PHYSICS (PHYS)

PHYS1000 COLLEGE PHYSICS I
General introduction to mechanics. Topics include kinematics, vectors, Newton's Laws, equilibrium, work and energy, momentum, and circular motion. **Prerequisite:** MATH1000 (4 credits) fall, spring, summer

PHYS1005 PHYSICS A
General introduction to mechanics, including Newton's Laws, equilibrium, work, energy and momentum. The laboratory work will support the concepts studied in class. **Prerequisite:** MATH1005 (3 credits) fall, spring, summer

PHYS1010 CONCEPTUAL PHYSICS
A survey of physics and its applications to modern life. Mechanics, sound, heat, electricity, light, and structure of matter are examined. Understanding of concepts, rather than detailed calculations, is emphasized through lecture and laboratory. (4 credits) fall, spring

PHYS1035 PHYSICS B
General introduction to mechanical and thermal properties of matter, sound, light, and electricity. The laboratory work will support the concepts studied in class. **Prerequisites:** PHYS1005 (3 credits) fall, spring

PHYS1100 THE COSMIC SYSTEM
This course provides a tour of the universe from our own Sun and solar system to the very edge of space and time itself. Topics include the 8 planets, our Sun and the structure of stars, nuclear fusion as a stellar energy source, stellar evolution, the Milky Way galaxies and galaxy formation, large scale structure, and the fate of the universe. We finish with a discussion of exoplanets and the possibility of other life in the universe. No prior knowledge of astronomy is necessary. (3 credits)

PHYS1250 ENGINEERING PHYSICS I
A calculus-based course emphasizing the principles and applications of mechanics. Topics include: Newton's Laws, equilibrium, work, energy, power; momentum, circular motion. **Corequisite:** MATH1750 or MATH1775 (4 credits) fall, spring, summer

PHYS1500 COLLEGE PHYSICS II
Physical properties of solids and fluids, heat, sound, light, electric, and magnetic forces. **Prerequisites:** MATH1500 and PHYS1000 (4 credits)

PHYS1750 ENGINEERING PHYSICS II
Topics include: physical properties of solids and fluids, atomic structure, heat, sound, wave motion, electricity and magnetism. **Prerequisites:** PHYS1250; and MATH1750 or MATH1775; **Corequisite:** MATH1850 (4 credits) fall, spring, summer

PHYS2000 INTRODUCTION TO ASTRONOMY
This course gives the student a tour of the universe, from our own Sun and Solar System to the very edge of space and time itself. Topics will include: the 8 planets; our Sun and the structure of stars, nuclear fusion as a stellar energy source; stellar evolution; the Milky Way galaxies and galaxy information; large scale structure; and the fate of the universe. No prior knowledge of astronomy is necessary (4 credits)

PHYS2990 INDEPENDENT STUDY IN PHYSICS
This course investigates a topic of special interest to faculty and students that is outside existing course offerings. **Prerequisite:** Consent of department head and instructor (1 - 4 credits)

PHYS3000 COMPUTATIONAL PHYSICS
Numerical and computational methods and techniques applied to a variety of physics topics. Use of computers to numerically solve problems and graphically illustrate solutions involving differential equations. Integration, matrices and root finding. **Prerequisites:** PHYS1750 and MATH1850 (4 credits) fall

PHYS3100 MODERN PHYSICS
This course takes a student on a journey of the physics after 1905. Emphasis is placed on the shortcoming of classical physics at the turn of the century leading to the discoveries of the modern era. The special theory of relativity and foundations of quantum mechanics serve as the cornerstone of the course. Extensions of these topics will include the modern view of the atom, nuclear physics, wave-particle duality of light and mass, space time structure and GPS implementation of relativity. The emphasis of the class is to gain a strong mathematical and conceptual understanding of post-Newtonian physics and its applications as well as the development of specific problem solving skills, including the use of calculus, differential equations, and linear algebra. **Prerequisites:** MATH1850 or MATH1875; and PHYS1750 (4 credits)

PHYS3500 THERMAL PHYSICS
This course introduces the fundamental principles of thermodynamics, examining the relationship between temperature, heat, work, and energy. Topics include the laws of thermodynamics, heat engines and ideal gasses. **Prerequisites:** MATH1850 or MATH1875; and PHYS1750 (4 credits) summer

PHYS3600 CLASSICAL MECHANICS
This course emphasizes the systematic approach to the mathematical formulation of the principles of Newtonian mechanics. The fundamental concepts and principles will be applied to particles, system of particles and rigid bodies. Topics will include oscillatory motion, noninertial reference frames, Lagrangian and Hamiltonian dynamics, gravitation, central force motion, and dynamics of system of particles. **Prerequisites:** MATH2500 and PHYS1750 (4 credits) fall

PHYS3800 SPECIAL TOPICS IN PHYSICS
These courses present topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the semester schedule for the courses offered that semester. Contact the faculty assigned for more information about the course topic. (1 - 4 credits)

PHYS4500 INTRODUCTION TO QUANTUM MECHANICS
This course serves as an introduction to quantum mechanics. Students will be introduced to the mathematics necessary to understand and solve problems in quantum mechanics. The time independent Schrodinger equation will be discussed and solved to determine the quantum wavefunction for a number of different one-dimensional potentials. Quantum observables will be introduced and calculated by applying linear operators to particles wavefunctions. Realistic quantum systems such as the hydrogen atom will be explored to demonstrate how quantum mechanics shapes the nature of atomic matter. Particle spin will be used as an example of a two-state quantum system leading to an investigation of quantum entanglement. **Prerequisites:** MATH2500 and PHYS3100 (4 credits) summer

PHYS4700 ELECTRODYNAMICS
This course is designed to build on topics first investigated in PHYS 1750 in a more advanced and rigorous manner. Students will be introduced to vector calculus and its application to Maxwell's equations. Topics will include but are not limited to Electrostatics, Laplace's equation, Dielectrics, Magnetostatics, and Electrodynamics. **Prerequisites:** PHYS3100 (4 credits)