Physics

Physics

The Physics department is in the College of Science . To find the most up-to-date information, including Program Learning Outcomes for degree programs offered by the Physics department, visit their website.

Physics department

DEPARTMENT CHAIR

JENSEN, Joseph *Professor*

FACULTY

ANDERSEN, Bonnie *Professor*
DRAPER, Christian *Assistant Professor*
DURFEE, Dallin S. *Assistant Professor*
HAISCH, Karl Jr. *Professor*
HART, Vern *Associate Professor*
HINTZ, Maureen *Lecturer*
JAMES, Daniel *Assistant Professor*
JENSEN, Joseph *Professor*
LOTHRINGER, Joshua *Assistant Professor*
MATHESON, Philip *Professor*
NIELSEN, Kim *Assistant Professor*
POWELL, John *Lecturer*
SHIPP, Dustin *Assistant Professor*
SLEZAK, Cyrill B. *Professor*
WASSERBAECH, Steven R. *Professor*
WEBER, Paul *Associate Professor*
YOUNG, York E. *Assistant Professor*

Degrees & Programs

Physics, Minor

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Requirements

A minor in physics represents a substantial investment in mastering the basics of physics and gaining suitable problem solving skills that may then be applied to other disciplines.

Total Program Credits: 20

Matriculation Requirements:			
1. Admitted to a bachelor degree program at UVU.			
Discipline Core Requirements:			20 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
Complete a minimum of 5 credits from the following courses:			5
	ASTR 3050	Astrophysics I (3)	
	ASTR 3060	Astrophysics I(3)	
	PHYS 2500	Elementary Fluids and Thermal Physics (3)	
	PHYS 2700	Biophysics (undefined)	
	PHYS 2800	Introduction to Materials Physics (3)	
	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 Physics (3)	
	PHYS 3310	Advanced Mathematical Physics (3)	
	PHYS 4300	Computational Physics (3)	
	PHYS 3400	Classical Mechanics (3)	
	PHYS 3500	Thermodynamics (3)	
	PHYS 4600	Optics (3)	
	PHYS 3800	Energy use on Earth (3)	
	PHYS 4210	Advanced Experimental Techniques (3)	
	PHYS 4250	Nuclear Physics (3)	
	PHYS 4410	Electrostatics and Magnetism (3)	
	PHYS 4420	Electrodynamics (3)	
	PHYS 4510	Quantum Mechanics I (3)	
	PHYS 4520	Quantum Mechanics II (3)	
	PHYS 4700	Acoustics (3)	
	PHYS 4800	Solid State Physics (3)	
	PHYS 490R	Seminar (0.5)	
	METO 3100	Climate and the Earth System (3)	

Graduation Requirements:

1. A minimum grade of "C" must be earned in all minor courses.

Physics, Minor
Careers

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.

Related Careers

- Natural Sciences Managers
- Physicists
- Physics Teachers, Postsecondary
- Secondary School Teachers, Except Special and Career/Technical Education

Physics Education, B.S.

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Requirements

Prepares the student to teach high school physics and AP physics. The program allows for those interested to supplement their studies with extra courses in physics or other science through elective upper division credit. A seminar course provides the student with exposure to careers in physics.

Total Program Credits: 120

Matriculation Requirements:			
1. Students are admitted directly to the Baccalaureate degree program in Physics Education upon acceptance to the Secondary Education Program. 2. Students must obtain the departmental Advisor's signature on an approved program plan prior to enrollment in their second semester of study. Secondary Education Requirements: 1. ENGL and MATH QL courses must have a grade C or higher. 2. GPA of 3.0 or higher with no grade lower than a C in content area courses. 3. Completion of all General Education requirements and 70% of content area courses. 4. Pass LiveScan Criminal Background Check.			
General Education Requirements:			38 Credits
	ENGL 1010	Introduction to Academic Writing CC	3
or	ENGH 1005	Literacies and Composition Across Contexts CC (5)	
	ENGL 2010	Intermediate Academic Writing CC	3
	MATH 1210	Calculus I QL	4
or	PHYS 1100	Introductory Math Techniques for Physics and Engineering	
Complete one of the following:			3
	HIST 1700	American Civilization AS (3)	
	HIST 2700	US History to 1877 AS (3)	
and	HIST 2710	US History since 1877 AS (3)	
	HIST 1740	US Economic History AS (3)	
	POLS 1000	American Heritage SS (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	2
Distribution Courses:			
	Biology		3
	CHEM 1210	Principles of Chemistry I PP (To be taken with CHEM 1215)	4
	CHEM 1220	Principles of Chemistry II PP (To be taken with CHEM 1225)	4
	Humanities		3
	Fine Arts		3
	Social/Behavioral Science		3
Discipline Core Requirements:			77 Credits
	Must be completed with a grade B- or higher.		
	CHEM 1215	Principles of Chemistry I Laboratory	1
	CHEM 1225	Principles of Chemistry II Laboratory	1
	HIST 4320	History of Scientific Thought	3
	MATH 1220	Calculus II	4
	MATH 2210	Calculus III	4
	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 3010	Physics Experiments for Secondary Education	1
	PHYS 3110	Modern Physics I	3
	PHYS 3115	Introduction to Experimental Physics I WE	2
Education Courses:			
	EDSC 1010	Introduction to Education	2
	EDSC 3000	Educational Psychology	3
	EDSC 325G	Equitable Technology Integration GI	2
	EDSC 4200	Classroom Management I	2
	EDSC 4250	Classroom Management II	2
	EDSC 4440	Content Area Literacies	3
	EDSC 445G	Multicultural Instruction ESL GI	3
	EDSC 455G	Secondary Curriculum Instruction and Assessment GI	3
	EDSC 4850	Student Teaching Secondary	8
	EDSC 4990	Teacher Performance Assessment Project WE	2
	EDSP 340G	Exceptional Students GI	2
Complete the following set:			
	SCIE 4210	Science Teaching Methods I	3
	SCIE 4220	Teaching Methods in Science II	3
PHYSICS:			
	PHYS 490R	Seminar (must be repeated two times)	1
Complete 9 credits from the following:			9
	ASTR 3050	Astrophysics I (3)	
	ASTR 3060	Astrophysics II (3)	

	PHYS 1100	Introductory Math Techniques for Physics and Engineering (3)	
	PHYS 2500	Elementary Fluids and Thermal Physics (3)	
	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 Physics (3)	
	PHYS 3400	Classical Mechanics (3)	
	PHYS 3500	Thermodynamics (3)	
	PHYS 3800	Energy use on Earth (3)	
	PHYS 4700	Acoustics (3)	
Elective Requirements:			5 Credits
	Complete 5 credits of upper division electives.		5

Graduation Requirements:

1. Completion of a minimum of 120 semester credits with a minimum of 40 upper-division credits.
2. Overall Grade of 3.0 (B) or above with no grade lower than a C or better in major required content courses and no grade lower than a B- in Licensure and Methods 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. A minimum of 52 credit hours must be in the major with a minimum of 20 credits taken at UVU. A minimum of 24 chemistry and physics credits must be upper-division.
6. Successful completion of at least one Global/Intercultural course.

Physics Education, B.S.

Careers

1. Demonstrate how to teach about how science and physics work in practice by correctly using evidence, experiment and observation, interpretation, physical concepts, etc.
2. Learn to apply and teach about 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.

Related Careers

- Physics Teachers, Postsecondary
- Education Teachers, Postsecondary
- Secondary School Teachers, Except Special and Career/Technical Education

Physics, B.S.

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Requirements

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 receipients 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.

Total Program Credits: 120

Matriculation Requirements:			
1. Advisor approval. 2. Completion of PHYS 2210 and MATH 1210 with a C or higher.			
General Education Requirements:			37 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
	MATH 1210	Calculus I QL	4
Complete one of the following:			3
	HIST 2700	US History to 1877 AS (3)	
and	HIST 2710	US History since 1877 AS (3)	
	HIST 1700	American Civilization AS (3)	
	HIST 1740	US Economic History AS (3)	
	POLS 1000	American Heritage SS(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	2
Distribution Courses:			
	Biology		3
	Physical Science		3
	Additional 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 Physics	3
	PHYS 3330	Computational Physics	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 (3)	
	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 (3)	
	PHYS 3800	Energy use on Earth (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)	

Notes:

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.

Physics, B.S.
Careers

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