcare/Medicine/Ethical Competencies Course (from Department List) | 3         |
| CHEM 213W (or Supporting Course)   | 2 General Education Course   | 3         |
| General Education Course   | 3 PHYS 214 (or Supporting Course)  | 2         |
| Healthcare/Medicine/Ethical Competencies Course (from Department List)           | 3 Supporting course (consult with an academic adviser for options)                 | 3         |
| PHYS 213 (or Supporting Course)  | 2 Supporting course (consult with an academic adviser for options)                 | 1         |
|  | <b>16</b>  | <b>15</b> |

### Total Credits 124

\* Course requires a grade of C or better for the major

‡ Course requires a grade of C or better for General Education

# Course is an Entrance to Major requirement

† Course satisfies General Education and degree requirement

### University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity 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.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of 'C' or better.

All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student's program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C. Each course is 3 credits.

Students intending to enter a health professional school should consult with an academic adviser on which organic chemistry sequence is appropriate.

## Biological Science and Health Professions Option: Science, B.S. at Commonwealth Campuses

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 <sup>**†</sup>              | 4 CHEM 112 <sup>†</sup>          | 3         |
| CHEM 110 <sup>**†</sup>              | 3 CHEM 113 <sup>†</sup>          | 1         |
| CHEM 111 <sup>†</sup>                | 1 MATH 141B or 141 <sup>††</sup> | 4         |
| ENGL 15, 30H, or ESL 15 <sup>‡</sup> | 3 PHYS 250 or 211 <sup>*#</sup>  | 4         |
| MATH 140B or 140 <sup>*††</sup>      | 4 General Education Course       | 3         |
| PSU 16                               | 1                                |           |
|                                      | <b>16</b>                        | <b>15</b> |

### Second Year

| Fall  | Credits Spring   | Credits   |
|---|--|-----------|
| BIOL 230W (consult with an adviser for alternative options) | 4 CHEM 212 or 202  | 3         |
| CHEM 210 or 202   | 3 CHEM 213W (or supporting course)                                       | 2         |
| HPA 101   | 3 PHYS 213 (or supporting course)  | 2         |
| PHYS 251 or 212   | 4 PHYS 214 (or supporting course)  | 2         |
| General Education Course                                    | 3 Healthcare/Medicine/Ethical Competencies Course (from Department List) | 3         |
|   | General Education Course   | 3         |
|   | <b>17</b>  | <b>15</b> |

### Third Year

| Fall   | Credits Spring   | Credits   |
|--|--|-----------|
| MICRB 201 (consult with an adviser for alternative options)            | 3 ENGL 202C, 202A, 202B, or 202D <sup>‡</sup>                            | 3         |
| STAT 250 (consult with an adviser for alternative options)             | 3 400-level Life Science: BIOL, BIOTC, BMB, or MICRB <sup>*</sup>        | 3         |
| Healthcare/Medicine/Ethical Competency Course (from Department List)   | 3 Healthcare/Medicine/Ethical Competencies Course (from Department List) | 3         |
| Teamwork and Interpersonal Communication Course (from Department List) | 3 General Education Course   | 3         |
| General Education Course   | 3 Supporting course (consult with an academic adviser for options)       | 3         |
|  | <b>15</b>  | <b>15</b> |

### Fourth Year

| Fall   | Credits Spring   | Credits   |
|--|--|-----------|
| CAS 100, CAS 100A, CAS 100B, or CAS 100C <sup>‡</sup>                            | 3 400-level Life Science: BIOL, BIOTC, BMB or MICRB <sup>*</sup>                   | 3         |
| 400-level Life Science: BIOL, BIOTC, BMB, or MICRB <sup>*</sup>                  | 3 400-level Healthcare/Medicine/Ethical Competencies Course (from Department List) | 3         |
| 400-level Healthcare/Medicine/Ethical Competencies Course (from Department List) | 3 General Education Course   | 3         |
| Global, Social, and Personal Awareness Course (from Department List)             | 3 Supporting course (consult with an academic adviser for options)                 | 3         |
| General Education Course   | 3 Supporting course (consult with an academic adviser for options)                 | 3         |
| Supporting course (consult with an academic adviser for options)                 | 1  |           |
|  | <b>16</b>  | <b>15</b> |

### Total Credits 124

\* Course requires a grade of C or better for the major

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# Course is an Entrance to Major requirement

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### University Requirements and General Education Notes:

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Courses required with a C or better to enter the Science major are: MATH 140; and two out of the three of BIOL 110, CHEM 110, and either PHYS 250 or PHYS 211.

Students intending to enter a health professional school should consult with an academic adviser on which organic chemistry sequence is appropriate.

## 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 (<https://www.adea.org>)
- Association of Schools and Colleges of Optometry (<https://optometriceducation.org>)
- American Association of Colleges of Podiatric Medicine (<https://aacpm.org>)
- American Academy of Physician Assistants (AAPA) (<https://www.aapa.org>) Physician Assistant Education Association (<https://paeaonline.org>)

## Contact

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<https://science.psu.edu/interdisciplinary-programs/science-major>  
(<https://science.psu.edu/interdisciplinary-programs/science-major/>)

### Berks

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