

# Secondary Education/Science Education

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Students seeking certification in any Secondary Education Science program must complete the requirements for **both** the major in Secondary Education: Science and those for the content (second) major (Physics, Chemistry, or Biology) as specified by the College of Science and Technology. All students in this program **must meet with College of Science and Technology (CST) advising office in their first semester at Temple to declare the second major.**

## Summary of Requirements

### University Requirements

All students are required to complete the university's General Education (GenEd) curriculum.

All students (including transfer students) must take a minimum of two writing-intensive (WI) courses at Temple University. Writing intensive course numbers end in 96, 97 and 98.

### College Requirements

Students receive a Bachelor of Science in Education degree by meeting the following minimum College requirements:

- Completion of program requirements as detailed on the academic plan.
- Earn a "C-" or above in all required Education Courses.
- Earn a "C-" or above in all required University General Education Courses.
- Earn minimum grades required by CST in all science courses.
- Students in Secondary Education must maintain a 3.0 cumulative GPA and a 2.0 GPA in their content area courses.

For additional college and certification requirements, refer to the College Requirements page.

### Major Requirements

Code	Title	Credit Hours
EDUC 1255	Inclusive Education for a Diverse Society	3
EDUC 2103	Socio-cultural Foundations of Education in the United States <sup>1</sup>	3
EDUC 2109	Adolescent Development for Educators <sup>1</sup>	3
EDUC 2296	Effective Teaching: Theory and Practice	3
SPED 2231	Introduction to Special Education <sup>1</sup>	3
EDUC 2255	Effective Use of Instructional Technology in Classrooms	3
EDUC 2306	Assessment and Evaluation	3
ENES 3338	Foundations of Language Teaching: Teaching English Language Learners in Grades 4 to 12	3
SECE 3796	Differentiated Literacy Instruction in the Disciplines, 7-12	3
EDUC 4111	Classroom and Conflict Management in Grades 4 through 12	3
SECE 4801	Senior Seminar and Performance Assessment in Secondary Education	3
SECE 4688	Student Teaching in Secondary Education	9
Total Credit Hours		42

<sup>1</sup> Course required for candidacy.

### Program Requirements for Secondary Education / Science Education

Code	Title	Credit Hours
SCES 3146	The Teaching of Science in Secondary Schools	3
SCES 4146	Teaching Science in Secondary Schools II	3
EDUC 4389	Field Experience	1
EDUC 4389	Field Experience	1
Total Credit Hours		8

## Suggested Academic Plans

### B.S.ED. in Secondary Education / Science Education

#### Requirements for New Students starting in the 2020-2021 Academic Year

Certain courses require that a student secure clearances as per the College of Education and Human Development policy; students should check the current list of courses that require clearances on the College of Education and Human Development web site.

#### B.S.ED. in Secondary Education / Science Education: Biology

Year 1		Credit Hours
<b>Fall</b>		
ENG 0802, 0812, or 0902	Analytical Reading and Writing [GW] <sup>1</sup>	4
	GenEd Breadth Course	3
MATH 1041	Calculus I <sup>1</sup>	4
CHEM 1031	General Chemistry I	3
CHEM 1033	General Chemistry Laboratory I	1
	Term Credit Hours	15
<b>Spring</b>		
IH 0851 or 0951	Intellectual Heritage I: The Good Life [GY] <sup>1</sup>	3
	GenEd Breadth Course	3
BIOL 1111	Introduction to Organismal Biology <sup>2</sup>	4
	Select one of the following:	4
MATH 1042	Calculus II <sup>1</sup>	
MATH 1044	Introduction to Probability and Statistics for the Life Sciences	
CHEM 1032	General Chemistry II	3
CHEM 1034	General Chemistry Laboratory II	1
	Term Credit Hours	18
<b>Year 2</b>		
<b>Fall</b>		
IH 0852 or 0952	Intellectual Heritage II: The Common Good [GZ]	3
EDUC 2103	Socio-cultural Foundations of Education in the United States	3
EDUC 2255	Effective Use of Instructional Technology in Classrooms	3
BIOL 2112	Introduction to Cellular and Molecular Biology <sup>2</sup>	4
CHEM 2201	Organic Chemistry I	3
CHEM 2203	Organic Chemistry Laboratory I	1
	Term Credit Hours	17
<b>Spring</b>		
EDUC 2109	Adolescent Development for Educators <sup>1,3</sup>	3
EDUC 4111	Classroom and Conflict Management in Grades 4 through 12 <sup>1</sup>	3
SPED 2231	Introduction to Special Education <sup>1,3</sup>	3
CHEM 2202	Organic Chemistry II	3
CHEM 2204	Organic Chemistry Laboratory II	1
BIOL 2296	Genetics [WI]	4
	Term Credit Hours	17
<b>Year 3</b>		
<b>Fall</b>		
	GenEd Breadth Course	3
EDUC 1255	Inclusive Education for a Diverse Society	3
ENES 3338	Foundations of Language Teaching: Teaching English Language Learners in Grades 4 to 12 <sup>3</sup>	3
BIOL 3096	Cell Structure and Function [WI]	4
PHYS 2021	General Physics I	4
	Term Credit Hours	17
<b>Spring</b>		

GenEd Breadth Course		3
EDUC 2296	Effective Teaching: Theory and Practice [WI]	3
SCES 3146	The Teaching of Science in Secondary Schools	3
EDUC 4389	Field Experience	1
BIOL 2227	Principles of Ecology	3
PHYS 2022	General Physics II	4
Term Credit Hours		17
<b>Year 4</b>		
<b>Fall</b>		
SECE 3796	Differentiated Literacy Instruction in the Disciplines, 7-12 [WI]	3
SCES 4146	Teaching Science in Secondary Schools II	3
EDUC 4389	Field Experience	1
Biology Elective 2200 or higher		4
Biology Elective 2200 or higher		3
Biology Elective 2200 or higher		3
Term Credit Hours		17
<b>Spring</b>		
SECE 4688	Student Teaching in Secondary Education	9
SECE 4801	Senior Seminar and Performance Assessment in Secondary Education	3
EDUC 2306	Assessment and Evaluation	3
Term Credit Hours		15
Total Credit Hours:		133

<sup>1</sup> Course must be successfully completed to be eligible for Candidacy approval.

<sup>2</sup> These courses constitute the waiver for the GenEd Science and Technology category if the courses are completed with a C- or better.

<sup>3</sup> These 3 courses constitute the waiver for the GenEd Human Behavior category if the courses are completed with a C- or better.

### B.S.ED. in Secondary Education / Science Education: Chemistry

Year 1		Credit Hours
<b>Fall</b>		
ENG 0802, 0812, or 0902	Analytical Reading and Writing [GW] <sup>1</sup>	4
GenEd Breadth Course		3
MATH 1041	Calculus I <sup>1</sup>	4
CHEM 1031	General Chemistry I <sup>2</sup>	3
CHEM 1033	General Chemistry Laboratory I <sup>2</sup>	1
Term Credit Hours		15
<b>Spring</b>		
IH 0851 or 0951	Intellectual Heritage I: The Good Life [GY] <sup>1</sup>	3
GenEd Breadth Course		3
EDUC 2103	Socio-cultural Foundations of Education in the United States <sup>1</sup>	3
MATH 1042	Calculus II <sup>1</sup>	4
CHEM 1032	General Chemistry II <sup>2</sup>	3
CHEM 1034	General Chemistry Laboratory II <sup>2</sup>	1
Term Credit Hours		17
<b>Year 2</b>		
<b>Fall</b>		
IH 0852 or 0952	Intellectual Heritage II: The Common Good [GZ]	3
MATH 2043	Calculus III	4
CHEM 2201	Organic Chemistry I	3
CHEM 2203	Organic Chemistry Laboratory I	1
Select one of the following:		4
PHYS 1061	Elementary Classical Physics I	

PHYS 2021	General Physics I	
	Term Credit Hours	15
<b>Spring</b>		
EDUC 2109	Adolescent Development for Educators <sup>1,3</sup>	3
SPED 2231	Introduction to Special Education <sup>1,3</sup>	3
EDUC 4111	Classroom and Conflict Management in Grades 4 through 12	3
CHEM 2202	Organic Chemistry II	3
CHEM 2204	Organic Chemistry Laboratory II	1
Select one of the following:		4
PHYS 1062	Elementary Classical Physics II	
PHYS 2022	General Physics II	
	Term Credit Hours	17
<b>Year 3</b>		
<b>Fall</b>		
GenEd Breadth Course		3
CHEM 3301	Physical Chemistry Lecture I	3
EDUC 2296	Effective Teaching: Theory and Practice [WI]	3
EDUC 1255	Inclusive Education for a Diverse Society	3
ENES 3338	Foundations of Language Teaching: Teaching English Language Learners in Grades 4 to 12 <sup>3</sup>	3
	Term Credit Hours	15
<b>Spring</b>		
GenEd Breadth Course		3
CHEM 3103	Techniques of Chemical Measurement I	3
CHEM 3105	Introduction to Chemical Research Techniques	1
CHEM 3302	Physical Chemistry Lecture II	3
SCES 3146	The Teaching of Science in Secondary Schools	3
EDUC 4389	Field Experience	1
EDUC 2255	Effective Use of Instructional Technology in Classrooms	3
	Term Credit Hours	17
<b>Year 4</b>		
<b>Fall</b>		
SECE 3796	Differentiated Literacy Instruction in the Disciplines, 7-12 [WI]	3
EDUC 2306	Assessment and Evaluation	3
SCES 4146	Teaching Science in Secondary Schools II	3
EDUC 4389	Field Experience	1
CHEM 4196	Techniques of Chemical Measurement II [WI]	5
Select one of the following:		2
CHEM 3397	Physical Chemistry Laboratory I [WI]	
CHEM 3398	Physical Chemistry Laboratory II [WI]	
	Term Credit Hours	17
<b>Spring</b>		
SECE 4688	Student Teaching in Secondary Education	9
SECE 4801	Senior Seminar and Performance Assessment in Secondary Education	3
	Term Credit Hours	12
	Total Credit Hours:	125

<sup>1</sup> Course must be successfully completed to be eligible for Candidacy approval.

<sup>2</sup> These courses constitute the waiver for the GenEd Science and Technology category if the courses are completed with a C- or better.

<sup>3</sup> These 3 courses constitute the waiver for the GenEd Human Behavior category if the courses are completed with a C- or better.

**B.S.Ed. in Secondary Education / Science Education: Physics**

<b>Year 1</b>		<b>Credit Hours</b>
<b>Fall</b>		
ENG 0802, 0812, or 0902	Analytical Reading and Writing [GW] <sup>1</sup>	4
GenEd Breadth Course		3
MATH 1041	Calculus I <sup>1</sup>	4
Select one of the following: <sup>2</sup>		4
PHYS 1061	Elementary Classical Physics I	
PHYS 2021	General Physics I	
	Term Credit Hours	15
<b>Spring</b>		
IH 0851 or 0951	Intellectual Heritage I: The Good Life [GY] <sup>1</sup>	3
GenEd Breadth Course		3
MATH 1042	Calculus II <sup>1</sup>	4
EDUC 2103	Socio-cultural Foundations of Education in the United States <sup>1</sup>	3
Select one of the following: <sup>2</sup>		4
PHYS 1062	Elementary Classical Physics II	
PHYS 2022	General Physics II	
	Term Credit Hours	17
<b>Year 2</b>		
<b>Fall</b>		
IH 0852 or 0952	Intellectual Heritage II: The Common Good [GZ]	3
GenEd Breadth Course		3
MATH 2043	Calculus III	4
EDUC 2255	Effective Use of Instructional Technology in Classrooms	3
EDUC 2296	Effective Teaching: Theory and Practice [WI]	3
	Term Credit Hours	16
<b>Spring</b>		
EDUC 2109	Adolescent Development for Educators <sup>1,3</sup>	3
SPED 2231	Introduction to Special Education <sup>1,3</sup>	3
EDUC 4111	Classroom and Conflict Management in Grades 4 through 12	3
PHYS 2502	Mathematical Physics	4
PHYS 2796	Introduction to Modern Physics [WI]	4
	Term Credit Hours	17
<b>Year 3</b>		
<b>Fall</b>		
GenEd Breadth Course		3
Physics Elective (see list below)		3
Science Sequence Part 1 - Select one of the following:		4
BIOL 1011	General Biology I	
BIOL 1111	Introduction to Organismal Biology	
CHEM 1031 & CHEM 1033	General Chemistry I	
EES 2001	Physical Geology	
PHYS 3301	Electricity and Magnetism	4
EDUC 1255	Inclusive Education for a Diverse Society	3
	Term Credit Hours	17
<b>Spring</b>		
PHYS 2101	Classical Mechanics	3
Science Sequence Part 2 - Select one of the following to continue the sequence begun last semester:		4
BIOL 1012	General Biology II	
BIOL 2112	Introduction to Cellular and Molecular Biology	

CHEM 1032 & CHEM 1034 2000+ GEOL course	General Chemistry II	
PHYS 4796	Experimental Physics [WI]	3
SCES 3146	The Teaching of Science in Secondary Schools	3
EDUC 4389	Field Experience	1
ENES 3338	Foundations of Language Teaching: Teaching English Language Learners in Grades 4 to 12	3
Term Credit Hours		17
<b>Year 4</b>		
<b>Fall</b>		
SECE 3796	Differentiated Literacy Instruction in the Disciplines, 7-12 [WI]	3
Physics Elective (see list below)		3
Physics Elective (see list below)		3
SCES 4146	Teaching Science in Secondary Schools II	3
EDUC 4389	Field Experience	1
EDUC 2306	Assessment and Evaluation	3
Term Credit Hours		16
<b>Spring</b>		
SECE 4688	Student Teaching in Secondary Education	9
SECE 4801	Senior Seminar and Performance Assessment in Secondary Education	3
Term Credit Hours		12
Total Credit Hours:		127

<sup>1</sup> Course must be successfully completed to be eligible for Candidacy approval.

<sup>2</sup> These 2 courses constitute the waiver for the GenEd Science and Technology category if the courses are completed with a C- or better.

<sup>3</sup> These 3 courses constitute the waiver for the GenEd Human Behavior category if the courses are completed with a C- or better.

Code	Title	Credit Hours
<b>Physics Electives</b>		
PHYS 1004	Introduction to Astronomy (F)	3
PHYS 2501	(F)	3
PHYS 3101	Analytical Mechanics (F)	3
PHYS 3302	Classical Electromagnetism (S)	3
PHYS 3701	Introduction to Quantum Mechanics I (S)	3
PHYS 4101	Thermal Physics (F)	3
PHYS 4301	Electronics (S - odd years)	3
PHYS 4302	Optics (F)	3
PHYS 4701	Introduction to Solid State Physics (S - even years)	3
PHYS 4702	Introduction to Quantum Mechanics II (F)	3
Code	Title	Credit Hours

(F) - Fall only course

(S) - Spring only course