



BS in PHYSICS (694821) MAP Sheet

Department of Physics and Astronomy

For students entering the degree program during the 2016–2017 curricular year.

UNIVERSITY CORE AND GRADUATION REQUIREMENTS				PROGRAM REQUIREMENTS (62–65 total hours)		
UNIVERSITY CORE REQUIREMENTS				No more than 3 hours of D credit is allowed in major courses.		
<u>Requirements</u>	<u>#Classes</u>	<u>Hours</u>	<u>Classes</u>	Complete the following:		
Religion Cornerstones				C S 142	Introduction to Computer Programming	3.0
Teachings and Doctrine, Book of Mormon	1	2.0	Rel A 275	Phscs 121	Intro to Newtonian Mechanics	3.0
Jesus Christ & the Everlasting Gospel	1	2.0	Rel A 250	Phscs 123	Intro to Waves, Optics, & Thermodynamics	3.0
Foundations of the Restoration	1	2.0	Rel C 225	Phscs 140	Electronics Lab	1.0
The Eternal Family	1	2.0	Rel C 200	Phscs 145	Experimental Methods in Physics	1.0
The Individual and Society				Phscs 191	Intro Physics Careers & Research	0.5
Citizenship				Phscs 220	Intro to Electricity & Magnetism	3.0
American Heritage	1–2	3–6.0	from approved list	Phscs 222*	Modern Physics	3.0
Global & Cultural Awareness	1	3.0	from approved list	Phscs 230	Computational Physics Lab 1	1.0
Skills				Phscs 240	Design, Fabrication, & Use of Scientific Apparatus	2.0
Effective Communication				Phscs 245	Experiments in Contemporary Physics	2.0
First-Year Writing	1	3.0	from approved list	Phscs 291	Intro to Physics Careers & Research 2	0.5
Adv Written & Oral Communication	1	3.0	Phscs 416 or Engl 316	Phscs 318	Intro to Mathematical Physics	3.0
Quantitative Reasoning	1	4.0	Math 113*	Phscs 321	Mechanics	3.0
Languages of Learning (Math or Language)	1	4.0	Math 113*	Phscs 330	Computational Physics Lab 2	1.0
Arts, Letters, and Sciences				Phscs 360	Statistical and Thermal Physics	3.0
Civilization 1 and 2				Phscs 430	Computational Physics Lab 3	1.0
Arts	1	3.0	from approved list	Phscs 441	Electrostatics and Magnetism	3.0
Letters	1	3.0	from approved list	Phscs 442	Electrodynamics	3.0
Scientific Principles & Reasoning				Phscs 451	Quantum Mechanics	3.0
Biological Science	1–2	3–5.0	from approved list	Phscs 452	Applications of Quantum Mechanics	3.0
Physical Science	1	3.0	Phscs 222*	Phscs 471	Principles of Optics	3.0
Social Science	1	3.0	from approved list	Note: Phscs 191 should be taken the first semester as a freshman. Phscs 291 should be taken the first semester as a sophomore.		
Core Enrichment: Electives				Complete one of the following options:		
Religion Electives	3–4	6.0	from approved list	Either		
Open Electives	Variable	Variable	personal choice	Math 113*	Calculus 2	4.0
GRADUATION REQUIREMENTS:				Math 302	Mathematics for Engineering 1	4.0
Minimum residence hours required		30.0		Or		
Minimum hours needed to graduate		120.0		Math 113*	Calculus 2	4.0
				Math 313	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 a senior thesis, including the following:
 a. Choose a research mentor and group as early as possible, starting with information in Phscs 191 and 291, and discussion with faculty, your advisor and senior thesis coordinator. It is best to start as a freshman or sophomore. Interdisciplinary work in other departments or in internships is possible.

b. Complete 2 hours of the following:
 Phscs 498R Senior Thesis 3.0V

Note 1: Students planning careers in experimental, applied, or industrial physics should complete Stat 201.

Note 2: All students will benefit, through courses or individual study, by learning programming skills and numerical methods beyond what you are taught in C S 142 and our computational physics courses. Consider the following: CS courses, Math 410, Me En 373.

Note 3: Students planning graduate school in physics should learn complex analysis. Consider the following: Math 332, Phscs 601, 602.

***THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (7 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 ASSIGNED BY LAST TWO DIGITS OF BYU ID NUMBER, CONTACT::
 Department of Physics and Astronomy
 N-283 ESC
 Brigham Young University, Provo, UT 84602
 Telephone: (801) 422-4361

**BS in PHYSICS (694821)
2016–2017**

FRESHMAN YEAR

1st Semester

First-year Writing	3.0
or A Htg 100	(3.0)
Math 113 (FWSpSu)	4.0
Phscs 121 (FWSp)	3.0
Phscs 191 (F)	0.5
Religion Cornerstone course	2.0
General electives	2.0
Total Hours	14.5

2nd Semester

A Htg 100	3.0
or First-year Writing	(3.0)
Math 302(FW)	4.0
Phscs 123 (FWSp)	3.0
Phscs 140 (WSp)	1.0
Religion Cornerstone course	2.0
C S 142	3.0
Total Hours	16.0

SOPHOMORE YEAR

3rd Semester

Phscs 145 (FSu)	1.0
Phscs 220 (FWSu)	3.0
Phscs 230 (FW)	1.0
Phscs 291 (F)	0.5
Biological Science	3.0
Social Science	3.0
Religion Cornerstone course	2.0
General Elective	2.0
Total Hours	15.5

4th Semester

Math 303 (FW)	4.0
Phscs 222 (FWSp)	3.0
Phscs 240 (FW)	2.0
Religion Cornerstone course	2.0
General Elective	3.0
Total Hours	14.0

JUNIOR YEAR

5th Semester

Phscs 245 (FW)	2.0
Phscs 318 (FWSp)	3.0
Phscs 321 (FSp)	3.0
Phscs 330 (FSp)	1.0
Civilization 1	3.0
General Elective	1.0
Religion Elective	2.0
Total Hours	15.0

6th Semester

Phscs 360 (W)	3.0
Phscs 430 (WSu)	1.0
Arts	3.0
Civilization 2	3.0
General Elective	3.0
Religion Elective	2.0
Total Hours	15.0

SENIOR YEAR

7th Semester

Phscs 441 (FSp)	3.0
Phscs 451 (F)	3.0
Phscs 498R (FWSpSu)	2.0
Letters	3.0
Global & Cultural Awareness	3.0
Religion Elective	2.0
Total Hours	16.0

8th Semester

Phscs 416A&B (W)	3.0
Phscs 442 (WSu)	3.0
Phscs 452 (W)	3.0
Phscs 471 (WSu)	3.0
General Elective	2.0
Total Hours	14.0

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 experience 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 engineers, technicians, 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 (especially patent 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.

For more information on careers in your major, see physics.byu.edu/undergraduate/careers.

Note: 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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