PHYSICS (PHYS)

IIPHYS-305 The Physics of Music (4 Credits)
An interdisciplinary exploration of how analyses of the physics of sound aid our understanding of music. Students will learn how sound is created, sustained, amplified; how limits in human physiology shape approaches to music; how physical properties of instruments relate to tone quality and give insight into different genres of music.
Prerequisite(s): 24 credits in ISP including ITW-101 and QL
Offered: Fall, Every Year

IIPHYS-342 Data Analysis for Scientists (4 Credits)
Multi-disciplinary introduction to data analysis across the Sciences emphasized through problems in current research conducted at Keene State College, including Biology, Chemistry, Environmental Studies, Engineering, Astronomy, etc. Data visualization and communication is a primary focus. Topics include: basic programming techniques, file input/output, visualization, data mining, times series, image and movie analysis.
Prerequisite(s): 24 credits of ISP, including ITW-101 and QL
Offered: Fall, Every Year

INPHYS-131 Engineering Fundamentals (4 Credits)
Introduces students to a variety of engineering disciplines and covers aspects of engineering including the design process, data presentations, systems of units and conversions, Newtons laws of motion, thermodynamics, statics, strength of materials, electricity, and case studies based on contemporary engineering problems.
Offered: Fall, Every Year

INPHYS-141 College Physics I (4 Credits)
Algebra based introduction to Newtonian mechanics. Emphasis on conceptual understanding and problem solving: motion, forces, Newtons laws applied to both linear and rotational situations, momentum, energy and conservation laws. Knowledge of algebra and trigonometry expected. Math competency assessment administered. Includes 2 hour laboratory.
Offered: All, Every Year

INPHYS-201 Phenomenal Science (4 Credits)
A hands-on, minds-on inquiry based exploration of the basic physical principles that underlie our observations and experiences in the everyday world. Topics include motion, forces, energy, fluids, sound, heat, light, electricity, magnetism and the atom. Ideal for preservice teachers.
Prerequisite(s): IQL course or permission of the instructor
Offered: All, Every Year

INPHYS-241 University Physics I (4 Credits)
The first semester of a three semester calculus based sequence for science and technology majors. Emphasized are kinematics, forces, both static and dynamic, energy and momentum, gravitation thermal physics and thermodynamics. Includes a 2 hour laboratory.
Offered: Spring, Every Year

PHYS-142 College Physics II (4 Credits)
Continuation of PHYS 141 with extension of basic concepts to include fluids, vibrations and waves, thermal physics, thermodynamics, electrostatics electrical circuits and magnetism, and geometrical and physical optics. Includes 2 hour laboratory.
Prerequisite(s): PHYS-141
Offered: Spring, Every Year

PHYS-242 University Physics II (4 Credits)
A continuation of INPHYS-241 that treats rotational dynamics and angular momentum, oscillations, fluids and waves in general and sound, electrostatics, capacitors, d-c circuits, and magnetic fields and forces. Includes a two-hour laboratory.
Prerequisite(s): Grade C or higher in INPHYS-241
Corequisite(s): MATH-152 or permission of instructor
Offered: Fall, Every Year

PHYS-275 University Physics III (4 Credits)
This course concludes our introductory calculus-based sequence. Topics covered are nature of light, geometric optics and applications, interference and diffraction, quantum theory of light, particles and matter waves, special relativity, nuclear physics, introduction to quantum mechanics. Includes a two-hour laboratory.
Prerequisite(s): Grade of C or higher in PHYS-242 or permission of instructor
Offered: Spring, Every Year

PHYS-298 Independent Study (1-4 Credits)
An opportunity for a qualified student to explore work in an area of individual interest, selected and pursued in consultation with a faculty member. Consent is required from the instructor who will supervise the independent study. Repeatable to a total of 4 credits.

PHYS-339 Classical Mechanics (4 Credits)
Analytical treatment of Newtons laws in kinematics and dynamics, oscillations, noninertial reference systems, gravitation and central forces, mechanics and motion of rigid bodies. Lagrangian mechanics.
Prerequisite(s): Grade of C or higher in PHYS-275 or permission of the instructor
Offered: Fall, Odd Years

PHYS-410 Quantum Mechanics (4 Credits)
An introduction to the formulations of quantum physics including its historical development, its mathematical and logical foundation shown through two-state systems, the Schrodinger equation for one dimensional systems, scattering and tunneling phenomenon, wave-particle duality, the Compton effect, matter waves, the harmonic oscillator, angular momentum and the hydrogen atom.
Prerequisite(s): Grade of C or higher in MATH-231 & PHYS-275 or permission of instructor
Offered: Spring, Even Years

PHYS-490 Advanced Special Topics (1-4 Credits)
Study of selected topics not covered adequately in other Physics courses. Includes the study of experimental techniques and results, as well as various theoretical models.
Prerequisite(s): Grade of C or higher in PHYS-242 and permission of instructor
Offered: All, Every Year

PHYS-498 Independent Study (1-4 Credits)
Individualized, directed study in an area of Physics or to a depth not normally available in the curriculum. The student initiates a research project or takes part in ongoing research under supervision of a faculty investigator. May be repeated to a total of 4 credits.
Prerequisite(s): Permission of instructor
Offered: All, Every Year