Program Progression Guide

Disclaimer: The 2024-25 Purdue West Lafayette catalog is considered the source for academic and programmatic requirements for students entering programs during the Fall 2024, Spring 2025, and Summer 2025 semesters. The Program Progression Guide assists students in the development of an individualized 8-semester plan. Students are encouraged to use this guide and MyPurduePlan* (an online degree auditing tool) 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>
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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>
<td></td>
</tr>
</tbody>
</table>

University Core Curriculum**
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/

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 (2-3 credit approved BIOL lecture)

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

- Written Communication – 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
- STS (Science, Tech & Society) - 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. The College of Science has identified courses that are below the disciplinary level of each program and major area of study. While similar, Not Recommended course lists vary between departments.

* 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.
**2024-25 Biology**

**Degree Progression Guide**

The Department of Biological Sciences has suggested the following degree progression guide for the Biology Degree. Students will work with their academic advisors to determine their best path to degree completion. Course pre-requisites listed are notes specific to this degree plan (not all pre-requisites are listed for every course).

<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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<tr>
<td>2</td>
<td>BIOL 12100</td>
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<tr>
<td>5</td>
<td>CHM 12901</td>
<td>ALEKS 85 or Calc Placement</td>
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<td>CHM 25500-25501</td>
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<tr>
<td>2</td>
<td>BIOL 13500 or 1450x</td>
<td>(BIOL 121 or 131) &amp; CHM 12901 co-req</td>
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<td>C- or better in Calculus I</td>
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<td>3-5</td>
<td>Calculus I selective</td>
<td>ALEKS 75 or 85</td>
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<td>BIL 12100 co-req</td>
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<tr>
<td>1</td>
<td>Elective (BIL 11500 pref)</td>
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<td>16-18</td>
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<th>Credit</th>
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<th>Prerequisite</th>
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<td>BIOL 13100 and CHM 12901 co-req</td>
<td>3</td>
<td>BIOL 24100</td>
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<td>BIOL 23100 co-req</td>
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<td>BIOL 24200</td>
<td>BIOL 24100 co-req</td>
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<td>C- or better in CHM 25500</td>
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<td>CHM 33900</td>
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<td>CHM 33901</td>
<td>CHM 33900 co-req</td>
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<td>BIOL 28600</td>
<td>2</td>
<td>BIOL 28600</td>
<td>BIOS 12100</td>
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<td></td>
<td></td>
<td>1</td>
<td>Free Elective (BIL 29300 pref)</td>
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<td>Science Core Option</td>
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<th>Prerequisite</th>
<th>Credit</th>
<th>Spring 3rd Year</th>
<th>Prerequisite</th>
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<tr>
<td>3-4</td>
<td>Intermediate Biology Selective</td>
<td>BIOL 23100 &amp; 24100</td>
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<td>Group B Selective</td>
<td>varies</td>
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<td>2-3</td>
<td>Group A Selective</td>
<td>varies</td>
<td>3-4</td>
<td>Science Core Option</td>
<td></td>
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<tr>
<td>4</td>
<td>PHYS I Selective</td>
<td>BIOL, CHM, Calc 2 (varies)</td>
<td>4</td>
<td>PHYS II Selective</td>
<td>PHYS I</td>
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<tr>
<td>3</td>
<td>Science Core Option</td>
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<td>Elective (BIL 39300 pref)</td>
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<td>Science Core Option</td>
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<td>15-17</td>
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<th>Prerequisite</th>
<th>Credit</th>
<th>Spring 4th Year</th>
<th>Prerequisite</th>
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<td>2-4</td>
<td>Base Lab Requirement</td>
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<td>Biology 500 Level Selective</td>
<td>varies</td>
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<td>Science Core Option – CS 17700 rec.</td>
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<td>Biology Selective</td>
<td>varies</td>
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<td>3</td>
<td>Elective</td>
<td></td>
</tr>
<tr>
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<tr>
<td>14-17</td>
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</tbody>
</table>

**Science Core Curriculum Options**

*Options recommended for first- and second-year students*

- Written Communication\textsuperscript{UC}
- General Education\textsuperscript{UC} (9 credits needed)
- Foreign Language and Culture\textsuperscript{UC} (9 credits needed with JEDI)
- Science Tech and Society\textsuperscript{UC} (BIL 12100)

*Options recommended for third- and fourth-year students*

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

\textsuperscript{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.
BIOL 51101 Theory of Molecular Methods (3 cr.; spring)

9. Intermediate Biology Selective -- complete ONE of these:
   A. BIOL 32800 Principles of Physiology (4 cr.; spring)
   B. BIOL 36700 Principles of Development (2 cr.; fall)
   C. BIOL 38700 Macromolecules (2 cr.; fall)
   D. BIOL 41500 Intro. to Molecular Biology (3 cr.; spring)

BIOL 41600 Viruses & Viral Diseases (3 cr.; spring)
BIOL 42000 Eukaryotic Cell Biology (3 cr.; fall)
BIOL 43600 Neurobiology (3 cr.; fall)
BIOL 43800 General Microbiology (3 cr.; fall)
BIOL 44400 Human Medical Genetics (3 cr.; spring)
BIOL 44600 Molecular Bacterial Pathogenesis (3 cr.; alt spring)
BIOL 47800 Intro to Bioinformatics (3 cr.; fall)
BIOL 48100 Eukaryotic Genetics (3 cr.; spring)
BIOL 49500RNA RNA World: CRISPR & Coronavirus (2 cr.; spring)
BIOL 51099# Neutral Mechanisms in Health & Dis (3 cr.; alt spring)
BIOL 51101 Intro to X-Ray Crystallography (3 cr.; spring)
BIOL 51202 Methods & Measures in Biophysical Chem (3 cr.; fall)
BIOL 51600 Molecular Biology of Cancer (3 cr.; spring)
BIOL 51606 Pathways in Human Health & Disease (3 cr.; fall)
BIOL 51700 Molecular Biology: Proteins (2 cr.; alt spring)
BIOL 52900 Bacterial Physiology (3 cr.; spring)
BIOL 53300 Medical Microbiology (3 cr.; fall)
BIOL 53601 Biol & Structural Aspects of Drug Design & Action (3 cr; spr)
BIOL 53800 Molecular, Cellular & Develop Neuro (3 cr.; spring)
BIOL 54100 Molecular Genetics of Bacteria (3 cr.; fall)
BIOL 54900 Microbial Ecology (2 cr.; alt spring)
BIOL 55101 Theory of Molecular Methods (3 cr.; spring)
BIOL 56200 Neural Systems (3 cr.; spring)
BIOL 56310 Protein Bioinformatics (3 cr.; alt spring)
BIOL 59500CDP Bacteria in Cancer Dis & Prevention (3 cr.; spring)
BIOL 59500U Cell Biology of Plants (3 cr.; fall)
BIOL 59500MA CRISPR Mechanisms & Applications (3 cr.; spring)
BIOL 59500Cryo CryoEM 3D Reconstruction (3 cr.; fall)
BIOL 59500IC Immun. Cancer & Infectious Disease (3 cr.; spring)
BIOL 59500D Neurobiology of Learning & Memory (3 cr.; alt fall)
BIOL 59500M Practical Biocomputing (3 cr.; spring)
BIOL 59500V Molecular Virology (3 cr.; spring)
BCHM 43400 Medical Topics in Biochemistry (3 cr.; spring)
BCHM 56200 General Biochemistry II (3 cr.; spring)

Group B Selectives:
BIOL 20400 Human Anatomy & Physiology II (4 cr.; spring)
BIOL 32101# Experimental Design & Quant Analysis (3 cr.; summer)
BIOL 32800 Principles of Physiology (4 cr.; spring)
BIOL 36700 Principles of Development (2 cr.; fall)
BIOL 48300 Principles of Development (2 cr.; fall)
BIOL 49500BRB Biodiversity & Museum Research (3 cr.; fall)
BIOL 49500DB B Data Science for Biologists (3 cr.; fall)
BIOL 52905 Disease Ecology (3 cr.; spring)
BIOL 53700 Immunobiology (3 cr.; fall)

Additional Selectives (optional): can count toward the 14-16 cr. of Upper-Level Biol Coursework but not as Group A or Group B requirement:
BIOL 49400 or BIOL 49900 Research - max of 3 credits
BIOL 44100 Senior Seminar in Genetics (1 cr.; fall)
BCHM 52100 Comparative Genomics (3 cr.; spring)

11. Base Lab Requirement: see “Base Lab Requirement (BLR) for all Biology Majors” as described on the next page.
### 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>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 32101</td>
<td>Experim Design &amp; Analysis-Hnrs (3cr)</td>
<td>X X</td>
<td></td>
<td></td>
<td>Summer</td>
<td>online</td>
<td></td>
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<tr>
<td>BIOL 32800</td>
<td>Principles of Physiology (4cr)</td>
<td>X</td>
<td></td>
<td></td>
<td>Spring</td>
<td></td>
<td></td>
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<tr>
<td>BIOL 43900</td>
<td>Microbiology Lab (2cr)</td>
<td>X X X</td>
<td></td>
<td></td>
<td>Fall</td>
<td></td>
<td>PR/CR=43800</td>
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<tr>
<td>BIOL 44212</td>
<td>Microscopy &amp; Cell Bio (1cr)</td>
<td>X X</td>
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<td></td>
<td>Spring</td>
<td>5-wk module</td>
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<tr>
<td>BIOL 48300</td>
<td>Environmental &amp; Conservation Biology (3cr)</td>
<td>X X</td>
<td></td>
<td></td>
<td>alt Spring '24</td>
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<tr>
<td>BIOL 495008MR</td>
<td>Biodiversity &amp; Museum Research (3cr)</td>
<td>X X</td>
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<td>Fall</td>
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<tr>
<td>BIOL 49500OSB</td>
<td>Data Science for Biologists (3cr)</td>
<td>X X X</td>
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<td>Fall</td>
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<tr>
<td>BIOL 49500TEC</td>
<td>Topics in Endocrinology &amp; Cancer (2cr)</td>
<td>X X</td>
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<td>Spring</td>
<td></td>
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<tr>
<td>BIOL 51099</td>
<td>Neural Mechanisms in Health &amp; Disease (3cr)</td>
<td>X X</td>
<td></td>
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<td>alt Spring '23</td>
<td></td>
<td>PR=32800 or 43600; CR=56200</td>
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<td>BIOL 55101</td>
<td>Theory of Molecular Methods (3cr)</td>
<td>X X</td>
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<td>alt Spring</td>
<td>5-wk module</td>
<td>PR=41500</td>
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<td>BIOL 54200</td>
<td>Neurophysiology (1cr)</td>
<td>X X</td>
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<td>PR=32800 or CR=43600</td>
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<tr>
<td>BIOL 58210</td>
<td>Ecological Statistics (3cr)</td>
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<td>Fall</td>
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<tr>
<td>BIOL 58602</td>
<td>Laboratory in Ecology (1cr)</td>
<td>X X X</td>
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<td>Fall</td>
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<td>BIOL 59500BTL</td>
<td>Building the Tree of Life: Phylogenetics (3cr)</td>
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<td>Spring</td>
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<tr>
<td>BIOL 59500CRYO</td>
<td>CryoEM 3D Reconstruction (3cr)</td>
<td>X X</td>
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<td>Fall</td>
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<td>PR=PHYS 23300 or 17200</td>
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<tr>
<td>BIOL 59500SN</td>
<td>Data Analysis in Neuroscience (1cr)</td>
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<td>X</td>
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<td>5-wk module</td>
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<tr>
<td>BIOL 59500SBL</td>
<td>Structural Biology Lab (1cr)</td>
<td>X X</td>
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<td>Spring</td>
<td>5-wk module</td>
<td></td>
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</tbody>
</table>
CHEMISTRY (17 credits) -- complete all of the following:

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

2. **Organic Chemistry (8 credits):**
   - CHM 25500 Organic Chemistry I (3 cr; both) and
   - CHM 25501 Organic Chemistry Lab I (1 cr; both) and
   - CHM 25600 Organic Chemistry II (3 cr; both) and
   - CHM 25601 Organic Chemistry Lab II (1 cr; both)

3. **Biochemistry (4 credits):**
   - CHM 33900 Biochemistry: A Molecular Approach (3 cr; spring) and
   - CHM 33901 Biochemistry Laboratory (1 cr; spring)

PHYSICS (8 credits) -- One of these two options – (PHYS 23300+23400 are recommended):

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)

STATISTICS (3 credits) -- STAT 50300 is required (3 cr; fall, spring, summer); prerequisite is a C- or better in calculus 2

OTHER: all University Core, College of Science Core, and Civics Literacy Requirements must also be completed.

FREE ELECTIVES: Approximately 12-36 credits

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1 This course counts for Upper-Level Biology Coursework and the College of Science Teambuilding & Collaboration requirement.
2 This course counts towards portions of the Base Lab Requirement, but 14-16 total credits of Upper-Level Biology Coursework must still be earned.
3 This course may count for Upper-Level Biology Coursework and the College of Science Great Issues requirement.

BIOL 05/10/2024