

INTEGRATIVE SCIENCE, B.S. (ABINGTON)

Begin Campus: Any Penn State Campus

End Campus: Abington

Program Description

The Integrative 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 across disciplinary areas, and who seek a high degree of flexibility to obtain their educational objectives. After completing foundation courses in biology, calculus, chemistry, physics, and statistics, students select additional science courses from designated areas to customize the curriculum to their own interests. A large number of supporting credits enable students to incorporate significant breadth or specialization into their academic training, such as through courses in business, computer and information science, health science, social science, and other fields.

This major helps prepare students for careers in many different job sectors including agriculture, biotechnology, chemistry, education, government, industry, medicine, pharmaceutical, research & development, sustainability, and more. Graduates of this major pursue diverse career paths and hold a variety of roles such as research scientist, data analyst, technician, program coordinator, project manager, consultant, and laboratory associate. The degree can also be tailored to meet specific requirements of professional programs such as medical, dental, physician assistant, pharmacy, or law school, as well as graduate school.

General Science Option

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

The General Science option of the B.S. Integrative 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*

Secondary Education Option

Available at the following campuses: *Harrisburg*

Not all of these options are available at all locations. See the Science program director at your College for details regarding program curriculum at your location.

What is Integrative Science?

The Integrative Science major provides a broad and interdisciplinary foundation in the natural sciences. The Integrative 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 Integrative 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.

Entrance to the Integrative Science Secondary Education option requires the following additional requirements:

1. completed at least one of the following courses, BIOL 220W or BIOL 230W or BIOL 240W; PHYS 250, with a grade of C or better;
2. attained at least a 3.00 cumulative grade-point average;
3. completed ENGL 15 or ENGL 30H;
4. completed 3 credits of literature from a department-approved list with a grade of C or better;
5. completed 6 credits of college-level mathematics (GQ MATH or STAT prefixes) with a grade of C or better;
6. satisfy any entrance testing requirements set out by the Pennsylvania Department of Education in effect at the time of application for the major;
7. submission to the Teacher Education Office of current and clear background checks as required by the Pennsylvania Department of Education;
8. submission of documentation of 20 pre-major fieldwork hours.

Degree Requirements

For the Bachelor of Science degree in Integrative Science with an option in General Science; Biological Sciences and Health Professions; Legal Studies, Government Service, Public Policy; Life Science; and Mathematical Science, a minimum of 120 credits is required, with at least 15 credits at the 400 level. For the Bachelor of Science degree in Integrative Science with an option in Secondary Education, a minimum of 125 credits is required, with at least 15 credits at the 400 level.

Requirement	Credits
General Education	45
Requirements for the Major	90-110

13-30 of the 45 credits for General Education are included in the Requirements for the Major. For the General Science Option; Biological Sciences and Health Professions Option; Legal Studies, Government Service, Public Policy Option; Life Science Option this includes: 9 credits of GN courses and 4-6 credits of GQ courses. For the Mathematical Science Option this includes: 9 credits of GN courses and 6 credits of GQ courses. For the Secondary Education Option this includes: 9 credits of GN courses; 6 credits of GQ courses; 3 credits of GWS courses (ENGL 202C); 3 credits of GH courses (literature department list); 6 credits of GS courses (EDPSY 14 and HDFS 239); 3 credits of Integrative Studies courses (EDUC 466N).

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
Prescribed Courses		
CHEM 111	Experimental Chemistry I	1
CHEM 112	Chemical Principles II	3
CHEM 113	Experimental Chemistry II	1
<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
Requirements for the Option		
Select an option		74-94

Requirements for the Option

General Science Option (74 credits)

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

Code	Title	Credits
Additional Courses		
STAT 200	Elementary Statistics	3-4
or STAT 250	Introduction to Biostatistics	
Select 4 credits from the following:		4
BIOL 161 & BIOL 162	Human Anatomy and Physiology I - Lecture and Human Anatomy and Physiology I - Laboratory	
BIOL 220W	Biology: Populations and Communities	
BIOL 230W	Biology: Molecules and Cells	
BIOL 240W	Biology: Function and Development of Organisms	
Select 8-12 credits from 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	
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Supporting Courses and Related Areas

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 3 credits in Integrative and Applied Sciences from department approved course list in consultation with adviser	3
Select 6 credits of 400-level courses	6
Select 21-26 credits from program list ^{2,3}	21-26
<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 ^{4,5}	18

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

² A maximum of 12 credits of Independent Study (296, 496) may be applied toward credits for graduation.

³ Students may apply ROTC credits toward the Program List.

⁴ Only the 9 credits at the 400 level require a grade of C or better.

⁵ Life sciences include BIOL, BIOTC, BMB, FRNSC, MICRB. Mathematical sciences include CMPSC, DS, MATH, STAT. Physical sciences include ASTRO, CHEM, PHYS.

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		
STAT 200	Elementary Statistics	3-4
or STAT 250	Introduction to Biostatistics	
Select 4 credits from the following:		4
BIOL 161 & BIOL 162	Human Anatomy and Physiology I - Lecture and Human Anatomy and Physiology I - 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 from the following:		3-4
BIOL 222	Genetics	
BIOL 230W	Biology: Molecules and Cells	
BIOL 322	Genetic Analysis	
BMB 211	Elementary Biochemistry	
BMB/ MICRBREQUIREMENTS FOR THE MAJOR251	Molecular and Cell Biology I	
MICRB 201	Introductory Microbiology	
Select 6-8 credits from the following:		6-8
CHEM 202 & CHEM 203	Fundamentals of Organic Chemistry I and Fundamentals of Organic Chemistry II	

CHEM 210 & CHEM 212 & CHEM 213W	Organic Chemistry I and Organic Chemistry II and Laboratory in Organic Chemistry - Writing Intensive	
Select 8-12 credits from 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 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 15 credits in Healthcare/Medicine/Ethical Competencies from department approved course list in consultation with adviser ²	15
Select 9-17 credits from program list ^{3,4}	9-17
<i>Supporting Courses and Related Areas: Require a grade of C or better</i>	
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.

² 6 credits must be at the 400-level.

³ A maximum of 12 credits of Independent Studies (296, 496) may be applied toward credits for graduation.

⁴ Students may apply ROTC credits toward the Program List.

Legal Studies, Government Service, Public Policy Option (74 credits)

Available at the following campuses: University Park

Code	Title	Credits
Additional Courses		
STAT 200 or STAT 250	Elementary Statistics Introduction to Biostatistics	3-4
Select 4 credits from the following:		4
BIOL 161 & BIOL 162	Human Anatomy and Physiology I - Lecture and Human Anatomy and Physiology I - Laboratory	
BIOL 220W	Biology: Populations and Communities	
BIOL 230W	Biology: Molecules and Cells	
BIOL 240W	Biology: Function and Development of Organisms	
Select 8-12 credits from 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 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 18 credits in Legal Studies, Government Service, Public Policy from department approved course list in consultation with adviser ²	18
Select 12-17 credits from program list ^{3,4}	12-17

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 ^{5,6}	18
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¹ PHYS 211 and PHYS 250 require a grade of C or better.

² 6 credits must be at the 400-level.

³ A maximum of 12 credits of Independent Study (296, 496) may be applied toward credits for graduation.

⁴ Students may apply ROTC credits toward the Program List.

⁵ Only the 9 credits at the 400 level require a grade of C or better.

⁶ Life sciences include BIOL, BIOTC, BMB, FRNSC, MICRB. Mathematical sciences include CMPSC, DS, MATH, STAT. Physical sciences include ASTRO, CHEM, PHYS.

Life Science Option (74 credits)

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

Code	Title	Credits
Additional Courses		
STAT 200 or STAT 250	Elementary Statistics Introduction to Biostatistics	3-4
Select 4 credits from the following:		4
BIOL 220W	Biology: Populations and Communities	
BIOL 230W	Biology: Molecules and Cells	
BIOL 240W	Biology: Function and Development of Organisms	
Select 3-4 credits from the following:		3-4
BIOL 222	Genetics	
BIOL 230W	Biology: Molecules and Cells	
BIOL 322	Genetic Analysis	
BMB 211	Elementary Biochemistry	
BMB/ MICRBREQUIRE FOR THE MAJOR251	Molecular and Cell Biology I	
MICRB 201	Introductory Microbiology	
Select 6-8 credits from 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 from 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 3 credits in Global, Social, and Personal Awareness from department approved course list in consultation with adviser	3
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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
Select 21-29 credits from program list ^{2,3}	21-29
<i>Supporting Courses and Related Areas: Require a grade of C or better</i>	
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.

² A maximum of 12 credits of Independent Study (296, 496) may be applied toward credits for graduation.

³ Students may apply ROTC credits toward the Program List.

Mathematical Science Option (74 credits)

Available at the following campuses: Abington

Code	Title	Credits
Prescribed Courses		
MATH 220	Matrices	2-3
<i>Prescribed Courses: Require a grade of C or better</i>		
MATH 141	Calculus with Analytic Geometry II	4
Additional Courses		
CMPSC 122	Intermediate Programming	3
or CMPSC 132	Programming and Computation II: Data Structures	
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	
Select 3 credits from the following:		3
CMPSC 121	Introduction to Programming Techniques	
CMPSC 131	Programming and Computation I: Fundamentals	
CMPSC 201	Programming for Engineers with C++	
Select 3-4 credits from the following:		3-4
STAT 200	Elementary Statistics	
STAT 250	Introduction to Biostatistics	
STAT 318	Elementary Probability	
Select 3-4 credits from the following:		3-4
BIOL 222	Genetics	
BIOL 230W	Biology: Molecules and Cells	
BIOL 322	Genetic Analysis	
BMB 211	Elementary Biochemistry	
BMB/ MICRBREQUIR FOR THE MAJOR251	Molecular and Cell Biology I	
MICRB 201	Introductory Microbiology	
Select 8-12 credits from 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 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
Select 13-20 credits from program list ^{2,3}	13-20
<i>Supporting Courses and Related Areas: Require a grade of C or better</i>	
Select 9 credits of 400-level CMPSC, MATH, or STAT courses	9

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

² A maximum of 12 credits of Independent Study (296, 496) may be applied toward credits for graduation.

³ Students may apply ROTC credits toward the Program List.

SECONDARY EDUCATION OPTION (94 credits)

Available at the following campuses: Harrisburg

Code	Title	Credits
Prescribed Courses		
STAT 200	Elementary Statistics	4
<i>Prescribed Courses: Require a grade of C or better for teacher certification</i>		
EDUC 313	Secondary Education Field Experience	2
EDUC 314	Learning Theory and Instructional Procedures	3
EDUC 315Y	Social and Cultural Factors in Education	3
EDUC 385	Professional Development in Teaching	3
EDUC 400	Diversity and Cultural Awareness Practices in the K-12 Classroom	3
EDUC 414	Teaching Secondary Science	3
EDUC 458	Behavior Management Strategies for Inclusive Classrooms	3
EDUC 459	Strategies for Effective Teaching in Inclusive Classrooms	3
EDUC 490	Student Teaching	9
<i>Prescribed Courses: Require a Grade of C or Better</i>		
EDPSY 14	Learning and Instruction	3
EDUC 466N	Foundations of Teaching English as a Second Language	3
ENGL 202C	Effective Writing: Technical Writing	3
HDFS 239	Adolescent Development	3
MATH 141	Calculus with Analytic Geometry II	4
PHYS 250	Introductory Physics I	4
PHYS 251	Introductory Physics II	4
Additional Courses		
<i>Additional Courses: Require a grade of C or better</i>		
Select 4 credits from the following:		4
BIOL 220W	Biology: Populations and Communities	
BIOL 230W	Biology: Molecules and Cells	
BIOL 240W	Biology: Function and Development of Organisms	
Supporting Courses and Related Areas		
<i>Supporting Courses and Related Areas: Require a Grade of C or Better</i>		
Select 3 credits of GH literature from department list		3
Select a 3 credit EARTH course		3
Select a 3 credit ASTRO course		3

Select 9 credits of 400-level earth or physical science courses	9
Select 12 credits of science or education elective courses	12

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

- Have a basic knowledge of the fundamental concepts in molecular, organismal, and population biology.
- Demonstrate the ability to use scientific and quantitative reasoning.
- Demonstrate the ability to retrieve scientific information, analyze scientific data, and use computers and scientific equipment in a laboratory setting.
- Demonstrate the ability to disseminate scientific findings through oral and written communication.
- Demonstrate the ability to work cooperative in teams.

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/>)

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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 2024-25 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.

General Science Option: Integrative Science, B.S. at Abington 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 (GN) ^{**†}	4 CHEM 112	3
CHEM 110 (GN) ^{**†}	3 CHEM 113	1
CHEM 111 (GN) [†]	1 Global, Social, and Personal Awareness Course (from Department List)	3
MATH 140 or 140B (GQ) ^{†##}	4 CAS 100A, 100B, or 100C (GWS) [†]	3
ENGL 15, 30H, or ESL 15 (GWS) [†]	3 BIOL 240W (or Supporting Course (consult with academic adviser for options))	3-4
First-Year Seminar	1	
	16	13-14
Second Year		
Fall	Credits Spring	Credits
BIOL 220W or 230W (or Supporting Course (consult with academic adviser for options))	3-4 STAT 250 or 200 (GQ) [†]	3-4
Life, Mathematical, or Physical Science Course	3 Life, Mathematical, or Physical Science Course	3
Teamwork and Interpersonal Communication Course (from Department List)	3 Integrative and Applied Science Course (from Department List)	3
General Education Course (GS)	3 General Education Course (GA)	3
PHYS 250 (GN) ^{*#}	4 PHYS 251	4
	16-17	16-17
Third Year		
Fall	Credits Spring	Credits
Life, Mathematical, or Physical Science Course	3 400-Level Life, Mathematical, or Physical Science Course [*]	3
General Education Course (Integrative Studies)	3 General Education Course (Integrative Studies)	3
Supporting Course (consult with academic adviser for options)	3 General Education Course (GH)	3
Supporting Course (consult with academic adviser for options)	3 Supporting Course (consult with academic adviser for options)	3
ENGL 202C (GWS) [†]	3 Supporting Course (consult with academic adviser for options)	3
	15	15
Fourth Year		
Fall	Credits Spring	Credits
400-Level Life, Mathematical, or Physical Science Course [*]	3 400-Level Life, Mathematical, or Physical Science Course [*]	3
400-Level Supporting Course	3 400-Level Supporting Course	3
General Education Course (GHW)	3 General Education Course (Exploration)	3

Supporting Course (consult with academic adviser for options)	3 Supporting Course (consult with academic adviser for options)	3
Supporting Course (consult with academic adviser for options)	3 Supporting Course (consult with academic adviser for options)	2
15		14

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

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.

Program List Exclusions: The Following Coursework is not Applicable to Degree Requirements

Students may select supporting courses from nearly the entire range of the University's course offerings. However, the following courses may NOT be used to satisfy degree requirements for the Integrative Science major. This list applies to ALL options in the Integrative Science BS major.

- BIOL 001, 003, 011*, 012*
- BISC 001, 002, 003*, 004*
- BMB 001*
- CAS 126
- CHEM 001, 003, 005, 101, 108
- CMPSC 100
- ENGL 004, 005
- ESL 004, 005
- LL ED 005, 010
- MATH 003, 004, 010, 017, 018, 021, 030, 033, 034, 035, 036, 040, 081, 082, 083, 097, 110, 111, 200
- MICRB 150, 151A, 151B, 151C, 151D, 151E, 151F, 151G, 151W
- PHYS 001, 010, 097, 114, 150, 151
- STAT 100*

*On rare occasions, with adequate justification, a student may be permitted to use one or more of these courses to satisfy degree requirements. A petition must be submitted to request such an exception. Consult with your academic adviser.

In addition, the following types of courses may not be used to satisfy degree requirements in the Integrative Science major:

- Courses which are remedial in nature or which focus on reading improvement or study skills.
- Courses which substantially duplicate the subject matter covered in other completed courses taught at a comparable level.

Some courses may be counted toward degree requirements in the Science and Premedicine majors with some restrictions:

- No more than 4 credits of MATH 140A may be used.
- No more than 6 credits of ROTC courses (AIR, ARMY, NAVSC) may be used.
- No more than 12 credits of independent study (296, 496, etc.) may be used.
 - **Unless special permission is granted, Independent Study credit may only be used in "Supporting Courses" and "Any 400-level Course Work" categories.
- No more than 5 credits of KINES Physical Activity courses may be used.
 - **KINES Health Courses (KINES 180, etc.) are not limited to 5 credits.

Life Science Option: Integrative Science, B.S. at Abington 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 (GN) ^{**†}	4	CHEM 112	3
CHEM 110 (GN) ^{**†}	3	CHEM 113	1
MATH 140 or 140B (GQ) ^{*†#†}	4	Global, Social, and Personal Awareness Course (from Department List)	3
ENGL 15, 30H, or ESL 15 (GWS) [‡]	3	CAS 100A, 100B, or 100C (GWS) [‡]	3
CHEM 111 (GN)	1	BIOL 240W (or Supporting Course (consult with academic adviser for options))	3-4
First-Year Seminar	1		
	16		13-14

Second Year

Fall	Credits	Spring	Credits
BIOL 220W or 230W (or Supporting Course (consult with academic adviser for options))	3-4	CHEM 212	3
CHEM 210	3	CHEM 213	2
Teamwork and Interpersonal Communication Course (from Department List)	3	General Education Course (GA)	3
General Education Course (GS)	3	PHYS 251	4
PHYS 250 (GN) ^{*#}	4	Supporting Course (consult with academic adviser for options)	3
	16-17		15

Third Year

Fall	Credits	Spring	Credits
Supporting Course (consult with academic adviser for options)	3	400-level BMB, BIOL, BIOTC, or MICRB course [*]	3
General Education Course (Integrative Studies)	3	MICRB 201 (or Supporting Course (consult with academic adviser for options))	3
Supporting Course (consult with academic adviser for options)	3	General Education Course (Integrative Studies)	3
ENGL 202C (GWS) [‡]	3	General Education Course (GH)	3

STAT 250 or 200 (GQ) [‡]	3-4	Supporting Course (consult with academic adviser for options)	3
	15-16		15
Fourth Year			
Fall	Credits	Spring	Credits
400-Level BMB, BIOL, BIOTC, or MICRB course [*]	3	400-level BMB, BIOL, BIOTC, or MICRB course [*]	3
400-Level Supporting Course	3	400-level Supporting Course	3
General Education Course (GHW)	3	General Education Course (Exploration)	3
Supporting Course (consult with academic adviser for options)	3	Supporting Course (consult with academic adviser for options)	3
Supporting Course (consult with academic adviser for options)	3	Supporting Course (consult with academic adviser for options)	2
	15		14

Total Credits 119-122

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

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

Course is an Entrance to Major requirement

† Course satisfies General Education and degree requirement

University Requirements and General Education Notes:

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

Program List Exclusions: The Following Coursework is not Applicable to Degree Requirements

Students may select supporting courses from nearly the entire range of the University's course offerings. However, the following courses may NOT be used to satisfy degree requirements for the Integrative Science major. This list applies to ALL options in the Integrative Science BS major.

- BIOL 001, 003, 011*, 012*
- BISC 001, 002, 003*, 004*
- BMB 001*
- CAS 126
- CHEM 001, 003, 005, 101, 108
- CMPSC 100
- ENGL 004, 005
- ESL 004, 005
- LL ED 005, 010

- MATH 003, 004, 010, 017, 018, 021, 030, 033, 034, 035, 036, 040, 081, 082, 083, 097, 110, 111, 200
- MICRB 150, 151A, 151B, 151C, 151D, 151E, 151F, 151G, 151W
- PHYS 001, 010, 097, 114, 150, 151
- STAT 100*

*On rare occasions, with adequate justification, a student may be permitted to use one or more of these courses to satisfy degree requirements. A petition must be submitted to request such an exception. Consult with your academic adviser.

In addition, the following types of courses may not be used to satisfy degree requirements in the Integrative Science major:

- Courses which are remedial in nature or which focus on reading improvement or study skills.
- Courses which substantially duplicate the subject matter covered in other completed courses taught at a comparable level.

Some courses may be counted toward degree requirements in the Science and Premedicine majors with some restrictions:

- No more than 4 credits of MATH 140A may be used.
- No more than 6 credits of ROTC courses (AIR, ARMY, NAVSC) may be used.
- No more than 12 credits of independent study (296, 496, etc.) may be used.
 - **Unless special permission is granted, Independent Study credit may only be used in "Supporting Courses" and "Any 400-level Course Work" categories.
- No more than 5 credits of KINES Physical Activity courses may be used.
 - **KINES Health Courses (KINES 180, etc.) are not limited to 5 credits.

Mathematical Science Option: Integrative Science, B.S. at Abington 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
MATH 140 (GQ) ^{*†‡}	4	MATH 141 (GQ) ^{*†}	4
ENGL 15, 30H, or ESL 15 (GWS) [‡]	3	CAS 100A, 100B, or 100C (GWS) [‡]	3
BIOL 110 (GN) ^{*†}	4	CMPSC 131	3
CHEM 110 (GN) ^{*†}	3	CHEM 112 (GN)	3
CHEM 111 (GN)	1	CHEM 113 (GN)	1
First-Year Seminar	1	General Education Course (GHW)	1.5
	16		15.5

Second Year

Fall	Credits	Spring	Credits
CMPSC 132	3	DS 220	3
MATH 220	3	MATH 230 or 251	4
General Education Course (GS)	3	General Education Course (Integrative Studies)	3
PHYS 250 (GN) ^{*#}	4	PHYS 251	4
Supporting Course (consult with academic adviser for options)	3	General Education Course (GHW)	1.5
	16		15.5

Third Year

Fall	Credits	Spring	Credits
MATH/STAT 318	3	MATH 311W	4
ENGL 202C (GWS) [‡]	3	MICRB 201	3
Teamwork and Interpersonal Communication Course (from Department List)	3	Global, Social, and Personal Awareness Course (from Department List)	3
MATH 425 [*]	3	CMPSC 446 [*]	3
STAT 401 [*]	3	General Education Course (Integrative Studies)	3
	15		16

Fourth Year

Fall	Credits	Spring	Credits
General Education Course (GA)	3	General Education Course (GH)	3
MATH/CMPSC 455 or STAT 462 [*]	3	CMPSC 445 [*]	3
Supporting Course (consult with academic adviser for options)	3	General Education Course (Exploration)	3
Supporting Course (consult with academic adviser for options)	3	Supporting Course (consult with academic adviser for options)	3

Supporting Course (consult with academic adviser for options) 3

15

12

Total Credits 121

* 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.

Program List Exclusions: The Following Coursework is not Applicable to Degree Requirements

Students may select supporting courses from nearly the entire range of the University's course offerings. However, the following courses may NOT be used to satisfy degree requirements for the Integrative Science major. This list applies to ALL options in the Integrative Science BS major.

- BIOL 001, 003, 011*, 012*
- BISC 001, 002, 003*, 004*
- BMB 001*
- CAS 126
- CHEM 001, 003, 005, 101, 108
- CMPSC 100
- ENGL 004, 005
- ESL 004, 005
- LL ED 005, 010
- MATH 003, 004, 010, 017, 018, 021, 030, 033, 034, 035, 036, 040, 081, 082, 083, 097, 110, 111, 200
- MICRB 150, 151A, 151B, 151C, 151D, 151E, 151F, 151G, 151W
- PHYS 001, 010, 097, 114, 150, 151
- STAT 100*

*On rare occasions, with adequate justification, a student may be permitted to use one or more of these courses to satisfy degree requirements. A petition must be submitted to request such an exception. Consult with your academic adviser.

In addition, the following types of courses may not be used to satisfy degree requirements in the Integrative Science major:

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- No more than 5 credits of KINES Physical Activity courses may be used.
 - **KINES Health Courses (KINES 180, etc.) are not limited to 5 credits.

Career Paths

Penn State students with a BS in Integrative 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 Integrative 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>)

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