

Physical Science 1417

Western Texas College

- I. Basic Course Information
 - A. Course Title and Number – Physical Science 1417 (PHYS 1417)
 - B. Credit Hours – 4
 - C. Course Emphasis & Prerequisites – There are no prerequisites except to be able to read and comprehend college level material. The course is designed for non-science majors and especially for elementary education majors
 - D. Text and Lab Manual – Schaum's Physical Science Outlines, 2nd edition, ISBN: 978-0-07-004419-7 and Lab Student Notebook, ISBN: 1-4292-3054-12
- II. Course Coverage and Objectives
 - A. This is a two semester course. The first semester covers the basic concepts of chemistry and physics and the second covers fundamentals of geology, meteorology and astronomy. Let me see right up front that I love teaching this class. I hope that if you don't feel that way right now you will after you take it.

It is my opinion that if a person could only take one science course, that course should be some form of the physical sciences and especially one that deals with chemistry and physics, at least to some extent. Why? Because these two areas are intricately connected to all the other sciences. For example, in geology a person may study crustal movements or concentrate on the crystal formation a particular type of rock. A biologist may concentrate on whole organisms, cells, tissues or molecular genetics. Underlying both these is chemistry, which helps to explain both how, and why molecules of rocks or cells behave the way they do. Even more basic than chemistry, though, is physics. The person doing physics studies at a far less complex level than the geologist or biologist and, because of this, she is able to investigate the most fundamental forces of nature – the forces which we think are at the root of all the more complex sciences.

Much has been said and printed concerning the state of American education in the last couple of decades. Some of that is hype, but unfortunately, much of it is true. We simply don't have a population that understands the basic principles of how the world works and in today's culture and society that can be damaging. A person who professes to have a good liberal arts education must have a good understanding of science.

This is a course designed for the non-science major and is a great one for those of you considering elementary education as a career since any survey of elementary teachers will reveal their total fear and paranoia of

science.

Below is an “intended” scope and sequence of this course. Please understand that this is tentative. There are always unforeseen conditions that can alter the sequence of topics or the time spent on each, but this is pretty close.

- B. Scope and Sequence – Below is the intended plan for the topics to be covered in this course. Please understand that this is subject to change based on extenuating circumstances.

Week 1 & 2	Introduction to science in general and geology in particular. Introduction to basic chemistry needed for geology.
Week 3	Mineral characteristics and identification
Week 4 & 5	Rock types and the rock cycle
Week 6 & 7	Erosion, sedimentation and sedimentary environments
Week 8	Deserts
Week 9	Glaciers
Week 10	Volcanoes
Week 11	Earthquakes
Week 12	Diastrophism
Week 13	Mass Wasting
Week 14	Rivers and ground water
Week 15	Caves and caverns
Week 16	Seashores and their features

- III. NATURAL SCIENCES–Educational Objectives, Course Competencies, Learning Outcomes - These may seem somewhat confusing and overlapping but suffice it to say that this section deals with the esoteric and not so esoteric requirements of a good liberal arts education. In our course we pretty well restrict ourselves to the more tangible aspects and leave the esoteric ideas to other disciplines such as psychology, languages and the like.

The objective of the study of a natural sciences component of a core curriculum is to enable the student to understand, construct, and evaluate relationships in the natural sciences, and to enable the student to understand the basis for building and testing theories.

- IV. Exemplary Educational Objectives

- A. To understand and apply method and appropriate technology to the study of natural sciences.

- B. To recognize scientific and quantitative methods and the differences between these approaches and other methods of inquiry and to communicate findings, analyses, and interpretation both orally and in writing.
 - C. To identify and recognize the differences among competing scientific theories.
 - D. To demonstrate knowledge of the major issues and problems facing modern science, including issues that touch upon ethics, values, and public policies.
 - E. To demonstrate knowledge of the interdependence of science and technology and their influence on, and contribution to, modern culture.
- V. Intellectual Competencies - Below are a series of basic competencies that are essential to the learning process of any discipline. The ones that are especially pertinent to our study have been marked.
- A. Reading
 - B. Speaking
 - C. Critical Thinking
 - D. Writing
 - E. Listening
 - F. Computer Literacy
- VI. Student Learning Outcomes - These are somewhat different from learning objectives in that they vary from discipline to discipline and even from course to course within a particular discipline. Outcomes not only state the desired learning outcome but, also the method of assessing the learning be it a test or other instrument. Basically, these are some the things you will do while in this course
- A. The student will construct at least one cardboard model of a geologic feature such as a volcanic cone, badlands, entrenched meanders, etc. The model will be created using knowledge gained from the study of aerial photographs, stereographic images and topographical maps and geological maps. Assessment will be made on the accuracy of the model.
 - B. The student should be able to develop a flow chart or hierarchy of tests to use as a method of distinguishing between various minerals. Assessment will be based on a mineral ID test at the end of the unit.
 - C. The student should be able to differentiate between sedimentary, igneous and metamorphic rocks and distinguish between different rocks within each of these three major categories. Assessment will be based on a set of rock ID tests at the end of each unit.
- VII. Course Requirements, Grades and Policies
- A. Attendance and Punctuality – Attendance to all classes and labs is expected. After six (6) hours of class/lab absences the student's name will be turned in to the counselor. Continued absences may result in being dropped from the course. Please do not get in the habit of being late for class or lab. No one will be allowed to enter late for an exam.
 - B. Grading and Exams – Grades for the lecture portion of this class will be determined by the following scheme:
Quizzes – 25%

Hour Exams – 50%

Lab – 25%

- C. Missed hour quizzes and daily grades may not be made up. However, at the end of the semester, the lowest quiz grade will be dropped. Missed labs may not be made up. A comprehensive final will be given for those wishing to substitute it for the lowest exam grade.
- D. Academic Integrity – The student is expected to behave with the utmost academic integrity and honesty. Cheating may result in being dismissed from the course. Please refer to the WTC Course [Catalog](#)
- E. Lab Safety and Health – Typically the labs in this class pose little hazard to the student if all instructions are followed. Certain chemistry labs though may present “opportunities” for danger. Follow all safety procedures and instructions for each lab. Any horseplay or other inappropriate behavior will result in dismissal from the lab. Continued actions of this sort will result in being dropped from the course.

VIII. Other Information

- A. Safety – A number of safety measures are in place for your protection. In the event of inclement weather, shelters have been designated at several locations on campus. Your Student Handbook will have a map of these locations and you should familiarize yourself with it. The shelters are marked at the entrance to the appropriate buildings. WTC is part of the city-wide call list which is activated by the local law enforcement agencies. Warnings will be given throughout the campus if a call is received.
- B. Emergency – All offices serve as emergency communications points. Please notify the nearest WTC staff member should you need assistance of this type. Campus phone: Dial 9-911.
- C. ADA Statement – “Western Texas College does not discriminate on the basis of disability in the admission or access to, or treatment of, or employment in, its programs or activities. The college counselors have been designated to coordinate compliance with the nondiscrimination requirements contained in section 35.107 of the Department of Justice regulations. Information concerning the provisions of the Americans with Disabilities Act, and the rights provided there under, are available from the college counselors.” Affirmative Action – WTC is an equal opportunity institution and is in compliance with the Americans with Disabilities Act.
- D. Bad Weather Policy – In the event of classes being dismissed for inclement weather, holidays, national disaster or other unavoidable circumstance, the instructor notify the students as to what the make up requirements will be. Sufficient work will be assigned and documented to offset the number of hours missed. This notification will be given to students within one week of resuming classes.
- E. Special Assistance – “If, as a result of a disability, a student needs special assistance to participate in a class, the counselor is to be notified immediately so that the prescribed process can be initiated.”

PHYSICAL SCIENCE II LABORATORY	
Week 1 & 2	Mineral Identification
Week 3	Identification of igneous rocks
Week 4	Identification of sedimentary rocks
Week 5	Identification of metamorphic rocks – Lab manual and teacher handouts
Week 6	Topographic Maps
Week 7	Construction of 3 dimensional models based on topo maps.
Week 8	Construction and interpretation of a geological cross section. – Activity in manual and teacher handouts
Week 9	Deserts and glaciers – Teacher handout
Week 10	Earthquakes – Teacher handout
Week 11	Groundwater and running water – Teacher handout
Week 12	Waves, currents and tides – Teacher handout
Week 13 – 15	Air masses, mid-latitude cyclone and weather maps – Teacher handout
Weeks 16	Patterns in the solar system – Teacher handout

Last Modified: August 19, 2015