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 recommended for those who intend to enter the scientific workforce upon completion of a bachelor's degree.

**Undergraduate Contact Information:**

Dr. Robert Sanders, Chair  
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215-204-8851

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215-204-8876

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Juniors/Seniors, Research Questions  
Biology-Life Sciences Building, Room 311  
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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**
   - 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. Following is a list of courses that can be used to satisfy the writing-intensive requirement:
     - 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 (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**
   - 45 Upper Level (2000+) credits within the College of Science & Technology (CST) or the College of Liberal Arts (CLA).
   - 90 credits within the College of Science & Technology (CST) or the College of Liberal Arts (CLA).

3. **Major Requirements for Bachelor of Science (69-75 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.

   **Biology**
   - BIOL 1111 Introduction to Biology I 4
   - or BIOL 1911 Honors Introduction to Biology I
   - BIOL 2112 Introduction to Biology II 4
   - or BIOL 2912 Honors Introduction to Biology II
<table>
<thead>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 2227</td>
<td>Principles of Ecology (S)</td>
<td>3</td>
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<tr>
<td>BIOL 2296</td>
<td>Genetics (S)</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 3096</td>
<td>Cell Structure and Function (F)</td>
<td>4</td>
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Select 6 Biology electives 2200 or above \(^1\) 18-24

Chemistry

Select one of the following:

<table>
<thead>
<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>CHEM 1031</td>
<td>General Chemistry I &amp; General Chemistry Laboratory I</td>
<td>4</td>
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<tr>
<td>CHEM 1951</td>
<td>Honors General Chemical Science I &amp; Honors Chemical Science Laboratory I (F)</td>
<td>4</td>
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Select one of the following:

<table>
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<tr>
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<th>Course Title</th>
<th>Credits</th>
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<td>4</td>
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<tr>
<td>CHEM 1952</td>
<td>Honors General Chemical Science II &amp; Honors Chemical Science Laboratory II (S)</td>
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Select one of the following:

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 2201</td>
<td>Organic Chemistry I &amp; Organic Chemistry Laboratory I</td>
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<td>CHEM 2211</td>
<td>Organic Chemistry for Majors I &amp; Organic Majors Laboratory I (F)</td>
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<td>CHEM 2921</td>
<td>Organic Chemistry for Honors I &amp; Organic Honors Laboratory I (F)</td>
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Select one of the following:

<table>
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<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
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<td>CHEM 2202</td>
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<td>CHEM 2212</td>
<td>Organic Chemistry for Majors II &amp; Organic Majors Laboratory II (S)</td>
<td>4</td>
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<tr>
<td>CHEM 2922</td>
<td>Organic Chemistry for Honors II &amp; Organic Honors Laboratory II (S)</td>
<td>4</td>
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Mathematics

Select one of the following:

<table>
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<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MATH 1041</td>
<td>Calculus I</td>
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<tr>
<td>MATH 1941</td>
<td>Honors Calculus I</td>
<td>4</td>
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Select one of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MATH 1044</td>
<td>Introduction to Probability and Statistics for the Life Sciences</td>
<td>4</td>
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<td>MATH 1042</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 1942</td>
<td>Honors Calculus II</td>
<td>4</td>
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Physics

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<tr>
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<th>Course Title</th>
<th>Credits</th>
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</thead>
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<tr>
<td>PHYS 2021</td>
<td>General Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 2921</td>
<td>Honors General Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 2022</td>
<td>General Physics II</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 2922</td>
<td>Honors General Physics II</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Credit Hours 69-75

\(^{(F)}\) - Fall only course

\(^{(S)}\) - Spring only course

\(^1\) 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 or MATH 1942 or MATH 2043 or MATH 2943 (but only one of these math courses, and MATH 1042/MATH 1942 may only count if MATH 1044 was used to satisfy the second math course requirement); PHYS 2501, 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:** A grade of C or higher in CHEM 1031 or its Honors alternate is required to take BIOL 1111. Grades of C or higher in both CHEM 1031 and CHEM 1032 or their Honors alternates are required to take BIOL 2112. Grades of C or higher in BIOL 1111 and BIOL 2112 or their Honors
alternates are 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. Most research and independent study courses are not available for major credit, such as:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 2082</td>
<td>Independent Research I</td>
<td>1 to 4</td>
</tr>
<tr>
<td>BIOL 3082</td>
<td>Independent Research II</td>
<td>1 to 4</td>
</tr>
<tr>
<td>BIOL 3091</td>
<td>Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 3681</td>
<td>Cooperative Studies</td>
<td>2 to 4</td>
</tr>
<tr>
<td>BIOL 4291</td>
<td>Extradepartmental Research</td>
<td>1 to 4</td>
</tr>
<tr>
<td>BIOL 4483</td>
<td>Accelerated Research in Biochemistry</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 4491</td>
<td>Research in Biochemistry</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 4591</td>
<td>Research in Neuroscience</td>
<td>1 to 4</td>
</tr>
</tbody>
</table>

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 Extradepartmental 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 2017-2018 Academic Year**

**Year 1**

**Fall**

<table>
<thead>
<tr>
<th>Course Code &amp; Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>Select one of the following:</td>
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<tr>
<td>CHEM 1031 &amp; CHEM 1033</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>CHEM 1951 &amp; CHEM 1953</td>
<td>Honors General Chemical Science I (F)</td>
</tr>
<tr>
<td>MATH 1041 or 1941</td>
<td>Calculus I</td>
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<tr>
<td>General Education/Elective Credits</td>
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**Spring**

<table>
<thead>
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<th>Course Code &amp; Title</th>
<th>Credit Hours</th>
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<tr>
<td>BIOL 1111 or 1911</td>
<td>Introduction to Biology I</td>
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<tr>
<td>Select one of the following:</td>
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<td>CHEM 1032 &amp; CHEM 1034</td>
<td>General Chemistry II</td>
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<td>CHEM 1952 &amp; CHEM 1954</td>
<td>Honors General Chemical Science II (S)</td>
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<td>Select one of the following:</td>
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<tr>
<td>MATH 1044</td>
<td>Introduction to Probability and Statistics for the Life Sciences</td>
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<td>MATH 1042</td>
<td>Calculus II</td>
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<td>Year 2</td>
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<tr>
<td></td>
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<tr>
<td>BIOL 2112 or 2912</td>
<td>Introduction to Biology II</td>
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<tr>
<td>Select one of the following:</td>
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<td>CHEM 2201 &amp; CHEM 2203</td>
<td>Organic Chemistry I</td>
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<tr>
<td>CHEM 2211 &amp; CHEM 2213</td>
<td>Organic Chemistry for Majors I (F)</td>
</tr>
<tr>
<td>CHEM 2921 &amp; CHEM 2923</td>
<td>Organic Chemistry for Honors I (F)</td>
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<tr>
<td>General Education/Elective Credits</td>
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<tr>
<td>Term Credit Hours</td>
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<tr>
<td><strong>Spring</strong></td>
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</tr>
<tr>
<td>BIOL 2227</td>
<td>Principles of Ecology (S)</td>
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<td>BIOL 2296</td>
<td>Genetics [WI] (S)</td>
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<td>Select one of the following:</td>
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<td>CHEM 2202 &amp; CHEM 2204</td>
<td>Organic Chemistry II</td>
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<td>CHEM 2212 &amp; CHEM 2214</td>
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<tr>
<td>BIOL 3096</td>
<td>Cell Structure and Function [WI] (F)</td>
<td>4</td>
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<tr>
<td>Upper-Level 2200+ Biology Elective</td>
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<tr>
<td>Upper-Level 2200+ Biology Elective</td>
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</tr>
<tr>
<td>PHYS 2022 or 2922</td>
<td>General Physics II</td>
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<td>General Education/Elective Credits</td>
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<th>Year 4</th>
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<td></td>
<td><strong>Fall</strong></td>
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</tr>
<tr>
<td>Upper-Level 2200+ Biology Elective</td>
<td>3-4</td>
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<tr>
<td>Upper-Level 2200+ Biology Elective</td>
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<td><strong>Spring</strong></td>
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<tr>
<td>Upper-Level 2200+ Biology Elective or Cognate Elective</td>
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<tr>
<td>Upper-Level 2200+ Biology Elective or Cognate Elective</td>
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</table>

Total Credit Hours: 123
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.

(F) - Fall only course

(S) - Spring only course