PHYSICAL SCIENCE

College of Natural Science

203. Foundations of Physical Sciences
Fall, Winter, Spring, Summer. 4(3-3)
Primarily for elementary school teachers.
Integrated descriptive course in the elements of physical science including the interrelations among chemistry, geology, meteorology, astronomy, and physics.

401. Mathematics for Teachers
Fall. 4(4-0) Teaching experience and approval of department.
Provides mathematical background for science teachers. It will emphasize the basic concepts of mathematics, including number systems. Topics will be selected from algebra, analytic geometry and trigonometry to illustrate the principles of number, operation, relation, proof and other basic mathematical ideas.

402. Mathematics for Teachers
Fall, Winter. 4(4-0) 401 or approval of department.
Continuation of 401.

403. Mathematics for Teachers
Winter, Spring. 4(4-0) 402 or approval of department.
Continuation of 402.

404. Physical Science for Teachers
Fall, Winter, Spring. 4(3-3) Bachelor's degree.
An integrated course in the physical sciences on the nature of the matter and energy gained by interrelating the facts, principles and laws about light, electricity, magnetism, and sound as well as the structure and properties of substances, rates of reaction, equilibria. The concepts of measurement will be stressed. The course is for general science teachers and is not applicable for chemistry or physics majors.

405. Physical Science for Teachers
Fall, Winter, Spring. 4(3-3) 404.
Continuation of 404.

406. Physical Science for Teachers
Fall, Winter, Spring. 4(3-3) 406.
Continuation of 406.

407. Earth Science for Teachers
Fall. 3(3-0) or 4(3-2)
Fundamentals of climatology and its relationship to weathering in rocks; agents of erosion, transportation, and deposition; study of the common minerals; the three classes of rocks, and igneous, sedimentary and metamorphic processes; geologic features including glaciers, volcanoes, oceans, lakes, deserts, caves and others. Laboratory includes identification of minerals, rocks, study of topographic maps, and field trips to points of geologic interest.

408. Earth Science for Teachers
Winter. 3(3-0) or 4(3-2) 407.
Continuation of physical geology and introduction to historical geology, containing discussions of earth structures, mountain building, economic geology, geologic time, basic astronomy, theories of earth origin; the earliest geologic eras, first evidences of life.

409. Earth Science for Teachers
Spring. 3(3-0) or 4(3-2)
Historical development of the various geologic periods through time with reference to the evolutionary development of the physical landscape, ancient geography, past climate, diastrophic events, and marine and land animals and plants. Laboratory includes the identification of important animal and plant fossils, fossil environments, and geologic maps, field trips to collecting localities.

410. Seminar on Recent Advances in Physical Science
Fall, Winter, Spring, Summer. 3(3-0)
May re-enroll for a maximum of 6 credits if different topic is taken. Approval of department.
A series of lectures by senior faculty on topics on the history, development, the most recent advances and the possible future and limits of the Physical Sciences.

411. Seminar on Man, His Universe
Fall, Winter, Spring, Summer. 3(3-0) Approval of department.
A creative review by senior faculty from Astronomy, Biochemistry, Biophysics, Geology, Physics and Philosophy on the impact of recent space probes in developing modern concepts of the universe.

412. Seminar on Man, His Earth
Fall, Winter, Spring, Summer. 3(3-0) Approval of department.
A summary by senior faculty from Astronomy, Anthropology, Botany, Geology, Meteorology, and Ecology of new ideas, methods, and theories employed by current researchers to unravel the mysteries of the origin of the earth, its interior, the forces developing the scenic surface features, and the evolution of life within its historical setting.

PHYSICS

College of Natural Science

Introductory courses are divided into three groups:

(1) 237, 238, 239 (theory) and 257, 258, 259 (laboratory) open to students who are taking at the same time, or who have taken, first year mathematics through college algebra and trigonometry.

(2) 247, 258, 259 (theory) and 297, 298, 299 (laboratory) for students of engineering, physical sciences, mathematics, and others. Those electing this sequence should have completed courses in mathematics through two terms of analytic geometry and calculus.

(3) 291, 292, 293, 294, 302, 390, 394, 395 for physics majors and others who have a special interest in physics. Students electing this sequence should have completed or should be taking the second term of analytic geometry and calculus.

A student may change from one group of introductory courses to another but may not receive credit for the equivalent of more than one complete three-term introductory sequence.

Credit may not be earned for more than one of the courses PHY 291, 297, 394 or 491.

PHY 357 and 360 cannot be used to meet the requirements for a major in physics.

All 400 level physics courses require PHY 291 or 293 as prerequisites.

237. Introductory Physics
Fall, Winter. 3(4-0) MTH 112 or 100 or 111 or concurrently. Mechanics and heat.

238. Introductory Physics
Spring. 3(4-0) 237. Heat, electricity and magnetism.

239. Introductory Physics
Fall, Spring. 3(4-0) 238. Wave motion, sound, light, and modern developments.

257. Introductory Physics Laboratory
Fall, Winter. 1(0-2) 237 or concurrently. Mechanics and heat.

258. Introductory Physics Laboratory
Winter, Spring. 1(0-2) 238 or concurrently. Mechanics and heat.

259. Introductory Physics Laboratory
Fall. 1(0-2) 239 or concurrently. Wave motion, sound, light and modern developments.

287. Principles of Physics
Fall, Winter. 4(3-0) MTH 113. Mechanics.

288. Principles of Physics
Fall. 4(5-0) 287, MTH 214 or approval of department. Heat and thermodynamics, electricity and magnetism.

289. Principles of Physics
Fall, Spring, Summer. 4(5-0) 288, MTH 214 or approval of department. Wave motion, sound, light, and modern developments.