

# BS in Physics Education (694828) MAP Sheet

Physical and Mathematical Sciences, Physics and Astronomy

For students entering the degree program during the 2024-2025 curricular year

This major is designed to prepare students to teach in public schools. In order to graduate with this major, students are required to complete Utah State Office of Education licensing requirements.

To view these requirements go to <http://education.byu.edu/ess/licensing.html> or contact Education Advisement Center, 175 MCKB, 801-422-3426.

University Core and Graduation Requirements				Suggested Sequence of Courses				
<b>University Core Requirements:</b>				<b>FRESHMAN YEAR</b>		<b>JUNIOR YEAR</b>		
	<b>Requirements</b>	<b># Classes</b>	<b>Hours</b>	<b>Classes</b>				
<b>Religion Cornerstones</b>				<u>1st Semester</u>		<u>5th Semester</u>		
	Teachings and Doctrines of the Book of Mormon	1	2.00	REL A 275	PHSCS 121	3.00	PHSCS 127	3.00
	Jesus Christ and the Everlasting Gospel	1	2.00	REL A 250	UNIV 101	2.00	Physics Elective 1	3.00
	Foundations of the Restoration	1	2.00	REL C 225	PHSCS 191	0.50	IP&T 373	1.00
	The Eternal Family	1	2.00	REL C 200	MATH 112	4.00	WRTG 316	3.00
					First Year Writing	3.00	GE Arts, Letters, Sciences	3.00
					Religion Cornerstone Class	2.00	GE Religion	2.00
					<b>Total Hours:</b>	<b>14.50</b>	<b>Total Hours:</b>	<b>15.00</b>
<b>BYU Foundations for Student Success</b>				<u>2nd Semester</u>		<u>6th Semester</u>		
	Foundations for Student Success	1	2.00	UNIV 101	PHSCS 123	3.00	SC ED 353	2.00
<b>The Individual and Society</b>								
	American Heritage	1 to 2	3.00-6.00	from approved list	MATH 113	4.00	SC ED 375	3.00
	Global and Cultural Awareness	1	3.00	SC ED 353*	GE Arts, Letters, Sciences	3.00	PHSCS 310 or 311	3.00
<b>Skills</b>								
	First Year Writing	1	3.00	from approved list	American Heritage	3.00	Physics Elective 2	3.00
	Advanced Written and Oral Communications	1	3.00	PHSCS 416 or WRTG 316	Religion Cornerstone Class	2.00	GE Arts, Letters, Sciences	3.00
	Quantitative Reasoning	1	4.00	MATH 112*	<b>Total Hours:</b>	<b>15.00</b>	GE Religion	2.00
	Languages of Learning (Math of Language)	1	4.00	MATH 112*	<b>Total Hours:</b>	<b>16.00</b>	<b>Total Hours:</b>	<b>16.00</b>
<b>Arts, Letters and Sciences (Complete 6 of 7)</b>				<b>SOPHOMORE YEAR</b>		<b>SENIOR YEAR</b>		
	Civilization 1	1	3.00	from approved list	<u>3rd Semester</u>		<u>7th Semester</u>	
	Civilization 2	1	3.00	from approved list	PHSCS 220	3.00	Physics Elective 3	3.00
	Arts	1	3.00	from approved list	PHSCS 225	2.00	PHY S 377	3.00
	Letters	1	3.00	from approved list	MATH 302	4.00	PHY S 378	1.00
	Biological Science	1	3.00-4.00	from approved list	PHY S 276	4.00	CPSE 402	2.00
	Physical Science	2	3.00	PHSCS 222*	Religion Cornerstone Class	2.00	GE Arts, Letters, Sciences	3.00
	Social Science	1	3.00	from approved list	<b>Total Hours:</b>	<b>15.00</b>	GE Religion	2.00
<b>Core Enrichment: Electives</b>				<u>4th Semester</u>		<u>8th Semester</u>		
	Religion Electives	3 to 4	6.00	from approved list	PHSCS 222	3.00	PHY S 476R or 496R	12.00
	Open Electives	Variable	Variable	personal choice	PHSCS 240	2.00	<b>Total Hours:</b>	<b>12.00</b>
<b>Graduation Requirements:</b>								
	Minimum residence hours required		30.00		MATH 303	4.00		
	Minimum hours needed to graduate		120.00		IP&T 371	1.00		
					IP&T 372	1.00		
					GE Arts, Letters, Sciences	3.00		
					Religion Cornerstone Class	2.00		
					<b>Total Hours:</b>	<b>16.00</b>		
*These classes fill both university core and program requirements								

## Program Requirements

Licensure: This program meets the educational requirements designed to lead to an occupationally required professional license or certificate in the state of Utah. Students pursuing occupations requiring a license or certificate in a state other than Utah should contact the appropriate BYU academic advisement center as well as the licensing agency in the state where they intend to work to seek information and guidance regarding licensure and certification requirements.

This major is designed to prepare students to teach in public schools. In order to graduate with this major, students are required to complete Utah State Office of Education licensing requirements. To view these requirements go to <https://www.schools.utah.gov/curr/licensing> or contact the Education Advisement Center, 350 MCKB, 801-422-3426.

For students accepted into the major after December 16, 2019, grades below C in any required coursework in a teaching major or teaching minor will not be accepted. Teacher candidates must maintain a cumulative GPA of 2.7 or higher once admitted into the program and to qualify for student teaching. For additional details on 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 1 — Complete 10 Courses

Note: Phscs 191 should be taken the first semester.

MATH 112 - Calculus 1 4.0

MATH 113 - Calculus 2 4.0

PHSCS 121 - Intro to Newtonian Mechanics 3.0

PHSCS 123 - Intro to Waves, Optics, Thermo 3.0

PHSCS 127 - Descriptive Astronomy 3.0

PHSCS 191 - Intro Phscs Careers & Rsrch 1 0.5

PHSCS 220 - Intro Electricity & Magnetism 3.0

PHSCS 222 - Modern Physics 3.0

PHSCS 225 - Intro to Experimental Physics 2.0

PHSCS 240 - Dsgn, Fabricatn, Sci Apparatus 2.0

Requirement 2 — Complete 1 of 3 Options

Option 2.1 — Complete 2 Courses

MATH 302 - Math for Engr 1 4.0

MATH 303 - Math for Engineering 2 4.0

Option 2.2 — 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 Equation 3.0

Requirement 3 — Complete 1 of 2 Courses

PHSCS 310 - Physics By Inquiry: Mechanics 3.0

PHSCS 311 - Physics By Inquiry:Electricity 3.0

Requirement 4 — Complete 9 hours

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 hours

Complete UP TO 3.0 hours from the following. Courses from requirement 3 can't be double counted as electives.

PHIL 423R - History&Philosophy of Science - You may take once 3.0

PHSCS 137 - Energy, Climate, Environment 3.0

PHSCS 167 - Desc Acoustics of Music & Spch 3.0

PHSCS 310 - Physics By Inquiry: Mechanics 3.0

PHSCS 311 - Physics By Inquiry:Electricity 3.0

PHSCS 313R - Special Topics in Physics - You may take once 0.5v

Option 4.2 — Complete up to 9 hours

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

PHSCS 313R - Special Topics in Physics - You may take once 0.5v

PHSCS 318 - Intro Math Physics 3.0

PHSCS 321 - Mechanics 3.0

PHSCS 329 - Observational Astronomy 3.0

PHSCS 330 - Computational Physics Lab 2 1.0

PHSCS 360 - Statistical & Thermal Physics 3.0

PHSCS 391R - Seminar in Current Physics - You may take once 1.0

PHSCS 416 - Writing in Physics 3.0

PHSCS 427 - Stellar Astrophysics 3.0

PHSCS 428 - Galaxies and Cosmology 3.0

PHSCS 430 - Computational Physics Lab 3 1.0

PHSCS 441 - Electricity & Magnetism 3.0

PHSCS 442 - Electrodynamics 3.0

PHSCS 451 - Quantum Mechanics 3.0

PHSCS 452 - Appl Quantum Mechanics 3.0

PHSCS 461 - Introduction to Acoustics 3.0

PHSCS 471 - Principles of Optics 3.0

PHSCS 477R - Sec Minor Student Teaching - You may take once 4.0

PHSCS 492R - Capstone in Applied Phscs - You may take once 0.5v

PHSCS 497R - Research in Physics - You may take once 1.0v

PHSCS 498R - Senior Thesis - You may take once 0.5v

PHSCS 540 - Elect Eng Princpls & Practice 2.0

PHSCS 560 - Acoustical Measurement Methods 3.0

PHSCS 561 - Fundamentals of Acoustics 3.0

PHSCS 571 - Lasers & Atoms 3.0

PHSCS 581 - Solid State Physics 3.0

PHSCS 583 - Nano and Surface Phscs 3.0

PHSCS 585 - Thin-Film Physics 3.0

PHSCS 586 - Trans Electron Microscopy 3.0

PHSCS 587 - Semiconductor Devices Phscs 3.0

PHSCS 588 - Scanning Electron Microscopy 3.0

PHSCS 599R - Academic Internship - You may take once 0.5v

Requirement 5 — Complete 2 Requirements

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.

Requirement 5.1 — Complete 9 Courses

CPSE 402 - Educ Stndts w/Disablt in ScEd 2.0

IP&T 371 - Integrating K-12 Ed Tec 1 1.0

IP&T 372 - Integrating K-12 in El. Ed. 1.0

IP&T 373 - Tchng K-12 Online/Blended Lrn 1.0

PHY S 276 - Exploration of Teaching 4.0

PHY S 377 - Teaching Methods & Instruction 3.0

PHY S 378 - Practicum in Secondary Educ 1.0

SC ED 353 - Multicultural Educ 2.0

SC ED 375 - Ad Dev & Class Mgmt 3.0

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

Requirement 5.2 — Complete 12 hours

PHY S 476 - Secondary Student Teaching 0.0v

PHY S 496 - Acad Intern: Secondary Ed 0.0v

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.

## 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](http://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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**ADVISEMENT CENTER INFORMATION**

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