

Date Adopted 1965

Dates reviewed 1985, 1996, 2007, 2011

Dates revised 1986, 1998, 2001, 2004, 2008, 2011



Alabama Department of Postsecondary Education

Representing Alabama's Public Two-Year College System

Jefferson State Community College

PHS 111 Physical Science I

I. PHS 111 Physical Science - 4 Semester Hours
Core Area III, ASCI TSCI (Lec 3 hrs, Lab 2 hrs)

II. Course Description

This course provides the non-technical student with an introduction to the basic principles of geology, oceanography, meteorology, and Astronomy. Lab is required.

III. Prerequisite

As required by program.

IV. Textbook

Conceptual Physical Science, Hewitt, Suchocki, Hewitt 4th Ed. Addison Wesley, 2003. Conceptual Physical Science Laboratory Manual, Hewitt, Suchocki, Hewitt, 3rd Ed. Addison Wesley, 2004.

V. Course Objectives

The student will:

- A. Gain an understanding of basic geology, oceanography, and meteorology.
- B. Appreciate our planetary earth with its fragile environmental spheres in a boundless universe.
- C. Develop basic laboratory skills.

VI. Course Outline of Topics

- A. Fundamental concepts – time, earth spheres, basic cycles, atoms, molecules, isotopes, radioactivity. Lab and activities: size of molecule, background radiation, geologic time
- B. Rock cycle – mineralogy, igneous, metamorphic and sedimentary rocks. Lab and activities: crystal lab, mineral lab, rock labs
- C. Shaping the earth's crust – plate tectonics, earthquakes, igneous activity,

- weathering, work of water, glaciation. Labs and activities: effect of particles in settling, soil labs, river basins
- D. Earth's oceanic system – structure, physiography, ocean processes, coastal sculpture. Labs and activities: ocean currents
- E. Earth's atmosphere – structure, composition, circulation, weather, climate. Labs and activities: dew point, cloud formation, weather maps.
- F. Astronomy – earth, moon, sun, solar system, stars, and galaxy. Labs and activities: determination of latitude, retrograde motion, sunset pt.

VII. Evaluation and Assessment

Grades will be given based upon A = 90 – 100%, B = 80 – 89%, C = 70 – 79%, D = 60 – 69%, and F = below 60%.

VIII. Class Activities

- A. Lecture
- B. Discussion
- C. Experimentation
- D. Demonstration
- E. Recitation
- F. Written examination

IX. GENERAL COURSE COMPETENCIES

- A. The student will acquire understanding of the basic terms and methodologies used in the physical sciences.
- B. The student will acquire understanding of the basic structures and processes related to our solar system.
- C. The student will acquire understanding of the structure and cosmology of the universe.
- D. The student will acquire understanding of the dynamics of the earth's atmosphere.
- E. The student will acquire understanding of the dynamics and structure of the earth's internal systems.
- F. The student will demonstrate an understanding of the techniques required to observe carefully and to measure precisely.
- G. The student will develop skills in reasoning logically and reporting results concisely from data obtained.

X. COURSE OBJECTIVES STATED IN PERFORMANCE TERMS

- A. The student will acquire understanding of the basic terms and methodologies used in the physical sciences. The student will:
 1. State the appropriate units of measure of the fundamental properties of nature.
 2. Distinguish between percentage error and percentage difference.
 3. Express any number in powers of 10 notation and use the metric prefixes mega, kilo, centi, milli, and micro.
 4. Explain the process called the scientific method.
- B. The student will acquire understanding of the basic structures and processes related to our solar system. The student will be able to:
 1. State Kepler's three laws of planetary motion, and draw figures illustrating the first two laws.
 2. List the planets in order of distance from the sun.

3. List the terrestrial planets and the Jovian planets and give the distinguishing features of each.
 4. Describe and differentiate between comets, meteors, and asteroids.
 5. Define latitude and longitude with respect to the earth's axis system.
 6. Explain, with the aid of diagrams, the different seasons of the year.
 7. Describe the features and explain the origin of the moon's craters, plains, rills, and rays.
 8. Draw an earth-moon-sun diagram and use it to explain the phases of the moon and eclipses (lunar and solar).
- C. The student will acquire understanding of the structure and cosmology of the universe. The student will:
1. Define the term plasma and describe the composition of the sun's interior.
 2. Describe the basic processes by which a star shines.
 3. State the major events in the birth, life, and death of a star.
 4. Describe the motion of the stars and planets over one night and over one year.
 5. Draw an H-R diagram and label the axes and the major features.
 6. State and give experimental evidence to support the Big Bang theory.
- D. The student will acquire understanding of the dynamics of the earth's atmosphere. The student will:
1. State the nature and general composition of air.
 2. Explain why some planets have atmospheres and others do not.
 3. Distinguish the properties that give rise to vertical divisions of the atmosphere.
 4. State and explain the processes by which the lower atmosphere obtains the major portion of its energy content.
 5. Name the atmospheric properties that are commonly measured and describe how they are measured.
 6. Distinguish between winds and air currents.
 7. State the forces that produce air motion.
 8. Describe the Earth's general air circular structure.
 9. Tell how clouds are classified, naming the various types of common clouds.
 10. Explain the mechanisms by which clouds are formed.
 11. Distinguish the different air masses, particularly the ones that affect the weather in the United States.
 12. Describe the different kinds of fronts and their associated characteristics.
 13. Describe the formation and characteristics of a thunderstorm.
 14. Discuss the formation and effects of a tornado.
- E. The student will acquire understanding of the techniques required to observe carefully and to measure precisely. The student will:
1. Demonstrate correct graphing techniques.
 2. Make a series of consistent measurements on physical systems.
- G. The student will develop skills in reasoning logically and reporting results concisely from data obtained. The student will:
1. Construct a graph on the appropriate scales including units, clearly indicating data points and drawing the best fit curve.
 2. Demonstrate the technique for presenting and analyzing data by the submission of well written laboratory reports.

XI. Attendance

Students are expected to attend all classes for which they are registered. Students who are unable to attend class regularly, regardless of the reason or circumstance, should withdraw from that class before poor attendance interferes with the student's ability to

achieve the objectives required in the course. Withdrawal from class can affect eligibility for federal financial aid.

XII. Statement on Discrimination/Harassment

The College and the Alabama State Board of Education are committed to providing both employment and educational environments free of harassment or discrimination related to an individual's race, color, gender, religion, national origin, age, or disability. Such harassment is a violation of State Board of Education policy. Any practice or behavior that constitutes harassment or discrimination will not be tolerated.

XIII. Americans with Disabilities

The Rehabilitation Act of 1973 (Section 504) and the Americans with Disabilities Act of 1990 state that qualified students with disabilities who meet the essential functions and academic requirements are entitled to reasonable accommodations. It is the student's responsibility to provide appropriate disability documentation to the College. The ADA Accommodations office is located in FSC 300 (205-856-7731).