



School of Arts & Science
CHEMISTRY AND GEOSCIENCE DEPARTMENT

CHEM 120-001
College Chemistry 1
2007 Winter

COURSE OUTLINE

The Approved Course Description is repeated here from College website

CHEM 120 College Chemistry 1

- (4 credits) F, W (3,3,0,0)

For both university and technology students, this course starts with atomic structure and periodic properties and leads to a discussion of chemical bonding, thermochemistry, molecular structure, intermolecular structure, colligative properties, intermolecular forces of attraction and their role in environmental issues. The experiments include chemical synthesis and analysis by titration and spectroscopy. (T)

Prerequisite(s): Chemistry 12.

Ω Please note: this outline will be electronically stored for five (5) years only.
It is strongly recommended students keep this outline for your records.

1. Instructor Information

(a)	Instructor:	Dr. Tark Hamilton		
(b)	Office Hours:	M,W: 1:30-2:20 PM, T,Th: 9:30-10:20 AM		
(c)	Location:	Fisher 344A		
(d)	Phone:	370-3331	Alternative Phone:	
(e)	Email:	hamilta@camosun.bc.ca		
(f)	Website:	Under construction		

2. Intended Learning Outcomes

(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.)

Upon completion of this course the student will be able to:

- Utilize nomenclature rules to name ionic and covalent compounds.
- Demonstrate an understanding of stoichiometry by balancing chemical equations and performing mathematical calculations involving chemical reactions.
- Describe the electronic structure of any atom in the periodic table and apply it to explain many of the physical and chemical properties of the elements.
- Utilize simple bonding theories to explain why elements combine to form the compounds they do and also to explain many of the properties of compounds.
- Apply knowledge of intermolecular interactions to rationalize many important physical properties of bulk matter in the gas, liquid and solid phases.

6. Use standard chemistry lab equipment, including burets, pipets, Buchner filters, and volumetric glassware in the correct manner.
7. Perform many standard laboratory procedures, such as titrations, preparation of standard solutions, the preparation, isolation, and purification of compounds, as well as use spectrophotometers to make analytical measurements.

3. Required Materials

(a)	Texts	Chemistry: The Central Science, T.L. Brown, H.E. LeMay and B.E. Bursten, 10th edition. Prentice Hall
(b)	Other	Chem 120 Laboratory Manual Winter 2007 edition (Meanwell), Lab glasses or goggles for all labs, no contact lenses permitted in labs. Must attend lab safety videos in class or other lab section before 1 st lab on Jan 19.

4. Course Content and Lab Schedule

Lectures: Mon(F300), Tues(F360), Thurs(F300), (12:30-1:20)
Lab Friday: 12:30-3:20 Lab Period, in F356, computers F358

Lecture Schedule by chapter and topic:

<u>Topics:</u>	<u>Chapters:</u>	<u># Lect.</u>	<u>Hours</u>	<u>Finish</u>
1.) <u>Introduction & Review</u>	1-4	5-6	(mid-week 3)	
Classification of matter, units of measurement, dimensional analysis, significant figures, errors, atoms, protons, neutrons, electrons, isotopes, atomic masses. Compounds, stoichiometry, formulas, nomenclature, formula weights, molecular weights, percent composition by mass, the mole, molar mass. Chemical equations, reaction stoichiometry, limiting reagent, percent yield, solution concentration and reaction stoichiometry.				
2.) <u>Gases</u>	10	3-4	(end wk 4)	
<i>Midterm Exam 1 – 2 hours: Week 6 in Lab</i> <u>(Feb 16)</u> <i>Midterm 1</i>				
Nature of gases, states of matter, molecular nature of gas, pressure, gas laws: Boyle's, Charles', and Avogadro's, ideal gas law, reaction stoichiometry, gas density, gas mixtures. Molecular motion, diffusion, effusion, kinetic theory of gases, molecular speeds. Real gases, limitations of ideal gas law, Van der waals equation, Joule-Thompson effect				
3.) <u>Electronic Structure of Matter</u>	6	5	(end of week 6)	

8.) Solutions 13 3 (end wk 14)

Solution processes, saturation, solubility, factors affecting solubility, Concentration units. Henry's Law. Colligative properties and colloids

9.) Chemistry of the Environment 18 3 (end wk 14)

Structure of Earth's atmosphere, ozone layer & depletion.
Greenhouse effect & photochemical smog, tropospheric pollution.
Composition of oceanic & fresh waters. Common environmental chemical contaminants: particulates, heavy metals, organochlorines, pathways & residence. Nuclear fallout.

Lab Schedule, due dates for pre-labs, lab reports and Midterm Exams

Chem 120-05: Lab Thurs 2:30-5:20 in F356, computers F358

Note: Pre lab exercises are due at beginning of lab. Jan 19 both groups do Lab 3 stoichiometry questions. Pre lab questions count as 10% of lab mark. If you do not do them in advance you will not understand how to do the lab.

Lab Date	Activity
I Fri 01/12	Course Info & Lab Orientation (Attendance Mandatory)
II Jan 19	Expt. 2 & 3 Group A Densities & Gp B Stoichiometry #3 Q's
III Jan. 26	Expt. 2 & 3 Group B Densities & Gp A Stoichiometry
IV Feb. 2	Expt. 7 Determination of the Total Hardness of Water #7 Q's
V Feb. 9	Expt. 4 Spectroscopic Determination of Nickel #4 Q's
VI Feb. 16	Test I in Lab (2 hours)
VII Feb. 23	Expt. 5 Colorimetric Determination of Iron #5 Q's
VIII Mar. 2	Expt. 6 Determination of Copper Using A.A. Spec. #6 Q's
IX Mar. 9	Expt. 9 Preparation of $K_3[Fe(ox)_3]$ (Work-Up before March 14 on your own time!) #9 Q's
X Mar. 16	Expt. 10 Analysis of $K_3[Fe(ox)_3]$ #10 Q's
XI Mar. 23	Test II in Lab (2 hours)
XII Mar. 30	Expt. 8 Molecular Shapes & VSEPR Lecture #8 Q's
XIII Apr. 6	No Lab College Closed
XIV Apr. 13	Final Exam review in lab period

No rescheduling of finals. **Do not** book travel or plan to leave campus until after Apr 24, last day of final exams.

Grading of Your Lab Work:

Due dates for lab assignments, at beginning of lab period -10% per day late.

Expt.	Prelab	Report	Total
2, Densities	X, (Lab 3)	Jan 26 or Feb 2	
3, Stoich.	Jan 19	Feb 2 or Jan 26	
7, Hard H ₂ O	Feb 2	Feb 9	
4, Nickel	Feb 9	Feb 16	
5, Iron	Feb 23	Mar 2	
6, Copper	Mar 2	Mar 9	
9, $K_3[Fe(ox)_3]$	Mar 9	Mar 23 (combined 9+10)	
10, $K_3[Fe(ox)_3]$	Mar 16	Mar 23 (combined 9+10)	
8, VSEPR	Mar 30	Checked and Due by end of lab Mar 30 (no early finishes this day)	

5. Basis of Student Assessment (Weighting)

(Should be linked directly to learning outcomes.)

(a)	Lab Assignments	25% plus a minimum lab mark of 50% to pass the course
(b)	Quizzes	Optional depending on readings currency and attendance.
(c)	Exams	Midterm 1 – 15%, Midterm 2 – 25%, Final - 35%
(d)	Other (eg, Attendance, Project, Group Work)	Lab attendance is mandatory to hand in a lab. All data sheets are to be signed by the instructor before you leave the lab.

6. Grading System

(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.)

Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
95-100	A+		9
90-94	A		8
85-89	A-		7
80-84	B+		6
75-79	B		5
70-74	B-		4
65-69	C+		3
60-64	C		2
50-59	D		1
0-49	F	Minimum level has not been achieved.	0

Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy at camosun.ca or information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	<i>Incomplete:</i> A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	<i>In progress:</i> A temporary grade assigned for courses that are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
CW	<i>Compulsory Withdrawal:</i> A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy

E-1.5 at **camosun.ca** for information on conversion to final grades, and for additional information on student record and transcript notations.

7. Recommended Materials or Services to Assist Students to Succeed Throughout the Course

LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College calendar, at Student Services or the College web site at camosun.ca.

STUDENT CONDUCT POLICY

There is a Student Conduct Policy **which includes plagiarism**. It is the student's responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, at Student Services and on the College web site in the Policy Section.

