## Program Progression Guides

**Disclaimer**: The 2020-21 Purdue West Lafayette catalog is considered the source for academic and programmatic requirements for students entering programs during the Fall 2020, Spring 2021, and Summer 2021 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.

### University Degree Requirements

<table>
<thead>
<tr>
<th>Minimum 2.0 Cumulative GPA</th>
<th>Minimum 120 Credits that fulfill degree requirements</th>
<th>32 Residency Credits (30000 and above) at a Purdue University campus</th>
</tr>
</thead>
</table>

### University Core Curriculum**

- Human Cultures: Behavioral/Social Science
- Human Cultures: Humanities
- Information Literacy
- Oral Communication

**University Core Curriculum Course Listing**

- Quantitative Reasoning
- Science
- Science, Technology & Society Selective
- Written Communication

### Required Major Program Courses

Departmental specific requirements. 2.0 average GPA in classes required to fulfill biology requirements. Minimum 2.0 cumulative GPA

Must have a 500-level BIOL 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
- Multidisciplinary - 3 credits

- Mathematics - 6-10 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 Department of Biological Sciences has suggested the following degree progression guide for the Health & Disease Degree. Students will work with their academic advisors to determine their best path to degree completion. Course prerequisites 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 2nd Year</th>
<th>Prerequisite</th>
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<tbody>
<tr>
<td>2</td>
<td>BIOL 12100</td>
<td></td>
<td>3</td>
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<tr>
<td>5</td>
<td>CHM 12901</td>
<td>CHM 12901 co-req</td>
<td>4</td>
<td>Organic Chem I Selective</td>
<td>CHM 12901</td>
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<tr>
<td>2</td>
<td>BIOL 13500 or 19500</td>
<td>ALEKS 75 or 85</td>
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<td>Calculus II selective</td>
<td>Calc I</td>
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<td>3-5</td>
<td>Calculus I selective</td>
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<td>3-4</td>
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<tr>
<td>1</td>
<td>Elective (BIOL 11500 pref.)</td>
<td>BIOL 12100 co-req</td>
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<td>16-19</td>
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<th>Credit</th>
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<th>Prerequisite</th>
<th>Credit</th>
<th>Spring 2nd Year</th>
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<tr>
<td>3</td>
<td>BIOL 23100</td>
<td>BIOL 13100 and co-req CHM 12901</td>
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<td>BIOL 24100</td>
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<tr>
<td>2</td>
<td>BIOL 23200</td>
<td>Co-req BIOL 23200</td>
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<td>BIOL 24200</td>
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<td>BIOL 28600</td>
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<td>Free Elective (BIOL 29300 pref)</td>
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<table>
<thead>
<tr>
<th>Credit</th>
<th>Fall 3rd Year</th>
<th>Prerequisite</th>
<th>Credit</th>
<th>Spring 3rd Year</th>
<th>Prerequisite</th>
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<tr>
<td>3</td>
<td>BIOL 30100</td>
<td>BIOL 13100 and CHM 12901</td>
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<td>2-3</td>
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<td>PHYS II Selective</td>
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<tr>
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<td>Elective</td>
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<td>Elective (BIOL 39300 pref)</td>
<td>Science Core Option</td>
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<td>14-15</td>
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<table>
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<th>Prerequisite</th>
<th>Credit</th>
<th>Spring 4th Year</th>
<th>Prerequisite</th>
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<tr>
<td>3</td>
<td>BIOL 43800</td>
<td>BIOL 23100 &amp; 24100</td>
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<td>Biology Selective 500 Level</td>
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<td>2</td>
<td>BIOL 43900</td>
<td>BIOL 43800 co-req</td>
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<td>Health &amp; Disease Selective</td>
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<td>3</td>
<td>Science Core Option</td>
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<td>Science Core Option</td>
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<td>1-3</td>
<td>Science Core Option</td>
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<td>Pre-professional Selective</td>
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<td>Elective</td>
<td>3</td>
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<td></td>
<td></td>
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<td>14-15</td>
<td></td>
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</tbody>
</table>

**Science Core Curriculum Options**

(one course needed for each requirement unless otherwise noted)

<table>
<thead>
<tr>
<th>Options recommended for first- and second-year students</th>
<th>Options recommended for third- and fourth-year students</th>
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</thead>
<tbody>
<tr>
<td>Freshman Composition&lt;sup&gt;UC&lt;/sup&gt;</td>
<td>Technical Writing and Presentation&lt;sup&gt;UC&lt;/sup&gt; (COM 217 recommended)</td>
</tr>
<tr>
<td>General Education&lt;sup&gt;UC&lt;/sup&gt; (3 courses needed)</td>
<td>Statistics (STAT 50300)</td>
</tr>
<tr>
<td>Foreign Language and Culture&lt;sup&gt;UC&lt;/sup&gt; (3 courses needed)</td>
<td>Computing (CS 17700 or CS 15900)</td>
</tr>
<tr>
<td>Multidisciplinary Experience&lt;sup&gt;UC&lt;/sup&gt; (BIOL 12100 satisfies)</td>
<td>Great Issues</td>
</tr>
</tbody>
</table>

<sup>UC</sup> Select courses may also satisfy a University Core Curriculum requirement; see the University Core Requirement course list for approved courses. Students must have 32 credits at the 30000 level or above taken at Purdue.
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)
2. BIOL 13100 Biology II: Development, Structure, and Function of Organisms (3 cr.; spring)
3. BIOL 13500 1st Year Biology Lab (2 cr.; both) or
   BIOL 19500 Year I Bio Lab: Diet, Disease & the Immune System (2 cr.; spring) or
   BIOL 19500 Year I Bio Lab: Disease Ecology (2 cr.; alternate fall) or
   BIOL 19500 Year I Bio Lab: Phages to Folds (2 cr.; fall) or
   ABE 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 Biology Selective: Choose one of these eight options:
   (Health & Disease majors must choose option H, BIOL 43800)
   A. BIOL 32800 Principles of Physiology (4 cr.; spring)
   B. BIOL 36700 Principles of Development (2 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 39500 Human Anatomy & Physiology I (4 cr.; fall)
11. BIOL 39500 Human Anatomy & Physiology II (4 cr.; spring)
12. Lab Requirement: BIOL 43900 Lab in Microbiology (2 cr.; fall)
13. CHM 33901 Biochemistry Laboratory (1 cr; spring)
14. Health & Disease Selective: One of these three courses:
   A. BIOL 41600 Viruses & Viral Diseases (3 cr.; spring) or
   B. BIOL 53700 Immunology (3 cr.; fall) or
   C. BIOL 55900 Endocrinology (3 cr.; fall)
15. Biology Selectives: Six credits from the following:

Research (49400 or 49900; maximum of 3 credits) will count toward the Biology Selective requirement.

Footnotes and other requirements are on the back of this page.
1. Students must complete one of the Required courses in the chart below. Undergraduate research cannot be used to meet this requirement.
2. Students must also complete Objectives A and B as listed in the chart below with courses or research or a combination of the two.
3. Descriptions of Objectives A and B (not all tasks must be met to satisfy an objective):
   a. **Objective A** – Demonstrate the ability to plan and design hypothesis-driven experiments, simulations or discovery/observational experiments
      i. Conduct an appropriate literature review for a specific scientific topic.
      ii. Generate an applicable hypothesis (-es) for your research project
      iii. Identify techniques to be used in your project, with justification of those techniques.
      iv. Write a formal research proposal.
      v. Write a detailed outline of experiments
   b. **Objective B** - Develop the ability to appropriately analyze, critically evaluate, and depict data.
      Demonstrate the ability to effectively communicate scientific information orally and in writing, including synthesizing and evaluating scientific literature and putting experimental results in their appropriate scientific context.
      i. Analyze data
      ii. Use appropriate ways to depict and communicate data (e.g., graphs, movies, images, etc.).
         Present the research at lab meetings, in a talk, or at a poster session.
      iii. Write a summary (or summaries) of the data.
4. If research is used, the research director will be the one who decides if the research meets one or both objectives.
5. If research is used, it must include at least four credits of BIOL 49400 or 49900. BIOL 29400 research does not count toward this requirement.
6. Students who successfully complete a Biology Honors Research Thesis have successfully met Objectives A and B.
7. The Microbiology and **Health & Disease majors require BIOL 43900** and the Ecology, Evolution and Environmental Biology major requires BIOL 59500, Laboratory in Ecology.

### Base Laboratory Requirement Chart

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Required</th>
<th>Obj. A</th>
<th>Obj. B</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 32800</td>
<td>Principles of Physiology</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 39500</td>
<td>Exper Design &amp; Quant Analysis</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 39500</td>
<td>Macromolecules</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 43900</td>
<td>Microbiology Lab</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>BIOL 44205</td>
<td>LabView (5 week module)</td>
<td>X</td>
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<tr>
<td>BIOL 44207</td>
<td>Protein Structure (5 week module)</td>
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<tr>
<td>BIOL 44212</td>
<td>Microscopy &amp; Cell Bio (5 week module)</td>
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<tr>
<td>BIOL 48300</td>
<td>Environmental &amp; Conservation Biology</td>
<td>X</td>
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<tr>
<td>BIOL 54200</td>
<td>Neurophysiology (5 week module)</td>
<td>X</td>
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<tr>
<td>BIOL 58210</td>
<td>Ecological Statistics</td>
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<td>BIOL 59100</td>
<td>Field Ecology</td>
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<td>X</td>
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<tr>
<td>BIOL 59500</td>
<td>CryoEM 3D Reconstruction</td>
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<tr>
<td>BIOL 59500</td>
<td>Data Analysis in Neurosci (5 week module)</td>
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<tr>
<td>BIOL 59500</td>
<td>Laboratory in Ecology</td>
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<tr>
<td>BIOL 59500</td>
<td>Neural Mechanisms in Health &amp; Disease</td>
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<tr>
<td>BIOL 59500</td>
<td>Theory of Molecular Methods</td>
<td>X</td>
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</table>
CHEMISTRY

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

2. **Organic Chemistry Selectives:** (Must choose one option)
   A. 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)
   B. 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. **Chemistry Selectives:** (must choose one of the following options)  
   A. **Analytical Chemistry:**
      a. BCHM 22100 Analytical Biochemistry (3 cr.; both) or
      b. CHM 32100 Analytical Chemistry I (4 cr.; fall)
   B. **Biochemistry:**
      a. BCHM 56100 General Biochemistry I (3 cr.; both) or
      b. CHM 33900 Biochemistry: A Molecular Approach (3 cr.; spring) or
      c. CHM 43300 Introductory Biochemistry (3 cr.; fall)
   C. **Physical Chemistry:**
      a. CHM 37200 Physical Chemistry (4 cr.; spring) or
      b. CHM 37300 Physical Chemistry (3 cr.; fall)

**PHYSICS Selectives:** One of these two options:
1. PHYS 23300 Physics for Life Sciences I (4 cr.; both) and
   PHYS 23400 Physics for Life Sciences II (4 cr.; both)
2. PHYS 17200 Modern Mechanics (4 cr.; both) and one of the following two choices:
   A. PHYS 27200 Electric and Magnetic Interactions (4 cr.; both) or
   B. PHYS 24100 Electricity and Optics (3 cr.; both) and PHYS 25200 Electricity and Optics Laboratory (1 cr.; spring)

**PRE-PROFESSIONAL SELECTIVE** (choose one)
1. ANTH 21200 Culture, Food & Health (3 cr.; both)
2. ANTH 34000 Cultural Perspectives on Health (3 cr.; both)
3. ANTH 35200 Drugs, Culture & Society (3 cr.; spring)
4. HK 44000 Human Diseases and Disorders (3 cr.; both)
5. HK 44500 Epidemiology (3 cr.; both)
6. PHIL 27000 Biomedical Ethics (3 cr.; spring)
7. PHIL 28000 Ethics & Animals (3 cr.; fall)
8. SOC 37400 The Health of Americans (3 cr.; fall)
9. SOC 57200 Comparative Healthcare Systems (3 cr.; fall)
10. SOC 57300 Human Side of Medicine (3 cr.; fall)
11. SOC 57400 Social Organization of Healthcare (3 cr.; spring)
12. SOC 57600 Health and Aging in America (3 cr.; fall)

**UNIVERSITY CORE and 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 7-18 credits

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1. A 500-level BIOL course other than BIOL 54200 must be taken as part of either requirement #14 or #15.
2. A course used to satisfy requirement #14 may not also count for requirement #15.
3. This course may count as a Biology Selective and as the College of Science Teambuilding and Collaboration requirement.
4. This course may count as a Biology Selective and as the College of Science Multidisciplinary requirement.
5. This course may count as a Biology Selective and as the College of Science Great Issues requirement and toward the Base Lab requirement.
6. This course may not be used to satisfy the College of Science General Education or Language & Culture requirements.
7. This course may not be used to satisfy the College of Science General Education or Language & Culture requirements.
8. Students who select 12901 for General Chemistry must take CHM 33900 and 33901. Students who end up with Special Case approval for some other Gen Chem courses may choose the other Chem Selective options. Credit is not allowed for both BIOL 44201 and CHM 33901.