General Science

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541-346-3288
65C Klamath Hall

The general 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, neuroscience, 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 General Science Program is its flexibility. To exploit that strength, students need to design their programs carefully, consulting frequently with the general science director. Course sequences that meet requirements for professional schools and training programs should be selected in consultation with the program director or university 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 general 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
- Neurosciences—biology, chemistry, psychology

General 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 General 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 general 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 General 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 general science director in the program office.

Careers

Through the General Science Program, prehealth science students preparing for careers in medicine, dentistry, or related fields can meet professional school admission requirements. General 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>Lower Division</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 251–252</td>
<td>44-56</td>
<td>Calculus I-II</td>
<td></td>
</tr>
<tr>
<td>or MATH 241</td>
<td></td>
<td>Calculus for the Biological</td>
<td></td>
</tr>
<tr>
<td>247</td>
<td></td>
<td>Sciences I-II</td>
<td></td>
</tr>
</tbody>
</table>

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

Anthropology

- ANTH 270 Introduction to Biological Anthropology
- Select two of the following:
  - ANTH 171 Introduction to Monkeys and Apes
  - ANTH 173 Evolution of Human Sexuality
  - ANTH 361 Human Evolution
  - ANTH 362 Human Biological Variation

Biology

- BI 211–214 General Biology I-IV (choose three) or BI 281H–283H Honors Biology I-III
- Select two 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

Chemistry

- 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

- CIS 210–212 Computer Science I-III

Geography

- GEOG 141 The Natural Environment
- Select two of the following:
  - GEOG 181 Our Digital Earth
  - GEOG 321 Climatology
  - GEOG 322 Geomorphology
  - GEOG 323 Biogeography
  - GEOG 361 Global Environmental Change

Earth Sciences

- GEOL 201 Dynamic Planet Earth
General Science

GEOL 202 Earth's Surface and Environment
GEOL 203 History of Life

Physics

Select one of the following:

PHYS 201--203
PHYS 204--206
PHYS 251--253
& PHYS 290

Upper Division

32 credits of approved upper-division science courses
(for a complete list of approved courses see the General Science Program website gensci.uoregon.edu/general-science-checksheet)

Total Credits 76-88

1 All students must demonstrate a proficiency in mathematics by passing Calculus II. In addition, all students must take three course sequences (or three course combinations in the case of ANTH and GEOG) from the list above, two of which must include laboratories. The labs might be imbedded 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. Courses graded N (no pass) or F may be repeated for credit.

2 Two areas of emphasis from two different departments are required. Each emphasis consists of 12 graded upper-division credits from a single department. At least 24 of the 32 credits must be taken for letter grades and at least 24 must be taken at the University of Oregon. Four of the 32 credits may be Research (401), Thesis (403), or Supervised College Teaching (402). Other courses numbered 400–409 may not be included unless approved in advance by the general science advisor. Upper-division courses used for another major may not be used to satisfy upper-division general science requirements. All courses must be completed with grades of P or C– or better.

Bachelor of Science Degree Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Division 1</td>
<td></td>
<td>44-56</td>
</tr>
<tr>
<td>MATH 251--252</td>
<td>Calculus I-II</td>
<td></td>
</tr>
<tr>
<td>or MATH 241</td>
<td>Calculus for the Biological Sciences I-II</td>
<td></td>
</tr>
<tr>
<td>247</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Anthropology

ANTH 270 Introduction to Biological Anthropology

Select two of the following:

ANTH 171 Introduction to Monkeys and Apes
ANTH 173 Evolution of Human Sexuality
ANTH 361 Human Evolution
ANTH 362 Human Biological Variation

Biology

BI 211--214 General Biology I-IV (choose three)

or BI 281H– Honors Biology I-III
283H

Chemistry

Select one of the following:

CH 221--223 General Chemistry
& CH 227--229 and General Chemistry Laboratory

CH 224H– Honors General Chemistry
226H and Advanced General Chemistry
& CH 237--239 Laboratory

Computer and Information Science

CIS 210--212 Computer Science I-III

Geography

GEOG 141 The Natural Environment

Select two of the following:

GEOG 181 Our Digital Earth
GEOG 321 Climatology
GEOG 322 Geomorphology
GEOG 323 Biogeography
GEOG 361 Global Environmental Change

Earth Sciences

GEOL 201 Dynamic Planet Earth
GEOL 202 Earth's Surface and Environment
GEOL 203 History of Life

Physics

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

Upper Division

32 credits of approved upper-division science courses
(for a complete list of approved courses see the General Science Program website gensci.uoregon.edu/general-science-checksheet)

Total Credits 76-88

1 All students must demonstrate a proficiency in mathematics by passing Calculus II. In addition, all students must take three course sequences (or three course combinations in the case of ANTH and GEOG) from the list above, two of which must include laboratories. The labs might be imbedded 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. Courses graded N (no pass) or F may be repeated for credit.
Two areas of emphasis from two different departments are required. Each emphasis consists of 12 graded upper-division credits from a single department. At least 24 of the 32 credits must be taken for letter grades and at least 24 must be taken at the University of Oregon. Four of the 32 credits may be Research (401), Thesis (403), or Supervised College Teaching (402). Other courses numbered 400–409 may not be included unless approved in advance by the general science advisor. Upper-division courses used for another major may not be used to satisfy upper-division general science requirements. All courses must be completed with grades of P or C− or better.

General 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 general 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 general science. At least 24 upper-division science credits must be completed at the University of Oregon to meet the general science residency requirement.

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

**Honors Program**

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

Honors in general 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 general science committee.

To graduate with honors, students must have at least a 3.50 overall grade point average and a GPA of 3.50 or better in the sciences. In addition, they must complete 9 credits of Research (401) or Thesis (403) or both in the 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 general sciences are awarded.

For guidelines and calendar, see a general science program director.

**Program Planning**

Information about program planning and detailed sample programs are available in the General Science Program office. Prehealth science students who choose the general 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 general science can provide a strong background for certain teacher-education licensure programs. Students interested in teaching general 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 general science major. The College of Education offers a fifth-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 General Science with Education Focus**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Milestones</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CH 111</td>
<td>Introduction to Chemical Principles</td>
<td>4</td>
<td>Ideal for solid preparation for CH 221</td>
</tr>
<tr>
<td>MATH 111</td>
<td>College Algebra</td>
<td>4</td>
<td>Students should plan to start the degree with Math courses; math placement test determines which Math course one should take first</td>
</tr>
<tr>
<td>WR 121</td>
<td>College Composition I</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Winter</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 112</td>
<td>Elementary Functions</td>
<td>4</td>
<td></td>
</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>
<td></td>
<td></td>
</tr>
<tr>
<td>BI 211</td>
<td>General Biology I: Cells</td>
<td>4</td>
<td>Biology sequence fulfills the life science sequence with laboratory</td>
</tr>
</tbody>
</table>

General-education course that also satisfies multicultural requirement 4

Credits 16
## Spring

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<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>
</tr>
</tbody>
</table>

General-education course that also satisfies multicultural requirement
General-education course

Credits 16

## Second Year

### Fall

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 213 or BI 214</td>
<td>General Biology III: Populations or General Biology IV: Mechanisms</td>
<td>4</td>
</tr>
<tr>
<td>CH 221 or PHYS 201</td>
<td>General Chemistry I or General Physics</td>
<td>4</td>
</tr>
</tbody>
</table>

BI 213 or 214 are prerequisites for all upper-division biology courses

Credits 14

### Winter

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 227 or PHYS 204</td>
<td>General Chemistry Laboratory or Introductory Physics Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>General-education course</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>MATH 252</td>
<td>Calculus II</td>
<td>4</td>
</tr>
</tbody>
</table>

Credits 14

## Third Year

### Fall

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 201</td>
<td>Dynamic Planet Earth</td>
<td>4</td>
</tr>
<tr>
<td>CH 331</td>
<td>Organic Chemistry I</td>
<td>4</td>
</tr>
</tbody>
</table>

Choose either upper-division biology courses or organic chemistry sequence; major requires 32 upper-division credits (including 12 graded credits in one department and 12 graded credits in another)

Credits 16

### Spring

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 223 or PHYS 203</td>
<td>General Chemistry III or General Physics</td>
<td>4</td>
</tr>
<tr>
<td>CH 229 or PHYS 206</td>
<td>General Chemistry Laboratory or Introductory Physics Laboratory</td>
<td>2</td>
</tr>
</tbody>
</table>

CH 223 is a prerequisite for CH 331

Credits 14

## Winter

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 202</td>
<td>Earth’s Surface and Environment</td>
<td>4</td>
</tr>
</tbody>
</table>
### Bachelor of Science in General Science with Pre-Medical Focus

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Milestones</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CH 111</td>
<td>Introduction to Chemical Principles</td>
<td>4</td>
<td>Ideal for solid preparation for CH 221</td>
</tr>
<tr>
<td>MATH 111</td>
<td>College Algebra</td>
<td>4</td>
<td>Mathematics placement test determines which MATH course one should take first</td>
</tr>
<tr>
<td>WR 121</td>
<td>College Composition I</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>WR 122 or WR 123</td>
<td>College Composition II or College Composition III</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>MATH 212</td>
<td>Fundamentals of Elementary Mathematics II</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>CH 221</td>
<td>General Chemistry I</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>CH 227</td>
<td>General Chemistry Laboratory</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CH 222</td>
<td>General Chemistry II</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>CH 228</td>
<td>General Chemistry Laboratory</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>MATH 251 or MATH 246</td>
<td>Calculus I or Calculus for the Biological Sciences I</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Fourth Year</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper-division geology course</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Upper-division mathematics or elective course</td>
<td>Basic mathematics preparation requires 24 credits of MATH; 8 must be upper-division credits</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper-division biology course</td>
<td></td>
<td>4</td>
<td>One year of writing courses is a common medical school requirement</td>
</tr>
</tbody>
</table>
### Second Year

#### Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 211</td>
<td>General Biology I: Cells</td>
<td>4</td>
</tr>
<tr>
<td>CH 223</td>
<td>General Chemistry III</td>
<td>4</td>
</tr>
</tbody>
</table>

General chemistry must be completed during the second year to leave time for organic chemistry during the third year and biochemistry during the fourth year.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 229</td>
<td>General Chemistry Laboratory</td>
<td>4</td>
</tr>
</tbody>
</table>

General-education course that also satisfies multicultural requirement

| Credits | 14 |

#### Winter

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 212</td>
<td>General Biology II: Organisms</td>
<td>4</td>
</tr>
<tr>
<td>MATH 252 or MATH 247</td>
<td>Calculus II or Calculus for the Biological Sciences II</td>
<td>4</td>
</tr>
</tbody>
</table>

General-education course that also satisfies multicultural requirement

| General-education course | 4 |

| Credits | 16 |

#### Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 214</td>
<td>General Biology IV: Mechanisms</td>
<td>4</td>
</tr>
<tr>
<td>MATH 243 or MATH 425</td>
<td>Introduction to Methods of Probability and Statistics or Statistical Methods I</td>
<td>4</td>
</tr>
</tbody>
</table>

Basic mathematics preparation requires 24 credits of MATH; 8 must be upper-division credits

| Upper-division general-education course | 4 |

General-education course

| Credits | 16 |

---

### Third Year

#### Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 320</td>
<td>Molecular Genetics</td>
<td>4</td>
</tr>
</tbody>
</table>

Common requirement for medical schools

| CH 331 | Organic Chemistry I | 4 |

See chemistry department office about chemistry minor requirement

| CH 337 | Organic Chemistry Laboratory | 3 |

Upper-division general-education course

| Credits | 15 |

#### Winter

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 335</td>
<td>Organic Chemistry II</td>
<td>4</td>
</tr>
</tbody>
</table>

See biology and chemistry and biochemistry departments about minor requirement

| CH 338 | Organic Chemistry Laboratory | 3 |

| BI 358 | Investigations in Medical Physiology | 4 |

Check with specific programs to identify additional prerequisites

| Credits | 15 |

#### Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSY 201 or PSY 202 or PSY 304</td>
<td>Mind and Brain or Mind and Society or Biopsychology</td>
<td>4</td>
</tr>
</tbody>
</table>

Recommended for MCAT preparation

| SOC 204 or SOC 207 | Introduction to Sociology or Social Inequality | 4 |

<p>| Credits | 15 |</p>
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 336</td>
<td>Organic Chemistry III</td>
<td>4</td>
<td>Prerequisite for biochemistry (common medical school requirement)</td>
</tr>
<tr>
<td></td>
<td>Upper-division biology course</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Credits</td>
<td></td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

### Fourth Year

#### Fall

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 201</td>
<td>General Physics</td>
<td>4</td>
<td>Physics should be taken as part of MCAT preparation</td>
</tr>
<tr>
<td>PHYS 204</td>
<td>Introductory Physics Laboratory</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>CH 360</td>
<td>Physiological Biochemistry</td>
<td>4</td>
<td>Common medical school requirement</td>
</tr>
<tr>
<td>or CH 461</td>
<td>or Biochemistry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper-division biology or elective course</td>
<td>4</td>
<td>See biology department office about biology minor requirements</td>
<td></td>
</tr>
<tr>
<td>Credits</td>
<td></td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

#### Winter

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 202</td>
<td>General Physics</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PHYS 205</td>
<td>Introductory Physics Laboratory</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>CH 463</td>
<td>Biochemistry</td>
<td>4</td>
<td>Other upper-division elective may be substituted</td>
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<tr>
<td>Upper-division elective courses</td>
<td>6</td>
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</tr>
<tr>
<td>Credits</td>
<td></td>
<td>16</td>
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#### Spring

<table>
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<tr>
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<td>PHYS 203</td>
<td>General Physics</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PHYS 206</td>
<td>Introductory Physics Laboratory</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>CH 462</td>
<td>Biochemistry</td>
<td>4</td>
<td>Other upper-division elective may be substituted</td>
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<td>Upper-division elective course</td>
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<tr>
<td>Credits</td>
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Total Credits | 180 |