The computational physics concentration provides a thorough study of computer science and computational physics as well as a solid background in physics and mathematics. Graduates from this program have gone on to graduate programs in physics and computer science while others have found career opportunities in technical fields.

Bachelor of Arts - Physics; Computational Physics Concentration

College Humanities & Sciences

Degree Specific Credits: 73

Required Cumulative GPA: 2.0

Catalog Year: 2017-2018

General Education Requirements

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

Summary

Lower Division Physics Core 10

College Physics

Physics with Calculus

Upper Division Physics 18

Physics Elective 3

Math Requirements 19

Computer Science Requirements 20

Advanced College Writing Requirement 3

Total Hours 73

Lower Division Physics Core

Rule: Must complete all of the courses in one of the two sequences:

College Physics

Select one of the following Physics sequences: 10

Algebra- and Trigonometry-based:

PHSX 205N & PHSX 206N
College Physics I & College Physics I Laboratory

PHSX 207N & PHSX 208N
College Physics II & College Physics II Laboratory

Calculus-based (strongly recommended):

PHSX 215N & PHSX 216N
Fund of Physics w/Calc I & Physics Laboratory I w/Calc

PHSX 217N & PHSX 218N
Fund of Physics w/Calc II & Physics Laboratory II w/Calc

Total Hours 10

Upper Division Physics

Rule: Complete the following courses

PHSX 301 Intro Theoretical Physics 3
PHSX 311 Oscillations and Waves 2
PHSX 320 Classical Mechanics 3
PHSX 333 Computational Physics 3
PHSX 343 Modern Physics 3
PHSX 423 Electricity & Magnetism I 3
PHSX 499 Senior Capstone Seminar 1

Total Hours 18

Minimum Required Grade: C-

Physics Elective

Select one of the following: 3

PHSX 141N Einstein's Relativity
PHSX 323 Intermediate Physics Lab
PHSX 327 Optics
PHSX 330 Communicating Physics
PHSX 425 Electricity & Magnetism II (strongly recommended)
PHSX 444 Advanced Physics Lab
PHSX 446 Thermodynamics & Statistical Mechanics
PHSX 461 Quantum Mechanics I (strongly recommended)
PHSX 462 Quantum Mechanics II

Total Hours 3

Minimum Required Grade: C-

Math Requirements

Rule: Complete the following courses

Note: M 307, STAT 341, and STAT 458 are recommended as well

M 171 Calculus I 4
M 172 Calculus II 4
M 221 Introduction to Linear Algebra 4
M 225 Introduction to Discrete Mathematics 3
M 273 Multivariable Calculus 4

Total Hours 19

Minimum Required Grade: C-

Computer Science Requirements

Rule: Complete the following subcategories of courses

20 Total Credits Required

Computer Science Core Courses

Rule: Must complete all of the following courses
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 135</td>
<td>Fund of Computer Science I</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 136</td>
<td>Fund of Computer Science II</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 232</td>
<td>Data Structures and Algorithms</td>
<td>4</td>
</tr>
<tr>
<td>CSCI 332</td>
<td>Design/Analysis of Algorithms</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Hours 13

Minimum Required Grade: C-

**Computer Science Electives**

Select 7 credits from any CSCI course numbered 200 and above, the following are recommended:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 205</td>
<td>Programming Languages w/ C/C++</td>
</tr>
<tr>
<td>CSCI 250</td>
<td>Computer Mdlng/Science Majors</td>
</tr>
<tr>
<td>CSCI 361</td>
<td>Computer Architecture</td>
</tr>
<tr>
<td>CSCI 477</td>
<td>Simulation</td>
</tr>
</tbody>
</table>

Total Hours 7

**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 Code</th>
<th>Course 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-