Program Progression Guides

Disclaimer: The 2022-23 Purdue West Lafayette catalog is considered the source for academic and programmatic requirements for students entering programs during the Fall 2022, Spring 2023, and Summer 2023 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>
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</tr>
</thead>
<tbody>
<tr>
<td>Minimum 2.0 Cumulative GPA</td>
<td>Minimum 120 Credits that fulfill degree requirements</td>
<td>32 Residency Credits (30000-level and above) at a Purdue University campus</td>
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</table>

University Core Curriculum**
[https://www.purdue.edu/provost/students/s-initiatives/curriculum/courses.html](https://www.purdue.edu/provost/students/s-initiatives/curriculum/courses.html)

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

Civic Literacy Proficiency
[https://www.purdue.edu/provost/about/provostInitiatives/civics/](https://www.purdue.edu/provost/about/provostInitiatives/civics/)

Required Major Program Courses (see following pages)

Departmental specific requirements, including 2.0 average GPA in classes required to fulfill biology requirements.
Minimum 2.0 cumulative GPA
Must have a 500-level BIOL course (3-credit BIOL lecture)

College of Science Core Curriculum
[https://www.purdue.edu/science/Current_Students/curriculum_and_degree_requirements/college-of-science-core-requirements.html](https://www.purdue.edu/science/Current_Students/curriculum_and_degree_requirements/college-of-science-core-requirements.html)

- 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 Department of Biological Sciences 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.

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<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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<td>5</td>
<td>CHM 12901</td>
<td>ALEKS 85 or Calc Placement</td>
<td>4</td>
<td>CHM 25500-25501*</td>
<td>CHM 12901</td>
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<td>2</td>
<td>BIOL 13500 or 19500</td>
<td>CHM 12901 co-req</td>
<td>3-5</td>
<td>Calculus II selective*</td>
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<td>3-5</td>
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<tr>
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<td>BIOL 24200</td>
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<td>CHM 25600-25601*</td>
<td>CHM 25500</td>
<td>3</td>
<td>CHM 33900</td>
<td>C- or better in all prior CHM courses</td>
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<td>CHM 33901</td>
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<tr>
<td>3</td>
<td>BIOL 43800</td>
<td>BIOL 23100 &amp; 24100</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 II Selective*</td>
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<td>Elective (BIOL 39300 pref)</td>
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<th>Credit</th>
<th>Spring 4th Year</th>
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<td>Microbiology I Selective</td>
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<td>Microbiology II Selective</td>
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</table>

*Microbiology Honors (MICH) includes different (and additional) course work in MA and CHM along with specific courses in Calculus, Organic Chemistry and possibly Physics that are not listed here. See last page and discuss with advisor if interested.

Science Core Curriculum Options

Options recommended for first- and second-year students

- **Freshman Composition**\(^{UC}\)
- **General Education**\(^{UC}\) (3 courses needed)
- **Foreign Language and Culture**\(^{UC}\) (3 courses needed)
- **Multidisciplinary**\(^{UC}\) (BIOL 12100)

Options recommended for third- and fourth-year students

- **Technical Writing and Presentation**\(^{UC}\) (COM 217 recommended)
- **Statistics** (STAT 50300)
- **Computing** (CS 17700 or CS 18000 also meet Teambuilding)
- **Great Issues**

\(^{UC}\) 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
- At least one 3-credit 500-level Biology course is required
- A minimum of 32 credits at or above the 300-level completed at a Purdue campus
- 120 Total Credits

BIOLOGY CORE:
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:
   (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)
   C. BIOL 39500 Macromolecules (2 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. Lab Requirement: BIOL 43900 Microbiology Lab (2 cr.; fall)
12. BIOL 52900  Bacterial Physiology (3 cr.; spring)
13. CHM 33901 2 Biochemistry Laboratory (1 cr.; spring)
14. Microbiology Selective I: Choose one:
   A. BIOL 54100  Molecular Genetics of Bacteria (3 cr.; fall) or
   B. BIOL 59500  Genetics and –Oomics of Host-Microbe Interactions (3 cr.; alt spring)
15. Chemistry Selective: One of these three courses:
   A. BCHM 56100 2 General Biochemistry (3 cr.; fall)
   B. CHM 33900 2 Biochemistry : A Molecular Approach (3 cr.; spring)
   C. CHM 43300 2 Introductory Biochemistry (3 cr.; fall)
16. Microbiology Selective II: Three credits of the following:
   BIOL 44600  Molecular Biology of Pathogens (3 cr.; alt spring)
   BIOL 47800  Intro to Bioinformatics (3 cr.; fall)
   BIOL 49500  The RNA World, CRISPR and Coronavirus (2 cr.; spring)
   BIOL 53300  Medical Microbiology (3 cr.; fall)
   BIOL 54100  Molecular Genetics of Bacteria (3 cr.; fall)
   BIOL 54900  Microbial Ecology (2 cr.; alt spring) plus one credit of BIOL 442xx (1-2 cr.; both) or 54200 (1 cr.; fall)
   BIOL 55001  Eukaryotic Molecular Biology (3 cr.; spring)
   BIOL 59500  Building the Tree of Life (3 cr.; spring)
   BIOL 59500  CRISPR Mechanisms and Applications (3 cr.; spring)
   BIOL 59500  Genetics and –Oomics of Host-Microbe Interactions (3 cr.; alt spring)
   BIOL 59500  Theory of Molecular Methods (3 cr.; fall)
   ABE 59100  Principles of Systems/Synthetic Biology (3 cr.; fall)
   FS 59100  Techniques in Microbial Genomics & Metabolism (3 cr.; alt spring)

Footnotes and other requirements are on the next two pages.
Base Laboratory Requirement Chart

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Required Course</th>
<th>Obj. A</th>
<th>Obj. B</th>
<th>Usually Offered</th>
<th>Format</th>
<th>Pre-Req (PR) or Co-Req (CR) beyond core courses</th>
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<tbody>
<tr>
<td>BIOL 32800</td>
<td>Principles of Physiology (4cr)</td>
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<td>Spring</td>
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<tr>
<td>BIOL 39500DST</td>
<td>Exper Design &amp; Quant Analysis (3cr)</td>
<td>X X</td>
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<td>Summer</td>
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<tr>
<td>BIOL 43900</td>
<td>Microbiology Lab (2cr)</td>
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<td>BIOL 44212</td>
<td>Microscopy &amp; Cell Bio (1cr)</td>
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<tr>
<td>BIOL 48300</td>
<td>Environmental &amp; Conservation Biology (3cr)</td>
<td>X X</td>
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<td>BIOL 49500BMR</td>
<td>Biodiversity &amp; Museum Research (3cr)</td>
<td>X X</td>
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<td>BIOL 49500DSB</td>
<td>Data Science for Biologists (3cr)</td>
<td>X X</td>
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<td>BIOL 49500</td>
<td>Data Science: Good vs. Bad Data (3cr)</td>
<td>X X</td>
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<td>BIOL 49500RAB</td>
<td>Research in Animal Behavior (1cr)</td>
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<td>BIOL 49500TEC</td>
<td>Topics in Endocrinology &amp; Cancer (2cr)</td>
<td>X X</td>
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<td>BIOL 54200</td>
<td>Neurophysiology (1cr)</td>
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<tr>
<td>BIOL 58210</td>
<td>Ecological Statistics (3cr)</td>
<td>X X</td>
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<tr>
<td>BIOL 59100</td>
<td>Field Ecology (4cr)</td>
<td>X X X</td>
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<td>alt Fall '23</td>
<td>PR=</td>
<td>59500EL</td>
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<td>BIOL 59500BTL</td>
<td>Building the Tree of Life: Phylogenetics (3cr)</td>
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<td>BIOL 59500CRYO</td>
<td>CryoEM 3D Reconstruction (3cr)</td>
<td>X X</td>
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<td>Fall</td>
<td>PR=</td>
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<td>BIOL 59500BN</td>
<td>Data Analysis in Neuroscience (1cr)</td>
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<td>Spring</td>
<td>5-wk</td>
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<td>BIOL 59500EL</td>
<td>Laboratory in Ecology (1cr)</td>
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<td>Fall</td>
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<tr>
<td>BIOL 59500</td>
<td>Neural Mechanisms in Health &amp; Disease (3cr)</td>
<td>X X</td>
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<td>BIOL 59500SBL</td>
<td>Structural Biology Lab (1cr)</td>
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<tr>
<td>BIOL 59500TMM</td>
<td>Theory of Molecular Methods (3cr)</td>
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<td>molecular biology</td>
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CHEMISTRY

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

2. **Organic Chemistry:**
   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)

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)

COLLEGE OF SCIENCE CORE

Composition and Presentation; Teambuilding and Collaboration; Language and Culture; Great Issues; General Education; Multidisciplinary Experience; Mathematics; Statistics; Computing

OTHER: all University Core and Civics Literacy Requirements must also be completed.

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

*Students need to talk with their advisor if interested in switching from "Microbiology" to the "Microbiology Honors" major*

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 #14 or #16, but not both.
2. Students who take CHM 12901 for General Chemistry must take CHM 33900 and 33901 for the Chemistry Selective. Students who end up with Special Case approval for some other Gen Chem courses may choose the other Chem Selective options. All students must take CHM 33901.
3. Microbiology Honors requires different or specific course options (see “Microbiology Honors Curriculum” and discuss with advisor)
4. Microbiology Honors requires MA 16100 (or 16500) for Calculus 1 and MA 16200 (or 16600) for Calculus 2 to meet pre-requisites for MA 26100.