**Program Progression Guide**

**Disclaimer:** The 2018-2019 Purdue West Lafayette catalog is considered the source for academic and programmatic requirements for students entering programs during the Fall 2018, Spring 2019, and Summer 2019 semesters. The Program Progression Guide assists students in the development of an individualized 8-semester plan. Students are encouraged to use this guide, myPurduePlan* (online degree auditing tool) and the Student Educational Planner (SEP) as they work with their academic advisor towards the completion of their degree requirements. **Notification:** Each student is ultimately responsible for knowing, monitoring and completing all degree requirements.

An undergraduate degree in the College of Science requires completion of the following degree requirements.

<table>
<thead>
<tr>
<th>University Degree Requirements</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum 2.0 Cumulative GPA</td>
<td>Minimum 120 Credits that fulfill degree requirements</td>
</tr>
</tbody>
</table>

**University Core Curriculum**

- Human Cultures: Behavioral/Social Science
- Human Cultures: Humanities
- Information Literacy
- Oral Communication
- Quantitative Reasoning
- Science
- Science, Technology & Society Selective
- Written Communication

**Course Listing**

**Required Major Program Courses**

Minimum 2.0 cumulative GPA in all biology courses required for this major. A minimum of 32 credits at or above the 300-level completed at a Purdue campus. At least one 500-level Biology course other than BIOL 54200.

**College of Science Core Curriculum**

- Freshman Composition – 3 credits
- Technical Writing and Presentation - 3 credits
- Teaming & Collaboration (NC)
- General Education - 9 credits
- Foreign Language & Culture – 9 credits
- Great Issues - 3 credits
- Laboratory Science - 8 credits
- Mathematics - 6-10 credits
- Multidisciplinary - 3 credits
- Statistics - 3 credits
- Computing - 3 credits

**Degree Electives**

Any Purdue or transfer course approved to meet degree requirements in accordance with individual departmental policies. Consult the No Count course list for courses, which may not be used to meet any College of Science degree requirement.

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* This audit is not your academic transcript and it is not official notification of completion of degree or certificate requirements.

** University Core Curriculum Outcomes may be met through completion of the College of Science Core curriculum. Students should consult with their academic advisors and myPurdue Plan for course selections.
The Biology Department has suggested the following degree progression guide for the Biochemistry Degree. Students will work with their academic advisors to determine their best path to degree completion. Course pre-requisites are specific to this degree plan.

<table>
<thead>
<tr>
<th>Credit</th>
<th>Fall 1st Year</th>
<th>Prerequisite</th>
<th>Credit</th>
<th>Spring 1st Year</th>
<th>Prerequisite</th>
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<tbody>
<tr>
<td>2</td>
<td>BIOL 12100</td>
<td></td>
<td>3</td>
<td>BIOL 13100</td>
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<tr>
<td>2</td>
<td>BIOL 13500</td>
<td>CHM 12901 co-req</td>
<td>4</td>
<td>Organic Chem I Selective</td>
<td>CHM 11600 or 12901</td>
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<td>5</td>
<td>CHM 12901</td>
<td>ALEKS 85</td>
<td>4-5</td>
<td>Calculus II Selective</td>
<td>Calculus I</td>
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<td>ENGL 10600 or 10800</td>
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<tr>
<td>1</td>
<td>Elective (BIOL 11500 pref)</td>
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<tr>
<td>17-18</td>
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<td>17-19</td>
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<th>Prerequisite</th>
<th>Credit</th>
<th>Spring 2nd Year</th>
<th>Prerequisite</th>
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<tr>
<td>3</td>
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<td>CHM 12901 co-req; BIOL 13100</td>
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<td>BIOL 24100</td>
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<td>BIOL 24200</td>
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<td>4</td>
<td>PHYS I Selective</td>
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<tr>
<td>3</td>
<td>Language/Culture III Selective</td>
<td>Varies</td>
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<td>BIOL 28600</td>
<td>BIOL 12100</td>
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<tr>
<td>3</td>
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<td>Free Elective (BIOL 29300 pref)</td>
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<tr>
<td>3</td>
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<tr>
<td>3</td>
<td>BIOL 39500</td>
<td>BIOL 23100 &amp; 24100</td>
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<td>Computer Science Selective</td>
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<tr>
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<td>PHY 2 Selective</td>
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<td>3</td>
<td>BIOL 41500</td>
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<table>
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<th>Credit</th>
<th>Spring 4th Year</th>
<th>Prerequisite</th>
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<tr>
<td>3</td>
<td>BIOL 42000</td>
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<td>4</td>
<td>Physical Chemistry Selective</td>
<td>Varies</td>
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<tr>
<td>3</td>
<td>BIOL 59500</td>
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<td>3</td>
<td>STAT 50300</td>
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<tr>
<td>3-4</td>
<td>Analytical Chemistry Selective</td>
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<td>Great Issues Selective</td>
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<td>1-3</td>
<td>Multidisciplinary Selective</td>
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<td>2-4</td>
<td>Base Lab Requirement</td>
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<td>2</td>
<td>Free Elective</td>
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<tr>
<td>12-16</td>
<td></td>
<td></td>
<td>14-16</td>
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</table>

Courses in ( ) are recommended.

**College of Science Core Curriculum (SCC)**

A. Freshman Composition  
B. Technical Writing and Presentation  
C. Teaming and Collaboration  
D. General Education  
E. Foreign Language and Culture  
F. Great Issues  
G. Laboratory Science  
H. Multidisciplinary  
I. Mathematics  
J. Statistics  
K. Computing  

*Consult the University Core Requirement course list for approved courses.*
Graduation Requirements:

- A minimum 2.0 average in all biology courses required for this major
- A minimum of 32 credits at or above the 300-level completed at a Purdue campus
- At least one 500-level Biology course other than BIOL 54200
- 120 Total Credits

**BIOLOGY:**

1. BIOL 12100 Biology I: Diversity, Ecology and Behavior (2 cr.; fall) or
   BIOL 19500 Biodiversity, Ecology & Evolution (3 cr.; fall)
2. BIOL 13100 Biology II: Development, Structure, and Function of Organisms (3 cr.; spring) or
   BIOL 19500 Organismal Development & Physiology (3 cr.; spring)
3. BIOL 13500 1st Year Biology Lab (2 cr.; both) or
   BIOL 14501 1st Year Biology Lab w/Neuro Research Project (2 cr.; fall) or
   IT 22600 Biotechnology Lab (2 cr.; fall)
4. BIOL 23100 Biology III: Cell Structure and Function (3 cr.; fall)
5. BIOL 23200 Laboratory in Biology III: Cell Structure and Function (2 cr.; fall)
6. BIOL 24100 Biology IV: Genetics and Molecular Biology (3 cr.; spring)
7. BIOL 24200 Laboratory in Genetics and Molecular Biology (2 cr.; spring)
8. BIOL 28600 Intro. to Ecology & Evolution (2 cr.; spring)
9. Intermediate Requirement: Choose one of these eight options:
   (Biochemistry majors must choose BIOL 39500, Macromolecules)
   A. BIOL 32800 Principles of Physiology (4 cr.; spring)
   B. BIOL 36700 Principles of Development (2 cr.; spring) plus BIOL 36701 Principles of Development Laboratory (1 cr.; spring)
   C. BIOL 39500 Macromolecules (3 cr.; fall)
   D. BIOL 41500 Intro. to Molecular Biology (3 cr.; spring)
   E. BIOL 41600 Viruses & Viral Diseases (3 cr.; spring)
   F. BIOL 42000 Eukaryotic Cell Biology (3 cr.; fall)
   G. BIOL 43600 Neurobiology (3 cr.; fall)
   H. BIOL 43800 General Microbiology (3 cr.; fall)
10. BIOL 41500 Intro. to Molecular Biology (3 cr.; spring)
11. BIOL 42000 Eukaryotic Cell Biology (3 cr.; fall)
12. BIOL 59500 Methods & Measurement in Physical Biochemistry (3 cr.; fall)
13. Biology Selective: One of these courses:
   A. BIOL 41600 Viruses and Viral Diseases (3 cr.; spring)
   B. BIOL 43600 General Microbiology (3 cr.; fall)
   C. BIOL 47600 Intro to Bioinformatics (3 cr.; fall)
   D. BIOL 48100 Eukaryotic Genetics (3 cr.; spring)
   E. BIOL 51100 Intro to X-Ray Crystal (3 cr.; spring)
   F. BIOL 51700 Molecular Biology of Proteins (2 cr.; spring)
   G. BIOL 52900 Bacterial Physiology (3 cr.; spring)
   H. BIOL 53700 Immunology (3 cr.; spring)
   I. BIOL 53800 Molecular, Cellular & Developmental Neurobiology (3 cr.; spring)
   J. BIOL 54100 Molecular Genetics of Bacteria (3 cr.; fall)
   K. BIOL 55001 Eukaryotic Molecular Biology (3 cr.; fall)
   L. BIOL 59500 Epigenetics in Human Disease (3 cr.; fall)
   M. BIOL 59500 Genetics Omics Host Microbe (3 cr.; fall)
   N. BIOL 59500 Theory of Molecular Methods (3 cr.; fall)
14. Base Lab Requirement: Must meet Base Lab requirement as described below
15. BCHM 56100 General Biochemistry I (3 cr.; fall)
16. BCHM 56200 General Biochemistry II (3 cr.; spring)

**Base Laboratory Requirement for all Biology Majors**

1. Each student will satisfy each of the following three learning objectives:
   Objective 1 – Research planning, literature review, and writing
   Objective 2 – Observation, experimentation
   Objective 3 – Analysis, simulation, and presentation
   (continued on back)

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1 This course may count for the Biology Selective and as the College of Science Multidisciplinary requirement.
2 This course may NOT count for the Biology Selective and toward the Base Laboratory Requirement. It can only be used for one requirement.

*Other Biochemistry requirements and the extra requirements for the Biochemistry Honors Curriculum are on the back of this page.*
2. Objectives may be met by taking courses according to the following chart:

<table>
<thead>
<tr>
<th>Courses</th>
<th>Title</th>
<th>Objective 1</th>
<th>Objective 2</th>
<th>Objective 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 43900</td>
<td>Microbiology Lab</td>
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<td>X</td>
<td></td>
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<tr>
<td>BIOL 44201</td>
<td>Protein Expression</td>
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<tr>
<td>BIOL 44202</td>
<td>Animal Physiology</td>
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<tr>
<td>BIOL 44205</td>
<td>LabView</td>
<td>X</td>
<td>X</td>
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<tr>
<td>BIOL 44207</td>
<td>Protein Structure</td>
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<td>X</td>
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<td>BIOL 44211</td>
<td>Anatomy &amp; Physiology</td>
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<td>X</td>
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<tr>
<td>BIOL 44212</td>
<td>Microscopy &amp; Cell Bio</td>
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<td>X</td>
<td>X</td>
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<tr>
<td>BIOL 44215</td>
<td>Physiology Measurements</td>
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<tr>
<td>BIOL 54200</td>
<td>Neurophysiology</td>
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<td>X</td>
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<tr>
<td>BIOL 59100</td>
<td>Field Ecology</td>
<td>X</td>
<td>X</td>
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<tr>
<td>BIOL 59500</td>
<td>CryoEM 3D Reconstruction</td>
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<td>BIOL 59500</td>
<td>Data Analysis in Neurosci</td>
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<tr>
<td>BIOL 59500</td>
<td>Ecological Statistics</td>
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<tr>
<td>BIOL 59500</td>
<td>Theory of Molecular Methods</td>
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<td>X</td>
</tr>
<tr>
<td>BIOL 59500</td>
<td>Neural Mech in Hlth Disease</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

3. Students who successfully complete a Biology Honors Research Thesis have successfully met all three objectives.

4. Undergraduate Research may be used to meet these objectives. Student must get Research Mentor approval for each objective after that objective is completed. Student must also earn at least four credits of BIOL 49400 or 49900 research. Consult with your academic advisor for the forms used to obtain Research Mentor for each objective.

5. A combination of courses and research may be used to meet this requirement.

**CHEMISTRY**

1. **General Chemistry:**
   - CHM 12901 General Chemistry with a Biological Focus (5 cr.; fall)

2. **Organic Chemistry Selectives:** One of these two options:
   - CHM 25500 Organic Chemistry (3 cr.; both) and CHM 25501 Organic Chemistry Lab (1 cr.; both) and
     CHM 25600 Organic Chemistry (3 cr.; both) and CHM 25601 Organic Chemistry Lab (1 cr.; both)
   - CHM 26505 Organic Chemistry (3 cr.; fall) and CHM 26300 Organic Chemistry Lab (1 cr.; fall) and
     CHM 26605 Organic Chemistry (3 cr.; spring) and CHM 26400 Organic Chemistry Lab (1 cr.; spring)

3. **Analytical Chemistry Selective:** BCHM 22100 Analytical Biochemistry (3 cr.; both) or CHM 32100 Analytical Chemistry (4 cr.; spr.)

4. **Physical Chemistry Selective:** One of these two options:
   - CHM 37200 Physical Chemistry (4 cr.; spring)
   - CHM 37300 Physical Chemistry (3 cr.; fall) and CHM 37400 Physical Chemistry (3 cr.; spring)

**MATH:** For the Biochemistry Major, you must choose one of the following calculus sequences: MA 16100-16200 or MA 16500-16600.

**PHYSICS Selectives:** One of these two options:

1. PHYS 23300 Physics for Life Sciences (4 cr.; both) and PHYS 23400 Physics for Life Sciences (4 cr.; both)

2. PHYS 17200 Modern Mechanics (4 cr.; both) and one of the following two choices:
   - PHYS 27200 Electric and Magnetic Interactions (4 cr.; both) or
   - PHYS 24100 Electricity and Optics (3 cr.; both) and PHYS 24200 Intro to Heat and Thermal Physics (1 cr.; spring) and PHYS 25200 Electricity and Optics Laboratory (1 cr.; spring)

**COLLEGE OF SCIENCE CORE REQUIREMENTS**

Composition and Presentation; Teambuilding and Collaboration; Language and Culture; Great Issues; General Education; Multidisciplinary Experience; Mathematics; Statistics; Computing (see handout).

**FREE ELECTIVES**

Approximately 0 - 10 credits

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**BIOCHEMISTRY HONORS CURRICULUM**

A 3.0 or higher graduation index is required to graduate in the Biochemistry Honors Curriculum.

In addition to the requirements listed for the Biochemistry program, at least two of the following courses/course sequences must be completed when fulfilling other requirements:

1. CHM 32100 Analytical Chemistry (4 cr.; fall)
2. CHM 37300 Physical Chemistry (3 cr.; fall) and CHM 374 Physical Chemistry (4 cr.; spring)
3. PHYS 17200 Modern Mechanics (4 cr.; both) and one of the following two choices:
   - PHYS 27200 Electric and Magnetic Interactions (4 cr.; both) or
   - PHYS 24100 Electricity and Optics (3 cr.; both) and PHYS 25200 Electricity and Optics Laboratory (1 cr.; spring)

BIBI, BIOH 3/16