Degree Applicable

Glendale Community College
May, 1981
Revised January, 2010

Physical Science 131
General Physical Science

I. Catalog Statement

Physical Science 131 is designed to give a cultural appreciation of the scientific method and an elementary working knowledge of the fields studied. Emphasis is placed on the scientific theories. The course is an integrated survey of Physics and Chemistry with applications from planetary and space sciences. Elementary mathematical concepts are introduced as required.

Units - 4.0
Lecture Hours - 4.0
Total Laboratory Hours - 2.0
(Faculty Laboratory Hours 2.0 + Student Laboratory Hours 0 = 2.0 Total Laboratory Hours)

Prerequisites: None.

II. Course Entry Expectations

Skills expectations: Reading 5; Writing 5; Listening-Speaking 5; Math 2.

III. Course Exit Standards

Upon successful completion of the required course work, the student will be able to:

1. apply scientific facts and activities to interpret, evaluate, and make decisions on scientific and technological changes in society;
2. describe the nonliving universe and state the basic physical and chemical laws governing its behavior;
3. understand the interrelations of the fields of physics, chemistry, geology and astronomy;
4. develop and/or improve skills in solving problems involving measurements and conversion of measurements from one system to another;
5. understand how scientists throughout history secured information and developed an understanding of the universe;
6. describe many of the regularities and principles of the universe through observations made by carefully structured experimentation.

IV. Course Content

A. Introduction — 9 hours
   1. The beginnings of physics and chemistry
   2. Basic techniques of the scientific method

B. Fundamental Forces in Nature — 15 hours
   1. Newton's Laws of Motion
   2. Energy and conservation laws
   3. Molecular kinetic theory

4. Oscillations and waves
5. Basic electricity and magnetism
6. Electromagnetic radiation

C. The Atomic Concept and Atomic Structure 9 hours
1. Subatomic particles
2. Electron arrangements

D. Chemical Bonding 9 hours
1. Properties of elements and the Periodic Table
2. Ionic bonding and formulas
3. Covalent bonding and polarities of molecules

E. Basic Chemistry 12 hours
1. Physical and chemical changes and properties
2. Acids and bases: pH
3. Simple chemical equations

F. Organic Chemistry 3 hours

G. Radioactivity and the Nucleus 9 hours
1. Natural radioactivity
2. Half-life and activity
3. Fission and fusion reactions

H. Elements of Stellar and Planetary Physics 15 hours
1. Nuclear fusion reaction in stars
2. Birth, evolution and death of stars
3. Evidence of the Earth's motion with emphasis on the work of Galileo
4. The Earth-Moon gravity couple
5. Physics of the evolution of the solar system
6. Comparative description of planets and asteroids with emphasis on physics and chemistry

I. Physics and Chemistry of the solid Earth 15 hours
1. Physical structure and chemical composition of Earth
2. Physical and chemical evidence for plate tectonics and continental drift
3. Physics of geologic processes
4. Chemistry of rocks and minerals
5. Physical laws of Geology and their relation to the basic laws and theories of physics and chemistry

V. Methods of Presentation

The following instructional methodologies may be used in the course:
1. classroom lecture and demonstrations;
2. laboratory assignments and projects;
3. video presentations;
4. online;
5. field trips.

VI. Assignments and Methods of Evaluation

1. Written examinations.
2. Laboratory exercises, quizzes, and reports.
3. Written reports on field trips.
4. Final examination.

VII. Textbooks

Tillery, B. Physical Science. 4th ed.
New York: McGraw-Hill, 1998.
12th Grade Textbook Reading Level. ISBN: 978-0697358035

VIII. SLO

1. Students will gain an appreciation for how science works and the difference between evidence and theory.
2. Students will be able to discuss the conservation of energy and matter.
3. Students will be able to perform simple calculations and understand the result in the context of the problem posed.
4. Students will be able to discuss the model of the atom. Students will be able to discuss the four basic physical forces.