**BS in PHYSICS (694821) MAP Sheet**  
Department of Physics and Astronomy  
For students entering the degree program during the 2012–2013 curricular year.

<table>
<thead>
<tr>
<th>UNIVERSITY CORE REQUIREMENTS</th>
<th>PROGRAM REQUIREMENTS (59–62 total hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UNIVERSITY CORE REQUIREMENTS</strong></td>
<td><strong>PROGRAM REQUIREMENTS</strong></td>
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<tr>
<td>Requirements</td>
<td>#Classes</td>
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<tr>
<td>Doctrinal Foundation</td>
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<tr>
<td>Book of Mormon</td>
<td>2</td>
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<tr>
<td>New Testament</td>
<td>1</td>
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<tr>
<td>Doctrine and Covenants</td>
<td>1</td>
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<tr>
<td>The Individual and Society</td>
<td>1–2</td>
</tr>
<tr>
<td>Citizenship</td>
<td>1</td>
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<tr>
<td>Effective Communication</td>
<td>1</td>
</tr>
<tr>
<td>First-Year Writing</td>
<td>1</td>
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<tr>
<td>Adv Written &amp; Oral Communication</td>
<td>1</td>
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<tr>
<td>Quantitative Reasoning</td>
<td>1</td>
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<tr>
<td>Languages of Learning (Math or Language)</td>
<td>1</td>
</tr>
<tr>
<td>Arts, Letters, and Sciences</td>
<td>2</td>
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<tr>
<td>Civilization 1 and 2</td>
<td>1</td>
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<tr>
<td>Arts</td>
<td>1</td>
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<tr>
<td>Letters</td>
<td>1</td>
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<tr>
<td>Scientific Principles &amp; Reasoning</td>
<td>1–2</td>
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<tr>
<td>Biological Science</td>
<td>1</td>
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<tr>
<td>Physical Science</td>
<td>1</td>
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<tr>
<td>Social Science</td>
<td>1</td>
</tr>
<tr>
<td>Core Enrichment: Electives</td>
<td>3–4</td>
</tr>
<tr>
<td>Religion Electives</td>
<td>Variable</td>
</tr>
<tr>
<td>Open Electives</td>
<td>Variable</td>
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<tr>
<td>GRADUATION REQUIREMENTS:</td>
<td></td>
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<tr>
<td>Minimum residence hours required</td>
<td>30.0</td>
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<tr>
<td>Minimum hours needed to graduate</td>
<td>120.0</td>
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</tbody>
</table>

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

**Complete the following:**

- Phscs 121 Principles of Physics 1 3.0
- Phscs 123 Principles of Physics 2 3.0
- Phscs 140 Electronics Lab 1.0
- Phscs 145 Experimental Methods in Physics 1.0
- Phscs 191 Intro Physics Careers & Research 0.5
- Phscs 220 Principles of Physics 3 3.0
- Phscs 222* Modern Physics 3.0
- Phscs 230 Computational Physics Lab 1 1.0
- Phscs 240 Design, Fabrication, & Use of Scientific Apparatus 2.0
- Phscs 245 Experiments in Contemporary Physics 2.0
- Phscs 291 Intro to Physics Careers & Research 2 0.5
- Phscs 318 Intro to Mathematical Physics 3.0
- Phscs 321 Mechanics 3.0
- Phscs 330 Computational Physics Lab 2 1.0
- Phscs 360 Statistical and Thermal Physics 3.0
- Phscs 430 Computational Physics Lab 3 1.0
- Phscs 441 Electrostatics and Magnetism 3.0
- Phscs 442 Electrodynamics 3.0
- Phscs 451 Quantum Mechanics 3.0
- Phscs 452 Applications of Quantum Mechanics 3.0
- Phscs 471 Principles of Optics 3.0

**Note:** Phscs 191 should be taken the first semester as a freshman. Phscs 291 should be taken the first semester as a sophomore.

**Complete one of the following options:**

**Either**

- Math 113* Calculus 2 4.0
- Math 302 Mathematics for Engineering 1 4.0

**Or**

- Math 113* Calculus 2 4.0
- Math 313 Elementary Linear Algebra 3.0
- Math 314 Calculus of Several Variables 3.0

**Complete one course from the following:**

- Math 303 Mathematics for Engineering 2 4.0
- Math 334 Ordinary Differential Equations 3.0

**Complete a senior thesis,** including the following:

a. Choose a research mentor and group as early as possible, starting with information in Phscs 191 and 291, and discussion with faculty, your advisor and the capstone project coordinator or senior thesis coordinator. It is best to start as a freshman or sophomore. Interdisciplinary work in other departments or in internships is possible.

b. Complete 2 hours of the following:

- Phscs 498R Senior Thesis 3.0V

**Note 1:** Students planning careers in experimental, applied, or industrial physics should complete STAT 201.

**Note 2:** Students planning careers in computational physics should, through courses or individual study, learn programming skills and numerical methods beyond what you are taught in our computational physics courses. Consider the following: CS 142, MATH 410, Me En 373.

**Note 3:** Students planning graduate school in physics should learn complex analysis. Consider the following: MATH 332, PHSCS 601, 602.

*THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (7.0 hours overlap)*

FOR UNIVERSITY CORE OR PROGRAM QUESTIONS CONTACT THE ADVISEMENT CENTER  
Physical and Mathematical Sciences College Advisement Center  
N-181 ESC  
Brigham Young University, Provo, UT 84602  
Telephone: (801) 422-2674

FACULTY ADVISOR:  
Harold Stokes  
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BS in PHYSICS (694821)
2012–2013

FRESHMAN YEAR
1st Semester
First-year Writing 3.0
or A Htg 100 (3.0)
Math 113 (FWSpSu) 4.0
Phscs 121 (FWSp) 3.0
Phscs 140 (FSp) 1.0
Phscs 191 (F) 0.5
Rel A 121 2.0
General electives 2.0
Total Hours 15.5
2nd Semester
A Htg 100 3.0
or First-year Writing (3.0)
Math 302(FW) 4.0
Phscs 123  (FWSp) 3.0
Phscs 145 (WSu) 1.0
Rel A 122 2.0
General elective 2.0
Total Hours 15.0

2nd Semester
Phscs 360 (W) 3.0
Phscs 430 (WSu) 1.0
Arts 3.0
Civilization 2 3.0
General Elective 3.0
Religion Elective 2.0
Total Hours 15.0

SOPHOMORE YEAR
3rd Semester
Phscs 220 (FWSp) 3.0
Phscs 230 (FW) 1.0
Phscs 240 (FSp) 2.0
Phscs 291 (F) 0.5
Biological Science 3.0
Social Science 3.0
Rel C 324/325 2.0
Total Hours 15.0
4th Semester
Math 303 (FW) 4.0
or Math 334 (FWSpSu) (3.0)
Phscs 222 (FWSu) 3.0
Phscs 245 (WSu) 2.0
Physical Science (Chem or Geol) 3.0
Rel A 211/212 2.0
General Elective 1.0
Total Hours 15.0

JUNIOR YEAR
5th Semester
Phscs 318 (FWSp) 3.0
Phscs 321 (FSp) 3.0
Phscs 330 (FSp) 1.0
Civilization 1 3.0
General Elective 3.0
Religion Elective 2.0
Total Hours 15.0
6th Semester
Phscs 441 (FSp) 3.0
Phscs 451 (F) 3.0
Phscs 498R (FWSpSu) 2.0
Letters 3.0
Global & Cultural Awareness 3.0
Religion Elective 2.0
Total Hours 16.0

SENIOR YEAR
7th Semester
Phscs 416A&B (W or SpSu) 3.0
Phscs 442 (WSu) 3.0
Phscs 452 (W) 3.0
Phscs 471 (WSu) 3.0
General Elective 2.0
Total Hours 14.0
8th Semester
Phscs 442A&B (W or SpSu) 3.0
Phscs 442 (WSu) 3.0
Phscs 452 (W) 3.0
Phscs 471 (WSu) 3.0
Rel C 324/325 2.0
Total Hours 14.5

THE DISCIPLINE:
Over the centuries physicists and astronomers have studied the fundamental principles that govern the structure and dynamics of matter and energy in the physical world, from subatomic particles to the cosmos. Physicists also apply this understanding to the development of new technologies. For examples, physicists invented the first lasers and semiconductor electronic devices.

Physics and astronomy students learn to approach complex problems in science and technology from a broad background in mechanics, electricity and magnetism, statistical and thermal physics, quantum mechanics, relativity, and optics. The tools they develop at BYU include problem solving by mathematical and computational modeling, as well as experimental discovery and analysis. All students gain professional experience in a research, capstone, or internship project, usually in close association with faculty.

Together these experience can provide excellent preparation for employment of for graduate studies in physics, other sciences, engineering, medicine, law, or business.

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 engineers, technicians, 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 (especially patent 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 physics.byu.edu/undergraduate.

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.

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