Physics, B.S.

A Bachelor in Physics provides the student with an understanding of the laws of nature and with the experimental and analytical techniques necessary to describe and solve problems in physical systems. The degree prepares students for further graduate study in physics, astronomy, geophysics, medicine, engineering, or many other diverse fields. Bachelor's recipients also find employment in a variety of industries and careers, including engineering, education, computer science, programming, electronics, energy and the environment, geology, medical physics, optics, finance, law, and more.

Matriculation Requirements

1. Advisor approval.
2. Completion of PHYS 2210 and MATH 1210 with a C or higher.

Program Requirements

Code	Title	Credit Hours
Total Credit Hours		**120**
General Education Requirements		**36 Credits**
ENGL 1010	Introduction to Academic Writing CC	3
or ENGH 1005	Literacies and Composition Across Contexts CC	
ENGL 2010	Intermediate Academic Writing CC	3
Complete one of the following:		3
MATH 1210	Calculus I QL	4
HIST 2700 & HIST 2710	US History to 1877 AS and US History since 1877 AS (6)	
HIST 1700	American Civilization AS (3)	
HIST 1740	US Economic History AS (3)	
POLS 1000	American Heritage AS (3)	
POLS 1100	American National Government AS (3)	
Complete the following:		
PHIL 2050	Ethics and Values IH	3
HLTH 1100	Personal Health and Wellness TE	2
or EXSC 1097	Fitness for Life TE	
Distribution Courses:		
Biology		3
Physical Science		3
Second Biology or Physical Science		3
Humanities Distribution		3
Fine Arts Distribution		3
Social/Behavioral Science		3
Discipline Core Requirements		**63 Credits**
PHYS 2210	Physics for Scientists and Engineers I PP	4
PHYS 2215	Physics for Scientists and Engineers I Lab	1
PHYS 2220	Physics for Scientists and Engineers II PP	4
PHYS 2225	Physics for Scientists and Engineers II Lab	1
PHYS 3110	Modern Physics I	3
PHYS 3115	Introduction to Experimental Physics I WE	2
PHYS 3120	Modern Physics II	3
PHYS 3125	Introduction to Experimental Physics II WE	2
PHYS 3230	Principles of Electronics for the Physical Sciences	3
PHYS 3300	Mathematical and Computational Physics I	3
PHYS 3330	Mathematical and Computational Physics II	3
PHYS 3400	Classical Mechanics	3

PHYS 3500	Thermodynamics	3
PHYS 3600	Optics	3
PHYS 4210	Advanced Experimental Techniques	3
PHYS 4410	Electrostatics and Magnetism	3
PHYS 4420	Electrodynamics	3
PHYS 4510	Quantum Mechanics I	3
PHYS 490R	Seminar (0.5 credits, taken 4 times)	2
MATH 1220	Calculus II	4
MATH 2210	Calculus III	4
MATH 2280	Ordinary Differential Equations	3
Elective Requirements		**21 Credits**
Complete 21 credits from the following courses. The selection of elective coursework should present a coherent theme such as engineering physics, medical phyiscs, nuclear physics, geophysics, computational physics, etc. (Consult Advisor or Department Chair for assistance or to consider possible course substitutions.)		21
ASTR 2040	Intermediate Astronomy (3)	
ASTR 3050	Astrophysics I (3)	
ASTR 3060	Astrophysics II (3)	
ASTR 4100	Brown Dwarfs and Exoplanets (undefined)	
ASTR 4350	Research Methods in Astronomy (3)	
PHYS 1100	Introductory Math Techniques for Physics and Engineering (3)	
PHYS 2500	Elementary Fluids and Thermal Physics (3)	
PHYS 2700	Biophysics (undefined)	
PHYS 2800	Introduction to Materials Physics (3)	
PHYS 3310	Advanced Mathematical Physics (3)	
PHYS 3350	Applications of LabVIEW in Physics (3)	
PHYS 3700	Particle Physics (undefined)	
PHYS 3800	Energy Use on Earth GI (3)	
PHYS 4150	Medical Physics (3)	
PHYS 4250	Nuclear Physics (3)	
PHYS 4350	Research Methods in Physics (3)	
PHYS 4520	Quantum Mechanics II (3)	
PHYS 4700	Acoustics (3) [1]	
PHYS 4800	Solid State Physics (3) [1]	
PHYS 481R	Physics Internship (1-4) (no more than 4 hours counted toward degree)	
PHYS 489R	Undergraduate Research in Physics (1-3) (no more than 9 hours counted toward degree)	
PHYS 492R	Topics in Physics (3) (may only be taken once toward degree credit)	
PHYS 495R	Independent Readings (1-3) (no more than 3 hours counted toward degree)	
PHYS 499A	Senior Project (2) [1]	
PHYS 499B	Senior Thesis (1) [1]	
See Physics Department academic advisor for possibly more complete and up to date list.		
CHEM 1210	Principles of Chemistry I PP (4) [2]	
CHEM 1215	Principles of Chemistry I Laboratory (1)	
CHEM 1220	Principles of Chemistry II PP (4) [2]	
CHEM 1225	Principles of Chemistry II Laboratory (1)	
Any CHEM course 2310 or higher except internship and independent study type courses.		
Any EENG course 2700 or higher except internship and independent study type courses.		
Any ENGR course 2010 or higher except internship and independent study type courses.		
MATH 2270	Linear Algebra (3)	
Any MATH course 3200 or higher except intership and independent study type courses.		
Any GEO course 3080 or higher, except internship and independent study-type courses.		
METO 3100	Climate and the Earth System (3)	

1

Suggested elective option for the student intent on continuing physics studies in graduate school.

2

Strongly recommended for inclusion in any elective option.

Graduation Requirements

1. Completion of a minimum of 120 semester credits.
2. Overall grade point average of 2.0 (C) or above with no grade lower than a "C" in core and elective requirement courses.
3. Residency hours--minimum of 30 credit hours through course attendance at UVU, with at least 10 hours earned in the last 45 hours.
4. Completion of GE and specified departmental requirements.
5. Successful completion of at least one Global/Intercultural course.

Graduation Plan

This graduation plan is a sample plan and is intended to be a guide. Your specific plan may differ based on your Math and English placement and/or transfer credits applied. You are encouraged to meet with an advisor and set up an individualized graduation plan in Wolverine Track (http://www.uvu.edu/wolverinetrack/).

First Year		
Semester 1		**Credit Hours**
MATH 1210 or PHYS 1100	Calculus I QL or Introductory Math Techniques for Physics and Engineering	4
ENGL 1010 or ENGH 1005	Introduction to Academic Writing CC or Literacies and Composition Across Contexts CC	3
EXSC 1097 or HLTH 1100	Fitness for Life TE or Personal Health and Wellness TE	2
PHYS 2210	Physics for Scientists and Engineers I PP	4
PHYS 2215	Physics for Scientists and Engineers I Lab	1
	Credit Hours	**14**
Semester 2		
MATH 1220	Calculus II	4
PHYS 2220	Physics for Scientists and Engineers II PP	4
PHYS 2225	Physics for Scientists and Engineers II Lab	1
ENGL 2010	Intermediate Academic Writing CC	3
FINE ARTS		3
	Credit Hours	**15**
Second Year		
Semester 3		
PHYS 3110	Modern Physics I	3
PHYS 3115	Introduction to Experimental Physics I WE	2
MATH 2210	Calculus III	4
PHYS 3300	Mathematical and Computational Physics I	3
PHYS 490R	Seminar	0.5
Humanities		3
PHIL 205G	Ethics and Values IH GI	3
	Credit Hours	**18.5**
Semester 4		
MATH 2280	Ordinary Differential Equations	3
PHYS 3230	Principles of Electronics for the Physical Sciences	3
PHYS 3120	Modern Physics II	3
PHYS 3125	Introduction to Experimental Physics II WE	2
PHYS 490R	Seminar	0.5
Soc/Behavioral Elective		3
	Credit Hours	**14.5**
Third Year		
Semester 5		
PHYS 3400	Classical Mechanics	3
PHYS 3500	Thermodynamics	3
Physics electives		9
	Credit Hours	**15**

Semester 6		
PHYS 3330	Mathematical and Computational Physics II	3
PHYS 3600	Optics	3
Physics Electives		9
PHYS 490R	Seminar	0.5
	Credit Hours	**15.5**
Fourth Year		
Semester 7		
PHYS 4210	Advanced Experimental Techniques	3
PHYS 4410	Electrostatics and Magnetism	3
PHYS 4510	Quantum Mechanics I	3
PHYS 499A	Senior Project	2
Physics elective		3
PHYS 490R	Seminar	0.5
	Credit Hours	**14.5**
Semester 8		
PHYS 3600	Optics	3
PHYS 4420	Electrodynamics	3
PHYS 499B	Senior Thesis	1
Physics electives		6
	Credit Hours	**13**
	Total Credit Hours	**120**

Program Learning Outcomes

1. Demonstrate understanding of how science and physics work in practice by correctly using evidence, experiment and observation, interpretation, physical concepts, etc.
2. Apply fundamental physical concepts including conservation laws, forces, fields, energy, optics, thermal and statistical physics, relativity, and quantum mechanics.
3. Use mathematics and mathematical models correctly to solve physics problems.
4. Follow practices necessary for safely using laboratory equipment.
5. Demonstrate understanding of the role of computation in physics and appropriate computer skills.
6. Communicate effectively about physics in writing and in presentations, in both formal and informal settings.
7. Demonstrate physics research skills and use ethical research practices.