

# Natural Sciences, B.A.

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The Bachelor of Arts (B.A.) in Natural Sciences provides students more breadth than traditional science programs. Many exciting areas of scientific inquiry, such as the neurosciences, environmental sciences, and biophysical sciences, require general science backgrounds that encompass multiple science disciplines.

Students planning graduate study or technical careers in one of these interdisciplinary areas, as well as students preparing for careers in health sciences, legal professions, science education, science-related business, or social service might be well served by the B.A. in Natural Sciences.

However, this program of study will not prepare students for graduate study in a traditional science discipline nor will it prepare students for technical employment in a traditional science discipline.

## Undergraduate Contact Information:

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## Bachelor of Arts

### Summary of Requirements for the Degree

#### 1. University Requirements (123 total s.h.)

- MATH 0701 (4 s.h.) and/or ENG 0701 (4 s.h.), if required by placement testing.
- All Temple students must take a minimum of two writing-intensive courses at Temple as part of their major. For Natural Sciences majors, one must be ENG 2696 and the second may be selected from the following list:
 

BIOL 2296	Genetics
BIOL 3096	Cell Structure and Function
BIOL 3396	Scientific Writing for Biology: The Art of Communicating
CHEM 4196	Techniques of Chemical Measurement II
CHEM 3397 & CHEM 3398	Physical Chemistry Laboratory I and Physical Chemistry Laboratory II
EES 2096	Climate Change: Oceans To Atmosphere
PHIL 2196	Perspectives on Science and Mathematics
PHIL 2596	Philosophical Perspectives on the Environment
PHYS 2796	Introduction to Modern Physics
PHYS 4796	Experimental Physics
SCTC 4396	Paradigms of Scientific Knowledge: Knowledge Discovery from Scientific Data
- Students must complete the General Education (GenEd) requirements.
  - See the General Education (<http://bulletin.temple.edu/undergraduate/general-education>) section of the *Undergraduate Bulletin* for the GenEd curriculum.
  - Students who complete CST majors typically receive a waiver for 2 Science & Technology (GS) and 1 Quantitative Literacy (GQ) GenEd courses.
- Students must satisfy general Temple University residency requirements (<http://bulletin.temple.edu/undergraduate/academic-policies/academic-residency-requirements>).

#### 2. College Requirements

- 90 credits within the College of Science & Technology (CST) or the College of Liberal Arts (CLA).
- 45 Upper-Level (2000+) credits within the College of Science & Technology (CST) or the College of Liberal Arts (CLA).
- Two (2) Upper-Level (2000+) Liberal Art courses.
- Second (2nd) Level of a Foreign Language (1002).

#### 3. Major Requirements for Bachelor of Arts (60-69 s.h.)

At least 7 courses required for the major must be completed at Temple. At least 2 courses in the chosen concentration must be completed at Temple.

### Biology

Select one of the following:		4
BIOL 1011	General Biology I (F)	
BIOL 1111	Introduction to Biology I	
BIOL 1911	Honors Introduction to Biology I (S)	
Select one of the following:		4
BIOL 1012	General Biology II (S)	
BIOL 2112	Introduction to Biology II	
BIOL 2912	Honors Introduction to Biology II (F)	

### Chemistry

Select one of the following:		4
CHEM 1031 & CHEM 1033	General Chemistry I and General Chemistry Laboratory I	
CHEM 1951 & CHEM 1953	Honors General Chemical Science I and Honors Chemical Science Laboratory I (F)	
Select one of the following:		4
CHEM 1032 & CHEM 1034	General Chemistry II and General Chemistry Laboratory II	
CHEM 1952 & CHEM 1954	Honors General Chemical Science II and Honors Chemical Science Laboratory II (S)	

### College of Science & Technology

Select one of the following: <sup>1</sup>		4
SCTC 1501	STEM Challenge: The World Around Us	
SCTC 1502	STEM Challenge: The World Within	
Select one of the following:		3
SCTC 4351	Paradigms of Scientific Knowledge: Knowledge Discovery from Scientific Data (F)	
SCTC 4396	Paradigms of Scientific Knowledge: Knowledge Discovery from Scientific Data	

### Computer Programming/Physics

Select one of the following:		3-4
CIS 1051	Introduction to Problem Solving and Programming in Python	
CIS 1052	Introduction to Web Technology and Programming	
CIS 1053	Programming in Matlab	
PHYS 1004	Introduction to Astronomy (F)	

### Earth & Environmental Science

EES 2001	Physical Geology	4
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### Mathematics

Select one of the following:		4-8
MATH 1031	Differential and Integral Calculus	
MATH 1041 & MATH 1044	Calculus I and Introduction to Probability and Statistics for the Life Sciences	
MATH 1041 & MATH 1042	Calculus I and Calculus II	
MATH 1941 & MATH 1942	Honors Calculus I and Honors Calculus II	

### Philosophy/History

Select one of the following:		3
PHIL 2196	Perspectives on Science and Mathematics (WI)	
SCTC 3001	History of Science	

### Physics

Select one of the following:		4
PHYS 1021	Introduction to General Physics I	

PHYS 1061	Elementary Classical Physics I	
PHYS 1961	Honors Elementary Classical Physics I (F)	
PHYS 2021	General Physics I	
PHYS 2921	Honors General Physics I (F)	
Select one of the following:		4
PHYS 1022	Introduction to General Physics II	
PHYS 1062	Elementary Classical Physics II	
PHYS 1962	Honors Elementary Classical Physics II (S)	
PHYS 2022	General Physics II	
PHYS 2922	Honors General Physics II (S)	
<b>Science Electives</b>		
Four Upper-Level (2000+) Science Electives <sup>2</sup>		12-16
<b>Technical Writing</b>		
ENG 2696	Technical Writing	3
Total Credit Hours		60-69

(F) - Fall only course

(S) - Spring only course

<sup>1</sup> It is recommended that SCTC 1501 or SCTC 1502 be completed before SCTC 4351 or SCTC 4396.

<sup>2</sup> The four science electives must be taken from the same department. The departments from which you can choose electives are: Biology, Chemistry, Earth & Environmental Science or Physics. In the circumstance where a laboratory course is the complement of a lecture course, both must be completed to fulfill the requirement for ONE science elective.

**Note:** A grade of C or higher in CHEM 1031 and CHEM 1032 is required to take BIOL 1111 and BIOL 2112. A grade of C or higher in BIOL 1111 and BIOL 2112 is required to take upper-level Biology courses, and a C- or higher is required unless otherwise specified in all other courses for the major, including course prerequisites.

## Calculation of Major GPA

Courses listed under the major requirements for the degree will be included in the calculation of the major GPA. Courses that could not apply toward the major as an elective or required course would not be counted in the calculation of the major GPA. This would include MATH 1022, for example.

## Distinction in Major

To graduate with a Distinction in Natural Sciences a student is required to achieve a 3.33 GPA or higher in all of the content area courses in the major.

## Suggested Academic Plan

### Bachelor of Arts in Natural Sciences

#### Requirements for New Students starting in the 2017-2018 Academic Year

Year 1		Credit Hours
<b>Fall</b>		
Select one of the following: <sup>1</sup>		4
SCTC 1501	STEM Challenge: The World Around Us	
SCTC 1502	STEM Challenge: The World Within	
Select one of the following:		4
CHEM 1031 & CHEM 1033	General Chemistry I	
CHEM 1951 & CHEM 1953	Honors General Chemical Science I (F)	
Select one of the following:		4
MATH 1031	Differential and Integral Calculus	
MATH 1041	Calculus I	
MATH 1941	Honors Calculus I (F)	
General Education/Elective Credits		3
Term Credit Hours		15

**Spring**

Select one of the following:		4
CHEM 1032 & CHEM 1034	General Chemistry II	
CHEM 1952 & CHEM 1954	Honors General Chemical Science II (S)	
Select one of the following: <sup>2</sup>		0-4
MATH 1044	Introduction to Probability and Statistics for the Life Sciences	
MATH 1042	Calculus II	
MATH 1942	Honors Calculus II	
General Education/Elective Credits		12-8
	Term Credit Hours	16

**Year 2****Fall**

Select one of the following:		4
BIOL 1011	General Biology I (F)	
BIOL 1111	Introduction to Biology I	
BIOL 1911	Honors Introduction to Biology I (S)	
EES 2001	Physical Geology	4
General Education/Elective Credits		7
	Term Credit Hours	15

**Spring**

Select one of the following:		4
BIOL 1012	General Biology II (S)	
BIOL 2112	Introduction to Biology II	
BIOL 2912	Honors Introduction to Biology II (F)	
ENG 2696	Technical Writing [WI]	3
Science Elective (2000+) <sup>3</sup>		3-4
General Education/Elective Credits		6-5
	Term Credit Hours	16

**Year 3****Fall**

Select one of the following:		4
PHYS 1021	Introduction to General Physics I	
PHYS 1061	Elementary Classical Physics I	
PHYS 1961	Honors Elementary Classical Physics I (F)	
PHYS 2021	General Physics I	
PHYS 2921	Honors General Physics I (F)	
Select one of the following:		3
PHIL 2196	Perspectives on Science and Mathematics [WI]	
SCTC 3001	History of Science	
Science Elective (2000+) <sup>3</sup>		3-4
General Education/Elective Credits		5-4
	Term Credit Hours	15

**Spring**

Select one of the following:		4
PHYS 1022	Introduction to General Physics II	
PHYS 1062	Elementary Classical Physics II	
PHYS 1962	Honors Elementary Classical Physics II (S)	
PHYS 2022	General Physics II	
PHYS 2922	Honors General Physics II (S)	

General Education/Elective Credits		11
	Term Credit Hours	15
<b>Year 4</b>		
<b>Fall</b>		
Select one of the following:		3
SCTC 4351	Paradigms of Scientific Knowledge: Knowledge Discovery from Scientific Data (F)	
SCTC 4396	Paradigms of Scientific Knowledge: Knowledge Discovery from Scientific Data [WI]	
Select one of the following:		3-4
CIS 1051	Introduction to Problem Solving and Programming in Python	
CIS 1052	Introduction to Web Technology and Programming	
CIS 1053	Programming in Matlab	
PHYS 1004	Introduction to Astronomy (F)	
Science Elective (2000+) <sup>3</sup>		3-4
General Education/Elective Credits		6-4
	Term Credit Hours	15
<b>Spring</b>		
Science Elective (2000+) <sup>3</sup>		3-4
General Education/Elective Credits		13-12
	Term Credit Hours	16
	Total Credit Hours:	123

<sup>1</sup> It is recommended that SCTC 1501 or SCTC 1502 be completed before SCTC 4351 or SCTC 4396.  
<sup>2</sup> These courses are not required if MATH 1031 is completed.  
<sup>3</sup> The four science electives must be taken from the same department. The departments from which you can choose electives are: Biology, Chemistry, Earth & Environmental Science or Physics. In the circumstance where a laboratory course is the complement of a lecture course, both must be completed to fulfill the requirement for ONE science elective.

(F) - Fall only course

(S) - Spring only course