

PHS 121
APPLIED PHYSICAL SCIENCE I

COURSE DESCRIPTION:

Prerequisites: MAT 060 and RED 080 or satisfactory score on placement test

Corequisites: None

This course introduces the general principles of physics and chemistry. Topics include measurement, motion, Newton's laws of motion, momentum, energy, work, power, heat, thermodynamics, waves, sound, light, electricity, magnetism, and chemical principles. Upon completion, students should be able to demonstrate an understanding of the physical environment and be able to apply the scientific principles to observations experienced. This course includes concepts of chemistry and physics that apply to dental materials; laboratory work reinforces the principles discussed in lecture. *This course has been approved to satisfy the Comprehensive Articulation for transferability as a pre-major and/or elective course requirement.* Course Hours Per Week: Class, 3. Lab, 2. Semester Hours Credit, 4.

LEARNING OUTCOMES:

Upon completion of this course, the student will demonstrate basic knowledge in the following:

- a. Fundamental concepts in inorganic chemistry.
- b. Fundamental concepts in organic chemistry.
- c. Fundamental principles of Newtonian Physics applying to forces, stresses and strain in materials.
- d. Fundamental concepts of the Kinetic Theory dealing with molecular motion and energy.
- e. Fundamental concepts of static and dynamic electrical charges and their characteristic behavior.
- f. Fundamental concepts of the theories of light and color.

OUTLINE OF INSTRUCTION:

- I. Measurements in chemistry
 - A. Metric system
 - B. Density and specific gravity
 - C. Temperature scales

- II. Properties of matter
 - A. States of matter
 - B. Physical and chemical changes
 - C. Physical and chemical properties
 - D. Mixtures

- E. Elements
- F. Compounds

- III. Structure of matter
 - A. Atomic structure
 - B. Periodic table

- IV. Chemical bonding
 - A. Types of chemical bonds
 - B. Writing formulas for compounds
 - C. Naming compounds
 - D. Mole

- V. Chemical equations
 - A. Types of equations
 - B. Balancing equations

- VI. Water
 - A. Chemical properties
 - B. Physical properties
 - C. Hydrates

- VII. Solutions
 - A. Properties of true solutions
 - B. Properties of colloidal solutions
 - C. Properties of suspensions

- VIII. Acids and bases
 - A. Properties of Arrhenius acids and bases
 - B. Properties of Bronstead-Lowery acids and bases
 - C. pH

- IX. Organic chemistry
 - A. Hydrocarbons
 - B. Alcohols
 - C. Esters
 - D. Ethers
 - E. Organic acids
 - F. Cyclic organic compounds

- X. Polymers
 - A. Addition polymers
 - B. Condensation polymers

- XI. Newtonian physics
 - A. Mechanics

- B. Newton's laws
 - C. Stress and strain
- XII. Kinetic theory
- A. Basic principles
 - B. Absolute zero
 - C. Energy and types of molecular motion
 - D. Heat and temperature
 - E. Surface energy
- XIII. Electricity, magnetism and light
- A. Historical developments
 - B. Static electricity
 - C. DC/AC circuit characteristics
 - D. Light

REQUIRED TEXTBOOKS AND MATERIALS:

Chemical Education Resources. Laboratory Packet (lab modules). Thomson Custom Publishing, 2005.

Periodic chart.

SUGGESTED REFERENCES, PERIODICALS AND VISUAL AIDS:

Numerous supplementary texts, programmed materials, and audiovisual packages are available in the Educational Resources Center. These materials may be utilized to reinforce the lecture and lab material or to provide material for independent study by the student.

STATEMENT FOR STUDENTS WITH DISABILITIES:

Students who require academic accommodations due to any physical, psychological, or learning disability are encouraged to request assistance from a disability services counselor within the first two weeks of class. Likewise, students who potentially require emergency medical attention due to any chronic health condition are encouraged to disclose this information to a disability services counselor within the first two weeks of class. Counselors can be contacted by calling 686-3652 or by visiting the Student Development Office in the Phail Wynn Jr. Student Services Center, room 1309.