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.