

DEPARTMENT OF PHYSICS

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www.txstate.edu/physics/ (<http://www.txstate.edu/physics/>)

Physics, the study of matter and energy, is at the root of every field of natural science and underlies all physical phenomena. The problem-solving skills learned in the study of physics are valuable even if one's career is not in a physics-related field.

The B.S. with a major in Physics provides a rigorous background in physics as a preparation for graduate studies or a career in industry. The B.A. with a major in Physics is for students who want a background in physics but plan to pursue fields of interest other than physics as a life's work.

Career opportunities for a physics major exist in a wide variety of settings—from teaching in a classroom to basic research in an industrial or government laboratory, as a self-employed consultant, or as a member of a multidisciplinary research team.

Students who enter Texas State needing mathematics at a level below MATH 2417 are urged to attend a summer session to avoid any delay in starting their physics courses.

For more information contact the College of Science and Engineering Advising Center or the departmental advisor for the Department of Physics. For information on engineering technology, electrical engineering, industrial engineering, and manufacturing engineering see the Ingram School of Engineering and Department of Engineering Technology sections of this catalog.

Teacher Certification

Students should visit the catalog program page if interested in seeking a certification in Physical Science (Texas Grades 6-12) (<http://mycatalog.txstate.edu/undergraduate/science-engineering/physics/physics-teacher-certification-physical-science-grades-6-12-bs/>) or Physics/Mathematics (Texas Grades 7-12) (<http://mycatalog.txstate.edu/undergraduate/science-engineering/physics/physics-teacher-certification-physics-math-grades-7-12-bs/>). Initial or additional certification may also be acquired as a post-baccalaureate or graduate student. Students interested in certification are strongly encouraged to see the Science Advisor early in their undergraduate program or certification process.

Bachelor of Arts (B.A.)

- Major in Physics (<http://mycatalog.txstate.edu/undergraduate/science-engineering/physics/physics-ba/>)

Bachelor of Science (B.S.)

- Major in Physics (<http://mycatalog.txstate.edu/undergraduate/science-engineering/physics/physics-bs/>)
- Major in Physics (Teacher Certification in Physical Science, Grades 6-12) (<http://mycatalog.txstate.edu/undergraduate/science-engineering/physics/physics-teacher-certification-physical-science-grades-6-12-bs/>)
- Major in Physics (Teacher Certification in Physics/Mathematics, Grades 7-12) (<http://mycatalog.txstate.edu/undergraduate/science-engineering/physics/physics-teacher-certification-physics-math-grades-7-12-bs/>)

[engineering/physics/physics-teacher-certification-physics-math-grades-7-12-bs/](http://www.txstate.edu/undergraduate/science-engineering/physics/physics-teacher-certification-physics-math-grades-7-12-bs/))

Minor

- Physics

Courses in Physics (PHYS)

PHYS 1110. Elementary Physics Laboratory.

This course explores and illustrates some of the basic principles covered in PHYS 1310 and PHYS 1320. Corequisite: PHYS 1310 or PHYS 1320 either with a grade of 'D' or better.

1 Credit Hour. 0 Lecture Contact Hours. 2 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: PHYS 1105

PHYS 1115. General Physics I Laboratory.

First of two laboratory courses in General Physics for science-related majors. Course introduces students to the basics of measurement.

Topics cover mechanics and heat. Corequisite: PHYS 1315 with a grade of 'D' or better.

1 Credit Hour. 0 Lecture Contact Hours. 2 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: PHYS 1101

PHYS 1125. General Physics II Laboratory.

Second of two laboratory courses in general Physics. Course introduces the students to experimental measurements and demonstration of principles of electricity, magnetism, optics, modern physics, electromagnetic waves.

1 Credit Hour. 0 Lecture Contact Hours. 2 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: PHYS 1102

PHYS 1140. Introductory Laboratory in Astronomy.

An introduction to the constellations, the uses of telescopes, and other material relating to the study of stars and planets. This course is designed to be taken with PHYS 1340 or PHYS 1350 or those students desiring a laboratory course.

1 Credit Hour. 0 Lecture Contact Hours. 2 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering|Lab Required

Grade Mode: Standard Letter

TCCN: PHYS 1111

PHYS 1310. Elementary Physics.

A non-mathematical survey of mechanics, properties of matter, heat and sound. These topics are described in a conceptual way with applications relating to the world around us. The laboratory experience may be obtained in a separate one-hour credit lab (PHYS 1110). PHYS 1310 and PHYS 1320 are designed for the liberal arts student. The order in which they are taken is not important. They are not recommended for pre-engineering students or majors and minors in science. The laboratory experience is recommended with the second course.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Life & Phys Sciences Core 030|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: PHYS 1305

PHYS 1315. General Physics I.

The first course in a two semester sequence which is a survey of the basic laws and principles of physics and includes the topics of mechanics and heat. Designed for students whose program requires technical physics, but who are not pre-engineering students or majors or minors in physics. Credit for both (PHYS 1315 and PHYS 1115) and PHYS 1430 cannot be given. Prerequisite: MATH 1315 with a grade of 'C' or better or ACT Mathematics score of 24 or better or SAT Mathematics score of 520 or better or SAT Math section score of 550 or better. Corequisite: PHYS 1115 with a grade of 'D' or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Co-requisite(s): PHYS 1115

Course Attribute(s): Life & Phys Sciences Core 030|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: PHYS 1301

PHYS 1320. Elementary Physics.

A non-mathematical survey of electricity, magnetism, light, relativity, and atomic and nuclear physics. These topics are described in a conceptual way with applications relating to the world around us. The laboratory experience may be obtained in a separate one-hour credit lab (PHYS 1110). PHYS 1310 and PHYS 1320 are designed for the liberal arts student. The order in which they are taken is not important. They are not recommended for pre-engineering students or majors and minors in science. The laboratory experience is recommended with the second course.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Life & Phys Sciences Core 030|Dif Tui- Science & Engineering|Lab Required

Grade Mode: Standard Letter

TCCN: PHYS 1307

PHYS 1325. General Physics II.

Second course in a two semester sequence which is a survey of the basic laws and principles of physics and includes the topics of waves, light, electricity and magnetism. Designed for students whose program requires technical physics, but who are not pre-engineering students or majors or minors in physics. Prerequisites: PHYS 1315 with a grade of 'C' or better and [MATH 1315 with a grade of 'C' or better or ACT Mathematics score of 24 or better or SAT Mathematics score of 520 or better or SAT Math section score of 550 or better or Accuplacer College Mathematics score of 86 or better or Compass College Algebra score of 46 or better.].

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Co-requisite(s): PHYS 1125

Course Attribute(s): Life & Phys Sciences Core 030|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: PHYS 1302

PHYS 1340. Astronomy: Solar System.

A study of the solar system. Topics included are a study of the sun, the planets and their satellites, the comets, and other components of the solar system. Some aspects of telescopes and ancient astronomy will be included also.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Life & Phys Sciences Core 030|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: ASTR 1304

PHYS 1350. Astronomy: Stars and Galaxies.

A study of the universe beyond the solar system. Topics included are a study of the stars and star clusters, nebulae, galaxies, and an introduction to some aspects of cosmology.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Life & Phys Sciences Core 030|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: ASTR 1303

PHYS 1360. Development of Concepts in Physics I.

This studio-style course introduces physics concepts through active exploration and discussion of physical phenomena. Course content includes developing concepts of electricity, magnetism, and energy, and research on physics learning. Focus is on how physics helps make sense of everyday experience. It's the first in a sequence of two courses.

3 Credit Hours. 4 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Life & Phys Sciences Core 030|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: PHYS 1305

PHYS 1370. Development of Concepts in Physics II.

This studio-style course introduces physics concepts through active exploration and discussion of physical phenomena. Course content includes concepts of force, motion, waves, light, and matter, and research on physics learning. Focus is on how physics helps make sense of everyday experience. It's the second in a sequence of two courses.

Prerequisite: PHYS 1360 with a grade of 'D' or better.

3 Credit Hours. 4 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Life & Phys Sciences Core 030|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: PHYS 1307

PHYS 1430. Mechanics.

This course covers the principles of classical mechanics through problem solving and laboratory investigations. PHYS 1430, PHYS 2425, and PHYS 2435 are designed for students majoring and minoring in physics and/or other disciplines within the college of science and engineering. Credit for both (PHYS 1315 and PHYS 1115) and PHYS 1430 cannot be given. Corequisite: MATH 2471 with a grade of 'C' or better.

4 Credit Hours. 3 Lecture Contact Hours. 3 Lab Contact Hours.

Course Attribute(s): Life & Phys Sciences Core 030|Dif Tui- Science & Engineering|Lab Required

Grade Mode: Standard Letter

TCCN: PHYS 2425

PHYS 2150. Professional Development for Beginning Physicists.

This course introduces to physics majors career options and opportunities for internships, scholarships, and research internal and external to the university. The course also develops essential practical skills for job seekers. Prerequisite: PHYS 2425 and PHYS 2435 both with grades of 'D' or better.

1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

PHYS 2230. Introduction to Computational Modeling for Physics.

This course is an introduction to computational concepts and tools that physicists use for data analysis, simulation and modeling, and visualization in research and dissemination. Python and its various libraries are emphasized. Prerequisite: PHYS 1430 with a grade of 'D' or better. Corequisite: PHYS 2425 or PHYS 2435 either with a grade of 'C' or better.

2 Credit Hours. 0 Lecture Contact Hours. 3 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

PHYS 2425. Electricity and Magnetism.

This course is a calculus-based introduction to electricity and magnetism. Prerequisites: PHYS 1430 and [MATH 2472 or MATH 2473] both with grades of 'C' or better.

4 Credit Hours. 3 Lecture Contact Hours. 3 Lab Contact Hours.

Course Attribute(s): Life & Phys Sciences Core 030|Component Area Core 090|Life & Phys Sciences CAO 093|Dif Tui- Science & Engineering|Lab Required

Grade Mode: Standard Letter

TCCN: PHYS 2426

PHYS 2435. Waves and Heat.

This course is a study of the fields of wave motion, sound, light, and heat at a beginning level for physics majors and minors. Prerequisites: MATH 2471 and PHYS 1430 both with grades of 'C' or better. Corequisite: MATH 2472 with a grade of 'C' or better.

4 Credit Hours. 3 Lecture Contact Hours. 3 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering|Lab Required

Grade Mode: Standard Letter

TCCN: PHYS 2427

PHYS 3210. Physics Cognition and Pedagogy.

This course is an introduction to physics-specific pedagogy and the methods and results of physics education research (PER). Students will investigate relevant literature in PER and cognitive science, engage in discussions about physics teaching and learning, and reflect on their own teaching practice in the role of Physics Learning Assistants. (WI).

2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering|Writing Intensive

Grade Mode: Standard Letter

PHYS 3301. Musical Acoustics.

A survey of the physics of sound and acoustic measurement. Special emphasis will be placed on sound production, propagation, and perception as applied to music.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

PHYS 3311. Mechanics I.

This course discusses the fundamentals of classical mechanics focusing on the physical description of the behavior of single and multiple particle systems. Topics included are advanced problem solving strategies for systems with position and velocity dependent forces, simple harmonic oscillators, and non-inertial reference frames. Prerequisite: PHYS 2435 with a grade of 'C' or better. Corequisite: PHYS 3320 with a grade of 'C' or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

PHYS 3312. Modern Physics.

This course is an introduction to the foundations of modern physics, including the following topics: relativistic mechanics, foundational experiments in the development of quantum mechanics, light and energy, wave nature of particles, and nuclear physics. Prerequisite: PHYS 2435 with a grade of 'C' or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

PHYS 3313. Astrophysics.

This course surveys a variety of issues in astrophysics through problem solving, quantitative measurements, and theoretical reasoning. Topics include celestial mechanics, stellar dynamics and evolution, galaxy evolution, and cosmology. Corequisite: PHYS 3312 with a grade of 'D' or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

PHYS 3315. Thermodynamics.

This course is a fundamental study of thermodynamics and statistical mechanics. Prerequisite: MATH 3323 and [PHYS 2435 or (PHYS 1125 and PHYS 1325) or (ENGR 2300 and PHYS 2425)] all with grades of 'D' or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

PHYS 3320. Introduction to Mathematical Physics.

This course is an introduction to the mathematical methods of theoretical physics with emphasis on development of mathematical tools used in upper division core physics courses. Students will also develop their ability to communicate mathematical ideas in the context of physics.

Prerequisite: MATH 3373 and PHYS 2425 both with grades of 'C' or better.

Corequisite: MATH 3323 with a grade of 'C' or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

PHYS 3411. Advanced Physics Laboratory.

This course is an introduction to experimental modern physics, with emphasis on the design and assembly of physics apparatus and the development of practical skills for controlling and automating data collection. (WI) Prerequisites: PHYS 2425 with a grade of 'C' or better. Corequisites: PHYS 2435 with a grade of 'C' or better.

4 Credit Hours. 2 Lecture Contact Hours. 6 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering|Lab Required|Writing Intensive

Grade Mode: Standard Letter

PHYS 3416. Applied Electronics.

This Laboratory/lecture course is an introduction to electronic test bench methods for the construction, operation and analysis of important DC/AC circuits utilizing resistors, capacitors, diodes, BJTs, FETs, and OpAmps. The behavior of the circuits will be modeled in SPICE. Elementary semiconductor device physics and microfabrication methods will be discussed. (WI) Prerequisites: PHYS 2425 and PHYS 2435 both with grades of 'C' or better.

4 Credit Hours. 3 Lecture Contact Hours. 4 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering|Writing Intensive

Grade Mode: Standard Letter

PHYS 3417. Optics.

This course is a one-semester survey of geometrical and physical optics accompanied by laboratory experience. Topics covered include electromagnetic waves and their propagation, geometrical optics, polarization, interference, diffraction, Fourier optics, and holography. (WI) Prerequisites: PHYS 2425 and PHYS 2435 both with grades of 'C' or better.

4 Credit Hours. 3 Lecture Contact Hours. 3 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering|Writing Intensive

Grade Mode: Standard Letter

PHYS 3418. Methods in Observational Astrophysics.

This course is an introduction to methods and instrumentation used in observational astrophysics. Topics include image processing, data acquisition and analysis, and detectors for data across the electromagnetic spectrum. Prerequisite: PHYS 2425 and PHYS 2435 both with grades 'C' or better.

4 Credit Hours. 3 Lecture Contact Hours. 3 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering|Writing Intensive

Grade Mode: Standard Letter

PHYS 4121. Undergraduate Research.

This course represents a student's research project in physics to be carried out under the supervision of a faculty member. The student must contact a faculty member in advance to arrange the topic and specific course objectives. This course may be repeated for credit. Prerequisite: Instructor approval.

1 Credit Hour. 0 Lecture Contact Hours. 3 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

PHYS 4150A. Physics Cognition and Pedagogy Lab.

In this lab course, students will apply principles introduced in PHYS 3210, which include observation of student interactions, reflection on the process of learning and the use of evidence based reasoning, metacognition, and facilitation, of discourse around difficult concepts. Prerequisite: PHYS 1430 with grade of 'C' or better or instructor approval. Corequisite: PHYS 3210 with a grade of 'D' or better.

1 Credit Hour. 0 Lecture Contact Hours. 4 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing|Dif Tui- Science & Engineering|Topics

Grade Mode: Standard Letter

PHYS 4150B. Computational Modeling Lab: Mechanics.

This lab provides experience in computational modeling of problems in classical mechanics. Students design and code computer programs to simulate physical dynamics and analyze data. Corequisite: PHYS 3311 with a grade of 'D' or better.

1 Credit Hour. 0 Lecture Contact Hours. 3 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing|Dif Tui- Science & Engineering|Topics

Grade Mode: Standard Letter

PHYS 4221. Undergraduate Research.

This course represents a student's research project in physics to be carried out under the supervision of a faculty member. The student must contact a faculty member in advance to arrange the topic and specific course objectives. This course may be repeated for credit. Prerequisite: Instructor approval.

2 Credit Hours. 0 Lecture Contact Hours. 6 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

PHYS 4305. Statistical Physics.

Statistical physics is the study of energy flow and energy distributions within systems in equilibrium. Students will explore a range of phenomena including black-body radiation, diffusion, phase transitions, and magnetism. Emphasis will be placed on topics of entropy, probability, free energy, Boltzmann distributions, and the atomic behavior of these systems. Prerequisite: MATH 3323 and PHYS 3312 and PHYS 3320 all with grades of 'C' or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

PHYS 4310. Electromagnetic Field Theory I.

An introduction to the electromagnetic field theory of classical physics for static fields. Topics included will be the electrostatic field, polarization and dielectrics, electrostatic energy, magnetic field of steady currents, magneto static energy, and magnetic properties of matter. Prerequisite: MATH 3323 and MATH 3373 and PHYS 3320 all with grades of 'C' or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

PHYS 4311. Condensed Matter Physics.

Application of physics principles to solid materials. Topics include crystal structure and the reciprocal lattice, including x-ray diffraction, crystal binding and elastic properties, lattice vibrations, energy bands, semiconductors and metals. Prerequisite: PHYS 3312 and PHYS 3320 both with grades of 'C' or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

PHYS 4312. Quantum Mechanics I.

This course introduces students to quantum mechanics. Topics include mathematical foundations, fundamental postulates, time development, and one dimensional problems. Prerequisite: PHYS 3312 PHYS 3320 both with grades of 'C' or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

PHYS 4315. Electromagnetic Field Theory II.

An introduction to the electromagnetic field theory of classical physics for time varying fields. Topics included will be electromagnetic induction, time varying electric and magnetic fields, Maxwell's equations, electromagnetic energy, electromagnetic waves and radiation, and a brief introduction to some specialized topics. Prerequisite: PHYS 4310 with a grade of 'C' or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

PHYS 4320. Selected Study in Physics.

Topics are chosen in theoretical and experimental areas of current interest in physics with specific topic to be discussed agreed upon prior to registration. May be repeated once with different emphasis and professor for additional credit. Prerequisite: Instructor approval.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

PHYS 4321. Undergraduate Research.

A research project in physics to be carried out under the supervision of a faculty member by upper division physics majors. Student must contact a faculty member in advance to arrange topic and specific course objective. Course may be repeated only as an elective towards the BS or BA in physics. Prerequisite: Instructor approval.

3 Credit Hours. 0 Lecture Contact Hours. 9 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

PHYS 4350B. Relativity.

This course includes a review of Special Relativity, an introduction to the mathematics of tensor calculus and differential geometry, and such topics from General Relativity as the Schwarzschild solution and black holes, tests of General Relativity, cosmological models, and applications of relativity in the Global Positioning System (GPS). Prerequisite: PHYS 2425 and PHYS 2435 both with grades of 'C' or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing|Dif Tui- Science & Engineering|Topics

Grade Mode: Standard Letter

PHYS 4350D. Biophysics.

This course applies the principles of physics to the study of living organisms. An emphasis will be placed on the topics of structure, fluids, diffusion, entropy, stochastic processes, and probabilities, and on scientific modes of thinking including modeling, estimation, and data analysis. Prerequisite: PHYS 2425 and PHYS 2435 both with grades of 'C' or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing|Dif Tui- Science & Engineering|Topics

Grade Mode: Standard Letter

PHYS 4360. Physics Cognition and Pedagogy II.

This course addresses historical, philosophical, and cognitive perspectives on the learning, teaching, and discovery of physics, including results from contemporary research on learning. It is recommended for students pursuing teacher certification. Prerequisite: PHYS 3210 with a grade of 'C' or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering|Writing Intensive

Grade Mode: Standard Letter