

# Biophysics BS

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## Overview

The **Bachelor of Science in Biophysics**, offered by the Department of Physics, explores the fundamental principles of biology, chemistry, mathematics and physics and how these fields work together to advance scientific discovery. Biophysics students are prepared to pursue professional degrees in medicine and pharmacy, or advanced degrees in biology, biophysics, molecular biology or neuroscience, as well as the combined MD/PhD degree in medical physics, health physics or nuclear medicine.

**Campus Location:** Main

**Program Code:** ST-BIOP-BS

## Distinction in Major

To graduate with distinction in this major, a student must satisfy the following criteria:

- achieve a minimum 3.5 major GPA and
- carry out an independent study or undergraduate thesis project.

Consult the undergraduate physics faculty advisor for more details.

## Undergraduate Contact Information

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Learn more about the Bachelor of Science in Biophysics.

*These requirements are for students who matriculated in academic year 2023-2024. Students who matriculated prior to fall 2023 should refer to the Archives to view the requirements for their Bulletin year.*

## Bachelor of Science Requirements

### Summary of Requirements for the Degree

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

- Students must complete all University requirements including those listed below.
- All undergraduate students must complete at least two writing-intensive courses for a total of at least six credits at Temple as part of their major. The specific writing-intensive course options for this major are:

Code	Title	Credit Hours
BIOL 2297	Research Techniques in Genetics (S)	3
BIOL 3396	Scientific Writing for Biology: The Art of Communicating	3
BIOL 4396	Advanced Study in Biology	3
CHEM 3398	Physical Chemistry Laboratory II	2
CHEM 4196	Techniques of Chemical Measurement II	5
MATH 3098	Modern Algebra (F)	3
MATH 4096	Senior Problem Solving	3
PHYS 2796	Introduction to Modern Physics (S)	4
PHYS 4796	Experimental Physics	3

- Students must complete the General Education (GenEd) requirements.
  - See the General Education section of the *Undergraduate Bulletin* for the GenEd curriculum.
  - Students who complete CST majors receive a waiver for 2 Science & Technology (GS) and 1 Quantitative Literacy (GQ) GenEd courses.
- Students must satisfy general Temple University residency requirements.

## 2. College Requirements

- A minimum of 90 total credits within the College of Science & Technology (CST), the College of Liberal Arts (CLA), and/or the College of Engineering (ENG).
  - A minimum of 45 of these credits must be upper-level (courses numbered 2000 and above).
- Complete a one-credit first-year or transfer seminar.
  - SCTC 1001 CST First Year Seminar for every entering first-year CST student.
  - SCTC 2001 CST Transfer Seminar for every entering transfer CST student.

## 3. Major Requirements for Bachelor of Science (77-81 s.h.)

At least 10 courses required for the major must be completed at Temple. At least 3 Biology and 4 Physics courses must be completed at Temple.

Code	Title	Credit Hours
<b>Biology</b>		
BIOL 2112	Introduction to Cellular and Molecular Biology	4
or BIOL 2912	Honors Introduction to Cellular and Molecular Biology	
BIOL 2207	Genetics (S) <sup>1</sup>	3
BIOL 2297	Research Techniques in Genetics (S) <sup>1</sup>	3
BIOL 3204	Cell Structure and Function (F)	4
<b>Physics</b>		
Select one of the following:		4
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 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)	
PHYS 2502	Mathematical Physics (S)	4
PHYS 2796	Introduction to Modern Physics (S)	4
PHYS 3301	Electricity and Magnetism (F)	4
PHYS 4101	Thermal Physics (F)	3
<b>Chemistry</b>		
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)	
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Select one of the following: 4

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

CHEM 2201 & CHEM 2203	Organic Chemistry I and Organic Chemistry Laboratory I	
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CHEM 2211 & CHEM 2213	Organic Chemistry for Majors I and Organic Majors Laboratory I (F)	
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CHEM 2921 & CHEM 2923	Organic Chemistry for Honors I and Organic Honors Laboratory I (F)	
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Select one of the following: 4

CHEM 2202 & CHEM 2204	Organic Chemistry II and Organic Chemistry Laboratory II	
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CHEM 2212 & CHEM 2214	Organic Chemistry for Majors II and Organic Majors Laboratory II (S)	
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CHEM 2922 & CHEM 2924	Organic Chemistry for Honors II and Organic Honors Laboratory II (S)	
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#### Mathematics

MATH 1041 or MATH 1941	Calculus I Honors Calculus I	4
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MATH 1042 or MATH 1942	Calculus II Honors Calculus II	4
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MATH 2043 or MATH 2943	Calculus III Honors Calculus III	4
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#### Biophysics Electives

Four 2000+ Biophysics Electives chosen in consultation with the Physics faculty advisor. At least two of the electives must be Physics courses. 12-16

**Total Credit Hours** **77-81**

Code	Title	Credit Hours
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(F) - Fall only course

(S) - Spring only course

1

This course has a co-requisite of BIOL 2207.

The research and independent study courses shown below do not count as Biology electives, but they may count as free elective credits toward graduation. Most research courses can only be taken ONCE for a letter grade. Check individual course descriptions for details and/or exceptions.

Code	Title	Credit Hours
BIOL 2082	Independent Research I	1 to 4
BIOL 3082	Independent Research II	1 to 4
BIOL 3181	Cooperative Research in Biochemistry	3
BIOL 3681	Cooperative Studies	2 to 4
BIOL 3685	Externship Studies	3
BIOL 4291	Extrdepartmental Research	1 to 4
BIOL 4391	Accelerated Research in Biology	1 to 4
BIOL 4483	Accelerated Research in Biochemistry	3

BIOL 4491	Research in Biochemistry	3
BIOL 4591	Research in Neuroscience	1 to 4

## Suggested Academic Plan

### Bachelor of Science in Biophysics

#### Suggested Plan for New Students Starting in the 2023-2024 Academic Year

<b>Year 1</b>		
<b>Fall</b>		<b>Credit Hours</b>
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)	
MATH 1041 or MATH 1941	Calculus I or Honors Calculus I	4
SCTC 1001	CST First Year Seminar	1
ENG 0802 or ENG 0812 or ENG 0902	Analytical Reading and Writing or Analytical Reading and Writing: ESL or Honors Writing About Literature	4
Elective		2
<b>Credit Hours</b>		<b>15</b>
<b>Spring</b>		
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)	
MATH 1042 or MATH 1942	Calculus II or Honors Calculus II	4
IH 0851 or IH 0951	Intellectual Heritage I: The Good Life or Honors Intellectual Heritage I: The Good Life	3
Elective		5
<b>Credit Hours</b>		<b>16</b>
<b>Year 2</b>		
<b>Fall</b>		
Select one of the following:		4
CHEM 2201 & CHEM 2203	Organic Chemistry I and Organic Chemistry Laboratory I	
CHEM 2211 & CHEM 2213	Organic Chemistry for Majors I and Organic Majors Laboratory I (F)	
CHEM 2921 & CHEM 2923	Organic Chemistry for Honors I and Organic Honors Laboratory I (F)	
MATH 2043 or MATH 2943	Calculus III or Honors Calculus III	4
Select one of the following:		4
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)	
IH 0852 or IH 0952	Intellectual Heritage II: The Common Good or Honors Intellectual Heritage II: The Common Good	3
<b>Credit Hours</b>		<b>15</b>

**Spring**

Select one of the following:	4
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CHEM 2202 & CHEM 2204	Organic Chemistry II and Organic Chemistry Laboratory II		
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CHEM 2212 & CHEM 2214	Organic Chemistry for Majors II and Organic Majors Laboratory II (S)		
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CHEM 2922 & CHEM 2924	Organic Chemistry for Honors II and Organic Honors Laboratory II (S)		
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Select one of the following:	4
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PHYS 1062	Elementary Classical Physics II		
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PHYS 1962	Honors Elementary Classical Physics II (S)		
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PHYS 2022	General Physics II		
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PHYS 2922	Honors General Physics II (S)		
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GenEd Breadth Course	3-4
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Elective	5-4
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<b>Credit Hours</b>	<b>16</b>
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**Year 3****Fall**

BIOL 2112 or BIOL 2912	Introduction to Cellular and Molecular Biology or Honors Introduction to Cellular and Molecular Biology		4
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PHYS 3301	Electricity and Magnetism (F)		4
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2000+ Biophysics Elective <sup>1</sup>			3-4
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GenEd Breadth Course			3
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Elective			1-0
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<b>Credit Hours</b>	<b>15</b>
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**Spring**

PHYS 2502	Mathematical Physics (S)		4
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PHYS 2796	Introduction to Modern Physics (S)		4
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2000+ Biophysics Elective <sup>1</sup>			3-4
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GenEd Breadth Course			3
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Elective			1-0
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<b>Credit Hours</b>	<b>15</b>
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**Year 4****Fall**

BIOL 3204	Cell Structure and Function (F)		4
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PHYS 4101	Thermal Physics (F)		3
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2000+ Biophysics Elective <sup>1</sup>			3-4
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GenEd Breadth Course			3
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Elective			2-1
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<b>Credit Hours</b>	<b>15</b>
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**Spring**

BIOL 2207	Genetics (S)		3
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BIOL 2297	Research Techniques in Genetics (S)		3
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2000+ Biophysics Elective <sup>1</sup>			3-4
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GenEd Breadth Course			3
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Elective			4-3
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<b>Credit Hours</b>	<b>16</b>
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<b>Total Credit Hours</b>	<b>123</b>
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Code	Title	Credit Hours
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(F) - Fall only course

(S) - Spring only course

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Four electives must be chosen in consultation with the physics advisor. All courses must be 2000-level or above. At least two electives must be Physics courses. Choose courses in Physics, Biology (Neuroscience, Genetics, Cell Structure, Physiology), Chemistry (Physical Chemistry), Biochemistry and Biophysics. Recommended for graduate school in Physics: PHYS 2101, PHYS 3302, PHYS 3701 and PHYS 4796 and as much of the BS program in Physics as time allows. Students planning to go to medical school should complete BIOL 1111 Introduction to Organismal Biology.