Program Progression Guide

Disclaimer: The 2017-2018 Purdue West Lafayette catalog is considered the source for academic and programmatic requirements for students entering programs during the Fall 2017, Spring 2018, and Summer 2018 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

University Core Curriculum Course Listing

Required Major Program Courses

A minimum 2.0 average 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
- 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.

* 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 Microbiology 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.

### 2017-18 Microbiology Degree Progression Guide

<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>
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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>3-5</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>
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<table>
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<th>Prerequisite</th>
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<tr>
<td>3</td>
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<td>Organic I</td>
<td>3-4</td>
<td>Chemistry Selective</td>
<td>Organic II</td>
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<td>3</td>
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<td>Varies</td>
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<td>BIOL 28600</td>
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<tr>
<td>3</td>
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<td>Elective (BIOL 29300 pref)</td>
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<tr>
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<tr>
<td>3</td>
<td>BIOL 43800</td>
<td>Varies</td>
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<td>BIOL 41600</td>
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<td>BIOL 43900</td>
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<td>BIOL 52900</td>
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<td>PHYS 2 Selective</td>
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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>
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<td>1-3</td>
<td>Multidisciplinary Selective</td>
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<td>Great Issues Selective</td>
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<td>3</td>
<td>Free Elective</td>
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<td>14-17</td>
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<td>15</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)
4. BIOL 22600 Biotechnology Lab (2 cr.; fall)
5. BIOL 23100 Biology III: Cell Structure and Function (3 cr.; fall)
6. BIOL 23200 Laboratory in Biology III: Cell Structure and Function (2 cr.; fall)
7. BIOL 24100 Biology IV: Genetics and Molecular Biology (3 cr.; spring)
8. BIOL 24200 Laboratory in Genetics and Molecular Biology (2 cr.; spring) or BIOL 28600 Intro. to Ecology & Evolution (2 cr.; spring)
9. **Intermediate Biology Selective:** Choose one of these eight options:
   (Microbiology 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) 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 41600 Viruses and Viral Diseases (3 cr.; spring)
11. **Base Lab Requirement:** BIOL 43900 Microbiology Lab (2 cr.; fall)
12. BIOL 52900 Bacterial Physiology (3 cr.; spring)
13. **Microbiology Selective I:** Choose one:
   - A. BIOL 54100 Molecular Genetics of Bacteria (3 cr.; fall) or
   - B. BIOL 59500 Genetics and –Oms of Host-Microbe Interactions (3 cr.; fall)
14. **Chemistry Selective:** One of these three courses:
   - A. BCHM 56100 General Biochem (3 cr.; fall)
   - B. CHM 33900 Biochemistry: A Molecular Approach (3 cr.; spring)
   - C. CHM 53300 Introductory Biochemistry (3 cr.; fall)
15. **Microbiology Selective II:** Three credits of the following:
   - BIOL 44600 Molecular Biology of Pathogens (3 cr.; spring)
   - BIOL 47800 Intro to Bioinformatics (3 cr.; fall)
   - BIOL 53300 Medical Microbiology (3 cr.; fall)
   - BIOL 54100 Molecular Genetics of Bacteria (3 cr.; fall)
   - BIOL 54900 Microbial Ecology (2 cr.; alternate spring) plus one credit of BIOL 442xx (1-2 cr.; both) or 54200 (1 cr.; fall) or CHM 33901 Biochemistry Laboratory (1 cr.; spring)
   - BIOL 55001 Eukaryotic Molecular Biology (3 cr.; fall)
   - BIOL 59500 Genetics and –Oms of Host-Microbe Interactions (3 cr.; fall)
   - BIOL 59500 Theory of Molecular Methods (3 cr.; fall)

Footnotes, additional requirements for the Microbiology major, and the additional requirements for the Microbiology Honors major continue on the back of this page.
Base Laboratory Requirement for all Biology Majors  (Microbiology majors are required to take BIOL 43900 to satisfy this)

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

2. Objectives may be met by taking courses according 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>X</td>
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<tr>
<td>BIOL 44201</td>
<td>Protein Expression</td>
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<td>X</td>
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<td>BIOL 44202</td>
<td>Animal Physiology</td>
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<td>X</td>
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<td>BIOL 44205</td>
<td>LabView</td>
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<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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<tr>
<td>BIOL 44211</td>
<td>Anatomy &amp; Physiology</td>
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<td>BIOL 44212</td>
<td>Microscopy &amp; Cell Bio</td>
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<td>BIOL 44215</td>
<td>Physiology Measurements</td>
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<td>BIOL 54200</td>
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<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></td>
<td>X</td>
</tr>
<tr>
<td>BIOL 59500</td>
<td>CryoEM 3D Reconstruction</td>
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<tr>
<td>BIOL 59500</td>
<td>Data Analysis in Neurosci</td>
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<tr>
<td>BIOL 59500</td>
<td>Theory of Molecular Methods</td>
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<td></td>
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<tr>
<td>BIOL 59500</td>
<td>Neural Mech in Hlth Disease</td>
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</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**:
   - A. CHM 129012 General Chemistry with a Biological Focus (5 cr.; fall)

2. **Organic Chemistry Selectives** Two of these two options:
   - A. CHM 25500 Organic Chemistry (3 cr.; both) and CHM 25501 Organic Chemistry Lab (1 cr.; both) and
     CHM 26500 Organic Chemistry (3 cr.; both) and CHM 26501 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)

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)

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 14-21 credits

MICROBIOLOGY HONORS CURRICULUM

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

In addition to the requirements listed for the Microbiology program, the following two choices must be completed:

1. 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)

2. MA 26100 Multivariate Calculus (4 cr.; both)

and at least two of the following four choices must be completed:

1. PHYS 17200 Modern Mechanics (4 cr.; both) and PHYS 27200 Electric and Magnetic Interactions (4 cr.; both)
2. CHM 32100 Analytical Chemistry (4 cr.; fall)
3. CHM 37200 Physical Chemistry (4 cr.; spring) or [CHM 37300 Physical Chemistry (3 cr.; fall) and CHM 37400 Physical Chemistry (4 cr.; spring)]
4. MA 26200 Linear Algebra and Differential Equations (4 cr.; both)

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1. This course may count for requirement #13 or #15, but not both.
2. 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.