

# Syllabus

## PHYS1100 Physical Science

2013

### Committee Members:

Dorothy Condreay, Central Community College  
Jim Garretson, Mid-Plains Community College  
Kim Timperly, Northeast Community College  
Dolen Freeouf, Southeast Community College  
Lorin King, Western Nebraska Community College

Facilitator:   
Date Reviewed: 1/25/2013

### NCCA Council of Instructional Officers

Chair:   
Date Approved: 1-25-13

## I. CATALOG DESCRIPTION

PHYS1100

Physical Science

**Prerequisite:** None

**Description:** A survey course in the physical sciences with emphasis on scientific processes and problem solving. Areas of study will include selected topics in physics, chemistry, astronomy, geology and meteorology. A scheduled laboratory will supplement classroom activities.

Credit Hours: 4 semester hours or 6 quarter hours

Lecture/classroom Hours: 45 hours

Laboratory Hours: 30 hours

## II. COURSE OBJECTIVES/COMPETENCIES

Course will:

- A. Develop skills in measuring and converting units within the metric systems
- B. Foster critical thinking skills using the scientific method in examining physical science concepts
- C. Relate scientific issues to societal and individual problems
- D. Relate basic physical science concepts to everyday experiences
- E. Explain basic chemical principles
- F. Describe the basic structure, features and workings of the solar system and universe
- G. Explain basic weather principles
- H. Describe the dynamic nature of earth and its cycles

## III. STUDENT LEARNING OUTCOMES:

Students will:

*From Objective 1*

- A. Demonstrate knowledge of different types of measurements and units such as CGS and MKS (SI)
- B. Demonstrate knowledge of measurements in different systems and correlate them.

*From Objective 2*

- A. Solve problems relating to Newton's Laws of Motion and Gravitation
- B. Evaluate situations involving momentum, energy and their conservation principles.

*From Objective 3*

- A. Demonstrate knowledge of how physical changes affect the environment.
- B. Describe available energy resources and how they affect global climate changes

*From Objective 4*

- A. Describe heat flow relative to temperature
- B. Demonstrate knowledge of electricity including magnetic fields and various phenomena

*From Objective 5*

- A. Demonstrate knowledge of chemical bonds and the properties of substances
- B. Identify the characteristics of elements based on the periodic table

*From Objective 6*

- A. Demonstrate knowledge of uniform circular motion and elliptical motion with regard to the motion of celestial objects
- B. Describe the components of the solar system

*From Objective 7*

- A. Demonstrate knowledge of weather fronts and systems.
- B. Explain the seasonal changes in weather patterns

*From Objective 8*

- A. Demonstrate knowledge of the basic structures of a dynamic earth
- B. Demonstrate knowledge of the components of earth materials

#### **IV. COURSE CONTENT /TOPICAL OUTLINE**

*(Order of presentation at instructor's discretion)*

##### **A. OUTLINE**

- 1. Physics
- 2. Chemistry
- 3. Meteorology
- 4. Geology
- 5. Astronomy

#### **V. INSTRUCTIONAL MATERIALS**

##### **A. Textbooks**

- 1. Krauskopf, et.al., *The Physical Universe*, 14<sup>th</sup> Edition, 2012: McGraw-Hill.
- 2. Shipman, et.al., *An Introduction to Physical Science*, 13 Ed; 2013; Brooks/Cole
- 3. Tillery, *Physical Science*, 10<sup>th</sup> Edition; 2014; McGraw-Hill

- B. **Laboratory Manual/Book:**
  - A. Tillery, Laboratory Manual to accompany Physical Science; McGraw-Hill
  - B. Garretson, Laboratory Studies in the Physical Sciences; Wm C Brown Publishers
  - C. Physical Science with Vernier
  - D. Instructor Generated Lab Manual/Worksheets
  
- C. **Other Resources**
  - A. Basic laboratory equipment.
  - B. Online assignments
  - C. Videos
  - D. Class demonstrations
  
- D. **Outside reading/research**

See specific course outline  
Selected outside readings on current topics

## VI. **METHOD OF PRESENTATION**

Instructors will make use of varied pedagogical techniques including several of the following:

- A. Lectures
- B. Discussion groups
- C. Individual and/or collaborative projects
- D. Debates, research, peer response, journals, essays, conferences
- E. Computer –assisted instruction, interactive/creative methods, multi-media
- F. Field trips

## VII. **METHODS OF EVALUATION**

- A. As determined by the instructor, course grades will be based on one or more of the following:
  - 1. Class and group participation
  - 2. Daily work, exams, presentations
  - 3. Projects, papers, and/or a portfolio
  
- B. The instructor will distribute and discuss evaluation and grading policies with students at the beginning/during of each term.