

Session 2006C
May 8 through June 26
Lecture: M 6:00-10:00 PM Room W-37

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Syllabus

Course: Physical Science I1 (3) PHS-104

I. Course Description

Gives the basic principles of chemistry and earth sciences. Designed to give the non-science major and the education major an appreciation of the physical universe as well as some of the basic principles that govern the universe. A historical perspective of contemporary science is also included.

II. Required Materials:

Textbook - *Physical Science* by Tillery; 6th edition, McGraw-Hill
Scientific calculator with the ability to perform scientific notation

III. SCI Mission Statement

The mission of Springfield College in Illinois is to provide students the best liberal arts education in the Ursuline tradition of a nurturing faith-based environment. We prepare students for a life of learning, leadership, and service in a diverse world.

IV. Goals, Objectives, and Outcomes

A. Goals

1. To develop in students an understanding of the scientific method
2. To develop in students a foundation of atomic theory and the basic concepts of chemistry
3. To develop in students a fundamental understanding of earth science and physical geography

B. Objectives – Common Student Learning Objectives (CSLOs)

Springfield College is committed to preparing students for a life of learning, leadership, and service in a diverse world. As a result of the College's Associate Degree Programs, graduates will develop:

1. Content Knowledge (Lifelong Learning (CK-1)
 - Know and apply the central concepts of the subject matter
 - Use current research to support assumptions and beliefs
 - Use technology to enhance learning
2. Communication skills (Lifelong Learning and Leadership) (CS-1)
 - Communicate effectively in oral and written forms
3. Problem-Solving Skills (Lifelong Learning and Leadership) (PS-2)
 - Use inquiry and collaboration to solve problems
 - Seek information and develop an in-depth knowledge base, grounded in research
 - Use self reflection to enhance personal growth and understanding of content

4. Social Responsibility (Service and Leadership) (SR-3)
 - Evaluate how choices and actions affect others
 - Make ethical and informed decisions
 - Develop good citizenship
5. Global Perspectives (Diversity) (GP-1)
 - Recognize the importance of diversity of opinion, abilities, and cultures.

C. Course Based Student Learning Objectives (CLSOs)

Upon completion of this course students will be able to

1. Follow the scientific method of reasoning (PS - 2)
2. Describe the major atomic particles (CK - 1)
3. Name and describe elements from the periodic table (CK - 1)
4. Name ionic and molecular compounds and write formulas for ionic and molecular compounds (CPS - 2)
5. Understand the application of plate tectonics to present-day land formations; apply patterns of weather and building of the earth to everyday life (CK - 1) (CS - 1)
6. Illustrate the systems of water sources on the earth (CK - 1) (CS - 1)

V. Teaching Methods

A variety of teaching methods will be used, including lecture, demonstrations, hands-on experiences, cooperative learning, mathematical analysis of data, computer applications, homework problems, and question sets.

VI. Course Requirements

Attendance

It is vital that you have excellent attendance. If you miss class, it is the student's responsibility to contact fellow students for handouts and topics covered during lecture.

Class Attendance and Policies

1. Be on time to class. Any in-class work missed because of being tardy will not be made up and will result in a grade of zero.
2. Attendance and tardies will be recorded. It is your responsibility to attend all class sessions.
3. You will need the following items: notebook, textbook, scientific calculator, and pencil or pen.
4. Show proper respect toward all individuals in the classroom.
5. Take lecture notes every day. Most examination questions will come from your notes. If you are absent, it is your responsibility to get class notes.
6. Reading and writing assignments (homework) are required for each course objective. Homework is due the following class session.
7. If you need additional help with the course material, please feel free to see me before or after class, or make an appointment to meet with me.
8. Only one lecture-exam make-up will be permitted. It is the responsibility of the student to set up the make-up exam, which will be given at the discretion of the instructor.

VII. Evaluation

Your grade will be based on points from tests, quizzes, hands on activities, and homework. The grade scale is:

A = 90-100%
B = 80–89%
C = 70–79%
D = 60–69%
Less than 60% = F

Plagiarism

Plagiarism is defined as follows: The act of appropriating the literary composition of another, or parts or passages of his (or her) writing or the idea of language of the same and passing them off as the product of one's own mind. To be liable for plagiarism it is not necessary to exactly duplicate another's literary work, it being sufficient if unfair use of such work is made by lifting a substantial portion thereof. *Black's Law Dictionary* (5th ed. 1979). The SCI Handbook lists plagiarism as a serious breach of conduct standards that will result in disciplinary action.

VIII. Topical Course Outline: Lecture Schedule (Tentative)

May 8 & 15 - Weeks 1 & 2(Chapters 1, 8, & 9)

See end of syllabus for assignment for May 8, due at start of class.

What is Science: What is science? Measurement and its application; The nature of science; The scientific method

Atoms & the Periodic Table: Atomic structure: the electron & the nucleus; Bohr's model and Bohr's theory; quantum mechanics, electron configuration, the periodic table

Chemical Bonds: Compounds, chemical change, valence electrons, ions; chemical bonds: ionic and covalent bonds

May 22 & 29 - Weeks 3 & 4 - Chapters 10, 11 & 12

Chemical Reactions: Chemical formulas and application; balancing chemical equations; main types of chemical reactions; information derived from chemical equations

Water & Solutions: Properties of water: structure, solution, and solubility; properties of water solutions; acids, bases and salts

Organic Chemistry: Organic compounds; hydrocarbons and their categories; petroleum; hydrocarbon derivatives; alcohol, esters, aldehydes, etc.; proteins, carbohydrates, fats and oils; synthetic polymers

June 5 & 12 - Weeks 5 & 6 – Chapters 13, 17, 18, 19 & 20

Rocks & Minerals: Overview of Earth's materials; mineral formation; types of rock: igneous, sedimentary and metamorphic; the rock cycle

Plate Tectonics: Earth's internal structure; theory of plate tectonics; magnetic field, ocean, lithosphere plates and boundaries

Building Earth's Surface: diastrophism and its effects: stress, strain, folding, faulting; overview of earthquakes; how mountains form

Shaping Earth's Surface: Overview of weathering, erosion, and transportation of solids and dissolved materials; soil and erosion: water, glaciers, and wind; landscape development

June 19 & 26 – Weeks 7 & 8 – Chapters 21, 22, 23 & 24

Geologic Time: Overview of fossils; interpreting rocks and geology; geologic time scale and its eras

The Atmosphere of Earth: Atmosphere: composition, pressure, warming, and structure; the effect of wind; water's significance; fog and clouds

Weather & Climate: Cloud formation and how precipitation arises; weather factors: air masses, fronts, waves and cyclones, storms; overview of and reasons for different climates

Earth's Waters: Freshwater, surface water, groundwater; seawater: a detailed overview of the hydrologic cycle

IX. Americans with Disabilities Act (ADA)

Springfield College in Illinois provides individuals with disabilities reasonable accommodations to participate in educational programs, activities, and services. Students with disabilities requiring accommodations to participate in class activities or to meet course requirements should contact the instructor as early as possible.

X. Classroom Assessment Techniques

Pre-tests and post-tests assessment tools will be utilized in each major topic area covered. In order to provide continuous improvement of instruction, students are required to take part in all assessment tools.

XI. Illinois Articulation Initiative

Physical Science 104 II has been approved by the IAI as meeting the criteria stipulated for IAI P9 900.

This syllabus is tentative and is subject to change by the instructor.

Assignment for May 8, due at the beginning of class

On a separate sheet of paper, answer the following questions:

- 1) What science classes have you completed in high school and college (to date)?
- 2) What was your favorite science class and why did you like it?
- 3) What 3 adjectives best describe how you feel about coming to the 1st day of this class?
- 4) Check labels to find a household product that contains the following chemicals (find 4 of the 7 listed):
 - a) sodium chloride
 - b) ethanol (ethyl alcohol)
 - c) sodium hypochlorite
 - d) acetic acid
 - e) sodium bisulfate
 - f) isopropyl alcohol
 - g) sodium hydroxide