### 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>
</tr>
<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>
<td></td>
<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>
</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

### 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>
</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>Total Hours</td>
<td>15.0</td>
</tr>
</tbody>
</table>

*It’s highly recommended to take PHSCS 220 and PHSCS 225 at the same time.

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

#### Junior Year

<table>
<thead>
<tr>
<th>5th Semester</th>
<th>6th Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHSCS 127 (FWSp)</td>
<td>3.0</td>
</tr>
<tr>
<td>Physics Elective 1</td>
<td>3.0</td>
</tr>
<tr>
<td>MATH 113 (FWSpSu)</td>
<td>4.0</td>
</tr>
<tr>
<td>American Heritage</td>
<td>3.0</td>
</tr>
<tr>
<td>Biological Science</td>
<td>3.0</td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
</tr>
<tr>
<td>Total Hours</td>
<td>15.0</td>
</tr>
</tbody>
</table>

#### Senior Year

<table>
<thead>
<tr>
<th>7th Semester</th>
<th>8th Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHSCS 310 or 311</td>
<td>3.0</td>
</tr>
<tr>
<td>Physics Elective 3</td>
<td>3.0</td>
</tr>
<tr>
<td>PHY S 377 (FW)</td>
<td>3.0</td>
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<tr>
<td>PHY S 378 (FW)</td>
<td>1.0</td>
</tr>
<tr>
<td>Religion Elective</td>
<td>2.0</td>
</tr>
<tr>
<td>Total Hours</td>
<td>15.0</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.**
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 310 - Physics By Inquiry: Mechanics
PHYSICS 311 - Physics By Inquiry: Electricity
PHYSICS 313R - Special Topics in Physics

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

PHYSICS 191 - Seminar in Current Physics
PHYSICS 416 - Writing in Physics
PHYSICS 427 - Stellar Astrophysics
PHYSICS 428 - Galaxies and Cosmology
PHYSICS 430 - Computational Physics Lab 3
PHYSICS 441 - Electrostatics and Magnetism
PHYSICS 442 - Electrodynamics
PHYSICS 451 - Quantum Mechanics
PHYSICS 452 - Applications of Quantum Mechanics
PHYSICS 461 - (Phscs-Me En) Introduction to Acoustics
PHYSICS 471 - Principles of Optics
PHYSICS 477R - Secondary Minor Student Teaching
PHYSICS 492R - Capstone Project in Applied Physics
PHYSICS 497R - Research in Physics
PHYSICS 498R - Senior Thesis
PHYSICS 540 - Electrical Engineering Principles and Practices for Physic 2.0
PHYSICS 560 - Acoustical Measurement Methods

B.S. in Physics Education (694828)
2019-2020 Program Requirements (77.5 - 79.5 Credit Hours)

REQUIREMENT 5 Complete 2 options

PROFESSIONAL EDUCATION COMPONENT:

Licensure requirements: Contact the Education Advisement Center, 350 MCBK, 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 402 - Educating Students with Disabilities in Secondary Classroom 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 1.0
PHY 5276 - Exploration of Teaching 4.0
PHY 5377 - Teaching Methods and Instruction 3.0
PHY 5378 - 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 5276.

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

PHY 5476 - Secondary Student Teaching 12.0v
PHY 5496 - Academic Internship: Secondary Education 12.0v

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.

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

PHSCS 191 - Should Be Taken the First Semester.
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
MATH 113 - Calculus 1
MATH 114 - Calculus 2
MATH 213 - Elementary Linear Algebra
MATH 215 - Computational Linear Algebra
MATH 311 - Calculus of Several Variables
MATH 312 - Calculus for Engineering 1
MATH 313 - (Not currently offered)
MATH 314 - Calculus of Several Variables
MATH 334 - Ordinary Differential Equations
MATH 341 - Linear Algebra
MATH 342 - Linear Algebra
MATH 441 - Advanced Calculus I
MATH 442 - Advanced Calculus II
MATH 443 - Advanced Calculus III
MATH 444 - Numerical Analysis
MATH 445 - Mathematical Methods
MATH 446 - Numerical Analysis
MATH 447 - Numerical Analysis
MATH 448 - Numerical Analysis
MATH 449 - Numerical Analysis
MATH 451 - Complex Variables
MATH 452 - Complex Variables
MATH 453 - Complex Variables
MATH 454 - Complex Variables
MATH 455 - Complex Variables
MATH 456 - Complex Variables
MATH 457 - Complex Variables
MATH 458 - Complex Variables
MATH 459 - Complex Variables
MATH 461 - (Phscs-Me En) Introduction to Acoustics
MATH 471 - Principles of Optics
MATH 477R - Secondary Minor Student Teaching
MATH 492R - Capstone Project in Applied Physics
MATH 497R - Research in Physics
MATH 498R - Senior Thesis
MATH 500 - (Phscs-Chem-C S-Geol-MthEd-Stat) Business Career 1.5
MATH 540 - Electrical Engineering Principles and Practices for Physic 2.0
MATH 560 - Acoustical Measurement Methods

REQUIREMENT 2 Complete 1 option

OPTION 2.1 Complete 2 courses

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

OPTION 2.2 Complete 3 courses

MATH 312 - Calculus for Engineering 1
MATH 334 - Ordinary Differential Equations
MATH 341 - Linear Algebra
MATH 342 - Linear Algebra
MATH 441 - Advanced Calculus I
MATH 442 - Advanced Calculus II
MATH 443 - Advanced Calculus III
MATH 444 - Numerical Analysis
MATH 445 - Mathematical Methods
MATH 446 - Numerical Analysis
MATH 447 - Numerical Analysis
MATH 448 - Numerical Analysis
MATH 449 - Numerical Analysis
MATH 451 - Complex Variables
MATH 452 - Complex Variables
MATH 453 - Complex Variables
MATH 454 - Complex Variables
MATH 455 - Complex Variables
MATH 456 - Complex Variables
MATH 457 - Complex Variables
MATH 458 - Complex Variables
MATH 459 - Complex Variables
MATH 461 - (Phscs-Me En) Introduction to Acoustics
MATH 471 - Principles of Optics
MATH 477R - Secondary Minor Student Teaching
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MATH 497R - Research in Physics
MATH 498R - Senior Thesis
MATH 500 - (Phscs-Chem-C S-Geol-MthEd-Stat) Business Career 1.5
MATH 540 - Electrical Engineering Principles and Practices for Physic 2.0
MATH 560 - Acoustical Measurement Methods

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)
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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Provo, UT 84602
Telephone: (801) 422-4361
physics_office@byu.edu

ADVISEMENT CENTER INFORMATION
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