**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 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 810P – Mathematical Techniques in the Physical Sciences  4 credit hours**
A formal development of selected topics from infinite series, determinants and matrices, partial differentiation, vector analysis, Fourier series, functions of a complex variable, and coordinate transformations, calculus or residues, and calculus of variations. Prerequisite: MATH 202 or permission of instructor

**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 meteors, 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. Prerequisite: PHYS 206 and PHYS 206L or PHYS 276 and PHYS 276L or permission of instructor

**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, Lagrangian, 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

**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