Chemistry and the Environment 311 Fall 2012

Class #40434 –Mo, We 1:00 pm. - 2:15 pm. UNIV 100 8/27/11 to 12/12/11

Instructor: P. Anderson **Office Hours:** TBA
E-mail: panderso@CSUSM.edu **Home page:** http://courses.csusm.edu/es100pa/

Required Text: ***Chemistry for Changing Times***; Hill, McCreary and Kolb 12e or 13e.
Only students who are officially registered may participate in this class. If you are given a permission code to add this class, you must officially add the class.

Course Objectives:
This course is designed to provide an introduction to the chemistry of substances found in the environment and the way in which they affect the quality of life on the planet. These include substances with both natural and human sources. The course is structured so that each environmental discussion is preceded by the introduction of some basic chemical principles. These topics will provide the basis for a fuller understanding of how scientists think and approach problems. The basic working knowledge of chemical principles and scientific literature developed in this course should allow the student to participate in intelligent conversation on scientific topics based on fact, not farce, throughout her/his life.
Each class meeting will open with a focus on traditional chemistry from the text and will transition to discussions based on applying concepts from the text to real life situations. I will give an environmental based question each week; you will be expected to research this topic/issue and be prepared to discuss your findings the following week. Your discussions should be scientific research based), and your arguments should be supported by the research you have performed. The supporting data should be from peer-reviewed sources (i.e.: scientific publications, or Internet: *.edu, *.gov, and *.mil. **Note:** *try to avoid the *.com, *.net, and *.org unless they are peer reviewed by scientific/academic sources*).

Some possible topics:

- Will Ethanol from Corn decrease CO_2 emissions in the atmosphere?
- What is Ozone? Where does it come from? Why is troposphereic Ozone bad while Stratospheric Ozone is necessary to sustain life?
- How has Silicon revolutionized the computer industry?
- Hybrid cars: What are the benefits and mitigations?
- What are Greenhouse Gases and why do we care?
- Why is Benzene banned in all but one substance; the gas we put in our cars?
- Why did Chernobyl happen? What can we do now to clean it up? Why did we dump milk in Wisconsin 4 days after Chernobyl?
- Nuclear Fission vs. Fusion: What are the advantages and disadvantages of each? Case study Japan.
- How does a Catalytic converter help reduce harmful emissions?
- How does antifreeze work to prevent your engine from cracking?
- Why is plastic so bad for the environment (Grocery bags: paper or plastic)
- Mistakes made by policy: Deepwater Horizon case study.
- Incandescent vs. fluorescent light bulbs: pros and cons
- Wind power: pros and cons
- Solar panels: are they net producers or consumers?

COURSE SCHEDULE (tentative)

Date	Topic	Chapter
8/27 8/29	Syllabus study skills, Chemistry	1
9/3 9/5	****Labor Day*** campus closed* Atoms	2
9/10 9/12	Atomic structure Chemical bonds	3 4
9/17 9/19	Chemical Accounting	5
9/24 9/26	Gases, Liquids, Solids, and intermolecular Forces	6
10/1 10/3	Acids and Bases Oxidation and Reduction	7 8
10/8 10/10	Organic Chemistry	9
10/15 10/17	Polymers Nuclear Chemistry	10 11
10/22 10/24	Chemistry of the Earth Air	12 13
10/29 10/31	Water	14
11/5 11/7	Energy	15
11/12 11/14	****Veteran's day holiday**** Biochemistry	16
11/19 11/21	Food Drugs	17 18
11/26 11/28	Fitness and Health Chemistry Down on the Farm	19 20
12/3 12/5	Household Chemicals Poisons	21 22
12/10	Final 1:45pm—3:45 pm Monday	

Grading: The course will be graded based on the following criteria:

14 Quizzes	15 points each (two lowest dropped)	180 points
Weekly or bi-weekly homework		120 points
Final Exam		100 points
Total Possible		*400 points*

Note: For ***Quizzes*** you will be allowed ***ONE* 8.5" x 11"** sheet of paper with your ***handwritten*** notes, both sides. For ***Final Exam*** you may use **ALL** your one page quiz notes. Photocopied notes and lift up flaps are **NOT** acceptable. If there is anything other than your handwritten notes, I will take it. It is highly recommended that you take good notes and condense down to one sheet of paper. It is also highly recommended that you answer the chapter questions throughout each chapter, as this is where I find most of the material for the exam questions.

Grades will be based on percentages:

A 93% – 100%	372 – 400	C 73% – 76%	292 – 307
A- 90% – 92%	360 – 371	C- 70% – 72%	280 – 291
B+ 87% – 89%	348 – 359	D+ 67% – 69%	268 – 279
B 83% – 86%	332 – 347	D 63% – 66%	252 – 267
B- 80% – 82%	320 – 331	D- 60% – 62%	240 – 251
C+ 77% – 79%	308 – 319	F Below 59%	250

Students with disabilities who require academic accommodations ***must be approved for services by providing appropriate and recent documentation to the Office of Disabled Student Services (DSS). This office is located in Craven Hall 4300, and can be contacted by phone at (760) 750-4905, or TTY (760) 750-4909. Students with disabilities should meet with me during my office hours or in a more private setting in order to ensure your confidentiality.

CLASS ATTENDANCE

To learn how to swim, you must get in the pool! Therefore, in order to learn Chemistry, you are expected to attend ***every*** class and to be <u>on time</u>. It is very disruptive to your classmates to show up late for class: So, DON'T steal their education! ***Cellular phones MUST be turned off or put on vibrate. NO phone conversations or texting will be permitted in class at any time! If you must take a call, take it outside. If this becomes a disruptive habit, I may ask you to leave the class. Absolutely NO calls or texts will be permitted during examines, as this will be seen as cheating. Cheating on any exam is cause for an immediate failure with no makeups.***

Most exam material will be from class lecture, films, discussions, and chapter questions. A significant part of class time will include films and slides related to concepts you will be expected to understand. If you are absent, please contact a friend in the class to get notes. It is your responsibility to obtain missed material from another student. I will ***NOT*** respond to e-mail requests for content of classes missed, even if you are notifying me in advance. Ask your classmates!

In addition to the above material I will include survival techniques for study management that will help you in building the skills needed to thrive in a college setting.

The key to success in my class is stay on top of the material, and asks lots of questions.

Classmates I Can Call:

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Should your study buddies drop it is your responsibility to find new ones.

WORK EXPECTED

You should plan to spend at least 3 hours studying for each hour of in-class time (if science "isn't your subject", or your reading skills are weak, it will take more time and effort). In other words, **you will spend 3 hours per week attending class plus approximately 9 hours per week of "quality study time" devoted to preparing for this class each and every week!!** (Don't expect to "cram" at the last minute before a test/exam...trust me, it won't work!) You should have a basic understanding of chemical concepts and vocabulary and be able to draw a visual image of the word and how it fits into the overall scope of the topic--ask yourself what, where, when, why, and how.

GOOD LUCK, WORK HARD, and remember: I am here to facilitate your learning