

California State University, Dominguez Hills
Department of Chemistry
CHEMISTRY FOR THE CITIZEN
General Information–Spring 2011

Course

CHE 102-01, 3 units

Meeting

Tuesday and Thursday 8:30–9:45 a.m. in NSM C-213

Materials:

- Text, *World of Chemistry Essentials*, 4th ed., by M. Joesten, M.E. Castellion, & J.L. Hogg
- Supplementary Lecture Notes to Chemistry for the Citizen
- Binder for notes, handouts and answers to chapter questions
- Scan-Tron 882(-E) forms, #2 pencil, and a soft eraser for exams

Instructor

Dr. Sofia Papatheodorou

Office Hours

M., 11:15 a.m.–12:15 p.m.; W. 11:15 a.m.–12:15 p.m; Th. 10:00 –12:00 p.m.; and by request

Faculty Office, Phone

NSM B-316, (310) 243-3384

Research Laboratory, Phone

NSM B-324, (310) 243-3425

Department Office, Phone

NSM B-202, (310) 243-3376

E-mail

sofia (“at” symbol) csudh.edu

Policy

Objectives and Regulations

The primary purpose of this general studies course is to educate the citizen to make informed and enlightened decisions about the many chemistry-related issues encountered in our technological society. The course will also provide the student with knowledge of the scientific method for acquiring information, and with the opportunity to develop skills in analytic and deductive reasoning. Finally, the course strives to impart knowledge of chemistry and to develop an appreciation of the contributions that scientific knowledge has made to our lives. This course is primarily non-mathematical and has no prerequisites.

Academic Integrity and Plagiarism

Please refer to pages 15 & 16 of the 2009-2011 University Catalog for a description of the CSUDH policy on academic integrity, and for the disciplinary options available in the event of violations. Students are expected to abide by the highest standards of academic integrity as expressed in this code.

Learning Outcomes

After completing this course the student should be able to:

- 1) work with symbols that represent matter.
- 2) distinguish among the types of chemical bonding.
- 3) work out correct chemical formulas and draw structures of compounds.
- 4) distinguish among physical, chemical, and nuclear change, and give examples of each.
- 5) use and balance equations to represent chemical and nuclear change.
- 6) describe the environmental consequences of utilizing nuclear reactions for energy or other purposes.
- 7) determine quantities of matter in terms of moles and masses.
- 8) relate quantities of matter among the reactants and products in chemical reactions.
- 9) explain the factors that control chemical reactivity and predict from these factors relative rates of chemical reactions.
- 10) explain chemical equilibrium and its relationship to chemical change.
- 11) Give the equation relating the thermodynamic factors which determine a spontaneous reaction and predict from this relationship the direction in which systems undergo spontaneous chemical change.
- 12) demonstrate awareness of the need to conserve the world's material and energy resources; give several options for implementing conservation.
- 13) distinguish among the several views of acids/bases, and apply the most appropriate view to specific situations.
- 14) determine concentrations of solutions from given data.
- 15) explain the meaning of the pH scale and apply its equation to determine acidity/basicity.
- 16) explain oxidation/reduction, identify those chemical species that effect and those that undergo these processes, and balance the equations of such reactions.
- 17) demonstrate an introductory knowledge of organic chemistry by identifying its distinguishing features.
- 18) identify the structure, synthesis, and applications of some important classes of organic chemicals, particularly of polymers.
- 19) identify the general structures, properties, and chemical reactions of hydrocarbons.
- 20) describe the production of energy from hydrocarbons and from nuclear reactions.
- 21) discuss with evidence the consequences of energy production on the environment, particularly on our atmosphere and water supply.
- 22) demonstrate knowledge of the composition of our atmosphere, both of healthy air and of conventional air pollutants, including the production of acid rain and of industrial and photochemical smog.
- 23) demonstrate knowledge of the two global air pollution problems, the depletion of stratospheric ozone and of global warming; be cognizant of worldwide efforts to remedy their consequences.
- 24) demonstrate knowledge about the particular considerations for recycling plastics.
- 25) demonstrate knowledge about the chemistry of life—the important classes of molecules and the energy involved in biochemical systems.

Course Schedule and Attendance

Topics and chapters to be covered and audio-visual materials to be viewed are listed on the schedule sheet p.4 of this syllabus. Class attendance is highly recommended and is mandatory for exams. Films shown in class and others that comprise the "World of Chemistry Video Series," listed on p.5 of the syllabus, can be viewed at Instructional Media Services in LIB C-121. The text of each film shown in class is in the Supplementary Notes.

Reading Assignments

Chapters listed on the schedule sheet should be **read before class** discussion and reviewed afterwards. To expedite the learning process, the student can refer to the **glossary** of scientific terms used in the text and the text **index**, both located at the rear of the text. Students are **responsible for all material given in class and in the text** unless indicated otherwise in class. Optional additional reading material will consist of recent newspaper and journal articles, and newsletters and brochures from private and public agencies. These items will be posted on the CHE 102 bulletin board in the third floor central corridor of the NSM Building. Any contributions by the student of other written information that is relevant to the course and worthy may be posted and will be rewarded by extra credit.

Problems

Students should do in each chapter the "Concept Check" tests, and the "Language of Chemistry" matching sets, study the "Examples," and do the "Try It" exercises. Answers to all exercises are given in Appendices E and F at the rear of the text. Additional practice questions are located in "Applying Your Knowledge" at the end of each chapter, with selected answers in Appendix G. Many questions on the exams will be based on the chapter exercises.

Written Exercises

An essay is required for the video, VHS-1016: *Jason's Journey* which will be shown in class. Extra credit questions will be given on the exams for Chapter 6, "Carbon Dioxide and the Greenhouse Effect," for Chapter 7, "Chlorofluorocarbons and the Ozone Layer," for Chapter 11, "Water, Water Everywhere," and for the final two videos shown in class. The aforementioned "World of Chemistry" films and the articles posted on the bulletin board will enhance knowledge and understanding of the course.

Assessment

Student success in meeting the learning outcomes will be determined by five exams as shown on the course schedule. The eligible material for each exam, including the final, will be limited to topics covered during that section of the course, and will come from the text, lectures, handouts, and films. Each of the exams is worth 100 points. The final exam is mandatory; its score cannot be replaced. The lowest score earned on the other exams will be replaced by the final exam grade if this is higher. There will be no other make-up provisions. The exam grades will be averaged to obtain the final score for each student. The course grade will be assigned from a scale based on the distribution of the average scores, and can be enhanced (less than a full grade) by any earned extra credit

CHE 102-01 Tentative Course Schedule Spring 2011

Date	Topic	Chapter
Jan. 25, 27	Living in a World of Chemistry	1
Feb. 1, 3	Chemical View of Matter	2
Feb. 8, Tuesday	Video, VHS-1016: Jason's Journey EXAM I	1, 2
Due date Feb. 10	Essay on video	
Feb. 10, 15, 17, 22	Atoms and the Periodic Table	3
Feb. 24; Mar. 1, 3	The Air We Breathe	4
Mar. 8, Tuesday	VHS-79: The Effects of Increases in Atmospheric Carbon Dioxide EXAM II Extra Credit Questions: Carbon Dioxide and the Greenhouse Effect	3,4 6
Mar. 10, 15, 17, 22	Chemical Bonding and States of Matter	5
Mar. 24, Thursday	EXAM III Extra Credit Questions: Chlorofluorocarbons and the Ozone Layer	5 7
Mar. 28 to Apr. 1	Spring Recess	review
Apr. 5,7,12	Chemical Reactivity: Chemicals in Action	8
Apr. 14, Thursday	Video, VHS-1648: Science and Human Values: Part 2 <i>Garbage: Trash or Resource?</i> EXAM IV Extra Credit Questions: On the Video	8
Apr. 19, 21	Acid-Base Reactions	9
Apr. 21	<u>Last day to withdraw: serious reason required</u>	
Apr. 26	Acid-Base Reactions	9
Apr. 28	Water, Water Everywhere	11
May. 3, 5, 10,12	Nuclear Changes	13
May. 17, Tuesday 10:00 am–12:00 noon	Video, VHS-1783: The Blue Planet FINAL EXAM Extra Credit Questions: On Chapter 11 and on the Video	9, 11,13

Any portion of this syllabus is subject to change.

Videos for CHE 102

The videocassettes listed below will be on hand in LIB C-121 (Instructional Media Services) during the semester. You may wish to view these to prepare for your exams or to enhance your knowledge and enjoyment of the course.

a. Videos shown in class:

<u>Catalog</u>	<u>Title</u>
VHS-1016	Jason's Journey
VHS-79	The Effects of Increases in Atmospheric Carbon Dioxide
VHS-1648	Garbage: Trash or Resource
VHS-1783	The Blue Planet

b. The World of Chemistry Video Series:

<u>Catalog</u>	<u>Program</u>	<u>Title</u>
VHS-2358	1	The World of Chemistry
VHS-2358	2	Color
VHS-2359	3	Measurement, the Foundation of Chemistry
VHS-2359	4	Modeling the Unseen
VHS-2360	5	A Matter of State
VHS-2360	6	The Atom
VHS-2361	7	The Periodic Table
VHS-2361	8	Chemical Bonds
VHS-2362	9	Molecular Architecture
VHS-2362	10	Signals From Within
VHS-2352	11	The Mole
VHS-2352	12	Water
VHS-2363	13	The Driving Forces
VHS-2363	14	Molecules in Action
VHS-2364	15	The Busy Electron
VHS-2364	16	The Proton in Chemistry
VHS-2365	17	The Precious Envelope
VHS-2365	18	The Chemistry of the Earth
VHS-2366	19	Metals
VHS-2366	20	On the Surface
VHS-2367	21	Carbon
VHS-2367	22	The Age of Polymers
VHS-2368	23	Proteins: Structure and Function
VHS-2368	24	The Genetic Code
VHS-2369	25	Chemistry and the Environment
VHS-2369	26	Futures