

Biology, B.S.

Learn more about the Bachelor of Science in Biology.

The Bachelor of Science in Biology provides a strong preparation for those wishing to attend professional or graduate school in biology or related disciplines such as cell or molecular biology, ecology, bioinformatics, biochemistry, biophysics, medicine, pharmacy, dentistry, and allied health fields. It is also recommended for those who intend to enter the scientific workforce upon completion of a bachelor's degree.

Undergraduate Contact Information:

Dr. Robert Sanders, Chair
Biology-Life Sciences Building, Room 255
215-204-8851

Dr. Erik Cordes, Vice Chair
Biology-Life Sciences Building, Room 315A
erik.cordes@temple.edu
215-204-8876

Dr. Joel Sheffield, Faculty Advisor
Juniors/Seniors, Research Questions
Biology-Life Sciences Building, Room 311
215-204-8839
jbs@temple.edu

Dr. Angela Bricker, Faculty Advisor
First Year Students/Sophomore Year Students
Biology-Life Sciences Building, Room 248C
215-204-8578
abricker@temple.edu

Bachelor of Science

Summary of Requirements for the Degree

1. University Requirements

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

| Code | Title | Credit Hours |
|-----------|--|--------------|
| BIOL 2296 | Genetics (S) | 4 |
| BIOL 3096 | Cell Structure and Function (F) | 4 |
| BIOL 3396 | Scientific Writing for Biology: The Art of Communicating (S) | 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

- 45 Upper Level (2000+) credits within the College of Science & Technology (CST), the College of Liberal Arts (CLA), or the College of Engineering (ENG).
- 90 credits within the College of Science & Technology (CST), the College of Liberal Arts (CLA), or the College of Engineering (ENG).
- All students in the College of Science and Technology are required to take a one credit first year seminar. SCTC 1001 CST First Year Seminar is the appropriate course option for every entering first year CST major. Transfer students should use SCTC 2001 CST Transfer Seminar to fulfill this requirement. Other courses that fulfill this requirement may be found on the CST College Requirements page.

3. Major Requirements for Bachelor of Science (68-75 s.h.)

At least 9 courses required for the major must be completed at Temple. At least 6 Biology courses must be completed at Temple.

| Code | Title | Credit Hours |
|---|---|--------------|
| Biology | | |
| BIOL 1111 or BIOL 1911 | Introduction to Organismal Biology Honors Introduction to Organismal Biology | 4 |
| Select one of the following: | | 4 |
| BIOL 1112 or BIOL 1912 | | |
| BIOL 2112 or BIOL 2912 | Introduction to Cellular and Molecular Biology Honors Introduction to Cellular and Molecular Biology | |
| Select one of the following: | | 3 |
| BIOL 2227 | Principles of Ecology | |
| BIOL 3101 | Evolution (F) | |
| BIOL 2296 | Genetics (S) | 4 |
| Select one of the following: ¹ | | 3-4 |
| BIOL 3096 | Cell Structure and Function (F) | |
| BIOL 3324 | Molecular Biology (F) | |
| BIOL 4375 | General Biochemistry I | |
| Select 6 Biology electives 2200 or above ² | | 18-24 |
| 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) | |
| Select one of the following: | | 4 |
| CHEM 2201 & CHEM 2203 | Organic Chemistry I and Organic Chemistry Laboratory I | |
| CHEM 2921 & CHEM 2923 | Organic Chemistry for Honors I and Organic Honors Laboratory I (F) | |
| Select one of the following: | | 4 |
| CHEM 2202 & CHEM 2204 | Organic Chemistry II and Organic Chemistry Laboratory II | |
| CHEM 2922 & CHEM 2924 | Organic Chemistry for Honors II and Organic Honors Laboratory II (S) | |
| Mathematics | | |
| MATH 1041 or MATH 1941 | Calculus I Honors Calculus I | 4 |
| Select one of the following: | | 4 |
| MATH 1042 or MATH 1942 | Calculus II Honors Calculus II | |
| MATH 1044 | Introduction to Probability and Statistics for the Life Sciences | |
| Physics | | |
| Select one of the following: | | 4 |
| PHYS 1021 | Introduction to General Physics I | |
| PHYS 1061 or PHYS 1961 | Elementary Classical Physics I Honors Elementary Classical Physics I | |
| PHYS 2021 or PHYS 2921 | General Physics I Honors General Physics I | |

Select one of the following: 4

| | |
|---------------------------|---|
| PHYS 1022 | Introduction to General Physics II |
| PHYS 1062 or PHYS 1962 | Elementary Classical Physics II Honors Elementary Classical Physics II |
| PHYS 2022 or PHYS 2922 | General Physics II Honors General Physics II |

Total Credit Hours 68-75

| Code | Title | Credit Hours |
|------|-------|--------------|
|------|-------|--------------|

(F) - Fall only course

(S) - Spring only course

1 Students need to take another WI course if BIOL 3096 is not selected.

2 Up to two (2) Biology Electives (6-8 s.h.) may be replaced by Cognate electives selected from the following (B.S. degree only): ANTH 2764; CHEM 3301, CHEM 3302; MATH 1042/MATH 1942; or MATH 2043/MATH 2943 (but only one of these math courses, and MATH 1042/MATH 1942 may only count if MATH 1044 is used to satisfy the second math course requirement in the major); PHYS 2511 and PHYS 3511, PHYS 4301; STAT 5002 (if substituted for BIOL 3312; students are not allowed to use both BIOL 3312 and STAT 5002 as upper-level electives).

Note: Grades of C- or higher are required unless otherwise specified in all courses for the major, including course prerequisites. Most research and independent study courses do not count as Biology electives, such as:

| Code | Title | Credit Hours |
|-----------|--------------------------------------|--------------|
| BIOL 2082 | Independent Research I | 1 to 4 |
| BIOL 3082 | Independent Research II | 1 to 4 |
| BIOL 3091 | Research Methods | 3 |
| BIOL 3681 | Cooperative Studies | 2 to 4 |
| BIOL 3685 | Externship Studies | 3 |
| BIOL 4291 | Extrdepartmental Research | 1 to 4 |
| BIOL 4483 | Accelerated Research in Biochemistry | 3 |
| BIOL 4491 | Research in Biochemistry | 3 |
| BIOL 4591 | Research in Neuroscience | 1 to 4 |

A GPA of 2.0 or better is required in Biology courses in order to graduate.

Distinction in the Major

To be eligible for distinction in the major, a student must retain a grade point average of 3.2 or better (overall and in the major); should register for BIOL 4391 Accelerated Research in Biology or BIOL 4291 Extrdepartmental Research for a total of 6 s.h. over two semesters; and must write a final research paper and present his/her research at a departmental research poster session before graduation. A student, however, does not have to enroll in the distinction program in order to participate in departmental research. Other courses (BIOL 2082 Independent Research I and BIOL 3082 Independent Research II), provide credit toward graduation and research experience, and are available to undergraduate students from their sophomore through their senior year. A student may register for BIOL 3082 more than one semester, however only one semester may be completed for a grade. The additional semester may be taken for credit/no credit. In all cases, permission of the faculty and application to the department Honors Committee is required before registering for research credits.

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 BIOL 1011, for example.

A total of up to 3 s.h. of Biology research courses numbered lower than 4000 (to include: BIOL 2082, BIOL 3082, BIOL 3181, BIOL 3281, and BIOL 3681) may be taken for a letter grade. Any additional credits in research courses in this category can be taken only on a CR/NC basis. No research courses numbered lower than 4000 may be used for Biology elective credit.

Suggested Academic Plan**Bachelor of Science in Biology****Requirements for New Students starting in the 2021-2022 Academic Year**

| Year 1 | | Credit Hours |
|------------------------------|--|---------------------|
| Fall | | |
| BIOL 1111 or 1911 | Introduction to Organismal Biology | 4 |
| Select one of the following: | | 4 |
| CHEM 1031 & CHEM 1033 | General Chemistry I | |
| CHEM 1951 & CHEM 1953 | Honors General Chemical Science I (F) | |
| SCTC 1001 | CST First Year Seminar | 1 |
| GenEd Breadth Course | | 3 |
| Elective | | 3 |
| Term Credit Hours | | 15 |
| Spring | | |
| Select one of the following: | | 4 |
| BIOL 1112 or 1912 | | |
| BIOL 2112 or 2912 | Introduction to Cellular and Molecular Biology | |
| Select one of the following: | | 4 |
| CHEM 1032 & CHEM 1034 | General Chemistry II | |
| CHEM 1952 & CHEM 1954 | Honors General Chemical Science II (S) | |
| MATH 1041 or 1941 | Calculus I | 4 |
| ENG 0802, 0812, or 0902 | Analytical Reading and Writing [GW] | 4 |
| Term Credit Hours | | 16 |
| Year 2 | | |
| Fall | | |
| Select one of the following: | | 3 |
| BIOL 2227 | Principles of Ecology | |
| BIOL 3101 | Evolution (F) | |
| Select one of the following: | | 4 |
| CHEM 2201 & CHEM 2203 | Organic Chemistry I | |
| CHEM 2921 & CHEM 2923 | Organic Chemistry for Honors I (F) | |
| Select one of the following: | | 4 |
| MATH 1042 or 1942 | Calculus II | |
| MATH 1044 | Introduction to Probability and Statistics for the Life Sciences | |
| IH 0851 or 0951 | Intellectual Heritage I: The Good Life [GY] | 3 |
| Elective | | 1 |
| Term Credit Hours | | 15 |
| Spring | | |
| BIOL 2296 | Genetics [WI] (S) | 4 |
| Select one of the following: | | 4 |
| CHEM 2202 & CHEM 2204 | Organic Chemistry II | |
| CHEM 2922 & CHEM 2924 | Organic Chemistry for Honors II (S) | |
| IH 0852 or 0952 | Intellectual Heritage II: The Common Good [GZ] | 3 |
| GenEd Breadth Course | | 3 |

| | | |
|---|--------------------------------------|---------------------|
| Elective | | 1 |
| Term Credit Hours | | 15 |
| Year 3 | | |
| Fall | | |
| Select one of the following: ¹ | | 3-4 |
| BIOL 3096 | Cell Structure and Function [WI] (F) | |
| BIOL 3324 | Molecular Biology (F) | |
| BIOL 4375 | General Biochemistry I | |
| Select one of the following: | | 4 |
| PHYS 1021 | Introduction to General Physics I | |
| PHYS 1061 or 1961 | Elementary Classical Physics I | |
| PHYS 2021 or 2921 | General Physics I | |
| GenEd Breadth Course | | 3 |
| Elective | | 3 |
| Elective | | 3-2 |
| Term Credit Hours | | 16 |
| Spring | | |
| Select one of the following: | | 4 |
| PHYS 1022 | Introduction to General Physics II | |
| PHYS 1062 or 1962 | Elementary Classical Physics II | |
| PHYS 2022 or 2922 | General Physics II | |
| Upper-Level 2200+ Biology Elective ² | | 3-4 |
| Upper-Level 2200+ Biology Elective ² | | 3-4 |
| GenEd Breadth Course | | 3 |
| Elective | | 3-1 |
| Term Credit Hours | | 16 |
| Year 4 | | |
| Fall | | |
| Upper-Level 2200+ Biology Elective ² | | 3-4 |
| Upper-Level 2200+ Biology Elective ² | | 3-4 |
| GenEd Breadth Course | | 3-4 |
| Elective | | 3 |
| Elective | | 3-0 |
| Term Credit Hours | | 15 |
| Spring | | |
| Upper-Level 2200+ Biology Elective or Cognate Elective ² | | 3-4 |
| Upper-Level 2200+ Biology Elective or Cognate Elective ² | | 3-4 |
| Elective | | 3 |
| Elective | | 3 |
| Elective | | 3-1 |
| Term Credit Hours | | 15 |
| Total Credit Hours: | | 123 |
| Code | Title | Credit Hours |

(F) - Fall only course

(S) - Spring only course

¹ Students need to take another WI course if BIOL 3096 is not selected.² If the student has taken the necessary prerequisite courses, some of the Biology or Cognate elective courses may be taken before the Spring semester of Year 3.