

PHYSICS (PHY)

PHY 505 Optics Lab 2 Credit hours

A course in optical experiments encompassing geometrical and physical optics. This course is to be taken with Physics 304.

Pre-req: PHY 304 (may be taken concurrently).

Concurrent PR: PHY 304

Grade Mode: Normal Grading Mode

PHY 515 Electronics Lab 2 Credit hours

A course in laboratory measurements encompassing transistors, integrated circuits, and their associated circuits. This course is to be taken with Physics 314.

Grade Mode: Normal Grading Mode

PHY 520 Astrophysics 3 Credit hours

A detailed study of core problems in Astrophysics such as orbital dynamics, radiation processes, stellar structure and evolution, galactic dynamics, and cosmology.

Grade Mode: Normal Grading Mode

PHY 521 Modern Physics Lab 2 Credit hours

Laboratory exercises on modern physics topics encompassing both experiments of historic significance and current applications. To be taken with Physics 320, or equivalent.

Grade Mode: Normal Grading Mode

PHY 525 Solid State Physics 3 Credit hours

The purpose of this course is to provide a broad introduction to the structures and physical properties of solids, which are of extraordinary importance in the modern world.

Grade Mode: Normal Grading Mode

PHY 535 Computational Physics 3 Credit hours

A course in using numerical methods and computer programming languages for solving complex physics problems and for the simulation of various physical processes. 2 lec-2 lab.

Grade Mode: Normal Grading Mode

PHY 542 Quantum Mechanics 3 Credit hours

Mathematical formalism of quantum mechanics, particles in potential fields, perturbation theory and other approximation methods, scattering, applications to simple systems. 3 lec.

Grade Mode: Normal Grading Mode

PHY 543 Quantum Mechanics II 3 Credit hours

This is the second part of a two-semester introduction to quantum mechanics. Emphasis is on applications of quantum theory including approximation techniques and the study of more realistic quantum systems.

Grade Mode: Normal Grading Mode

PHY 544 Advanced Lab 2 Credit hours

Developments in producing and detecting correlated photon pairs has enabled implementation of undergraduate laboratories demonstrating fundamental quantum mechanical principles. This laboratory also incorporates fundamental solid state and materials science experiments.

Pre-req: PHY 525 (may be taken concurrently) with a minimum grade of D and PHY 542 (may be taken concurrently) with a minimum grade of D.

Concurrent PR: PHY 525 and PHY 542

Grade Mode: Normal Grading Mode

PHY 545 Math Methods of Physics 3 Credit hours

An introduction to the theory of orthogonal functions, curvilinear coordinate systems, vector and tensor fields and their applications in Physics. Problems are drawn from different areas of physics. 3 lec.

Grade Mode: Normal Grading Mode

PHY 546 MTH Methods of Physics II 3 Credit hours

A second semester of a full year course on methods of solving problems in physics: calculus of variations, ordinary partial differential equations and special functions with real physics problems.

Pre-req: PHY 545.

Grade Mode: Normal Grading Mode

PHY 547 Mechanics for Teachers 4 Credit hours

An indepth study of mechanics for education majors specializing in Physics with emphasis on problem solving techniques, demonstrations, experiments and computer applications. (PR: PHY 203, MTH 122 and MTH 140)

Grade Mode: Normal Grading Mode

PHY 580 Special Topics 2-4 Credit hours

Grade Mode: Normal Grading Mode

PHY 581 Special Topics 1-4 Credit hours

Grade Mode: Normal Grading Mode

PHY 582 Special Topics 1-4 Credit hours

Grade Mode: Normal Grading Mode

PHY 583 Special Topics 1-4 Credit hours

Grade Mode: Normal Grading Mode

PHY 585 Independent Study 1-4 Credit hours

Grade Mode: Normal Grading Mode

PHY 586 Independent Study 1-4 Credit hours

Attributes: No Textbook Required

Grade Mode: Normal Grading Mode

PHY 587 Independent Study 1-4 Credit hours

Grade Mode: Normal Grading Mode

PHY 588 Independent Study 1-4 Credit hours

Grade Mode: Normal Grading Mode

PHY 600 Electricity and Magnetism I 4 Credit hours

A study of electrostatics and associated boundary-value problems, electric multipoles and macroscopic media, dielectrics, magnetostatics, time-varying fields, Maxwell equations and conservation laws, plane electromagnetic waves and wave propagation.

Grade Mode: Normal Grading Mode

PHY 608 Statistical Mechanics 4 Credit hours

The course introduces thermodynamics and statistical mechanics to graduate students of physics and other science and engineering disciplines as two complimentary approaches to study physical properties of systems in equilibrium.

Grade Mode: Normal Grading Mode

PHY 610 Special and Gen Relativity 3 Credit hours

General relativity, the classical theory of one of the four fundamental forces, is not a standard course offer. This course of Special and General Relativity intends to fill this gap by introducing the key concepts that lead to a revolution in our understanding of space and time. The students will learn about spacetime curvature, metrics, geodesics, black holes, gravitational waves, and cosmology.

Grade Mode: Normal Grading Mode

PHY 620 Modern Astrophysics I 3 Credit hours

Modern Astrophysics is firmly grounded in the fundamental principles of physics, and will offer students the opportunity to use the physics they have learned in understanding the nature of the universe. This course provides a graduate-level introduction to astrophysics, focusing on stellar structure and evolution.

Grade Mode: Normal Grading Mode

PHY 625 Condensed Matter Physics 3 Credit hours

This course studies complex phenomena that occur in solids and quantum liquids, and exposes the students to some theoretical tools used to describe the basic interactions behind these phenomena.

Grade Mode: Normal Grading Mode

PHY 630 Classical Mechanics 4 Credit hours

Study of variational principles and Lagrange's equations, the two-body central force problem, the kinematics and dynamics of rigid-body motion, Hamilton equations of motion, canonical transformations, Hamilton-Jacobi theory, and small oscillations.

Grade Mode: Normal Grading Mode

PHY 631 Seminar 1 Credit hour

Grade Mode: Normal Grading Mode

PHY 632 Seminar 1 Credit hour

Grade Mode: Normal Grading Mode

PHY 640 Fundamentals of Physics 4 Credit hours

A course in fundamental concepts of physics. Subject content varies. Designed primarily to strengthen conceptual understanding of teachers.

Grade Mode: Normal Grading Mode

PHY 642 Adv Quantum Mechanics 4 Credit hours

This course covers advanced topics of quantum mechanics at the graduate level. Topics include fundamental issues, approximation methods and applications.

Pre-req: PHY 630 (may be taken concurrently) with a minimum grade of D.

Concurrent PR: PHY 630

Grade Mode: Normal Grading Mode

PHY 645 Methods of Math. Physics 4 Credit hours

This course will review and develop theories of real and complex analysis, group theory, tensors, special functions, differential and integral transforms, emphasizing their application to electrodynamics, quantum statistical mechanics, etc.

Grade Mode: Normal Grading Mode

PHY 661 Special Topics 1-3 Credit hours

Grade Mode: Normal Grading Mode

PHY 662 Special Topics 1-3 Credit hours

Grade Mode: Normal Grading Mode

PHY 682 Thesis Research 1-6 Credit hours

Grade Mode: Normal Grading Mode

PHY 685 Independent Study 1-4 Credit hours

Advanced Independent Study in Physics.

Attributes: No Textbook Required

Grade Mode: Normal Grading Mode

PHY 686 Independent Study 1-4 Credit hours

Advanced Independent Study in Physics.

Grade Mode: Normal Grading Mode