### University Core and Graduation Requirements

#### University Core Requirements:

<table>
<thead>
<tr>
<th>Requirements</th>
<th>#Classes</th>
<th>Hours</th>
<th>Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Religion Cornerstones</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachings and Doctrine of The Book of Mormon</td>
<td>1</td>
<td>2.0</td>
<td>REL A 275</td>
</tr>
<tr>
<td>Jesus Christ and the Everlasting Gospel</td>
<td>1</td>
<td>2.0</td>
<td>REL A 250</td>
</tr>
<tr>
<td>Foundations of the Restoration</td>
<td>1</td>
<td>2.0</td>
<td>REL C 225</td>
</tr>
<tr>
<td>The Eternal Family</td>
<td>1</td>
<td>2.0</td>
<td>REL C 200</td>
</tr>
</tbody>
</table>

**The Individual and Society**:  
American Heritage: 1-2; 3-6.0 from approved list  
Global and Cultural Awareness: 1; 3.0 from approved list

**Skills**:  
First Year Writing: 1; 3.0 from approved list  
Advanced Written and Oral Communications: 1; 3.0 from approved list

Quantitative Reasoning: 1; 4.0; MATH 113*  
Languages of Learning (Math or Language): 1; 4.0; MATH 113*

**Arts, Letters, and Sciences**:  
Civilization 1: 1; 3.0 from approved list  
Civilization 2: 1; 3.0 from approved list  
Arts: 1; 3.0 from approved list  
Letters: 1; 3.0 from approved list  
Physical Science: 1; 3.0 from approved list  
Social Science: 1; 3.0 from approved list

**Core Enrichment: Electives**:  
Religion Electives: Variable; 6.0 from approved list  
Open Electives: Variable; personal choice

*THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (7 hours overlap)

#### Suggested Sequence of Courses

<table>
<thead>
<tr>
<th>FRESHMAN YEAR</th>
<th>JUNIOR YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1st Semester</strong></td>
<td><strong>5th Semester</strong></td>
</tr>
<tr>
<td>PHSCS 121 (FWSp)</td>
<td>PHSCS 318 (FW)</td>
</tr>
<tr>
<td>PHSCS 127 (FWSp)</td>
<td>PHSCS 321 (FWSp)</td>
</tr>
<tr>
<td>PHSCS 191 (F)</td>
<td>PHSCS 330 (FWSp)</td>
</tr>
<tr>
<td>MATH 112 (FWSpSu)</td>
<td>Civilization 1</td>
</tr>
<tr>
<td>First-year Writing</td>
<td>Social Science</td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>Religion Elective</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>Total Hours</strong></td>
</tr>
<tr>
<td>15.5</td>
<td>15.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>2nd Semester</strong></th>
<th><strong>6th Semester</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>PHSCS 123 (FWSp)</td>
<td>PHSCS 329 (FW)</td>
</tr>
<tr>
<td>MATH 113 (FWSpSu)</td>
<td>PHSCS 360 (W) or 471 (WSu) (requirement 2)</td>
</tr>
<tr>
<td>C S 142</td>
<td>Civilization 2</td>
</tr>
<tr>
<td>American Heritage</td>
<td>Arts</td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>General Elective</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>Total Hours</strong></td>
</tr>
<tr>
<td>15.0</td>
<td>18.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SOPHOMORE YEAR</strong></th>
<th><strong>SENIOR YEAR</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3rd Semester</strong></td>
<td><strong>7th Semester</strong></td>
</tr>
<tr>
<td>PHSCS 220 (FWSp)</td>
<td>PHSCS 416 (W)</td>
</tr>
<tr>
<td>PHSCS 227 (F)</td>
<td>PHSCS 427 (F)</td>
</tr>
<tr>
<td>PHSCS 230 (FW)</td>
<td>PHSCS 441 (FWSp)</td>
</tr>
<tr>
<td>PHSCS 291 (F)</td>
<td>PHSCS 451 (F)</td>
</tr>
<tr>
<td>MATH 302 (FW)</td>
<td>Letters</td>
</tr>
<tr>
<td>General Electives</td>
<td>Religion Elective</td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td><strong>Total Hours</strong></td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>Total Hours</strong></td>
</tr>
<tr>
<td>15.5</td>
<td>14.0</td>
</tr>
</tbody>
</table>

**4th Semester**  
The MATH 213/215/314/334 (9 cr) sequence can be taken in place of the MATH 302/303 (8 cr) sequence.

**5th Semester**  
The MATH 213/215/314/334 (9 cr) sequence can be taken in place of the MATH 302/303 (8 cr) sequence.

**6th Semester**  
The MATH 213/215/314/334 (9 cr) sequence can be taken in place of the MATH 302/303 (8 cr) sequence.

**7th Semester**  
The MATH 213/215/314/334 (9 cr) sequence can be taken in place of the MATH 302/303 (8 cr) sequence.

**8th Semester**  
The MATH 213/215/314/334 (9 cr) sequence can be taken in place of the MATH 302/303 (8 cr) sequence.

<table>
<thead>
<tr>
<th><strong>SENIOR YEAR</strong></th>
<th><strong>8th Semester</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7th Semester</strong></td>
<td><strong>Total Hours</strong></td>
</tr>
<tr>
<td>PHSCS 427 (F)</td>
<td>PHSCS 498R (Senior thesis credit; FWSpSu)</td>
</tr>
<tr>
<td>PHSCS 441 (FWSp)</td>
<td>Global and Cultural Awareness</td>
</tr>
<tr>
<td>PHSCS 451 (F)</td>
<td><strong>Total Hours</strong></td>
</tr>
<tr>
<td>Letters</td>
<td>3.0</td>
</tr>
<tr>
<td>Religion Elective</td>
<td>2.0</td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>Total Hours</strong></td>
</tr>
<tr>
<td>15.0</td>
<td>14.0</td>
</tr>
</tbody>
</table>

**Note**: Students are encouraged to complete an average of 15 credit hours each semester or 30 credit hours each year, which could include spring and/or summer terms. Taking fewer credits substantially increases the cost and the number of semesters to graduate.
BS in Physics and Astronomy (694832)
2020-2021 Program Requirements (68 - 69 Credit Hours)

No more than 3 hours of D credit is allowed in major courses.

REQUIREMENT 1
Complete 1 option

C S 142 - Introduction to Computer Programming 3.0
*MATH 113 - Calculus 2 4.0
PHSCS 121 - Introduction to Newtonian Mechanics 3.0
PHSCS 123 - Introduction to Waves, Optics, and Thermodynamics 3.0
PHSCS 127 - Descriptive Astronomy 3.0
PHSCS 191 - Introduction to Physics Careers and Research 1 0.5
PHSCS 220 - Introduction to Electricity and Magnetism 3.0
*PHSCS 222 - Modern Physics 3.0
PHSCS 227 - Solar System Astronomy 3.0
PHSCS 228 - Stellar and Extragalactic Astronomy 3.0
PHSCS 230 - Computational Physics Lab 1 1.0
PHSCS 291 - Introduction to Physics Careers and Research 2 0.5
PHSCS 318 - Introduction to Mathematical Physics 3.0
PHSCS 321 - Mechanics 3.0
PHSCS 329 - Observational Astronomy 3.0
PHSCS 330 - Computational Physics Lab 2 1.0
PHSCS 427 - Stellar Astrophysics 3.0
PHSCS 428 - Galaxies and Cosmology 3.0
PHSCS 441 - Electricity and Magnetism 3.0
PHSCS 451 - Quantum Mechanics 3.0

Note: Phscs 101 should be taken the first semester as a freshman. Phscs 291 should be taken the first semester as a sophomore.

REQUIREMENT 2
Complete 2 courses

PHSCS 360 - Statistical and Thermal Physics 3.0
PHSCS 442 - Electrodynamics 3.0
PHSCS 452 - Applications of Quantum Mechanics 3.0
PHSCS 471 - Principles of Optics 3.0

REQUIREMENT 3
Complete 1 option

OPTION 3.1 Complete 2 courses

MATH 302 - Mathematics for Engineering 1 4.0
MATH 303 - Mathematics for Engineering 2 4.0

OPTION 3.2 Complete 3 courses

MATH 313 - (Not currently offered) 4.0
MATH 314 - Calculus of Several Variables 3.0
MATH 334 - Ordinary Differential Equations 3.0

OPTION 3.3 Complete 4 courses

MATH 213 - Elementary Linear Algebra 2.0
MATH 215 - Computational Linear Algebra 1.0
MATH 314 - Calculus of Several Variables 3.0
MATH 334 - Ordinary Differential Equations 3.0

REQUIREMENT 4
Complete 1 option

PHSCS 430 (Computational Physics 3) and Me En 373 (Introduction to Scientific Computing).

REQUIREMENT 5
Complete 2.0 hours from the following course(s)

PHSCS 498R - Senior Thesis 3.0v

SENIOR THESIS:

Complete a senior thesis, including the following:

A. Choose a research mentor and group as early as possible, starting with information in Phscs 151 and 152, and discussions with faculty, your advisor, and the senior thesis coordinator. It is best to start as a freshman or sophomore. Some internships may qualify for your project.

OPTION 4.1 Complete 2.0 hours from the following course(s)

PHSCS 191 and 192, and discussions with faculty, your advisor, and the senior thesis coordinator. It is best to start as a freshman or sophomore. Some internships may qualify for your project.

OPTION 4.1 Complete 2.0 hours from the following course(s)

PHSCS 498R - Senior Thesis 3.0v

Most physicists and astronomers work in research and development in industrial, government, or university labs to solve new problems in technology and science. They also share the beauty discovered in our physical universe by teaching in high schools, colleges, and universities.

CAREER OPPORTUNITIES:

A degree in physics or physics-astronomy can provide:

1. Preparation for those who intend to enter industrial or governmental service as physicists or astronomers.
2. Education for those who intend to pursue graduate work in physics or astronomy.
3. Education in the subject matter of physics for prospective teachers of the physical sciences.
4. Undergraduate education for those who will pursue graduate work in the professions: business (e.g., an MBA), law, medicine, etc.
5. Fundamental background for other physical sciences and engineering, in preparation for graduate study in these fields.
6. Physics fundamentals required by the biological science, medical, dental, nursing, and related programs.

For more information, see www.physics.byu.edu/undergraduate/careers.
MAP DISCLAIMER
While every reasonable effort is made to ensure accuracy, there are some student populations that could have exceptions to listed requirements. Please refer to the university catalog and your college advisement center/department for complete guidelines.

DEPARTMENT INFORMATION
FACULTY ADVISORS ASSIGNED BY LAST TWO DIGITS OF BYU ID NUMBER. CONTACT:

Department of Physics and Astronomy
Brigham Young University
N-283 ESC
Provo, UT 84602
Telephone: (801) 422-4361

ADVISEMENT CENTER INFORMATION
Physical and Mathematical Sciences College Advisement Center
Brigham Young University
N-181 ESC
Provo, UT 84602
Telephone: (801) 422-2674