CHEM 1B Course Outline as of Spring 2010

CATALOG INFORMATION

Dept and Nbr: CHEM 1B Title: GENERAL CHEMISTRY
Full Title: General Chemistry
Last Reviewed: 5/13/2019

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	5.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	5.00	Lab Scheduled	6.00	17.5	Lab Scheduled	105.00
		Contact DHR	0		Contact DHR	0
		Contact Total	9.00		Contact Total	157.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00 Total Student Learning Hours: 262.50

Title 5 Category:	AA Degree Applicable
Grading:	Grade Only
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	

Catalog Description:
A continuation of Chemistry 1A. Topics include chemical kinetics, thermodynamics, chemical equilibrium, nuclear chemistry, electrochemistry, coordination compounds and bonding, and selective topics in descriptive chemistry. Laboratory emphasizes methods of analytical chemistry and quantitative work.

Prerequisites/Corequisites:
Chemistry 1A or equivalent with a grade of "C" or better.

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:
Description: A continuation of Chemistry 1A. Topics include chemical kinetics, thermodynamics, chemical equilibrium, nuclear chemistry, electrochemistry, coordination compounds and bonding, and selective topics in descriptive chemistry. Laboratory emphasizes methods of analytical chemistry and quantitative work. (Grade Only)
Prerequisites/Corequisites: Chemistry 1A or equivalent with a grade of "C" or better.

Recommended:
Limits on Enrollment:
Transfer Credit: CSU;UC.
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**		Effective:	Inactive:
	C	Natural Sciences	Fall 1981	
CSU GE:	**Transfer Area**		Effective:	Inactive:
	B1	Physical Science	Fall 1981	
	B3	Laboratory Activity		
IGETC:	**Transfer Area**		Effective:	Inactive:
	5A	Physical Sciences	Fall 1981	
	5C	Fulfills Lab Requirement		

CSU Transfer:	Transferable	Effective:	Fall 1981	Inactive:	Fall 2020
UC Transfer:	Transferable	Effective:	Fall 1981	Inactive:	Fall 2020

CID:

CID Descriptor:	CHEM 120S General Chemistry for Science Majors Sequence A
SRJC Equivalent Course(s):	CHEM1A AND CHEM1B OR CHEM4A AND CHEM4B OR CHEM3A AND CHEM3AL AND CHEM3B

Certificate/Major Applicable:
Major Applicable Course

COURSE CONTENT

Outcomes and Objectives:
After successful completion of this course, a student will be able to:
1. Identify factors that affect the rate of a chemical reaction and measure those rates experimentally in order to determine a rate law for that reaction.
2. Describe phenomena related to nuclear chemistry and radioactivity and perform associated calculations.
3. Use bonding theories such as molecular orbital theory and hybridization to explain the bonding in transition metal complexes.
4. Apply the principles of electrochemistry in the construction of galvanic and electrolytic cells.
5. Apply the laws of thermodynamics to chemical reactions and chemical equilibrium.
6. Describe specific behavior of various categories of elements on the periodic table.
7. Identify and control factors that influence experimental error in gravimetric and volumetric analysis.
8. Safely operate instruments and use computer interfaces to collect, evaluate, analyze, and communicate results.
9. Interpret laboratory data in the context of chemical principles and published scientific literature.

Topics and Scope:

Lecture Material

1. Properties of mixtures
2. Chemical kinetics
3. Nuclear chemistry and radioactivity
4. Advanced topics in chemical bonding
5. Thermodynamics and chemical equilibrium
6. Electrochemistry
7. Descriptive chemistry
8. Introduction to organic chemistry
9. Transition metal complexes

Laboratory Material
1. Volumetric analysis
2. Gravimetric analysis
3. Chemical Kinetics
4. Chemical Synthesis
5. Electrochemistry
6. Spectrophotometric analysis
7. Chromatography separation
8. Use of computer interfaces and software for data collection and analysis

Assignment:

1. Specific reading and study assignments from the lecture textbook (10-30 pages per week)
2. Completion of recommended end-of-chapter problems (averaging 15-20 per week)
3. Laboratory experiments and accompanying reports (10-20)
4. Completing the required pre-laboratory assignments (10-20)
5. Reviewing a published paper related to an analytical technique studied in class
6. Midterm exams (3-4), quizzes (0-4), and final exam

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Written homework, lab reports, published paper review, pre-laboratory assignment	Writing 10 - 25%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems, lab reports, pre-laboratory assignment	Problem solving 20 - 45%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Lab skill technique and accuracy and precision of lab results	Skill Demonstrations 5 - 15%

Exams: All forms of formal testing, other than skill performance exams.

Multiple choice, completion, problem solving, short essay	Exams 40 - 60%

Other: Includes any assessment tools that do not logically fit into the above categories.

Improvement demonstrated on final exam	Other Category 0 - 5%

Representative Textbooks and Materials:
Chemistry: The Central Science by Brown, LeMay, Bursten; Prentice Hall, 2009
Chemistry: The Molecular Nature of Matter and Change by Silberberg, McGraw Hill, 2009
Principles of Modern Chemistry by Oxtoby, Gillis, Nachtrieb, Cengage, 2008
General Chemistry: Atoms First by McMurry, Fay, Prentice Hall, 2009
Chemistry: The Science in Context by Gilbert, Kirss, Foster, Davies, W.W. Norton, 2008
Chemistry and Chemical Reactivity by Kotz, Treichel, Weaver, Cengage 2010
Lab Manuals
Instructor prepared materials
Laboratory Experiments for Chemistry: The Central Science , by Nelson and Kemp, Prentice Hall, Current edition
Experiments in General Chemistry by Greco, Rickard, Weiss, Prentice Hall, Current edition