Program Progression Guides

Disclaimer: The 2019-2020 Purdue West Lafayette catalog is considered the source for academic and programmatic requirements for students entering programs during the Fall 2019, Spring 2020, and Summer 2020 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>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>
<tbody>
<tr>
<td>University Core Curriculum**</td>
<td>Human Cultures: Behavioral/Social Science</td>
<td>Quantitative Reasoning</td>
<td>Science</td>
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<td></td>
<td>Human Cultures: Humanities</td>
<td>Science, Technology &amp; Society Selective</td>
<td>Written Communication</td>
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<td>Information Literacy</td>
<td>University Core Curriculum Course Listing</td>
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<td>Oral Communication</td>
<td>Required Major Program Courses</td>
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<td>Degree Electives</td>
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<tr>
<td>College of Science Core Curriculum</td>
<td>Freshman Composition – 3 credits</td>
<td>Mathematics - 6-10 credits</td>
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<tr>
<td></td>
<td>Technical Writing and Presentation - 3 credits</td>
<td>Statistics - 3 credits</td>
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<td></td>
<td>Teaming &amp; Collaboration (NC)</td>
<td>Computing - 3 credits</td>
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<td></td>
<td>General Education - 9 credits</td>
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<td></td>
<td>Foreign Language &amp; Culture – 9 credits</td>
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<td>Great Issues - 3 credits</td>
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<td></td>
<td>Laboratory Science - 8 credits</td>
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<td></td>
<td>Multidisciplinary - 3 credits</td>
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<tr>
<td>Degree Electives</td>
<td>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.</td>
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</tbody>
</table>

* 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.
# 2019-20 Ecology, Evolution, and Environmental Biology
## Degree Progression Guide

The Department of Biological Sciences has suggested the following degree progression guide for the Ecology, Evolution and Environmental Biology 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.

### Credit Fall 1st Year | Prerequisite | Credit Spring 2nd Year | Prerequisite
--- | --- | --- | ---
2 BIOL 12100 |  | 3 BIOL 13100 |  
5 CHM 12901 | ALEKS 85 or Calc Placement | 4 Organic Chem I Selective | CHM 12901  
2 BIOL 13500 or 19500 | CHM 12901 co-req | 3-5 Calculus II selective | Calc I  
3-5 Calculus I selective | ALEKS 75 or 85 | 3-4 Science Core Option |  
3 Science Core Option |  | 3 Science Core Option |  
1 Elective (BIOL 11500 pref.) | BIOL 12100 co-req |  |  
**16-18** |  |  | 

### Credit Fall 2nd Year | Prerequisite | Credit Spring 2nd Year | Prerequisite
--- | --- | --- | ---
3 BIOL 23100 | BIOL 13100 and co-req CHM 12901 | 3 BIOL 24100 | BIOL 23100  
2 BIOL 23200 | Co-req BIOL 23200 | 2 BIOL 24200 |  
4 Organic Chem II Selective | Organic I | 3 Chemistry Selective |  
3 Science Core Option |  | 1 CHM 33901 | CHM 33900 co-req  
3 Science Core Option |  | 2 BIOL 28600 | BIOL 12100  
 |  | 1 Free Elective (BIOL 29300 pref) |  
 |  | 3 Science Core Option |  
**15** |  |  | **15**

### Credit Fall 3rd Year | Prerequisite | Credit Spring 3rd Year | Prerequisite
--- | --- | --- | ---
3 BIOL 59500 (Ecology) | BIOL 28600 | 3 Ecology Selective |  
1 BIOL 59500 (Lab in Ecology) | BIOL 59500 co-req | 4 PHYS II Selective |  
4 PHYS I Selective |  | 3-4 Science Core Option |  
3 Science Core Option |  | 3 Science Core Option |  
3 Science Core Option |  | 1 Elective (BIOL 39300 pref.) |  
3 Elective |  |  |  
**17** |  |  | **14-15**

### Credit Fall 4th Year | Prerequisite | Credit Spring 4th Year | Prerequisite
--- | --- | --- | ---
3-4 Intermediate Biology Selective |  | 3 BIOL 58000 | BIOL 24100 and 28600  
2-4 Biology Selective |  | 3 Science Core Option |  
1-3 Science Core Option |  | 3 Elective |  
3 Elective |  | 3 Elective |  
3 Elective |  | 3 Elective |  
**12-17** |  |  | **15**

### Science Core Curriculum Options

- Options recommended for first- and second-year students
- Options recommended for third- and fourth-year students

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

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

**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 15900)
- 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.
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
   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:
   A. BIOL 32800 1 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.; fall)
   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 58000  Evolution  (3 cr.; spring)
11. BIOL 59500  Ecology  (3 cr.; fall)
12. BIOL 59500  Laboratory in Ecology  (1 cr.; fall)
13. CHM 33901  Biochemistry Laboratory  (1 cr; spring)
14. Lab Requirement: Must meet Base Lab requirement as described on the back of this page.
15. Ecology Selective: One of these five courses:
   A. BIOL 58210  Ecological Statistics  (3 cr.; fall)
   B. BIOL 58705  Animal Communication  (3 cr.; alt fall)
   C. BIOL 59100  Field Ecology  (4 cr.; alt fall)
   D. BIOL 59200  Evolution of Behavior  (3 cr.; alt spring)
   E. BIOL 59500  Disease Ecology  (3 cr.; spring)
   F. BIOL 59500  Sensory Ecology  (3 cr.; alt spring)
16. Biology Selective: One course from the following:
   BIOL 43800  General Microbiology  (3 cr.; fall)
   BIOL 43900  Microbiology Lab  (2 cr.; fall)
   BIOL 44400  Human Genetics  (3 cr.; fall)
   BIOL 48300  Environmental & Conservation Biology  (3 cr.; alt spring)
   BIOL 58210  Ecological Statistics  (3 cr.; fall)
   BIOL 58705  Animal Communication  (3 cr.; alt fall)
   BIOL 59100  Field Ecology  (4 cr.; alt fall)
   BIOL 59200  Evolution of Behavior  (3 cr.; alt spring)
   BIOL 59500  Disease Ecology  (3 cr.; spring)
   BIOL 59500  Sensory Ecology  (3 cr.; alt spring)
   AGEC 52500  Environmental Policy Analysis  (3 cr.; spring)
   ANTH 53500  Foundations of Biological Anthropology  (3 cr.; fall)
   ANTH 53600  Primate Ecology  (3 cr.; spring)
   BTNY 30200  Plant Ecology  (3 cr.; spring)
   BTNY 30500  Fundamentals of Plant Classification  (3 cr.; fall)
   BTNY 56100  Survey of Mathematical Biology  (3 cr.; alt both)
   CE 35000  Environmental Engineering  (3 cr.; both)
   CE 35200  Biological Principles of Environmental Engineering  (3 cr.; both)
   ENTM 50000  Fundamentals of Entomology  (3 cr.; fall)
   FNR 44700  Vertebrate Population Dynamics  (4 cr.; fall)
   FNR 48800  Global Environmental Issues  (3 cr.; fall)
   POL 52300  Environmental Politics and Public Policy  (3 cr.; fall)

Other courses may be considered for this elective requirement (#16). See your advisor for more information.

Footnotes and other requirements are on the back of this page.
Base Laboratory Requirement for all Biology Majors

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 39500</td>
<td>Exper Design &amp; Quant Analysis</td>
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<td>X</td>
<td>X</td>
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<tr>
<td>BIOL 43900</td>
<td>Microbiology Lab</td>
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<tr>
<td>BIOL 44202</td>
<td>Animal Physiology (5 week module)</td>
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<td>BIOL 44205</td>
<td>LabView (5 week module)</td>
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<td>X</td>
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<td>BIOL 44207</td>
<td>Protein Structure (5 week module)</td>
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<td>X</td>
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<tr>
<td>BIOL 44211</td>
<td>Anatomy &amp; Physiology (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>
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<td>BIOL 54200</td>
<td>Neurophysiology (5 week module)</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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<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><strong>BIOL 59500</strong></td>
<td>Laboratory in Ecology</td>
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<td>X</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>
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CHEMISTRY
1. General Chemistry:
   1. CHM 12901 General Chemistry with a Biological Focus (5 cr.; fall)

2. Organic Chemistry Selectives: (Must choose one option)
   1. 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)
   2. 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:
      1. BCHM 22100 Analytical Biochemistry (3 cr.; both) or
      2. CHM 32100 Analytical Chemistry I (4 cr.; fall)
   B. Biochemistry:
      1. BCHM 56100 General Biochemistry I (3 cr.; both) or
      2. CHM 33900 Biochemistry: A Molecular Approach (3 cr.; spring) or
      3. CHM 53300 Introductory Biochemistry (3 cr.; fall)
   C. Physical Chemistry:
      1. CHM 37200 Physical Chemistry (4 cr.; spring) or
      2. 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)

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 8-25 credits

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1 This course may count as the Intermediate Biology Selective and as the College of Science Teambuilding and Collaboration requirement.
2 BIOL 43800 may be used for requirement #9 or for requirement #14, but not both.
3 This course may be used for #15 or #16. It may not be used for #15 and #16.
4 This course may count for the Biology Selective course and as the College of Science Great Issues requirement and toward the Base Lab Requirement.
5 Students who select 12901 for General Chemistry must take CHM 33900 and 33901. CHM 33900 counts 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.
6 Students who do not take CHM 12901 for General Chemistry may use BIOL 44201 to satisfy this requirement.