## 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>
<tr>
<td><strong>The Individual and Society</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Heritage</td>
<td>1-2</td>
<td>3-6.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Global and Cultural Awareness</td>
<td>1</td>
<td>3.0</td>
<td>SC ED 353*</td>
</tr>
<tr>
<td><strong>Skills</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Year Writing</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Advanced Written and Oral Communications</td>
<td>1</td>
<td>3.0</td>
<td>PHSCS 416 or ENGL 316</td>
</tr>
<tr>
<td>Quantitative Reasoning</td>
<td>1</td>
<td>4.0</td>
<td>MATH 112*</td>
</tr>
<tr>
<td>Languages of Learning (Math or Language)</td>
<td>1</td>
<td>4.0</td>
<td>MATH 112*</td>
</tr>
<tr>
<td><strong>Arts, Letters, and Sciences</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civilization 1</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Civilization 2</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Arts</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Letters</td>
<td>1</td>
<td>3.0</td>
<td>PHIL 423*</td>
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<tr>
<td>Biological Science</td>
<td>1</td>
<td>3-4.0</td>
<td>from approved list</td>
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<tr>
<td>Physical Science</td>
<td>1</td>
<td>3.0</td>
<td>PHSCS 222*</td>
</tr>
<tr>
<td>Social Science</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td><strong>Core Enrichment: Electives</strong></td>
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<td></td>
<td></td>
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<tr>
<td>Religion Electives</td>
<td>3-4</td>
<td>6.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Open Electives</td>
<td>Variable</td>
<td>Variable</td>
<td>personal choice</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (13 hours overlap)*

### Graduation Requirements:

- Minimum residence hours required: **30.0**
- Minimum hours needed to graduate: **120.0**

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## Suggested Sequence of Courses

### FRESHMAN YEAR

<table>
<thead>
<tr>
<th>1st Semester</th>
<th>2nd Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHSCS 121 (FWSp)</td>
<td>3.0</td>
</tr>
<tr>
<td>PHSCS 191 (F)</td>
<td>0.5</td>
</tr>
<tr>
<td>MATH 112 (FWSpSu)</td>
<td>4.0</td>
</tr>
<tr>
<td>First-Year Writing</td>
<td>3.0</td>
</tr>
<tr>
<td>Arts</td>
<td>3.0</td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>15.0</strong></td>
</tr>
</tbody>
</table>

### SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>3rd Semester</th>
<th>4th Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHSCS 220 (FWSp)</td>
<td>3.0</td>
</tr>
<tr>
<td>PHSCS 225 (FW)**</td>
<td>2.0</td>
</tr>
<tr>
<td>MATH 302 (FW)**</td>
<td>4.0</td>
</tr>
<tr>
<td>PHY S 276 (FW)</td>
<td>4.0</td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>15.0</strong></td>
</tr>
<tr>
<td><em>It’s highly recommended to take PHSCS 220 and PHSCS 225 at the same time.</em>*</td>
<td></td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>17.0</strong></td>
</tr>
</tbody>
</table>

### JUNIOR YEAR

<table>
<thead>
<tr>
<th>5th Semester</th>
<th>6th Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHSCS 222 (FW)</td>
<td>3.0</td>
</tr>
<tr>
<td>PHSCS 240 (FW)</td>
<td>2.0</td>
</tr>
<tr>
<td>MATH 303 (FW)</td>
<td>4.0</td>
</tr>
<tr>
<td>IP&amp;T 371</td>
<td>1.0</td>
</tr>
<tr>
<td>IP&amp;T 372</td>
<td>1.0</td>
</tr>
<tr>
<td>Social Science</td>
<td>3.0</td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>15.0</strong></td>
</tr>
</tbody>
</table>

### SENIOR YEAR

<table>
<thead>
<tr>
<th>7th Semester</th>
<th>8th Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 476R or 496R (FW)</td>
<td>12.0</td>
</tr>
</tbody>
</table>

*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.*
For students accepted into the major after August 1, 2014, grades below C in any required coursework in a teaching major or teaching minor will not be accepted. Teacher candidates must maintain a total GPA of 3.0 or higher throughout the program and to qualify for student teaching. For details on admission and retention requirements for teaching majors and teaching minors, see Educator Preparation Program (EPP) Requirements.

Contact Education Student Services for entrance requirements into the licensure program.

A teaching minor is not required for licensure. However, it is strongly recommended.

REQUIREMENT 1 Complete 10 courses

NOTE: PHSC 191 SHOULD BE TAKEN THE FIRST SEMESTER.

- MATH 112 - Calculus 1 4.0
- 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 0.5
- PHSCS 220 - Introduction to Electricity and Magnetism 3.0
- MATH 213 - (Not currently offered) 4.0
- MATH 314 - Calculus of Several Variables 3.0
- MATH 334 - Ordinary Differential Equations 3.0

REQUIREMENT 2 Complete 2 courses

- MATH 302 - Mathematics for Engineering 1 4.0
- MATH 303 - Mathematics for Engineering 2 4.0
- MATH 313 - (Not currently offered) 4.0
- MATH 314 - Calculus of Several Variables 3.0
- MATH 334 - Ordinary Differential Equations 3.0

REQUIREMENT 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 9.0 hours from the following option(s)

PHSCS 310 - Physics By Inquiry: Mechanics 3.0
PHSCS 311 - Physics By Inquiry: Electricity 3.0

PHYSICS ELECTIVES: COMPLETE AN ADDITIONAL 9 HOURS FROM THE FOLLOWING (ANY PHYSICS COURSE ALREADY TAKEN WILL NOT DOUBLE COUNT).

OPTION 4.1 Complete up to 3.0 hours from the following course(s)

- PHYSICS 313R - Special Topics in Physics 3.0
- PHYSICS 318 - Introduction to Mathematical Physics 3.0
- PHYSICS 321 - Mechanics 3.0
- PHYSICS 329 - Observational Astronomy 3.0
- PHYSICS 330 - Computational Physics Lab 1 1.0
- PHYSICS 360 - Statistical and Thermal Physics 3.0
- PHYSICS 391R - Seminar in Current Physics 1.0
- PHYSICS 416 - Writing in Physics 3.0
- PHYSICS 427 - Stellar Astrophysics 3.0
- PHYSICS 428 - Galaxies and Cosmology 3.0
- PHYSICS 430 - Computational Physics Lab 3 1.0
- PHYSICS 441 - Electrostatics and Magnetism 3.0
- PHYSICS 442 - Electrodynamics 3.0
- PHYSICS 451 - Quantum Mechanics 3.0
- PHYSICS 452 - Applications of Quantum Mechanics 3.0
- PHYSICS 461 - (Phscs-Me En) Introduction to Acoustics 3.0
- PHYSICS 471 - Principles of Optics 3.0
- PHYSICS 477R - Secondary Minor Student Teaching 4.0
- PHYSICS 492R - Capstone Project in Applied Physics 2.0
- PHYSICS 497R - Research in Physics 3.0
- PHYSICS 498R - Senior Thesis 3.0
- PHYSICS 540 - Electrical Engineering Principles and Practices for Physic 2.0
- PHYSICS 560 - Acoustical Measurement Methods 3.0

OPTION 4.2 Complete up to 9.0 hours from the following course(s)

- PHYSICS 313R - Special Topics in Physics 3.0
- PHYSICS 318 - Introduction to Mathematical Physics 3.0
- PHYSICS 321 - Mechanics 3.0
- PHYSICS 329 - Observational Astronomy 3.0
- PHYSICS 330 - Computational Physics Lab 1 1.0
- PHYSICS 360 - Statistical and Thermal Physics 3.0
- PHYSICS 391R - Seminar in Current Physics 1.0
- PHYSICS 416 - Writing in Physics 3.0
- PHYSICS 427 - Stellar Astrophysics 3.0
- PHYSICS 428 - Galaxies and Cosmology 3.0
- PHYSICS 430 - Computational Physics Lab 3 1.0
- PHYSICS 441 - Electrostatics and Magnetism 3.0
- PHYSICS 442 - Electrodynamics 3.0
- PHYSICS 451 - Quantum Mechanics 3.0
- PHYSICS 452 - Applications of Quantum Mechanics 3.0
- PHYSICS 461 - (Phscs-Me En) Introduction to Acoustics 3.0
- PHYSICS 471 - Principles of Optics 3.0
- PHYSICS 477R - Secondary Minor Student Teaching 4.0
- PHYSICS 492R - Capstone Project in Applied Physics 2.0
- PHYSICS 497R - Research in Physics 3.0
- PHYSICS 498R - Senior Thesis 3.0
- PHYSICS 540 - Electrical Engineering Principles and Practices for Physic 2.0
- PHYSICS 560 - Acoustical Measurement Methods 3.0

REQUIREMENT 5 Complete 2 options

PROFESSIONAL EDUCATION COMPONENT:

Licensure requirements: Contact Education Student Services, 350 MCKB, 422-3426, to schedule the final interview to clear your application for the secondary teaching license. You should be registered for your last semester at BYU prior to the scheduled appointment.

OPTION 5.1 Complete 9 courses

- CPSE 402 - Educating Students with Disabilities in Secondary Classroc 2.0
- IP&T 371 - Integrating K-12 Educational Technology 1.0
- IP&T 372 - Integrating K-12 Educational Technology 2 1.0
- IP&T 373 - Teaching in K-12 Online and Blended Learning Contexts 4.0
- PHY 527 - Exploration of Teaching 1.0
- PHY 537 - Teaching Methods and Instruction 3.0
- PHY 538 - Practicum in Secondary Education 1.0
- *SC ED 353 - Multicultural Education for Secondary Education 3.0
- SC ED 375 - Adolescent Development and Classroom Management 3.0

Note: FBI fingerprint and background clearance must be completed prior to enrollment in Phy 5 276.

OPTION 5.2 Complete 12.0 hours from the following course(s)

- PHY 5 476 - Secondary Student Teaching 12.0v
- PHY 5 496 - Academic Internship: Secondary Education 12.0v

Student teachers/interns must complete three forms in their LiveText accounts (Pibs, Cds, Fed) and attach their Tws to the LiveText account for their program. All four must be completed to be cleared for graduation.

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 example, 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 experiences can provide excellent preparation for employment or 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 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
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physics_office@byu.edu

ADVICEMENT CENTER INFORMATION
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N-181 ESC
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Telephone: (801) 422-2674