### 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>
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<tr>
<td>Teachings and Doctrine, Book of Mormon</td>
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<td>2.0</td>
<td>Rel A 275</td>
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<tr>
<td>Jesus Christ &amp; the Everlasting Gospel</td>
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<td>Rel A 250</td>
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<td>Foundations of the Restoration</td>
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<td>Rel C 225</td>
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<td>The Eternal Family</td>
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<td>Rel C 200</td>
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<tr>
<td><strong>The Individual and Society</strong></td>
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<tr>
<td>Citizenship</td>
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<tr>
<td>American Heritage</td>
<td>1–2</td>
<td>3–6.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Global &amp; Cultural Awareness</td>
<td>1</td>
<td>3.0</td>
<td>Sc Ed 353*</td>
</tr>
<tr>
<td><strong>Skills</strong></td>
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<tr>
<td>Effective Communication</td>
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<tr>
<td>First-Year Writing</td>
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<td>3.0</td>
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<tr>
<td>Adv Written &amp; Oral Communication</td>
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<td>3.0</td>
<td>Phscs 416 or Engl 316</td>
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<tr>
<td>Quantitative Reasoning</td>
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<td>4.0</td>
<td>Math 112*</td>
</tr>
<tr>
<td>Languages of Learning (Math or Language)</td>
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<td>4.0</td>
<td>Math 112*</td>
</tr>
<tr>
<td><strong>Arts, Letters, and Sciences</strong></td>
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<tr>
<td>Civilization 1 and 2</td>
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<tr>
<td>Arts</td>
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<tr>
<td>Letters</td>
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<td>3.0</td>
<td>Phil 423*</td>
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<tr>
<td><strong>Scientific Principles &amp; Reasoning</strong></td>
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<tr>
<td>Biological Science</td>
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<td>3–5.0</td>
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<tr>
<td>Physical Science</td>
<td>1</td>
<td>3.0</td>
<td>Phscs 222*</td>
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<tr>
<td>Social Science</td>
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<tr>
<td><strong>Core Enrichment: Electives</strong></td>
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<td>Religion Electives</td>
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<tr>
<td>Open Electives</td>
<td>Variable</td>
<td>Variable</td>
<td>personal choice</td>
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</table>

#### PROGRAM REQUIREMENTS (74.5–77.5 total hours, including licensure hours)

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

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

**Complete the following:**

- **Phscs 121 Intro to Newtonian Mechanics** 3.0
- **Phscs 123 Intro to Waves, Optics, & Thermodynamics** 3.0
- **Phscs 127 Descriptive Astronomy** 3.0
- **Phscs 140 Electronics Lab** 1.0
- **Phscs 145 Experimental Methods in Physics** 1.0
- **Phscs 191 Intro to Physics Careers & Research 1** 0.5
- **Phscs 220 Intro to Electricity & Magnetism** 3.0
- **Phscs 222* Modern Physics** 3.0
- **Phscs 240 Design, Fabrication, & Use of Scientific Apparatus** 2.0

**Note:** Phscs 191 should be taken the first semester.

**Complete the following:**

- **Math 112* Calculus 1** 4.0
- **Math 113* Calculus 2** 4.0
- **Math 302 Mathematics for Engineering 1** 4.0
- **Math 311 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 an additional 12 hours from the following:

- a. Complete up to 6 hours from the following:
  - **Hist 291 History of Science** 3.0
  - **Phil 423* History & Philosophy of Science** 3.0
  - **Phscs 137 Severe & Hazardous Weather** 3.0
  - **Phscs 167 Descriptive Acoustics of Music & Speech** 3.0
  - **Phscs 281 Principles of Solid State Physics** 3.0
  - **Phscs 310 Physics By Inquiry: Mechanics** 3.0
  - **Phscs 311 Physics By Inquiry: Electricity** 3.0
  - **Phscs 313* Special Topics in Physics** 3.0

- b. Complete at least 6 hours from 300-, 400-, or 500-level or above physics courses, not including 310, 311, or 399R (Phscs 321, 461, and 471 are highly recommended).

**Complete the teacher licensure requirements:**

Contact Education Student Services, 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.

**Complete the Professional Education Component:**

A. Complete the following:

- **CPSE 402 Educating Students with Disabilities** 2.0
- **IP&T 286 Instructional Technology in Teaching** 1.0
- **Phy S 276 Exploration of Teaching** 4.0
- **Phy S 377 Teaching Methods and Instruction** 3.0
- **Phy S 378 Practicum in Secondary Education** 1.0
- **Sc Ed 353* Multicultural Education** 2.0
- **Sc Ed 375 Adolescent Development & Classroom Management** 3.0

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

B. Complete 12 hours of one of the following:

- **Phy S 476 Secondary Student-Teaching** 12.0
- **Phy S 496 Academic Internship** 12.0

*THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (13 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 ADVISORS:

Duane Merrell
N-143 ESC
Brigham Young University, Provo, UT 84602
Telephone: (801) 422-2255

Licensure Advisor: Tara Goulding
350 MCKB
Brigham Young University, Provo, UT 84602
Telephone: (801) 422-7327
### Suggested Sequence of Courses:

#### FRESHMAN YEAR

**1st Semester**  
First-year Writing 3.0  
or A Htg 100 (3.0)  
Math 112 (FWSpSu) 4.0  
Phscs 121 (FWSp) 3.0  
Phscs 191 (F) 0.5  
Religion Cornerstone course 2.0  
General electives 1.5  
**Total Hours** 14.0

**2nd Semester**  
A Htg 100 3.0  
or First-year Writing (3.0)  
Math 113 (FWSpSu) 4.0  
Phscs 123 (FWSp) 3.0  
Phscs 140 (WSp) 1.0  
Biological Science 3.0  
Religion Cornerstone course 2.0  
**Total Hours** 16.0

#### SOPHOMORE YEAR

**3rd Semester**  
Math 302 (FW) 4.0  
Phy S 276 (FW) 4.0  
Phscs 145 (F/Su) 1.0  
Religion Cornerstone course 2.0  
**Total Hours** 14.0

**4th Semester**  
Math 303(FW) 4.0  
Phscs 220 (FW) 3.0  
Phscs 240 (FW) 2.0  
Social Science 3.0  
Religion Cornerstone course 2.0  
General elective 2.0  
**Total Hours** 16.0

#### JUNIOR YEAR

**5th Semester**  
Phscs Elective 3.0  
IP&T 286 (FWSpSu) 1.0  
Phscs 127 (FWSpSu) 3.0  
Civilization 1 3.0  
Engl 316 3.0  
Religion Elective 2.0  
**Total Hours** 16.0

**6th Semester**  
Sc Ed 353 (FWSpSu) 2.0  
Sc Ed 375 (FWSp) 3.0  
Physics Elective 3.0  
Physics Elective 3.0  
Civilization 2 (and Arts) 3.0  
Religion Elective 2.0  
**Total Hours** 16.0

#### SENIOR YEAR

**7th Semester**  
Physics Elective 3.0  
CPSE 402 2.0  
Phy S 378 (FWSpSu) 1.0  
Phy S 377 (FW) 3.0  
Global and Cultural Awareness/Letters 3.0  
General Elective 2.0  
**Total Hours** 16.0

**8th Semester**  
Sc Ed 476R or 496R (FW) 12.0  
**Total Hours** 12.0

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### 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 experiences 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 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 physics.byu.edu/undergraduate/careers.

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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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**Department of Physics and Astronomy**  
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physics_office@byu.edu