PHYSICS (PHYS)

PHYS 404G Laboratory Optics 1 Hour
The conclusions and concepts of optics and techniques of experimental optics.
Corequisite(s): PHYS 441G
Recent Term(s) Offered: None

PHYS 431G Radiation Biophysics 4 Hours
The properties of the various forms of radiation and their interactions with, and effects on, living matter. Laboratory offers training in monitoring ionizing radiations and techniques of radioactive isotopes.
Prerequisite(s): PHYS 201 and PHYS 202 or (PHYS 231 and PHYS 232)
Recent Term(s) Offered: None

PHYS 440G Electromagnetism I 3 Hours
Introduction to the study of classical electromagnetic fields, including electrostatics.
Recent Term(s) Offered: None

PHYS 441G Optics 3 Hours
Geometrical and physical optics including wave propagation, refraction, dispersion, diffraction, and polarization. Note: One year of college physics and one year of calculus required.
Corequisite(s): PHYS 404G
Recent Term(s) Offered: None

PHYS 445G Electromagnetism II 3 Hours
Study of classical electrodynamics with emphasis on Maxwell's equations, electromagnetic waves, dispersion and radiation.
Recent Term(s) Offered: None

PHYS 450G Classical Mechanics II 3 Hours
A continuation of PHYS 350. Includes motion in central potentials, dynamics of systems of particles, rigid body motion.
Recent Term(s) Offered: None

PHYS 465G Geophysics 3 Hours
The fundamentals of general and exploration geophysics. Topics include the origin of the earth and solar system, the earth's interior, geochronology, gravity and isostasy, seismology, the earth's heat, geomagnetism, upper atmosphere, continents and ocean basins, ridges and island arcs, and plate tectonics. The theory and applications of exploration geophysics are also covered, especially gravity, magnetic, and seismic methods.
Equivalent(s): GEOS 565
Recent Term(s) Offered: None

PHYS 475G Topics/Physics 1-3 Hours (repeatable max of 6 hrs)
Directed study under the supervision of a faculty member.
Recent Term(s) Offered: None

PHYS 480G Quantum Mechanics 3 Hours
Fundamental principles of quantum mechanics including the hydrogen and helium atoms, the harmonic oscillator, and the Schroedinger wave equation.
Prerequisite(s): PHYS 320 and PHYS 350 and PHYS 450
Recent Term(s) Offered: None

PHYS 505 Investigations/Physics 3 Hours
Topics of individual interest relating to the teaching of physics.
Recent Term(s) Offered: None

PHYS 510 Methods in Math Physics 3 Hours
No course description is available
Recent Term(s) Offered: None

PHYS 511 Quantitative Modeling for Physics Instruction I: Mechanics 3 Hours
An in-depth study of topics in physics typically taught at the high school level. Emphasizes both the content of physics as well as the process of effectively communicating the content to secondary students. Topics include kinematics, Newton's laws of motion, energy, momentum and other topics in mechanics. Note: One year of math-based physics at the college level required.
Recent Term(s) Offered: None

PHYS 512 Quantitative Modeling for Physics Instruction II: Electromagnetism 3 Hours
An in-depth study of topics in physics typically taught at the high school level. Emphasizes both the content of physics as well as the process of effectively communicating the content to secondary students. Topics include electric and magnetic fields, and circuits. Note: One year of math-based physics at the college level required.
Recent Term(s) Offered: None

PHYS 518 Classroom Applications of Physics and Science Education Research 3 Hours (repeatable max of 6 hrs)
Help instructors to make practical connections between discipline-based science education research in physics and other areas with their own classroom teach. Students will read original research, document examples in classroom, and evaluate and modify curricular materials. Note: Must be instructor in a physical science course as verified by a letter from the school principal or equivalent.
Prerequisite(s): PHYS 511 or PHYS 512
Recent Term(s) Offered: None

PHYS 519 Physical Science Education Research Methods 3 Hours
Equips physics and physical science instructors to design and carry out practical educational research projects with the goal of improving instruction. Covers research methodologies in physics and other discipline-based science education research (DBSER), designing and carrying out research projects with the goal of informing classroom instruction.
Prerequisite(s): PHYS 518
Recent Term(s) Offered: None

PHYS 530 Statistical Physics 3 Hours
No course description is available
Recent Term(s) Offered: None

PHYS 540 Electromagnetic Theory 3 Hours
No course description is available
Recent Term(s) Offered: spring 2024

PHYS 550 Classical Mechanics 3 Hours
No course description is available
Recent Term(s) Offered: None

PHYS 560 Introduction to Physics Applications in Homeland Security 3 Hours
A preparatory course in Homeland Security Science for students with limited physics background. An overview of physics applicable to Homeland Security Sciences. Topics include atomic and nuclear physics, optics and analytical techniques.
Recent Term(s) Offered: fall 2022; fall 2023; fall 2024

PHYS 565 Optical Detection Methods of Biological and Chemical Agents 3 Hours
Explore the application of optical detection technologies to detect and characterize chemical and biological agents. Optical methods such as laser induced breakdown spectroscopy (LIBS), light detection and ranging (LIDAR), coherent anti-stokes Raman spectroscopy, photoacoustic, and photothermal imaging. Apply theoretical principles to real-world examples.
Prerequisite(s): PHYS 560 or permission of instructor
Recent Term(s) Offered: fall 2023

PHYS 570 Nuclear / Radiological Detection and Remediation 3 Hours
An advanced study of the fundamental principles of nuclear physics and their applications for detection and remediation of nuclear and radiological threats.
Prerequisite(s): PHYS 560
Corequisite(s): PHYS 571
Recent Term(s) Offered: None

PHYS 571 Nuclear / Radiological Detection and Remediation Laboratory 1 Hour
Students perform laboratory experiments in applications of nuclear physics for detection and remediation of nuclear and radiological threats. Students will gain experience in computerized data acquisition and data analysis using modern techniques and equipment.
Prerequisite(s): PHYS 560
Corequisite(s): PHYS 570
Recent Term(s) Offered: None

PHYS 580 Quantum Theory 3 Hours
No course description is available
Recent Term(s) Offered: None

PHYS 590 Physical Principles of CBE Detection and Remediation 3 Hours
The course explores physical principles behind chemical agent, biological agent and explosives detection and remediation, and examines current detection techniques and systems deployed.
Prerequisite(s): PHYS 570 or equivalent
Corequisite(s): PHYS 591
Recent Term(s) Offered: spring 2022; spring 2024

PHYS 591 Physics CBE Detection and Remediation Laboratory 1 Hour
Explores physical principles behind chemical agent, biological agent and explosives detection and remediation. Examines current detection techniques and systems deployed.
Prerequisite(s): PHYS 570 or equivalent
Corequisite(s): PHYS 590
Recent Term(s) Offered: spring 2022; spring 2024

PHYS 598 Graduate Seminar 0.5 Hours (repeatable max of 2 hrs)
No course description is available
Recent Term(s) Offered: spring 2022; spring 2024; fall 2024

PHYS 599 Thesis Research / Writing 1-6 Hours (repeatable max of 6 hrs)
Thesis research/writing.
Prerequisite(s): PHYS 570 or CHEM 572 or BIOL 552
Recent Term(s) Offered: spring 2022; spring 2023; spring 2024; fall 2024

PHYS 600 Maintain Matriculation 1-6 Hours (repeatable max of 6 hrs)
Continued enrollment for thesis completion.
Recent Term(s) Offered: summer 2022; fall 2022; spring 2023; fall 2023

PHYS 675 Advanced Topics in Physics 1-3 Hours
No course description is available
Recent Term(s) Offered: fall 2023