



**Course Name:** Physical Science II

**Course Number:** PSC\* E102

**Credits:** 3

**Catalog description:** This course provides an introduction to the methods of science in the areas of chemistry, earth science, and astronomy. The student will learn fundamental principles governing chemistry including chemical elements, bonding, chemical reactions, and radioactivity. This course will also focus on the basic science principles of the Earth's interior, plate tectonics, the driving forces of weather, the solar system, stars, and galaxies. The laboratory section of this course stresses the acquisition of skills in data gathering and manipulation in order to come up with logical results.

**Prerequisite:** MAT\*137 or MAT\*104 and ENG\*101

## General Education Competencies Satisfied:

**HCC General Education Requirement Designated Competency Attribute Code(s):**

SCKX      **Scientific Knowledge & Understanding**

**Additional CSCU General Education Requirements for CSCU Transfer Degree Programs:**

SCRX      **Scientific Reasoning**

**Embedded Competency(ies):**

*None*

**Discipline-Specific Attribute Code(s):**

SCI      **Science elective**

## Course objectives:

### General Education Goals and Outcomes:

**Scientific Knowledge & Understanding:** Students will gain a broad base of scientific knowledge and methodologies in the natural sciences. This will enable them to develop scientific literacy, the knowledge and understanding of scientific concepts and processes essential for personal decision making and understanding scientific issues.



☒ **Scientific Reasoning (for CSCU Transfer Degree Programs):** Students will become familiar with science as a method of inquiry. Students will develop a habit of mind that uses quantitative skills to solve problems and make informed decisions.

**Course Specific Objectives:**

1. Become familiar with the language of chemistry, earth science, and astronomy and use it to describe and interpret basic science phenomena.
2. Recognize basic science principles and apply them to solving problems.
3. Collect and correlate data in order to make intelligent decisions and predictions.
4. Discover the relationships among scientific principles and phenomena and use these relationships as a unified body of knowledge rather than as a disjointed collection of facts.
5. Apply mathematical concepts and methods in the treatment of data.
6. Carry out laboratory processes which illustrate and amplify the theoretical concepts examined in lecture.

**Course Content:**

**PHYSICAL SCIENCE:**

I. Introduction

- a. A brief history of advances of science
- b. Scientific method
- c. Hypothesis vs. theory

**CHEMISTRY:**

II. Atoms and the Periodic Table

- a. The elements
- b. Protons and neutrons
- c. Isotopes and atomic mass
- d. The periodic table
- e. Electrons and the shell model

III. Elements of chemistry

- a. Physical and chemical properties
- b. Determining chemical changes
- c. Formation of compounds
- d. Naming compounds

IV. How atoms bond and molecules attract

- a. The formation of ions



- b. Ionic bonds
- c. Covalent bonds
- d. Polar Covalent bonds
- V. Molecular mixtures
  - a. Classification of matter
  - b. Solutions
  - c. Solubility with changes in temperature
  - d. Solubility of gases
- VI. How chemicals react
  - a. Chemical equations
  - b. Counting atoms and molecules by mass
  - c. Converting between grams and moles
  - d. Energy and chemical reactions
- VII. Two classes of chemical reactions
  - a. Acids and bases
  - b. Oxidation/reduction reactions
- VIII. The atomic nucleus and radioactivity
  - a. Alpha, Beta, and Gamma rays
  - b. Radiometric dating
- EARTH SCIENCE:**
- IX. Rocks and minerals
  - a. Mineral properties
  - b. Igneous rocks
  - c. Sedimentary rocks
  - d. Metamorphic rocks
- X. Plate tectonics and Earth's interior
  - a. Seismic waves
  - b. Earth's internal layers: core, mantle, and surface crust
  - c. The theory of plate tectonics
  - d. Divergent plate
  - e. Convergent plate
  - f. Transform plate
- XI. Shaping Earth's surface
  - a. Aquifers and springs
  - b. The water table and groundwater movement
  - c. Surface water and drainage systems
  - d. Glaciers and glaciation
- XII. The oceans, atmosphere, and climatic effects



- a. Ocean waves, tides, and shorelines
  - b. Vertical structure of the atmosphere
  - c. The Greenhouse Effect and Global Warming
- XIII. Driving forces of weather
- a. Temperature changes and condensation
  - b. Cloud development
  - c. Air masses, fronts, and storms

**ASTRONOMY:**

- XIV. The Solar System
- a. The Solar System and its formation
  - b. The Inner Planets
  - c. The Outer Planets
  - d. The phases of the moon
  - e. Eclipses
- XV. Stars and galaxies
- a. Identify constellations in the night sky
  - b. The life cycles of stars
  - c. Black holes
  - d. Elliptical, Spiral, and Irregular Galaxies

Date Course Created:

Date of Last Revision: 02/27/2017