



PimaCommunityCollege

West Campus

CHM 121IN Chemistry and Society

REVISED Syllabus for Spring 2012

Course Information:

Course Prefix/Number: **CHM 121IN**

Course Title: **Chemistry and Society**

Semester: **Spring 2012**

CRN (Section Code): **23462**

Class Days/Times: **TTh 11:30 a.m.-2:10 p.m.**

Site/Room: **SCI K207**

Credit Hours: **4.0**

Teaching Format: **Integrated Lecture-Laboratory**

Instructor Information:

Name: **David A. Katz**

Office: **E-235 (Tortolita Building)**

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Tucson, AZ 85709-0270**

Phone/Voice Mail: **(520) 206-6044**

E-mail: **dkatz@Pima.edu**

Web site: **<http://www.chymist.com>**

Availability: **Office Hours: Office hours: MW 1:30-3:00 TTh 10:30-11:30; 2:30-3:00**

Generally, in addition to my office hours, I am in the office at least 30 minutes before or after class (if I am not in the lab). I am also available by appointment.

Instructional Materials:

Required Text: There is no required textbook for this course. **You must have access to a computer with Internet connections.** Course material or appropriate links to Internet sites will be available on the course web page at <http://www.chymist.com> under the heading **Pima Chem Courses** (left-hand menu) and then **Chem 121** (Left-hand menu). Some material will be supplied in class on a CD-ROM. The web files are in PDF format and require Adobe Acrobat Reader (available for free at <http://www.adobe.com>)

Laboratory Manual: **Laboratory Experiments for Chem 121**, Pima Community College. **The experiments are available for download from the course web page** at <http://www.chymist.com> - Pima Chem Courses (left-hand menu) - Chem 121 (Left-hand menu) The web files are in PDF format and require Adobe Acrobat Reader (available for free at <http://www.adobe.com>)

Laboratory Reference and Safety Manual: Katz, David A., **The General Chemistry Laboratory Survival Manual**, Hayden McNeil Publishing Co., 2006 (Textbooks are available at the West Campus bookstore. The PCC Bookstore can be accessed and books ordered via the Internet at www.Pima.bkstr.com.)

Instructional Materials (continued)

Explore the World of Earth Science An Internet link to investigations and visualizations designed to accompany *Earth Science*, a high school textbook authored by Spaulding and Namowitz and published by McDougal Littell, is provided on the CHM 121IN web page. The Web site was developed by TERC, a non-profit educational research and development firm in collaboration with McDougal Littell.

CD-ROM's – Instructor Supplied in class at no charge

Science and Science Fiction – Short stories and science articles

Forensics – Hands-on forensics with additional readings

Course Outline REVISED SCHEDULE

The following outline presents topics, activities, and experiments in the order they will be discussed in class. Although each topic is listed by specific date, there may be some changes due to extended class discussions or activities/experiments. **Applicable readings or links to reading material is available on the course web site** in addition to specific readings specified in the course outline, below. Science Fiction readings and Forensics readings and experiments will be supplied on CD-ROM. Problem assignments or calculations will be covered in context with activities and/or laboratory experiments.

Class topics are subject to change as issues become current in the news.

Laboratory experiments must be downloaded and read before class and the appropriate sections on laboratory techniques should be read before class. You will not be given copies of laboratory experiments in class.

Date	Topic	Lab Experiment and/or Activities
Jan. 17	Welcome to class Review syllabus and course requirements. Metric System (reading material on web site) Temperature (reading material on web site) Reading Assignment for next class: Explore the World of Earth Science (link on web site), Investigations page. Unit 7: Space Could Mars Support Life	No laboratory activities
Jan. 19	Are we alone? Elements and life in the universe and how they are detected Life on Mars (and elsewhere in the universe) Origin of the elements Detecting elements in space Reading Assignment for next class: Element Symbols, Web site.	Build a Spectroscope Lab Techniques: (Read for next class) The General Chemistry Laboratory Survival Manual Safety in the Academic Lab, Chapter 1 The MSDS, Chapter 2
Jan. 24	Atoms and elements Element symbols The periodic table Reading Assignment for next class: Formula Writing (web site)	Laboratory Orientation Check-in Lab safety Lab Techniques: The General Chemistry Laboratory Survival Manual Laboratory Glassware and Apparatus, Chapter 4 Your Laboratory Drawer, Chapter 5
Jan. 26	Quiz (in-class): Element names and symbols Chemical bonds Inorganic compounds and nomenclature Reading assignment for next class: Nomenclature of Organic Compounds (web site)	Laboratory Safety Test An Experiment in Alchemy: copper, silver, gold Lab Techniques: The General Chemistry Laboratory Survival Manual Laboratory Glassware: Its use, Care and Cleaning, Chapter 6 Volumetric Glassware: Graduated Cylinders, Burets, and Pipets, Chapter 7 The Bunsen Burner, Chapter 8 Mass Determination with Laboratory Balances, Chapter 9
Jan. 31	Take-home quiz: Names and formulas of inorganic compounds An introduction to organic compounds	Preparation of Synthetic Rubber (includes Preparation of a rubber ball from latex)

Date	Topic	Lab Experiment and/or Activities
Feb. 2	Take-home quiz: Names and structures of organic compounds The nucleus and nuclear stability of atoms and isotopes	Nuclear chemistry Exp. 1. Determination of the Background Radiation Exp. 2. Determination of Half-life Exp. 3. Determination of the Type of Radiation Exp. 4. Inverse Square Law NOTE: Data will be shared between groups
Feb. 7	Radioactivity, its applications and chemical and biological effects Radioactivity: Our Nuclear heritage Nuclear weapons Radiation we are exposed to every day (on web site)	Film: The Atomic Café Films to be viewed at home (links on web site): A Tale of Two Cities Hiroshima, Hirohito, & the Rising Sun Hiroshima-Nagasaki, August 1945
Feb. 9	The atmosphere Gases The greenhouse effect Reading assignment: Our atmosphere (web site) Our Changing Environment (web site) Explore the World of Earth Science (link on web site), Investigations page. Chapters 17-21 and Unit 5: Atmosphere and Weather	How Do We Affect the Quality of Our Atmosphere: Gases Simulating the Greenhouse Effect Cloud in a bottle Crush a can with air pressure Simulated sunset (Instructor Demonstration)
Feb. 14	Air pollution Acid rain: acids, bases, pH and the environment Reading assignments: Our Ozone Shield (web site) El Nino and climatic change (web site) Explore the World of Earth Science (link on web site), Investigations page. Unit 6: Can We Blame El Nino for Wild Weather?	How Do We Affect the Quality of Our Atmosphere: (continued) Acids, bases and pH Acid rain simulation (Instructor Demonstration) Effect of acid rain on our environment (Minerals and acid rain)
Feb. 16	Ozone depletion and Chlorofluorocarbons What have we done to our environment?	Sunscreens: Preparation and Evaluation NOTE: Data will be shared between groups Lab Techniques: The General Chemistry Laboratory Survival Manual The Spectronic 20 UV-Visible Spectrophotometer, Chapter 13
Feb. 21	Water and water pollution Reading assignment: Explore the World of Earth Science (link on web site), Investigations page. Chapters 13-15, 22-24	Testing the Waters (Samples will be provided. You may bring in a 1 Liter [1 quart] sample of water from home to test.) NOTE: Data will be shared between groups Lab Techniques: The General Chemistry Laboratory Survival Manual The pH Meter, Chapter 14
Feb. 23	Rodeo Days – no class	
Feb. 28	The Earth: Soil structure and minerals Minerals and mining Reading Assignment: Explore the World of Earth Science (link on web site), Investigations page. Chapters 6, 12	Earth Science: Edible Soil Profile Mining for natural resources

Date	Topic	Lab Experiment and/or Activities
Mar. 1	Metals and mining Properties of Metals	Properties of iron Extracting a metal from its ore
Mar. 6	Soil structure (continued) Types of soil Components of soil	Soil Analysis
Mar. 8	. Energy sources and resources: Natural resources: coal, oil, and natural gas Conservation of resources: recycling, reuse Nuclear energy and nuclear waste Science Fiction CD will be given out today	Recycling a metal into a chemical compound: The preparation of Alum Crystal growing (A homework assignment)
Mar. 12-18	Spring Break – no classes	
Mar. 20	Energy sources and resources: (continued) Alternative sources: wind power, hydroelectric, geothermal, solar power	Build a wind turbine
Mar. 22	Energy from chemical reactions: Electrochemical cells and batteries	Build a wind turbine (continued) Complete construction and testing
Mar. 27	Instructor out of town – no class Work on Report 1	
Mar. 29	Energy from chemical reactions (continued) Fuel cells Solar energy	Batteries (Part 1) The Voltaic Pile The Electrochemical Cell The Lemon Cell
Apr. 3	Nanotechnology Viewing assignment: What is Nanotechnology? Report 1 is due today	Batteries (Part 2) The Storage Cell Construct a Dry Cell Battery Fuel Cells – build a mini fuel cell
Apr. 5	Nanotechnology Discussion of articles/information	The Synthesis of Biodiesel from Vegetable Oil
Apr. 10	The science in science fiction Readings and discussions of the science behind the stories	Magnetic Fluid (a nanotechnology project) Liquid crystals (a nanotechnology project)
Apr. 12	The science in science fiction (continued) Readings and discussions of the science behind the stories	Construct a solar cell (A nanotechnology project)
Apr. 17	Forensic Science: Crime Scene Investigation Material Evidence	Faces: Identification of a suspect
Apr. 19	Forensic Science: Fingerprinting	Fingerprinting Fingerprints Dusting and lifting of fingerprints Cyanoacrylate development
Apr. 24	Forensic Science: Analysis of Inks and dyes Handwriting analysis	Ink Analysis Handwriting Analysis
Apr. 26	Forensic Science: Fibers and fiber identification Hair identification	Fibers and fiber identification: TIS fabric stain Hair Analysis

Date	Topic	Lab Experiment and/or Activities
May 1	Forensic Science Blood and blood drops The 2nd report is due today	Blood drop studies
May 3	Forensic Science: Drugs Poisons	Drug Testing of Some Over-The-Counter Drugs
May 8	Forensic Science DNA	DNA Isolation DNA Identification
May 10	Forensics Exam	Lab Check-out

Course Requirements:

The final course grade will be based on attendance, class participation, quizzes, exams, lab experiments, projects, two short reports, and a final exam. The approximate percent weight of each is given below:

Attendance (includes participation in experiments)..... 10%
Short Reports (see schedule of important dates) 30%
Exams, quizzes, lab experiments, and projects 60%

Spring 2012 Calendar of Important Dates

Jan. 17	Spring classes begin
Jan. 30	Last day to withdraw with a refund
Feb. 21	Topic for 1st Report due
Feb. 23-24	Rodeo Days – no classes
Mar. 1	45 th Day (Census day) Non-attending students will be withdrawn from the course
Mar. 27	Topic for 2nd Report due
Mar. 12-18	Spring Break – no classes
Apr. 3	1st Report due
Apr. 5	Withdrawal deadline
Apr. 19	Exam 3 – Write a science fiction story. Story is due no later than today.
May 1	2nd Report due
May 8	Last day of regular classes. Last date to request a W grade in writing
May 9-15	Final exam week
May 10	Forensics Exam