

INTEGRATIVE SCIENCE, B.S. (SCIENCE)

Begin Campus: Any Penn State Campus

End Campus: University Park

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 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 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 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 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/MICRB 251	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	Organic Chemistry I and Organic Chemistry II	
CHEM 213W	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 or 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
<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 ^{5,6}	18

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 or 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/MICRB 251	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
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 or CMPSC 132	Intermediate Programming Programming and Computation II: Data Structures	3
CMPSC 360 or MATH 311W	Discrete Mathematics for Computer Science Concepts of Discrete Mathematics	3-4
MATH 230 or MATH 251	Calculus and Vector Analysis Ordinary and Partial Differential Equations	4
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/MICRB 251	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

Supporting Courses and Related Areas: Require a Grade of C or Better

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.