PHYSICS - TEACHING BROADFIELD SCIENCE

Individuals interested in teaching in K-12 schools must complete a degree in the content area they want to teach plus the teacher preparation program through the Department of Teaching and Learning. Individuals must complete the teaching major/teaching track within that degree program, which may contain different course requirements than the academic major since the sequence of courses is designed to meet state standards. Upon completion of the degree program with the teaching track and the secondary licensure program, one will be eligible for a standard Montana teaching license in this content area.


Bachelor of Arts - Physics; Broadfield Teaching Science Concentration

College Humanities & Sciences

Degree Specific Credits: 83

Required Cumulative GPA: 2.0

Catalog Year: 2017-2018

Note: Students must be formally admitted to the Teacher Education Program and complete all of the professional education licensure requirements. See the Department of Teaching and Learning [http://catalog.umt.edu/colleges-schools-programs/education-human-sciences/teaching-learning](http://catalog.umt.edu/colleges-schools-programs/education-human-sciences/teaching-learning) in the College of Education and Human Sciences for more information. A major GPA of 2.75 is required to be eligible for student teaching.

General Education Requirements

Information regarding these requirements can be found in the General Education Section [http://catalog.umt.edu/academics/general-education-requirements](http://catalog.umt.edu/academics/general-education-requirements) of the catalog.

Summary

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Physics Courses</td>
<td>24</td>
</tr>
<tr>
<td>Physics Elective</td>
<td>15</td>
</tr>
<tr>
<td>Math Requirements</td>
<td>15</td>
</tr>
<tr>
<td>Statistics Requirements</td>
<td>3-4</td>
</tr>
<tr>
<td>Astronomy Requirements</td>
<td>4</td>
</tr>
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<td>Geology Requirements</td>
<td>7</td>
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<tr>
<td>Biology Requirements</td>
<td>12</td>
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<tr>
<td>Chemistry Requirements</td>
<td>11</td>
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<tr>
<td>Advanced College Writing Requirement</td>
<td>3</td>
</tr>
<tr>
<td>Physics Requirements</td>
<td>24</td>
</tr>
<tr>
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<td>15</td>
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<td>3-4</td>
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<td>Geology Requirements</td>
<td>7</td>
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<tr>
<td>Biology Requirements</td>
<td>12</td>
</tr>
<tr>
<td>Chemistry Requirements</td>
<td>11</td>
</tr>
<tr>
<td>Advanced College Writing Requirement</td>
<td>3</td>
</tr>
<tr>
<td>Total Hours</td>
<td>83-84</td>
</tr>
</tbody>
</table>

Teaching Methods Requirement 4

Physics Requirements

Rule: Must complete all of the following subcategories

Minimum Required Grade: C-

24 Total Credits Required

Required Physics Courses

Rule: All courses are required

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHSX 215N</td>
<td>Fund of Physics w/Calc I</td>
<td>4</td>
</tr>
<tr>
<td>PHSX 216N</td>
<td>Physics Laboratory I w/Calc</td>
<td>1</td>
</tr>
<tr>
<td>PHSX 217N</td>
<td>Fund of Physics w/Calc II</td>
<td>4</td>
</tr>
<tr>
<td>PHSX 218N</td>
<td>Physics Laboratory II w/Calc</td>
<td>1</td>
</tr>
<tr>
<td>PHSX 301</td>
<td>Intro Theoretical Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHSX 311</td>
<td>Oscillations and Waves</td>
<td>2</td>
</tr>
<tr>
<td>PHSX 330</td>
<td>Communicating Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHSX 343</td>
<td>Modern Physics</td>
<td>3</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>21</td>
</tr>
</tbody>
</table>

Minimum Required Grade: C-

Physics Elective

Rule: Must complete 1 additional upper division Physics course

Math Requirements

Rule: All courses are required

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 171</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>M 172</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>M 273</td>
<td>Multivariable Calculus</td>
<td>4</td>
</tr>
<tr>
<td>M 311</td>
<td>Ordinary Differential Equations and Systems</td>
<td>3</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>

Minimum Required Grade: C-

Statistics Requirements

Rule: Must complete 1 of the following courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 216</td>
<td>Introduction to Statistics</td>
<td>3-4</td>
</tr>
<tr>
<td>or STAT 341</td>
<td>Introduction to Probability and Statistics</td>
<td></td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>3-4</td>
</tr>
</tbody>
</table>

Minimum Required Grade: C-

Astronomy Requirements

Rule: All courses are required

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTR 131N</td>
<td>Planetary Astronomy</td>
<td>3</td>
</tr>
<tr>
<td>ASTR 134N</td>
<td>Planetary Astronomy Lab</td>
<td>1</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>
Minimum Required Grade: C-

Geology Requirements

Rule: Must complete the following subcategories

7 Total Credits Required

Required Geology Courses

Rule: All courses are required

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEO 101N</td>
<td>Introduction to Physical Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEO 102N</td>
<td>Introduction to Physical Geology Lab</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Hours 4

Minimum Required Grade: C-

Geology Electives

Select one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTR 351</td>
<td>Planetary Science</td>
<td>3</td>
</tr>
<tr>
<td>GEO 105N</td>
<td>Oceanography</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours 3

Minimum Required Grade: C-

Biology Requirements

Rule: Must complete all of the following courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOB 160N</td>
<td>Principles of Living Systems</td>
<td>3</td>
</tr>
<tr>
<td>BIOB 161N</td>
<td>Prncpls of Living Systems Lab</td>
<td>1</td>
</tr>
<tr>
<td>BIOB 260</td>
<td>Cellular and Molecular Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIOB 272</td>
<td>Genetics and Evolution</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Hours 12

Minimum Required Grade: C-

Chemistry Requirements

Rule: Must complete all of the following courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHMY 141N &amp; CHMY 142N</td>
<td>College Chemistry I and College Chemistry I Lab</td>
<td>5</td>
</tr>
<tr>
<td>CHMY 143N &amp; CHMY 144N</td>
<td>College Chemistry II and College Chemistry II Lab</td>
<td>5</td>
</tr>
<tr>
<td>CHMY 485</td>
<td>Laboratory Safety</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Hours 11

Minimum Required Grade: C-

Advanced College Writing Requirement

Rule: Must take the following course

Note: May substitute another advanced writing course as approved by the department chair.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHSX 330</td>
<td>Communicating Physics</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Hours 3

Minimum Required Grade: C-

Teaching Methods Requirement

Rule: Complete the following course.

Note: The EDU 497 course number is used for multiple courses. Students should register for EDU 497 Methods: 5-12 Science.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDU 497</td>
<td>Teaching and Assessing</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Hours 4

Minimum Required Grade: C-