

GENERAL CHEMISTRY AND CHEMICAL ANALYSIS

INSTRUCTOR: Greg Sanchez Ph.D.
CRN 70157 & 70237

OFFICE HOURS: By appointment only

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DESCRIPTION: Standard general chemistry for science and engineering majors, with emphasis on quantitative methods and calculations. Topics include atomic structure, chemical bonding, stoichiometry, gases, liquids, solids, solution chemistry, thermochemistry, and kinetics. Quantitative analysis using analytical balances, gravimetric and volumetric procedures, spectrophotometry, and calorimetry.

PREREQUISITES: (1) Math 131 or its equivalent, and
(2) Chem 22 or equivalent skills as demonstrated through placement based on the chemistry assessment process.

MATERIALS: CHEMISTRY, A Molecular Approach by Nivaldo J Tro, 4thth Ed.
Chem IA lab packet (for sale at the stockroom, SV19).
Eye protection (safety goggles).
Scientific calculator (**nonprogrammable**).

Student Learning Outcomes:

SLO #1: Apply the appropriate chemical and mathematical equations to solve problems related to physical and chemical changes of matter.

SLO #2: Demonstrate competency in scientific communication through nomenclature and data presentation.

SLO #3: Utilize various scientific technologies and lab practices to collect, evaluate and interpret laboratory data

GRADING:

Lecture Exams (100 points each)	300
Laboratory Experiment Reports (~4 points each)	40
Spectrophotometric Lab Report	20
Laboratory Unknowns (5, 10, 20 points each).....	55
Study & Computer Assignments (4 points each)	36
Quizzes (Lecture Pop Quizzes 6 points / 10 points each, drop the lowest)	249
Final Exam (Lecture and Laboratory)	200
Approximate Total Points	900

Course grades will be based approximately on the following scale:

86 - 100 %	A
74 - 85 %	B
60 - 73 %	C
50 - 59 %	D
0 - 49 %	F

EXAMINATIONS: All exam dates are listed on the Lecture and Laboratory Schedule provided. On each exam you are responsible for all assigned reading and lectures to that date. It is important that you take each exam on the assigned date. **NO MAKE-UP EXAM** will be given unless there is a valid reason for missing that exam (be prepared to show proof). Simply being unprepared is NOT a valid reason. If you miss an exam, you must contact your instructor as soon as possible. A penalty may be assessed for an exam taken late. A missed exam may be made up only until it has been returned or reviewed in any class. After this time, no make-up exam will be given, and a zero will be recorded for that exam.

QUIZZES: Pop quizzes covering lectures, experiments, and study assignments will be given weekly. In addition you will also have lab quizzes to test your preparation for the laboratory materials. There is **NO MAKE-UP** for a missed quiz; however, the lowest quiz score will be dropped.

CALCULATORS: During exams and quizzes, it is assumed that each student has a calculator. You are NOT allowed to borrow a calculator from another student during a quiz or exam. In an emergency you may rent a calculator from the Stockroom for a two-hour period.
NO PROGRAMMABLE CALCULATORS OR USE OF MOBILE DEVICES are allowed.

LAB WORK: All lab assignments will be performed **individually** unless directed otherwise by your instructor. Students will keep their work space (locker area), reagent shelves, troughs, sinks, fume hoods, and balances, which they utilize, **neat and clean**. Points will be deducted for each infraction.

LAB REPORTS: Unless directed otherwise by your instructor, lab reports are due at the beginning of the next class meeting following the last lab period scheduled for work on that experiment. **Reports must be stapled, and neatness counts!** As a general rule, late work will be heavily penalized. Lab reports will be graded and returned with a KEY for self-correcting. This KEY must be returned to your instructor with your name in pencil at the top. Otherwise a grade of zero may be recorded for that report. **Failure to complete (in an acceptable manner) a total of 3 lab/study assignments will result in a course grade of no higher than a "D".**

LAB UNKNOWN: For Experiment 4 only, unknown results are submitted with the lab report. For all other experiments, unknown results are submitted at the end of the last lab period scheduled for work on that experiment. **NO LATE UNKNOWN RESULTS will be accepted.**

STOCKROOM: You are responsible to the Chemistry Stockroom (SV19), not your instructor, for all equipment (in your lab locker or checked out) and for all instruments you use within the laboratory. All reagents are issued and refilled by the Stockroom. Lost or forgotten locker combinations will be provided by the Stockroom for a fee.

SAFETY: By State Law and for your protection **you are required to wear eye protection at all times while in the laboratory!** **Consumption of food or beverages in the laboratory is not allowed.** Violations will first cause the loss of quiz points, then removal from the laboratory for one lab period, and finally dismissal from the course for repeated violations. Shoes must be worn at all times in the lab. **NO SMOKING** is allowed anywhere in the Science Village.

STUDY AREAS: The Chemistry study and tutor room and the computer lab is SV24. These areas are intended for **quiet work only**. Free tutoring will be provided in SV24 during the hours posted.

CHEATING: Any form of academic dishonesty, whether it occurs inside or outside of the classroom, will result in a score of zero for that exam, quiz, or assignment and may result in dismissal from the course. If, in the judgment of your instructor, one student knowingly allows another student to copy from his/her paper, both students will be penalized.

DROP DEADLINE: Last day to drop with a **"W"** is **Friday November 17**. It is the student's responsibility to withdraw from the course. Anyone enrolled in the class after Friday, November 17 will receive a letter grade for the course.

*****ALL MOBILE DEVICES must be SILENCED DURING LECTURE and LAB DISCUSSION*****

LECTURE & LABORATORY SCHEDULE, T/TH

Week	Date	Text	Lecture Topics	Laboratory Assignments
1	8/28	1.1-1.8 2.1-2.8	Introduction, Measurements, Significant Fig. Atomic Theory, Molecules, Ions, Formulas	T Introduction, Lab Safety, Check-in TH Exp 1 Part A– Volumes and Density
2	9/4	Complete Ch 2 3.2-3.6	Atomic Theory, Molecules, Ions, Formulas Nomenclature, Chemical Equations,	T Finish Exp 1 Part A TH Exp 1 Part B – Unknown Salt Soln.
3	9/11	3.6-3.11 4.2-4.3	Moles, Percent Composition, Empirical & Molecular Formulas Stoichiometry, Limiting Reagent, Rxn Yield	T Finish Exp 1 Part B TH Exp 2 - % CuCO ₃ , SA-1 & SA-2 are due
4	9/18	4.4,4.6,4.8 6.1-6.9	Molarity, Dilution, Solution Stoichiometry Thermochemistry, Hess's Law, DH _f ^o , Calorimetry	T Exp 2 - % CuCO ₃ TH Exp 3 – Thermochemistry
5	9/25	7.1-7.3 7.4-7.6	Quantum Theory, Quantum Mechanics, Atomic Orbitals	T Exp 3–Thermochemistry, SA-3 is due TH Review for Exam 1
6	10/2	8.3,8.4,8.5-8.9 9.2-9.4	Electron Configuration, Periodic Properties Ionic Bonding, Lattice Energy	T EXAM 1 (Ch 1-4, 6) TH Exp 5 –Nanomaterials
7	10/9	9.5-9.10	Covalent Bonding, Lewis Dot Structures Bond Polarity, Resonance, Bond Energy	T Exp 4 – Spectrophotometry TH Exp 4 – Spectrophotometry
8	10/16	10.2-10.5 10.6-10.7	Molecular Geometry, Molecular Polarity Valence Bond Theory, Hybrid Orbitals	T Exp 4 – Spectrophotometry TH SA-4 – Dot Structures, Formal Charges
9	10/23	10.8	Molecular Orbital Theory Gas Laws, Ideal Gas Equation	T SA-5- Computer molecular Modeling TH Review for Exam 2
10	10/30	5.2-5.7 5.8-5.10	Gas Stoichiometry, Dalton's Law Kinetic Molecular Theory of Gases, Real Gases	T EXAM 2 (Ch. 7-10) TH SA-6 due; Start Exp 6
11	11/6	11.2-11.5 11.5-11.7	Liquids, Intermolecular Forces Properties of Liquids	T Exp 6 – Experimental determination of R TH Exp 7 – Titrations
12	11/13	11.8-11.9, 12.4-12.6 13.2-13.5,4.5-4.8	Properties of Liquids, Phase Changes, Phase Diagrams, Solids, Solutions, Solubility, Concentration Units Writing net Ionic Equations	T Exp 7 – Titrations TH Exp 8 - Part A – Conductivity, Start Part B
13	11/20	13.6-13.7	Solution Stoichiometry Colligative Properties of Solutions	T SA-8 due, Exp 8 - Part B –Electrolyte concentrations in sports drinks) TH Exp 9 – Intermolecular Forces
14	11/27	4.9 3.12, 21.1-21.8	Oxidation-Reduction reactions Organic Chemistry	T SLO #1/SA-7 is due TH SA-9 due, Review for Exam 3
15	12/4	21.8-21.13	Organic Chemistry Review	T EXAM 3 (Ch. 10,11,13) TH Lab Cleanup, Checkout

FINAL EXAM Will be on Tuesday, December 12; 8am-10am

This schedule is tentative and is subject to change.

CHEMISTRY IA POINT TALLY SHEET

Exams

Exam #1		100
Exam #2		100
Exam #3		100
Final Exam		200

Lab Quizzes (drop the lowest score)

#1		25
#2		25
#3		25
#4		25
#5		25
#6		25
#7		25
#8		25

Approximate Grading Scale

86-100% = A

74-85% = B

60-73% = C

50-59% = D

Lab Unknowns

Exp #1 Salt Solution		5
Exp #2 CuCO_3		20
Exp #4 Spectro		10
Exp #7 Titration		20

Lab Reports and Study Assignments

Exp #1 (formal lab report)		6
Exp #2		4
SA-1		4
SA-2		4
SA-3		4
Exp #3		4
Exp #4 (formal lab report)		20
Exp #5		4
SA-4		4
SA-5		4
SA-6		4
Exp #6 (formal lab report)		6
Exp #7		4
Exp #8 (Part A and Part B)		8
SA-8		4
SA-7		4
Exp #9		4
SA-9		4

