The Biology program of study prepares students to understand the fundamental concepts and methodologies of the biological sciences, to engage in scientific research, and to investigate the relationships between biology and other fields of study, including social and environmental sciences. The biology program prepares students for numerous careers in specific areas of applied biology such as medical (including pre-medicine and pre-veterinary), agricultural, and environmental fields. In addition, the program includes components that target a student’s preparation for successful graduate studies.

THE BIOLOGY DISCIPLINE
Defined simply, biology is the study of life. The 21st century world will have to find solutions to many biological and environmental issues. Those biologists most capable of devising these solutions will understand the connections between biological knowledge and other scientific disciplines such as chemistry, geology, physics, meteorology, and climatology.

WHY STUDY BIOLOGY AT MONTREAT COLLEGE?
At Montreat College, the biology major is uniquely developed with a Christ-centered approach and small, intimate classes. Within the department, the faculty is highly accessible and genuine in their approach to students. The faculty works directly with students in developing research projects and career opportunities that are congruent with the student’s goals, while additionally providing connections with the Au Sable Environmental Institute, the Council for Christian Colleges and Universities, and the Appalachian College Association. Montreat College is home to the Christian Environmental Studies Center (CESC).

Set in the Southern Appalachian Mountains, adjacent to the Pisgah National Forest, Montreat College is equally adept at immersing the student into the subject matter. Students have the opportunity to learn experientially, whether inside the classroom or in the outdoors. Yet, those trained in biology must have more than a solid understanding of basic principles. They must possess an understanding of the ethical and worldview implications involved in the application of biological knowledge. Montreat College students are challenged to understand these implications through discussions and inquiry.

The biology major allows much room for individualization. Possible academic choices are the Pre-Professional Biology Concentration which can be augmented by the honors track or professional honors track, the Environmental Biology Concentration, and the Special Emphasis (self-designed) Concentration. These options ensure a well-tailored education for any student.
REQUIREMENTS FOR A MAJOR IN BIOLOGY

A major in Biology requires the following components:

- **Completion of the General Education Core (53 hours)**
  - BL 101-102

- **Completion of the General Education Competency Requirements**

- **Required Major Courses (41.5 hours):**
  - BL 205 Animal Diversity and Ecology (4)
  - BL 315 Cell Biology (4)
  - BL 215 Plant Diversity and Ecology (4)
  - BL 301 Biometrics (3)
  - BL 311 Plant Physiology (3)
  - BL 204 Animal Physiology (3)
  - BL 401 Genetics (3)
  - CH 201 Environmental Inorganic Chemistry I (4)
  - CH 202 Environmental Inorganic Chemistry II (4)
  - ES 206 Ecology (4)
  - ES 230 Sophomore Science Seminar I (0.5)
  - ES 445 Senior Science Seminar (1)
  - MT 191 Applied Calculus I (4)

- General electives to bring total to 126 semester hours. Refer to “Requirements for Baccalaureate Degrees” for more information.

- All biology majors are required to take the Major Field Test (MFT) in their discipline prior to graduation.

- Complete one of the following concentrations:

  **Pre-Professional Concentration (22-23 hours)**

  The Pre-professional concentration offers a wide range of courses designed to prepare students for entrance into *medical school*, *veterinary school*, *dental school*, *physical therapy* programs, and other professional or graduate schools.

  - BL 340/ES 340 Research Methods (3)
  - CH 320 Organic Chemistry I (3)
  - CH 322 Organic Chemistry Lab- I (2)
  - CH 321 Organic Chemistry II (3)
  - CH 323 Organic Chemistry Lab- II (1)
  - BL 421 Contemporary Biological Investigations (3)
  - MT 192 Applied Calculus II (4)
  - PC 131 College Physics I (4)

  Plus *one* of the following courses:

  - BL 404 Microbiology (3)
  - BL 406 Conservation Biology (3)
  - ES 315 Freshwater Ecosystems (4)
  - BL 415 Biochemistry/Toxicology (4)
  - CH 316 Chemistry of the Environment (3)
- **Honors Option:**
  Honors recognition will be indicated on the student’s transcript. Students pursuing this option must meet the following requirements in addition to those listed above:
  - Complete an acceptable research proposal by the end of the fall semester of the junior year.
  - Complete six semester hours of independent research (ES/BL 340 and ES/BL 440).
  - Orally present research findings prior to graduation.
  - Complete an additional nine semester hours of courses specific to the concentration.

- **Professional Honors Option**
  This option is designed to challenge students of an advanced academic ability by providing a program of study involving a unique set of courses and distinguished research. Completion of this program will be indicated as “Professional Honors” on the transcript. Those pursuing this option must complete all the requirements for the honors option (including the selection of BL 404, BL 415, CH 316, and PC 132 for the fourth requirement in the honors option) plus submit a publication-quality research manuscript based on their independent research project.

### Environmental Biology Concentration (20-22 hours)
The Environmental Biology concentration offers a wide range of courses designed to prepare students for entrance into such fields as biology, ecology, field research, and many other possible career paths. The concentration also equips students for graduate school in a variety of disciplines, including biology, ecology, and botany.

- CH 320 Organic Chemistry I (3)
- CH 322 Organic Chemistry Lab-I (2)
- ES/BL 340 Research Methods (3)
- PC 131 College Physics I (4)

Plus 9-12 hours selected from courses in Biology, Environmental Studies, Math, Chemistry, and Physics, in consultation with the advisor.

### Special Emphasis Concentration (Minimum of 6 courses, 22 hours)
Students may transfer a set of courses from other institutions, study abroad and certification programs (e.g., Au Sable Institute), or complete courses in other departments at Montreat College to fulfill the requirements of this emphasis. Students develop the special emphasis curriculum in consultation with the advisor. The advisor and the Biology Review Committee must approve a formal proposal of emphasis requirements by the end of the student’s sophomore year.
# BACHELOR OF SCIENCE IN BIOLOGY:
Environmental Biology Concentration | FOUR YEAR PLAN

## Freshman Year

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL 101 Survey of Biological Principles I (4)</td>
<td>BL 102 Survey of Biological Principles II (4)</td>
</tr>
<tr>
<td>EN 101 English Composition I (3)</td>
<td>EN 102 English Composition II (3)*</td>
</tr>
<tr>
<td>HS 101 History of World Civilization I (3)</td>
<td>ES 200 Intro to Environmental Studies (3)</td>
</tr>
<tr>
<td>IS 102 Foundations of Faith &amp; Learning (2)</td>
<td>HS 102 History of World Civilization II (3)*</td>
</tr>
<tr>
<td>Physical Education Activity Course (1)</td>
<td>MT 191 Applied Calculus I (4)</td>
</tr>
</tbody>
</table>

Gen Ed Writing Competency should be completed by the end of the Freshman year
See General Education Core Requirements for optional offerings.
MT 121 College Algebra must be taken Freshmen Fall if needed for Applied Calculus

## Sophomore Year

<table>
<thead>
<tr>
<th>Fall Semester</th>
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<tbody>
<tr>
<td>CH 201 Inorganic Chemistry I (4)</td>
<td>BL 315 Cell Biology and Lab (4)</td>
</tr>
<tr>
<td>ES 206 Ecology or PC131 General Physics (4)</td>
<td>CH 202 Inorganic Chemistry II (4)</td>
</tr>
<tr>
<td>BL 230 Sophomore Science Seminar I (0.5)</td>
<td>BL 205 Animal Diversity and Ecology (4)</td>
</tr>
<tr>
<td>BL 204 Animal Physiology (3)</td>
<td>Gen Ed Humanities Requirement (3)</td>
</tr>
<tr>
<td>Gen Ed Computer Skills Competency (3)</td>
<td>Gen Ed Oral Competency Requirement (3)</td>
</tr>
<tr>
<td>Physical Education Activity Course (1)</td>
<td>Additional hours selected from courses in BL, ES, MT, CH and PC in consultation with advisor**</td>
</tr>
</tbody>
</table>

Gen Ed Computer Skills Competency should be completed by the end of the Sophomore year

## Junior Year

<table>
<thead>
<tr>
<th>Fall Semester</th>
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</tr>
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<tbody>
<tr>
<td>ES/BL 340 Research Methods (3)</td>
<td>Gen Ed English Literature Requirement (3)</td>
</tr>
<tr>
<td>BL 401 Genetics (3)</td>
<td>Gen Ed Humanities Requirement (3)</td>
</tr>
<tr>
<td>BL 215 Plant Diversity and Ecology (4)</td>
<td>Gen Ed Social Science Requirement (3)</td>
</tr>
<tr>
<td>ES 206 Ecology or PC131 General Physics (4)</td>
<td>BL 311 Plant Phys or BL 301 Biometrics (2/3)</td>
</tr>
<tr>
<td>CH 320 Organic Chemistry I (4)</td>
<td>Additional hours selected from courses in BL, ES, MT, CH and PC in consultation with advisor**</td>
</tr>
<tr>
<td>Additional hours selected from courses in BL, ES, MT, CH and PC in consultation with advisor**</td>
<td>CH 322 Organic Chemistry Lab (2)</td>
</tr>
</tbody>
</table>

Gen Ed Mathematical Computation, Oral Expression, and Reading Competencies should be completed by the end of the Junior year

## Senior Year

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES 445 Senior Science Seminar (1)</td>
<td>BL 311 Plant Phys or BL 301 Biometrics (2/3)</td>
</tr>
<tr>
<td>IS 461 Philosophy of Faith &amp; Learning (2)</td>
<td>Recommended: BL 421 Bio. Investigations Lab (3)</td>
</tr>
<tr>
<td>Elective (3)</td>
<td>Elective (3)</td>
</tr>
<tr>
<td>Additional hours selected from courses in BL, ES, MT, CH and PC in consultation with your advisor**</td>
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<td>Elective (3)</td>
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Completion of the Major Field Test by the end of the Senior year
# BACHELOR OF SCIENCE IN BIOLOGY:
**Environmental Biology Concentration**
**FOUR YEAR PLAN**

## Freshman Year

### Fall Semester
- **BB 101** Survey of Old Testament (3)
- **BL 101** Survey of Biological Principles I (4)
- **EN 101** English Composition I (3)
- **HS 101** History of World Civilization I (3)
- **IS 102** Foundations of Faith & Learning (2)
- **Physical Education Activity Course** (1)

### Spring Semester
- **BB 102** Survey of New Testament (3)
- **BL 102** Survey of Biological Principles II (4)
- **EN 102** English Composition II (3)*
- **HS 102** History of World Civilization II (3)*
- **ES 200** Intro to Environmental Studies (3)

Gen Ed Writing Competency should be completed by the end of the Freshman year

See General Education Core Requirements for optional offerings.

MT 121 College Algebra must be taken Freshmen Fall if needed for Applied Calculus

## Sophomore Year

### Fall Semester
- **CH 201** Inorganic Chemistry I (4)
- **BL 204** Animal Physiology (3)
- **BL 230** Sophomore Science Seminar I (0.5)
- **ES 206** Ecology or PC131 General Physics (4)
- **BL 2XX** Animal Diversity and Ecology (4)
- **Gen Ed Humanities Requirement** (3)
- **Gen Ed Computer Skills Competency** (3)
- **Gen Ed Oral Competency Requirement** (3)
- **Physical Education Activity Course** (1)

### Spring Semester
- **CH 202** Inorganic Chemistry II (4)
- **BL 204** Animal Physiology (3)
- **Gen Ed Humanities Requirement** (3)
- **Gen Ed Computer Skills Competency** should be completed by the end of the Sophomore year

## Junior Year

### Fall Semester
- **ES/BL 3xx** Research Methods (3)
- **BL 401** Genetics (3)
- **BL 2xx** Plant Diversity and Ecology (4)
- **ES 206** Ecology or PC131 General Physics (4)
- **CH 320** Organic Chemistry I (4)

### Spring Semester
- **ES/BL 3xx** Research Methods (3)
- **Gen Ed English Literature Requirement** (3)
- **Gen Ed Social Science Requirement** (3)
- **CH 322** Organic Chemistry Lab (2)

Gen Ed Mathematical Computation, Oral Expression, and Reading Competencies should be completed by the end of the Junior year

## Senior Year

### Fall Semester
- **ES 430** Senior Science Seminar III (0.5)
- **IS 461** Philosophy of Faith & Learning (2)
- **Recommended: BL 421 Bio. Investigations Lab (3)**
- **Elective (3)**

### Spring Semester
- **ES 430** Senior Science Seminar III (0.5)
- **IS 461** Philosophy of Faith & Learning (2)
- **Recommended: BL 421 Bio. Investigations Lab (3)**
- **Elective (3)**

Elective (3)

Gen Ed Writing Competency should be completed by the end of the Freshman year

Completion of the Major Field Test by the end of the Senior year
### Bachelor of Science in Biology: Pre-Professional Concentration | Four Year Plan

#### Freshman Year

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<th>Fall Semester</th>
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<td></td>
</tr>
<tr>
<td>Physical Education Activity Course (1)</td>
<td>MT 191 Applied Calculus I (4)</td>
</tr>
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Gen Ed Writing Competency should be completed by the end of the Freshman year
See General Education Core Requirements for optional offerings.
MT 121 College Algebra must be taken Freshmen Fall if needed for Applied Calculus

#### Sophomore Year

| CH 201 Inorganic Chemistry I (4)        | BL 315 Cell Biology and Lab (4)          |
| ES 206 Ecology or PC131 General Physics (4) | CH 202 Inorganic Chemistry II (4)       |
| BL 230 Sophomore Science Seminar I (0.5) | BL 205 Animal Diversity and Ecology (4) |
| BL 204 Animal Physiology (3)            | Gen Ed Humanities Requirement (3)        |
| Physical Education Activity Course (1)  | Gen Ed Oral Competency Requirement - pres|
| MT 192 Applied Calculus II (4)          |                                          |

Gen Ed Computer Skills Competency should be completed by the end of the Sophomore year
Gen Ed Oral Competency Requirement met through class presentations – student is responsible for this.

#### Junior Year

| BL 401 Genetics (3)                   | Gen Ed English Literature Requirement (3) |
| BL 215 Plant Diversity and Ecology (4) | CH 322 Organic Chemistry Lab (2)          |
| ES 206 Ecology or PC131 General Physics (4) | BL 311 Plant Phys or BL 301 Biometrics (2/3) |
| CH 320 Organic Chemistry I (4)         | CH 321 Organic Chemistry II (4)           |
| ES/BL 340 Research Methods (3)         | Recommended - PC 132 General Physics (4)  |

Gen Ed Mathematical Computation, Oral Expression, and Reading Competencies should be completed by the end of the Junior year

#### Senior Year

| ES 445 Senior Science Seminar (1)      | CH 323 Organic Chemistry Lab- Part II (1) |
| BL 404 Microbiology (3) –at least one  | BL 421 Biological Investigations Lab (3)  |
| BL 406 Conservation Biology (3) –at least one |                                     |
| CH 315/316 Chemistry of Environment (3)-opp | CH 316 Chemistry of Environment (3) - opp |
| ES 315 Freshwater Ecology (4)-at least one | BL 311 Plant Phys or BL 301 Biometrics (2/3) |
| ES 315 Biochemistry/Tox (4)-at least one | Gen Ed Humanities Requirement (3)         |

Completion of the Major Field Test by the end of the Senior year
At least one = The P-P Conc. Requires the selection of at least one of these courses, often many are taken. opp = optional

See General Education Core Requirements for optional offerings.
MT 121 College Algebra must be taken Freshmen Fall if needed for Applied Calculus
**Environmental Biology Concentration requires at least an additional 9-12 hours of courses that are developed with your advisor. This is listed each semester to remind you to make room in your schedule to get this done by the end of your senior year.

#### Special Emphasis Concentration

Be sure that you have the Biology Core courses in your four year plan, plus the courses that you develop with your advisor to fulfill this concentration.
REQUIREMENTS FOR A MINOR IN BIOLOGY
Montreat College offers a minor in Biology that requires a minimum of 20 semester hours including:

- BL 101 (4) Biological Principles I (4)
- BL 102 (4) Biological Principles II (4)
- Choose an additional 4 hours from Biology
- Choose an additional 8 hours from Biology, Chemistry, and/or Environmental Studies.

AFTER GRADUATION
With a comprehensive education in biology, students are prepared to enter such fields as field biology, ecology, applied research, teaching, environmental biology, and many other possible career paths. The biology program also equips student for graduate school in a variety of disciplines, including physical therapy, veterinary medicine, biology, ecology, and medicine.