PHYSICS (PHYS)

PHYS 800 – Advanced Physical Science  3 credit hours
An inquiry-oriented course involving the study of selected areas of physics, such as motion, electricity, light, and heat. This course will allow the student to learn science content by working with concrete materials as well as acquaint the student with teaching strategies and materials. Students will be required to complete a project for the course.

PHYS 801 – Earth Science for High School Teachers  3 credit hours
The basic laws of physics, chemistry and geology are investigated and applied to earth science, meteorology and astronomy. Student interaction is used to sharpen the ability to observe, reason and communicate.

PHYS 802 – Applied Physical Science  3 credit hours
An inquiry oriented course designed to enhance process skills and critical thinking ability. Emphasis will be placed on understanding the physical principles in the areas of mechanics, optics, electronics, electromagnetism, and microchemistry. Computer activities will be utilized in many of these areas.

PHYS 805 – Introduction to Engineering  3 credit hours
Introduce students to the engineering profession, how to prepare for an exciting career, the design process, engineering communication, and ethics. Also, students will be introduced to the basic principles, engineering fundamentals, and physical laws that will be encountered repeatedly during the study of engineering disciplines. Moreover, to introduce students to engineering drawings, schematics that are important in conveying useful information to other engineers and machinists, and visualization of proposed products. Finally, introduce students to important mathematical, statistical, and economical concepts.

PHYS 809 – Meteorology  3 credit hours
An investigation and application of the basic principles of physics and chemistry to the understanding of weather including a study of the atmosphere's origin, composition, circulation patterns, energy budget and its role in the hydro-logic cycle. Topics include: instruments for observation, precipitation process, wave cyclones, jet streams, weather forecasting, weather modification and applications of meteorology to air pollution, agriculture, and aviation.

PHYS 810 – Mathematical Techniques in the Physical Sciences  4 credit hours
A formal development of selected topics from infinite series, power series, complex numbers and coordinate transformations, linear algebra, determinants and matrices, multiple integrals, vector analysis, Fourier series and transforms, probability, and statistics. Students should have completed at least two semesters of college calculus before enrolling in this course.

PHYS 811 – Astronomy for High School Teachers  3 credit hours
The basic principles of astronomy are studied and applied through research and observation to topics ranging from sunspots and meteorites, to quasars, pulsars and black holes.

PHYS 813 – Intro to A&D Electronics  4 credit hours
An introduction to the analysis and design of analog and digital electronic circuits. Basic analysis and design are covered. Laboratory activities are designed to support the lectures. Applications to computers, television, radio, and automobiles are discussed. Students should have completed one semester of college level general physics with Ohm's law and simple circuits AND two semesters of general calculus before enrolling in this course.

Additional Course Fee Required

PHYS 817P – Quantum Mechanics  3 credit hours
A formal development of the principles of quantum mechanics. The mathematics of Hamiltonian Mechanics are presented as a bridge from Classical Physics to Quantum Physics. Topics are selected to extend the treatment given in Modern Physics II.
Prerequisite: PHYS 411 or permission of instructor

PHYS 822 – Topics in Physical Science  1-4 credit hours
The following special subjects which are not covered in traditional 800 level courses will be discussed here at the graduate level.
Total Credits Allowed: 4.00

PHYS 823P – Electronics  4 credit hours
Operational amplifiers, their use in instrumentation and analog computer, logic circuits, digital electronics, applications to computer and control systems.
Prerequisite: PHYS 323 or equivalent

PHYS 825 – Classical Mechanics  3 credit hours
The Newtonian, Langranian, and Hamiltonian formulation of the laws of motion, including the dynamics of rigid bodies.
Department Consent Required

PHYS 830P – Optics  4 credit hours
Geometric and wave optics including optical instruments.
Prerequisite: PHYS 276 and PHYS 276L and MATH 202

PHYS 840P – Heat and Thermodynamics  4 credit hours
The study of temperature, heat, and work, the laws of thermodynamics, heat engines, Maxwell’s relations and an introduction to statistical thermodynamics.
Department Consent Required

PHYS 846P – Modern Physics for High School Teachers I  4 credit hours
An advanced study of selected topics in electricity and modern physics including introductory concepts in atomic and nuclear physics. Research or design of educational projects will be used to aid in explaining these areas.
Prerequisite: PHYS 206 and PHYS 206L or PHYS 276 and PHYS 276L or permission of instructor

PHYS 847 – Modern Physics for High School Teachers II  4 credit hours
A continuation of PHYS 846P. Introductory concepts in quantum mechanics and quantum statistics will be treated. Other areas of emphasis will include atomic structure, solid state, and nuclear physics. Research or design of educational projects will be used to aid in explaining these areas.
Prerequisite: PHYS 346 or PHYS 446 or PHYS 846P or permission of instructor

PHYS 856P – Regional Field Study  1-4 credit hours
Includes visits to specialized research or scientific centers, or expeditions to observe or study special events such as solar eclipses.
Total Credits Allowed: 4.00

PHYS 871P – Methods in Secondary Science Teaching  3 credit hours
Included in this course will be a study of curriculum, teaching techniques, and materials.
Prerequisite: 10 hours of work in CHEM or PHYS

PHYS 872P – Science Curricula  1-3 credit hours
Involves the history of science curricula, introduction to the specifics of selected science curricula, and experience working with science curricula materials in elementary, junior high, or senior high school.
Total Credits Allowed: 3.00
PHYS 895P – Research in Physics  1-3 credit hours
Approximately five hours per week for each semester hour of credit. A student may accumulate a total of nine hours.
Department Consent Required
Total Credits Allowed: 3.00
Prerequisite: One senior level PHYS course and permission of the instructor

PHYS 896 – Thesis  1-6 credit hours
Total Credits Allowed: 6.00

PHYS 899P – Problems in Physical Science  1-3 credit hours
Independent investigation of physical science problems. Three hours of laboratory work each week for each hour of credit.
Department Consent Required
Total Credits Allowed: 3.00