



SOUTHWESTERN COLLEGE

2625 E. Cactus Road, Phoenix, AZ 85032

Phone: 602-489-5300

Physical Science – SCI 202

Course Name – Physical Science

Course Number – SCI 202

Semester Offered – Spring 2010

Instructor Information:

Name – Dr. Warren Pettitt

Office location - 2nd floor Doerkson Administration Building Room 200

Office phone - 602-489-5300 ext. 119

email address – warren.pettitt@swcaz.edu

Office hours – Monday through Friday 8:30 to 4:00 except the following times:

M,W,F 9:00-10:00 and 1:00-2:40

T,Th – 10:30-11:45 and 4:00-5:45

Course meeting Days – M,W,F

Course meeting Time – 9:00-9:50

Course meeting Place – A101

Course Description: SM 202 will explore the principle concepts of physical science, which include physics, chemistry, astronomy and geology. When taken in sequence with SM 201 the student will receive a comprehensive overview of the modern science disciplines. This course will consist of lecture, demonstration, and lab sessions. Opportunities will be provided for the student to make observations, develop problem-solving skills, and use inductive and deductive reasoning.

Prerequisites: *None*

Start the course by developing some empathy for your instructor, who is under the illusion that you are taking this course because you have an insatiable curiosity about things around you and a phenomenal motivation to learn about these things. You, on the other hand, may think of physical science as an incomprehensible hocus-pocus of jargon and numbers. You are probably in the course because you are looking for credits in science and have no idea about your instructor's illusions.

The truth, of course, is probably somewhere between the two extremes. Your motivation and curiosity should be sufficient if you are aware of the world around you. You live in a culture where science and technology are everywhere, touching almost

every part of your life. It appears that many people in the general population are interested in learning about science. (Did you know that more people visit science museums than art and history museums combined)? A proficiency in or at least an understanding of physical science is a basic requirement for every educated person

Realistically, I am trying to understand many of your apprehensions. This apprehension probably comes from a limited background in science and math. This limitation will not be an impediment, however, as long as you do not argue that such limitations are a reason for not understanding. No prior work in science will be assumed. The language as well as the math will be as simple as practical for a college-level course. An equation sheet will be provided with each quiz or exam so there is no need to memorize equations, but do not assume that the equation sheet will enable you to complete an exam successfully without understanding the concepts represented. Calculators may be used but not shared during an exam. Practicing arithmetic is not one of the goals of this class; always have your calculator with you for lectures as well as lab.

Course Student Learning Outcomes:

Students shall:

- A. Understand the relationship between matter, energy and motion.
 1. List the international System units of measure for length, mass, volume, time and force, and apply the basic metric system prefixes to these measurements.
 2. Define mechanics, vector and scalar quantities, speed, velocity, acceleration, work, potential energy, kinetic energy, power and momentum; and calculate any of these when given sufficient information.
 3. State Newton's 3 laws of motion and use each to analyze the implications for objects at rest or in motion.
 4. Discuss the differences between nuclear fission and fusion.
 5. Explain and interpret heat, temperature, specific heat, heat capacity, entropy, plasma, and latent heat of fusion, latent heat of vaporization, and the laws of thermodynamics.
- B. Understand the macro- and microscopic composition of matter.
 1. Describe the general structure of an atom and distinguish between the electromagnetic, gravitational, and nuclear forces that bind the atom together.
 2. Identify the relationships between atomic structure, atomic mass, atomic number, periodic ordering, and chemical bonding.
 3. Define compounds, mixtures, molecules, ions, solutions, colloids, and exothermic, endothermic, activation energy, equilibrium, and electrochemistry.
 4. Utilize chemical symbols to construct, balance and read chemical equations.
- C. Recognize the distinguishing characteristics of the universe.
 1. Characterize the components of the solar system with respect to their similarities and their differences.
 2. Explain the basis for our time-keeping system and the reasons we have seasons and eclipses.
 3. Relate what information may be gained from an analysis of light, and explain how this is used to establish the physical properties of stellar objects.

- D. Understand the earth's structure and the processes which operate to change its surface features.
1. Define mineral, and use physical properties to identify the most common minerals.
 2. List the 3 types of rocks and describe how each is formed and place each h within the rock cycle.
 3. Explain the weathering and erosion processes that are a result of water, ice, wind and gravity.
 4. Describe how earthquakes are used to determine the earth's internal structure.
 5. Discuss how volcanoes and earthquakes are related to plate tectonics.

These goals help accomplish objectives 4 and 5 of the listed Objectives of the College (page 4 of the College Catalog) and objective 3 of the General Studies Objectives (page 44 of the College Catalog). The use of the computer in laboratory exercises will also help accomplish objective 6 in the General Studies Objectives.

Texts and Resources:

Physical Science, Tillery, Bill W. 7th edition Boston, MA: WCB McGraw Hill, 2007.

Lab Manual - Pettitt

Web site www.swcit.org/warren.

Course Schedule:

Week of:	Chapter reading/Assignment	Lab
Jan. 11 13 15	Introduction - 1 Chapter 1 assessment quiz Chapter 2 assessment quiz	No lab
Jan. 18 20 22	Motion – 2a Internet Assignment Reading Quiz	No lab (MLK day)
Jan. 25 27 29	Patterns of Motion – 2b Internet Assignment Chapter 3 assessment quiz <u>and</u> Reading quiz	Intro and Friction
Feb. 1 3 5 5	Energy - 3 Internet assignment <u>and</u> Chapter 4 assessment quiz EXAM 1 Homework for exam 1	Work

Feb. 8 8 12	Heat - 4 Internet Assignment Chapter 8 assessment quiz <u>and</u> Reading Quiz	Heat I
Feb. 15 17	Atoms – 8a Internet Assignment	Heat II
Feb. 22 24 26	Elements – 8b Internet Assignment Internet Assignment <u>and</u> Reading Quiz <u>and</u> Chapter 9 assessment quiz	Conservation of mass
March 1 3 5 5	Compounds - 9 Chapter 10 assessment quiz EXAM 2 Homework for exam 2	Hydrated Crystals
March 8	SPRING BREAK	
March 15 17 19	Equations - 10 Internet Assignment Chapter 11 assessment quiz <u>and</u> Reading quiz	Single Replacement Reaction
March 22 24 26	Solutions - 11 Internet Assignment Chapter 13 assessment quiz <u>and</u> Internet Assignment <u>and</u> Reading quiz	Internet – Energy
March 29 31 2	Organic/Nuclear – 12,13 Internet Assignment Chapter 16 assessment quiz <u>and</u> NO SCHOOL	Titration of vinegar
April 5 5 7 9 9	Astronomy – 15,16 Internet Assignment Chapter 18 assessment quiz EXAM 3 Homework for exam 3	Acid indigestion
April 12 12 14 16	Geology – 18,19 Internet assignment Internet assignment Reading quiz	Internet – Astronomy
April 19 21 23	Geology – 21,22 Internet assignment Chapter 24 assessment quiz <u>and</u> Reading Quiz	Internet – Geology

April 26	Earth's waters - 24	Make up lab
30	EXAM 4	
30	Homework for exam 4	
May 3	Review for final	
May 4-7	Final Exams	

Assignments and Activities:

The progress of each student will be evaluated by means of FOUR one hour exams to be given during the semester, reports related to laboratory exercises to be performed, internet worksheet assignments, homework problems from the text, lab and internet quizzes and a comprehensive final exam. The lowest exam score will be dropped (because of this there will be NO makeup of missed exams).

The test days will be: Homework problems/questions due

Exam 1 –	Feb. 5 th	Chapters 1-3
Exam 2 –	March 5 th	Chapters 4, 8, 9
Exam 3 –	April 9 th	Chapters 10,11,13
Exam 4 –	April 30 th	Chapters 16,18,22,24
Final –	May 4 th – 7 th	

Each week in lab a quiz will be given over the previous lab. Each week an assessment quiz will be due by the indicated date at midnight. You will email it to pshomework@swcaz.edu and it will be accepted for a grade as long as it is received by midnight. To take the quiz go to www.mhhe.com/tillery, click on the picture of your textbook. At the top click on Resources, then click on the chapter desired on the left, then on Quizzes. You will always be taking the multiple choice quiz for this assignment so click on this and take the quiz (Always do the multiple choice quiz). Please submit your answers to: pshomework@swcaz.edu.

Assessment Quizzes:

Date due:	Chapter:	Numbers to turn in:
Jan. 13	chapter 1	all 10
Jan. 15	chapter 2	all 19
Jan. 29	chapter 3	all 10
Feb. 3	chapter 4	all 10
Feb. 12	chapter 8	all 16 except 9,10
Feb. 26	chapter 9	all 10
March 3	chapter 10	all 10
March 19	chapter 11	#'s 1-6,9
March 26	chapter 13	#'s 1,2,3,6,7,10

April 2	chapter 16	#’s 1-3,7-10
April 7	chapter 18	all 10
April 23	chapter 24	all 10

Selected day’s in class a quiz will be given over the following reading pages from the text:

- Jan. 22nd – pg 41 – A bicycler racers edge
Pg. 43 – free fall
Pg. 58 – gravity problems
- Jan. 29th - Pg. 82 – grow your own fuel
Pg. 83 – People behind the scenes
- Feb. 12th – Pg. 98 – Goose bumps and shivers
Pg. 108 – Passive solar design
- Feb. 26th – Pg. 241 – The rare earths
Pg. 241 – People behind the scenes
- March 19th – Pg. 264 – Microwave ovens
- March 26th – Pg. 290 – Catalytic converter
Pg. 317 – Acid rain
- April 16th – Pg. 494-496 – Evidence from the oceans
Pg. 521 – Earthquake preparedness
- April 23rd – Pg. 554-556 – Fossils (up to Reading rocks)

Internet Worksheets located at:

www.swcit.org/warren/Physical_science_assignments.htm.

- Jan. 20th - Arch Bridge
- Jan. 27th - Galileo thought experiment
- Feb. 3rd - Newton’s third law
- Feb. 8th - Segway
- Feb. 17th - Grass Bridge
- Feb. 24th - Levers
- Feb. 26th - Raising an Obelisk
- March 17th - Quarks
- March 24th - Anatomy of a firework
- March 26th - Carbon fibre car
- March 31st - Fusion
- April 5th - Nuclear reaction
- April 12th - How to land on the moon
- April 14th - Galileo and Jupiter
- April 21st - Jupiter

The approximate % of points will be as follows:

- Tests – 50%
- Quizzes – 20%
- Lab exercises and reports – 15%
- Homework from text – 15%

Homework Assignments from the text:

The Applying the Concepts (AC) questions that should be mastered for each test are listed below (You do not need to turn any of Applying the Concepts in).

Assignments to be turned in on test days are all underlined:

Chapter 1 – AC: 3,5,7,12,14,15,19,21,30,32,33,34,35. Group B – 1-7 and 10

Chapter 2 – AC: 2,9,11,12,13,14,22,24,25 Group B 1-5,7,8,13,14-16,18,20,22-24

Chapter 3 – AC: 1,2,3,4,6,11,12,15,17,19,24,34,36 Group B 1,7,10,11,12,14,18,20

Chapter 4 – AC: 2,6,7,8,9,10,12,17,20,29,30,34,43 Group B 3,6,8,11,12

Chapter 8 – AC: 2,3,6,7,19,23,26,29,31,33,36,37,39,41,42,48,49 Group B 8-13,15,17

Chapter 9 – AC: 2,6,20,22,23,24,25,26,27,29,30,31,33,34,36,37,44,47,50 Group B 1,3-5,7

Chapter 10 – AC: 4,9,10,20,21,22,23,25,34,36,38,39 Group B 2-5,7

Chapter 11 – AC: 4,17,20,21,22,32,43 Group B 1-6,8

Chapter 12 – AC: 1,5,13,17,21

Chapter 13 – AC: 2,3,12,16,17,30,31,34,38,39,40 Questions for Thought 1,5,8 Group B 4,5

Chapter 15 – AC: 3,11,24,29,31

Chapter 16 – AC: 2,9,10,18,19,24,31,32,33,37,40,41,42,44 Questions for Thought 2,5,6,7,12,13,25

Chapter 18 – AC: 7,8,14,16,25,26,28,29,30,31,32,33 Questions for Thought 2,5,9,13,14

Chapter 19 – AC: 1,11,12,23,28,29,30,32,42,49

Chapter 21 – AC: 1,7,16,20,23

Chapter 22 – Questions for Thought 1,4,5,9,12

Chapter 24 – AC: 3,7,13,14,18,19,27,30,31,35,44,45,46 Questions for Thought 2,3,7,14

Assessment and Grading:

Grading Scale –

A = 90% to 100%

B = 80% to 89%

C = 70% to 79%

D = 60% to 69%

F = below 60%

Expectations for Students:

Students are required to:

1. Attend all lecture and laboratory exercises except in the case of illness or unforeseen emergencies. It is the student's responsibility to contact the instructor about any missed worked.
2. Be punctual. Attendance will be taken promptly at the beginning of the session.
3. Read over and take notes on the indicated chapters before they are presented in class. This activity mentally prepares one for the learning experience. It also is important because it raises questions that one needs to have answered in order to fully understand the concepts presented.
4. Study about 2 hours for every hour in lecture.
5. Take exams on the scheduled dates. No make up exams will be permitted, this is the reason for the lowest test being dropped. An automatic grade of zero is recorded for any exam missed.
6. Master the homework problems and submit work on time. For most of the math homework problems just an answer with no work will NOT be accepted, you must show your work.
7. Keep all assignments until the end of the semester in case of recording errors.
8. Do not make airline reservations before the final for this class has been given (please tell your parents this).
9. There is NO late homework.
10. **Accommodation and Special Needs - Include the following statement:** Your instructor is willing to make any reasonable adaptations for limitations due to any disability, including learning disability, in keeping with SWC policies and the Student Handbook. Any student with documented certifiable special needs should contact the office of the Dean of Student Services on campus and they will inform me of the proper accommodations you require. If you have a special need, including a learning disability, it is your responsibility to contact this office as soon as possible to discuss your accommodation needs.

Retention of Examinations and Assignments: Instructors will retain copies of student examinations and assignments not returned to students for one semester in case of dispute between a faculty member and a student in assigning or recording a grade. After that time, instructors may discard course materials in a manner that preserves student confidentiality.

E-mail Policy – Include the following statement: Students are issued an official Southwestern College student email address when they are admitted to the College. These addresses all have the same form: firstname.lastname@swcaz.edu. This is the only electronic mailing address recognized by the college. Students are responsible for all official college communications, including attachments, transmitted to this address. SWC faculty and staff are not responsible for forwarding email to personal email accounts that are not assigned by the college. Students are required to check their SWC email on a daily basis.

Withdrawal:

Last day to withdraw unrestricted - Jan.29th: Last day to withdraw with signature of faculty - March 19th

Disclaimer note - Include: *This syllabus is subject to modification. The instructor will communicate with students any changes.*