NATURAL LABORATORY SCIENCE
- Offered Fall 2014

- ANT 102 Cr. 4
Introduction to Physical Anthropology
This course introduces the basic fields of physical anthropology: population genetics, human osteology, primatology, paleoanthropology, and forensics. The class provides a substantive framework for learning about the biological diversity of the human species through scientific inquiry. The foundations of evolutionary theory and the fossil evidence for human evolution are also presented. Lect. 3, Lab. 2.

- BIO 100 Cr. 4
Biology for the informed citizen
This course develops an understanding of what science is and utilizes biology as a framework for investigating the importance of science in our everyday lives. Topics include evolution, ecology, human impact on the environment, cell biology, and genetics as it relates to human reproduction. This course is designed as a general education course for non-science or non-allied health majors. Not applicable to the major or minor in biology. Prerequisite: Students with credit in BIO 103 or BIO 105 cannot earn credit in BIO 100.

- BIO 105 Cr. 4
General Biology
An introduction to biology including topics in ecology, population biology, nutrient cycling, food webs, cell structure and function, metabolism, photosynthesis, reproduction, genetics, molecular biology and evolution. This course provides a strong foundation for further science courses, and is designed for science majors, allied health majors and students with an interest in science. Lect. 3, Lab. 2. Students cannot earn credit in both BIO 103 and 105.

- CHM 100 Cr. 4
Contemporary Chemistry
A survey course focusing on applied chemistry. Fundamental chemistry and science concepts are developed and then used to study applications of this science to technology in society. Emphasis is placed on selected topics that are current. Lect. 3, Lab. 2. Course is not applicable to a major or minor in chemistry and does not meet the prerequisite requirement of any other chemistry course.

- CHM 103 Cr. 5
General Chemistry I
An introduction to chemistry including topics in atomic structure, chemical bonding, molecular structure, chemical stoichiometry, reactivity, states of matter, solutions, acid-base theory, and nuclear chemistry, and also including selected topics in descriptive and applied chemistry. Scientific inquiry, experimental design and data analysis are included. Lect. 3, Lab. 3, Disc. 1. Prerequisite: MTH 150 or placement into MTH 151 or higher.
ESC 101 Cr. 4
Earth Environments
This course concentrates on understanding the earth’s dynamic environments through the study of processes and physical and human interactions related to the lithosphere, hydrosphere and atmosphere. A scientific approach is used to examine fundamental concepts in earth and environmental science related to topics such as plate tectonics, landform development, atmospheric processes, global climate, and water resources, in order to provide an understanding of how the earth system functions and the human role in these phenomena. Lect. 3, Lab. 2.

MIC 100 Cr. 4
Microbes and Society
Microbiology plays an integral role in human affairs and our daily lives. Some microorganisms have caused tremendous suffering throughout history, however many microbes have also provided countless benefits to humans and play vital roles in essential global cycles. This course examines the science of microbiology and the impact of microbiology on human affairs. The principles of microbial diversity, cell structure, growth and reproduction, global processes, disease, and prevention of disease are covered. Each topic provides a basis for discussion of current issues where microorganisms play a role. The laboratory provides an inquiry based approach to examining the diversity of microorganisms and their role in disease, spoilage, genetic engineering, food and antibiotic production, agriculture, and the environment. Not applicable to a major in microbiology or biology. Lect. 3, Lab. 2.

PHY 103 Cr. 4
Fundamental Physics I
A broad theoretical and experimental introduction to the study of physics using the techniques of algebra and trigonometry. Topics covered are kinematics with constant acceleration, vectors, Newton’s laws of motion, circular motion, work, energy, momentum, rigid body motion, angular momentum, torque, oscillatory motion, gravitation, fluid mechanics, waves, resonance and sound. Additional topics may be selected from the area of thermodynamics. Wherever possible, applications to other fields of science such as chemistry, biology, and medicine will be discussed. Lect. 3, Lab. 2. Prerequisite: MTH 150 recommended.  Offered Sem. I

PHY 106 Cr. 4
Physical Science for Educators
A survey course focusing on applied physical science and the nature of scientific knowledge. Fundamental theories about the nature and interactions of matter and energy are developed using self-paced, small group, inquiry based teaching modules. The scientific knowledge developed is applied to issues of technology in society and everyday use situations. Emphasis is on modeling science teaching practices advocated by state and national science education standards using active learner practices. Lect. 3, Lab. 2. Prerequisite: elementary/middle level education major plan.

PHY 125 Cr. 4
Physics for the Life Sciences
An introductory study of physics concepts using algebra and trigonometry, primarily for life science and allied health students. Description of matter, motion, energy, thermodynamics, waves, light, electricity and topics in modern physics, with application to the life sciences. Lect. 3, Lab. 2. Prerequisite: MTH 150 recommended.
• **PHY 155  Cr. 4**  
**Solar System Astronomy**  
Astronomy as an observational science. Topics studied include: The history of astronomy; astronomical observations; measuring the sky; motions of the Earth, Moon, Sun and planets; models of the solar system; the planets and their moons; comets, asteroids and meteoroids; and the structure and formation of the solar system. Lect. 3, Lab. 2. (Cross-listed with AST; may only earn credit in PHY or AST, not both.)

**PHY 160  Cr. 4**  
**Stars, Galaxies and the Universe**  
An introduction to astronomy as a science, emphasizing celestial objects beyond our solar system. Throughout the course, comparison of observations with theoretical models will be stressed. Topics studied include the size and scale of the universe, using light and gravity to study the cosmos, the sun, the properties of other stars, lives and deaths of stars, star clusters, black holes, the Milky Way galaxy, dark matter, other galaxies, quasars, Big Bang cosmology, dark energy, and gravitational waves. Particular emphasis will be placed on recent discoveries. Lect. 3 Lab. 2. (Cross-listed with AST; may only earn credit in PHY or AST, not both.)

• **PHY 203  Cr. 4**  
**General Physics I**  
A broad introduction to the study of physics using the techniques of calculus. Topics covered are vectors, kinematics, Newton's laws of motion, circular motion, work, energy, momentum, rigid body motion, angular momentum, torque, oscillatory motion, gravitation, fluid mechanics, waves, resonances, temperature, ideal gases, heat, first and second laws of thermodynamics, kinetic theory of gases, heat engines and entropy. Additional topics will be selected from chaos, black holes, solar system mechanics, computational physics, rocket motion and wherever possible, applications to other fields of science such as chemistry, biology, geology, medicine and engineering will be discussed. Lect. 3, Lab. 2. Prerequisite: MTH 207 or concurrent enrollment.