PHYSICS - COMPUTATIONAL PHYSICS

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

College Physics

Physics with Calculus

Upper Division Physics

Physics Elective

Math Requirements

Computer Science Requirements

Advanced College Writing Requirement

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:

Algebra- and Trigonometry-based:

PHSX 205N & PHSX 206N

PHSX 207N & PHSX 208N

Calculus-based (strongly recommended):

PHSX 215N & PHSX 216N

PHSX 217N & PHSX 218N

Total Hours

10

Upper Division Physics

Rule: Complete the following courses

Minimum Required Grade: C-

Upper Division Physics

Rule: Complete the following courses

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

Total Hours

18

Physics Elective

Select one of the following:

Minimum Required Grade: C-

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 Thermodyn & Stat Mech
PHSX 461 Quantum Mechanics I (strongly recommended)
PHSX 462 Quantum Mechanics II

Total Hours

3

Math Requirements

Rule: Complete the following courses

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

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

Total Hours

19

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>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td><strong>13</strong></td>
</tr>
</tbody>
</table>

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>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
</tr>
</tbody>
</table>

**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>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td><strong>3</strong></td>
</tr>
</tbody>
</table>

Minimum Required Grade: C-