### University Core Requirements

#### Religion Cornerstones
- **Teachings and Doctrine of The Book of Mormon**
  - Classes: 1
  - Hours: 2.0
  - Class: REL A 275
- **Jesus Christ and the Everlasting Gospel**
  - Classes: 1
  - Hours: 2.0
  - Class: REL A 250
- **Foundations of the Restoration**
  - Classes: 1
  - Hours: 2.0
  - Class: REL C 225
- **The Eternal Family**
  - Classes: 1
  - Hours: 2.0
  - Class: REL C 200

#### The Individual and Society
- **American Heritage**
  - Classes: 1-2
  - Hours: 3-6.0
  - Class: from approved list
- **Global and Cultural Awareness**
  - Classes: 1
  - Hours: 3.0
  - Class: SC ED 353*

#### Skills
- **First Year Writing**
  - Classes: 1
  - Hours: 3.0
  - Class: from approved list
- **Advanced Written and Oral Communications**
  - Classes: 1
  - Hours: 3.0
  - Class: PHSCS 416 or WRTG 316
- **Quantitative Reasoning**
  - Classes: 1
  - Hours: 4.0
  - Class: MATH 112*
- **Languages of Learning (Math or Language)**
  - Classes: 1
  - Hours: 4.0
  - Class: MATH 112*

#### Arts, Letters, and Sciences
- **Civilization 1**
  - Classes: 1
  - Hours: 3.0
  - Class: from approved list
- **Civilization 2**
  - Classes: 1
  - Hours: 3.0
  - Class: from approved list
- **Arts**
  - Classes: 1
  - Hours: 3.0
  - Class: from approved list
- **Letters**
  - Classes: 1
  - Hours: 3.0
  - Class: PHIL 423*
- **Biological Science**
  - Classes: 1
  - Hours: 3–4.0
  - Class: from approved list
- **Physical Science**
  - Classes: 1
  - Hours: 3.0
  - Class: PHSCS 222
- **Social Science**
  - Classes: 1
  - Hours: 3.0
  - Class: from approved list

#### Core Enrichment: Electives
- **Religion Electives**
  - Classes: 3-4
  - Hours: 6.0
  - Class: from approved list
- **Open Electives**
  - Classes: Variable
  - Hours: Variable
  - Class: personal choice

### 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>5th Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHSCS 121 (FWSp)</td>
<td>PHSCS 127 (FWSp)</td>
</tr>
<tr>
<td>PHSCS 191 (FW)</td>
<td>Physics Elective 1</td>
</tr>
<tr>
<td>MATH 112 (FWSpSu)</td>
<td>MATH 302 (FW) **</td>
</tr>
<tr>
<td>First-year Writing</td>
<td>PHYS 276 (FW)</td>
</tr>
<tr>
<td>Arts</td>
<td>Religion Cornerstone course</td>
</tr>
<tr>
<td>Total Hours 15.5</td>
<td>Total Hours 15.5</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>PHY S 378 (FW)</td>
</tr>
<tr>
<td>PHSCS 225 (FW) *</td>
<td>CPSE 402</td>
</tr>
<tr>
<td>MATH 302 (FW)**</td>
<td>1.0</td>
</tr>
<tr>
<td>PHYS 276 (FW)</td>
<td>Religion Elective</td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>Total Hours 15.0</td>
</tr>
<tr>
<td>Total Hours 15.0</td>
<td>Letters</td>
</tr>
<tr>
<td><strong>It's highly recommended to take PHSCS 220 and PHSCS 225 at the same time.</strong></td>
<td>Religion Elective 2.0</td>
</tr>
<tr>
<td><strong>The Math 213/215/314/334 (9 cr) sequence can be taken in place of the MATH 302/303 (6 cr) sequence.</strong></td>
<td>General Elective 1.0</td>
</tr>
<tr>
<td>*These classes fill both university core and program requirements (13 hours overlap)</td>
<td>Total Hours 15.0</td>
</tr>
</tbody>
</table>

#### JUNIOR YEAR

<table>
<thead>
<tr>
<th>5th Semester</th>
<th>6th Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHSCS 122 (FW)</td>
<td>PHY S 476R or 496R (FW)</td>
</tr>
<tr>
<td>PHSCS 240 (FW)</td>
<td>Total Hours 12.0</td>
</tr>
<tr>
<td>MATH 303 (FW)</td>
<td>Total Hours 12.0</td>
</tr>
<tr>
<td>IP&amp;T 371</td>
<td>Letters</td>
</tr>
<tr>
<td>IP&amp;T 372</td>
<td>Variable</td>
</tr>
<tr>
<td>Social Science</td>
<td>Personal choice</td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>Total Hours 16.0</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.

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*These classes fill both university core and program requirements (13 hours overlap)*
REQUIREMENT 1

Recommended.

A teaching minor is not required for licensure.

For admission and retention requirements for teaching majors and teaching minors, see Educator Preparation Program Requirements in the Undergraduate Catalog.

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

REQUIREMENT 2

Complete 10 courses

NOTE: PHSCS 151 SHOULD BE TAKEN THE FIRST SEMESTER.

*MATH 112 - Calculus 1
*MATH 113 - Calculus 2
PHSCS 121 - Introduction to Newtonian Mechanics
PHSCS 122 - Introduction to Waves, Optics, and Thermodynamics
PHSCS 127 - Descriptive Astronomy
PHSCS 191 - Introduction to Physics Careers and Research
PHSCS 220 - Introduction to Electricity and Magnetism
*PHSCS 222 - Modern Physics
PHSCS 225 - Introduction to Experimental Physics
PHSCS 240 - Design, Fabrication, and Use of Scientific Apparatus

REQUIREMENT 3

Complete 1 course

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

REQUIREMENT 4

Complete 9.0 hours from the following option(s)

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

OPTION A.1 Complete up to 3.0 hours from the following course(s)

COMPLETE UP TO 3.0 HOURS FROM THE FOLLOWING. COURSES FROM REQUIREMENT 3 CAN'T BE DOUBLE COUNTED AS ELECTIVES.

*PHIL 421R - History and Philosophy of Science
PHSCS 167 - Descriptive Acoustics of Music and Speech
PHSCS 310 - Physics By Inquiry: Mechanics
PHSCS 311 - Physics By Inquiry: Electricity
PHSCS 313R - Special Topics in Physics

OPTION A.2 Complete up to 9.0 hours from the following course(s)

COMPLETE AT LEAST 6 HOURS FROM 300-, 400-, OR 500-LEVEL PHYSICS COURSES, NOT INCLUDING 310 OR 311 OR 393R (PHSCS 312, 461, AND 471 ARE HIGHLY RECOMMENDED).

PHSCS 313R - Special Topics in Physics
PHSCS 318 - Introduction to Mathematical Physics
PHSCS 321 - Mechanics
PHSCS 329 - Observational Astronomy
PHSCS 330 - Computational Physics Lab 2
PHSCS 360 - Statistical and Thermal Physics
PHSCS 393R - Seminar in Current Physics
PHSCS 416 - Writing in Physics
PHSCS 427 - Stellar Astrophysics
PHSCS 428 - Galaxies and Cosmology
PHSCS 430 - Computational Physics Lab 3
PHSCS 441 - Electricity and Magnetism
PHSCS 442 - Electrodynamics
PHSCS 451 - Quantum Mechanics
PHSCS 452 - Applications of Quantum Mechanics
PHSCS 461 - (Phscs-Me En) Introduction to Acoustics
PHSCS 471L - Principles of Optics
PHSCS 477R - Secondary Minor Student Teaching
PHSCS 492R - Capstone Project in Applied Physics
PHSCS 497R - Research in Physics
PHSCS 498R - Senior Thesis

PHSCS 502 - Job Search Strategies
PHSCS 540 - Electrical Engineering Principles and Practices for Physicists
PHSCS 560 - Acoustical Measurement Methods
PHSCS 561 - (Phscs-Me En) Fundamentals of Acoustics
PHSCS 571 - Lasers and Atoms
PHSCS 581 - Solid State Physics
PHSCS 583 - Physics of Nanostructures, Surfaces, and Interfaces
PHSCS 585 - Thin Film Physics
PHSCS 586 - Transmission Electron Microscopy for Physical Science
PHSCS 587 - Physics of Semiconductor Devices
PHSCS 588 - Scanning Electron Microscopy (SEM) for Physical Science
PHSCS 599R - Academic Internship

REQUIREMENT 5

Complete 2 options

PROFESSIONAL EDUCATION COMPONENT:

Licensure requirements: Contact the Education Advisement Center, 350 MCKB, 801-422-3426, 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 462 - Educating Students with Disabilities in Secondary Classrooms
IP&T 372 - Integrating K-12 Educational Technology 2
IP&T 373 - Teaching in K-12 Online and Blended Learning Contexts
PHY S 276 - Exploration of Teaching
PHY S 377 - Teaching Methods and Instruction
PHY S 378 - Practicum in Secondary Education
*SC ED 353 - Multicultural Education for Secondary Education
SC ED 375 - Adolescent Development and Classroom Management

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

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

PHY S 475 - Secondary Student Teaching
PHY S 496 - Academic Internship: Secondary Education

Student teachers/interns must complete three forms in their Educator accounts (PIBS, CDS, FED) and attach their TWS to the Educator 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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