Multidisciplinary Science

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The multidisciplinary science curriculum allows students to design academic programs that satisfy the requirements for a bachelor of science degree and provide more breadth than traditional science programs. Many exciting areas of scientific inquiry, such as bioinformatics, environmental science, and biophysical science, require broad science backgrounds and encompass several disciplines. Students planning technical careers in one of these areas or careers in the health sciences, in science education, or in a science-related business or social service might be best served by a well-designed multidisciplinary science program.

One strength of the Multidisciplinary Science Program is its flexibility. To exploit that strength, students need to design their programs carefully, consulting frequently with their Advisors in the Tykeson College and Career Center. Course sequences that meet requirements for professional schools and training programs should be selected in consultation with advisors that specialize in the specific area (for example the Health Professions Program advisors). Students should seek assistance in program planning when they identify or change career goals, because successful application to professional schools and training programs may require completion of additional courses beyond those required for the multidisciplinary science major.

Examples of cross-disciplinary fields, and the subject-matter areas that might be combined in designing a program, are given below:

- **Animal behavior and ethology**—anthropology, biology, psychology
- **Biophysical sciences**—biology, chemistry, human physiology, physics
- **Cognitive sciences**—computer and information science, mathematics, psychology
- **Environmental sciences**—biology, chemistry, earth sciences, geography, physics
- **Bioinformatics**—biology, computer and information science

Multidisciplinary science majors are encouraged to consult with the program director during their junior year to ensure that their remaining course work is structured to meet all the requirements for the major. Students should notify the Multidisciplinary Science Program office of their intention to graduate at least one term before the proposed graduation date.

**Preparation**

High school students planning to major in multidisciplinary science should take as much mathematics as possible, including two years of algebra and trigonometry. They should also take science courses in their areas of interest. Students planning to transfer into the Multidisciplinary Science Program after two years at a community college or at another college or university should complete courses equivalent to the lower-division requirements listed in this catalog and as many of the university’s general-education requirements for a bachelor’s degree as possible.

Acceptance of transfer courses and credits is determined by evaluators in the Office of Admissions in consultation with departmental advisors.

Upon admission, transfer students should consult with the multidisciplinary science director in the program office.

**Careers**

Through the Multidisciplinary Science Program, prehealth science students preparing for careers in medicine, dentistry, or related fields can meet professional school admission requirements. Multidisciplinary science, when combined with a minor or a second major, can work well for students planning careers in science-related business, public relations, and human services.

- **Bachelor of Arts**
- **Bachelor of Science**

**Undergraduate Studies**

**Bachelor of Arts Degree Requirements**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 251</td>
<td>Calculus I or MATH 245 for the Biological Sciences I</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Select one of the following:</td>
<td></td>
</tr>
<tr>
<td>CIS 122</td>
<td>Introduction to Programming and Problem Solving</td>
<td></td>
</tr>
<tr>
<td>MATH 231</td>
<td>Elements of Discrete Mathematics I</td>
<td></td>
</tr>
<tr>
<td>MATH 243</td>
<td>Introduction to Methods of Probability and Statistics</td>
<td></td>
</tr>
<tr>
<td>MATH 247</td>
<td>Calculus for the Biological Sciences II</td>
<td></td>
</tr>
<tr>
<td>MATH 252</td>
<td>Calculus II</td>
<td></td>
</tr>
<tr>
<td>MATH 425</td>
<td>Statistical Methods I (Students who complete MATH 425 as part of the math requirement, cannot also use this same class towards the 32 credits of upper-division General Science major requirements.)</td>
<td></td>
</tr>
</tbody>
</table>

Select three sequences or three-course combinations from the following; two sequences must include labs: 36-48

Anthropology: Applies as a non-lab course combination

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 270</td>
<td>Introduction to Biological Anthropology (Required for ANTH course combination)</td>
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</table>

Select two of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>ANTH 145</td>
<td>Principles of Archaeology</td>
</tr>
<tr>
<td>ANTH 170</td>
<td>Introduction to Human Origins</td>
</tr>
<tr>
<td>ANTH 171</td>
<td>Introduction to Monkeys and Apes</td>
</tr>
<tr>
<td>ANTH 173</td>
<td>Evolution of Human Sexuality</td>
</tr>
<tr>
<td>ANTH 175</td>
<td>Evolutionary Medicine</td>
</tr>
<tr>
<td>ANTH 176</td>
<td>Introduction to Forensic Anthropology</td>
</tr>
<tr>
<td>ANTH 361</td>
<td>Human Evolution</td>
</tr>
<tr>
<td>ANTH 362</td>
<td>Human Biological Variation</td>
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</tbody>
</table>

Biology: Applies as a lab sequence

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 211–214</td>
<td>General Biology I-IV (choose three: BI 211, BI 212, and either BI 213 or BI 214)</td>
</tr>
</tbody>
</table>
or BI 281H– Honors Biology I-III
283H
Chemistry: Can apply as either a lab sequence or a non-lab sequence

Select one of the following:
- CH 221–223 General Chemistry
- CH 227–229 and General Chemistry Laboratory
- CH 224H–226H Honors General Chemistry and Advanced General Chemistry
- CH 237–239 Laboratory

Computer and Information Science: Applies as a lab sequence
- CIS 210–212 Computer Science I-III

Earth Sciences: Applies as a lab sequence
- ERTH 201 Dynamic Planet Earth (OR ERTH 101 with a mid-B or better grade)
- ERTH 202 Earth’s Surface and Environment (OR ERTH 102 with a mid-B or better grade)
- ERTH 203 History of Life (OR ERTH 103 with a mid-B or better grade)

Geography: Applies as a non-lab course combination
- GEOG 141 The Natural Environment (Required for GEOG course combination)

Select two of the following:
- GEOG 181 Our Digital Earth
- GEOG 321 Climatology
- GEOG 322 Geomorphology
- GEOG 323 Biogeography
- GEOG 361 Global Environmental Change

Physics: Can apply as a lab sequence or a non-lab sequence

Select one of the following:
- PHYS 201–203 General Physics
- PHYS 204–206 and Introductory Physics Laboratory
- PHYS 251–253 Foundations of Physics I
- PHYS 290 and Foundations of Physics Laboratory (must take all 3 terms of PHYS 290 for this to count as a lab sequence)

Upper Division courses from the below departments
- BB, CH, CIS, ERTH, HPHY, MATH, PHYS, and PSY
- ANTH

Upper division courses from these departments are approved for the major.

GEOG
Upper division GEOG courses from the physical geography and GIScience subfields are approved (for a complete list of approved upper division GEOG courses see the Program website). Experimental courses (410) require program approval.

Emphasis areas
At least twelve graded credits (not P/NP) must be in one department and at least twelve graded credits must be in a second department. We strongly encourage students to take all majors classes for a grade.

401-409
4 of the 32 credits may be research (401), thesis (403), or supervised college teaching (402) credits. Seminar, Readings & Conference, Practicum, Internship, and Tutorial credits (404-409) may not be used for the Multidisciplinary Science major.

Residency requirement
24 credits must be taken at UO.

Double Majors
Upper division credits used for another major may not be used to satisfy MSCI requirements.

Minors in related fields
There is no MSCI imposed restriction on course overlap between the MSCI major and any minor (though the department offering the minor might have restrictions). We encourage you to look into minors in your emphasis areas.

Prerequisites
All students are subject to all prerequisites, minimum grade requirements, and registration restrictions set by each department for its own courses. These things cannot be circumvented because one is a MSCI major. Please investigate the prerequisites and restrictions for the courses you are interested in taking early on.

Total Credits 76-88

1 All students must demonstrate a proficiency in mathematics by passing calculus I and one additional math or computer science class from the provided list. All courses must be completed with grades of C– or P (pass) or better

2 All students must take three course sequences (or three course combinations in the case of ANTH and GEOG) from the provided list, two of which must include laboratories. The labs might be embedded in the class (as with BI, CIS, and GEOE), or taken as separate courses (as with CH and PHYS). All courses must be completed with grades of C– or P (pass) or better, except ERTH 101-103 which must be completed with grades of mid-B or better.

3 All courses must be completed with grades of C– or P or better. All upper division emphasis area courses must be taken for a letter grade.
# Bachelor of Science Degree Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lower Division MATH/CIS Requirement</strong></td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>MATH 251</td>
<td>Calculus I</td>
<td></td>
</tr>
<tr>
<td>or MATH 244</td>
<td>Calculus for the Biological Sciences I</td>
<td></td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Select three sequences or three-course combinations from the following; two sequences must include labs: 36-48

| Anthropology: Applies as a non-lab course combination |         |
| ANTH 270  | Introduction to Biological Anthropology (Required for ANTH course combination) |         |

Select two of the following:

| ANTH 145  | Principles of Archaeology                                             |         |
| ANTH 170  | Introduction to Human Origins                                          |         |
| ANTH 171  | Introduction to Monkeys and Apes                                      |         |
| ANTH 173  | Evolution of Human Sexuality                                           |         |
| ANTH 175  | Evolutionary Medicine                                                 |         |
| ANTH 176  | Introduction to Forensic Anthropology                                  |         |
| ANTH 361  | Human Evolution                                                       |         |
| ANTH 362  | Human Biological Variation                                             |         |

| Biology: Applies as a lab sequence |         |
| BI 211–214 | General Biology I-IV (choose three: BI 211, BI 212, and either BI 213 or BI 214) | 32 credits |
| or BI 281H | Honors Biology I-III                                                 |         |
| 283H       |                                                                 |         |

| Chemistry: Can apply as either a lab sequence or a non-lab sequence |         |
| Select one of the following: | 36 credits |
| CH 221–223 | General Chemistry                                                     |         |
| & CH 227–229 | General Chemistry Laboratory                                        |         |
| CH 224H–226H | Honors General Chemistry and Advanced General Chemistry Laboratory |         |
| & CH 237–239 | Laboratory                                                          |         |

| Computer and Information Science: Applies as a lab sequence |         |
| CIS 210–212 | Computer Science I-III                                               |         |

| Earth Sciences: Applies as a lab sequence |         |
| ERTH 201 | Dynamic Planet Earth (OR ERTH 101 with a mid-B or better grade)     |         |
| ERTH 202 | Earth's Surface and Environment (OR ERTH 102 with a mid-B or better grade) |         |

<table>
<thead>
<tr>
<th><strong>Upper Division</strong></th>
<th>32 credits of approved upper-division courses from the below departments</th>
<th>32 credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI, CH, CIS, ERTH, HPHY, MATH, PHYS, and PSY</td>
<td>Upper division courses from these departments are approved for the major.</td>
<td></td>
</tr>
</tbody>
</table>

| ANTH | Upper division ANTH courses from the biological anthropology and physical archeology subfields are approved (for a complete list of approved upper division ANTH courses see the Program website). Experimental courses (410) require program approval. |         |

| GEOG | Upper division GEOG courses from the physical geography and GIScience subfields are approved (for a complete list of approved upper division GEOG courses see the Program website). Experimental courses (410) require program approval. |         |

| Emphasis areas | At least twelve graded credits (not P/NP) must be in one department and at least twelve graded credits must be in a second department. We strongly encourage students to take all majors classes for a grade. | 401-409 |
| 401-409        | 4 of the 32 credits may be research (401), thesis (403), or supervised college teaching (402) credits. Seminar, Readings & Conference, Practicum, Internship, and Tutorial credits (404-409) may not be used for the Multidisciplinary Science major. |         |

| Residency requirement | 24 credits must be taken at UO. |         |

| Double Majors | upper division credits used for another major may not be used to satisfy MSCI requirements. |         |
Minors in related fields

There is no MSCI imposed restriction on course overlap between the MSCI major and any minor (though the department offering the minor might have restrictions). We encourage you to look into minors in your emphasis areas.

Prerequisites

All students are subject to all prerequisites, minimum grade requirements, and registration restrictions set by each department for its own courses. These things cannot be circumvented because one is a MSCI major. Please investigate the prerequisites and restrictions for the courses you are interested in taking early on.

Total Credits: 76-88

1 All students must demonstrate a proficiency in mathematics by passing calculus I and one additional math or computer science class from the provided list. All courses must be completed with grades of C– or P (pass) or better

2 All students must take three course sequences (or three course combinations in the case of ANTH and GEOG) from the provided list, two of which must include laboratories. The labs might be embedded in the class (as with BI, CIS, and GEOL), or taken as separate courses (as with CH and PHYS). All courses must be completed with grades of C– or P (pass) or better, except ERTH 101-103 which must be completed with grades of mid-B or better.

3 All courses must be completed with grades of C– or P or better. All upper division emphasis area courses must be taken for a letter grade.

Multidisciplinary science courses must be completed with grades of C– or P (pass) or better. Courses graded N (no pass) or F may be repeated for credit, in accordance with university policy.

The upper-division requirements are for students who declared the multidisciplinary science major fall 2000 or later. Students who declared the major before fall 2000 follow the requirements that were in effect when they declared the major. Upper-division credits used to satisfy minimum requirements of another major may not be used to satisfy upper-division requirements in multidisciplinary science. At least 24 upper-division science credits must be completed at the University of Oregon to meet the multidisciplinary science residency requirement.

Upper-division courses may be selected from the multidisciplinary science website (http://gensci.uoregon.edu/).

Honors Program

Students preparing to graduate with honors in multidisciplinary science should notify the program director no later than the first term of the senior year.

Honors in multidisciplinary science centers on a thesis, which is the culmination of research conducted under the direction of a faculty advisor. The advisor does not need to be a member of the Multidisciplinary Science Committee.

To graduate with honors, students must have at least a 3.50 overall grade point average and an average GPA of 3.50 or better in all classes counting towards the multidisciplinary science major. In addition, they must complete 6 credits (or equivalent experience per-approved by MSCI Director) of Research (401) or Thesis (403) or both in an appropriate department. These credits must be distributed over at least two terms and cannot be used to fulfill emphasis-area requirements.

Upon approval of the thesis by the advisor and the program director, honors in multidisciplinary science are awarded.

For guidelines and calendar, contact the Multidisciplinary Science Program Director.

Program Planning

Information about program planning and detailed sample programs are available on the Multidisciplinary Science Program website. Pre-health science students who choose the multidisciplinary science major should design their programs to meet the admission requirements of the professional school of their choice. See also Preparatory Programs in the Academic Resources section of this catalog.

Kindergarten through Secondary Teaching Careers

An academic major in multidisciplinary science can provide a strong background for certain teacher-education licensure programs. Students interested in teaching science in middle school and junior high school should be aware that the integrated science endorsement requires broader preparation than the minimum requirements for the multidisciplinary science major. The College of Education offers a five-year program for middle-secondary teaching licensure in science. See the College of Education (http://catalog.uoregon.edu/education/) section of this catalog.

Four-Year Degree Plan

The degree plan shown is only a sample of how students may complete their degrees in four years. There are alternative ways. Students should consult their advisor to determine the best path for them.

Bachelor of Science in Multidisciplinary Science with Education Focus

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CH 111</td>
<td>Introduction to Chemical Principles</td>
<td>4</td>
</tr>
<tr>
<td>MATH 111</td>
<td>College Algebra</td>
<td>4</td>
</tr>
<tr>
<td>WR 121</td>
<td>College Composition I</td>
<td>4</td>
</tr>
<tr>
<td>Core-education course</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Winter</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>MATH 112</td>
<td>Elementary Functions</td>
<td>4</td>
</tr>
<tr>
<td>WR 122</td>
<td>College Composition II</td>
<td>4</td>
</tr>
<tr>
<td>or WR 123</td>
<td>College Composition III</td>
<td>4</td>
</tr>
<tr>
<td>BI 211</td>
<td>General Biology I: Cells</td>
<td>4</td>
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<tr>
<td>Core-education course that also satisfies multicultural requirement</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Spring</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>BI 212</td>
<td>General Biology II: Organisms</td>
<td>4</td>
</tr>
<tr>
<td>MATH 251</td>
<td>Calculus I</td>
<td>4</td>
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</tbody>
</table>
# Bachelor of Science in Multidisciplinary Science with Pre-Medical Focus

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Milestones</th>
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<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Fall</strong></td>
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</tr>
<tr>
<td>CH 111</td>
<td>Introduction to Chemical Principles</td>
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<td>College Algebra</td>
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<tr>
<td>WR 121</td>
<td>College Composition I</td>
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<tr>
<td>Core-education course</td>
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<tr>
<td><strong>Winter</strong></td>
<td></td>
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</tr>
<tr>
<td>WR 122</td>
<td>College Composition II</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>or WR 123</td>
<td>or College Composition III</td>
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<tr>
<td>MATH 212</td>
<td>Fundamentals of Elementary Mathematics II</td>
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<tr>
<td>CH 221</td>
<td>General Chemistry I</td>
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<tr>
<td>CH 227</td>
<td>General Chemistry Laboratory</td>
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<tr>
<td><strong>Second Year</strong></td>
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<tr>
<td><strong>Fall</strong></td>
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<tr>
<td>BI 213</td>
<td>General Biology III: Populations or General Biology IV: Mechanisms</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>CH 221</td>
<td>General Chemistry I or General Physics</td>
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<td></td>
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<tr>
<td>or PHYS 201</td>
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<tr>
<td>CH 227</td>
<td>General Chemistry Laboratory or Introductory Physics Laboratory</td>
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<td>or PHYS 204</td>
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<tr>
<td>Core-education course</td>
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<tr>
<td><strong>Winter</strong></td>
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<tr>
<td>CH 222</td>
<td>General Chemistry II or General Physics</td>
<td>4</td>
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<tr>
<td>or PHYS 202</td>
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<tr>
<td>CH 228</td>
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<td>or PHYS 205</td>
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<td>Calculus II</td>
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<td>Core-education course</td>
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<tr>
<td><strong>Spring</strong></td>
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</tr>
<tr>
<td>CH 223</td>
<td>General Chemistry III or General Physics</td>
<td>4</td>
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<tr>
<td>or PHYS 203</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CH 229</td>
<td>General Chemistry Laboratory or Introductory Physics Laboratory</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>or PHYS 206</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>MATH 243</td>
<td>Introduction to Methods of Probability and Statistics</td>
<td>4</td>
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</tr>
<tr>
<td>or MATH 425</td>
<td>or Statistical Methods I</td>
<td></td>
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<tr>
<td>Core-education course</td>
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<td>4</td>
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<tr>
<td><strong>Third Year</strong></td>
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<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
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<tr>
<td>ERTH 101</td>
<td>Exploring Planet Earth (completed with a letter grade of mid-B or higher) or Dynamic Planet Earth</td>
<td>4</td>
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</tr>
<tr>
<td>CH 331</td>
<td>Organic Chemistry I</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Core-education course</td>
<td></td>
<td>4</td>
<td></td>
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<tr>
<td>Elective course</td>
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<td>4</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Winter</strong></td>
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<tr>
<td>ERTH 102</td>
<td>Exploring Earth’s Environment (completed with a letter grade of mid-B or higher) or Earth’s Surface and Environment</td>
<td>4</td>
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<tr>
<td>CH 335</td>
<td>Organic Chemistry II</td>
<td>4</td>
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</tr>
<tr>
<td>Elective courses</td>
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<td></td>
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<tr>
<td><strong>Fourth Year</strong></td>
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## Second Year

### Fall
- **BI 211** General Biology I: Cells 4
- **CH 223** General Chemistry III 4
- **CH 229** General Chemistry Laboratory 2
- Core-education course that also satisfies multicultural requirement 4

### Credits
14

### Winter
- **BI 212** General Biology II: Organisms 4
- **MATH 252** or **MATH 247** Calculus II or Calculus for the Biological Sciences II 4
- Core-education course that also satisfies multicultural requirement 4
- Core-education course 4

### Credits
16

### Spring
- **BI 214** General Biology IV: Mechanisms 4
- **MATH 243** or **MATH 425** Introduction to Methods of Probability and Statistics or Statistical Methods I 4
- Upper-division core-education course 4
- Core-education course 4

### Credits
16

## Third Year

### Fall
- **BI 320** Molecular Genetics 4
- **CH 331** Organic Chemistry I 4
- **CH 337** Organic Chemistry Laboratory 3
- Upper-division core-education course 4

### Credits
15

### Winter
- **CH 335** Organic Chemistry II 4
- **CH 338** Organic Chemistry Laboratory 3
- **BI 358** Investigations in Medical Physiology 4
- Upper-division elective course 4

### Credits
15

### Spring
- **PSY 201** or **PSY 202** Mind and Brain or Biopsychology 4
- **SOC 204** or **SOC 207** Introduction to Sociology or Social Inequality 4
- **CH 336** Organic Chemistry III 4
- Upper-division biology course 4

### Credits
16

## Fourth Year

### Fall
- **PHYS 201** General Physics 4
- **PHYS 204** Introductory Physics Laboratory 2

### Spring
- **PHYS 203** General Physics 4
- **PHYS 206** Introductory Physics Laboratory 2
- **CH 462** Biochemistry 4
- Upper-division elective course 4

### Credits
14

### Total Credits
180