



School of Arts & Science
CHEMISTRY AND GEOSCIENCE DEPARTMENT

CHEM 120-03
College Chemistry 1
2007W

COURSE OUTLINE

The Approved Course Description is available on the web @ _____

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. Nasr Khalifa		
(b)	Office Hours:	T, W, Th 9:30am-10:30am and W, Th 11:30am-12:30pm, Monday 5:30-6:20pm		
(c)	Location:	F348C		
(d)	Phone:	370-3201	Alternative Phone:	
(e)	Email:	khalifa@camosun.bc.ca		
(f)	Website:	http://www.camosun.ca/schools/artsci/chemgeo/nasr.php		

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:

1. Utilize nomenclature rules to name ionic and covalent compounds.
2. Demonstrate an understanding of stoichiometry by balancing chemical equations and performing mathematical calculations involving chemical reactions.
3. 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.
4. 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.
5. 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	<ul style="list-style-type: none"> - Chemistry: The Central Science” by T. Brown, E. LeMay, and B. Bursten (Tenth Edition) - Chem120 lab Manual, Winter 2007 Edition (in house) <p style="text-align: center;">*****Both texts are REQUIRED*****</p>
(b)	Other	

4. Course Content and Schedule

(Can include: class hours, lab hours, out of class requirements and/or dates for quizzes, exams, lectures, labs, seminars, practicums, etc.)

Detailed Course Outline:

1. Review: (Chapters 1, 2, 3, 4)

- General Review, Stoichiometry-including solutions
- Per cent composition, Empirical formulas
- Molecular formulas
- Naming simple compounds

2. Atomic Structure/Periodic Properties: (Chapters 6, 7)

- Protons, Electrons, Neutrons
- Models of the atom, Historical background
- Isotopes, Atomic symbols
- Radiation, Electromagnetic spectrum, Quantization of energy
- Rutherford atom, Bohr atom
- Simple Wave mechanics, Wave-Particle duality
- Quantum numbers and Electron orbitals
- Heisenberg uncertainty principle
- Exclusion principle, Aufbau principle, Hund's rule
- Electron configurations and the periodic table
- Atomic size, Ionization energy, Electron affinity, Ionic radius, Electronegativity
- Born-Haber cycle

3. Bonding and Molecular Geometry: (Chapters 8, 9)

- Ionic, Covalent, Polar covalent, Per cent ionic character
- Lewis structures, Octet rule
- Valence bond theory
- Resonance
- Hybridization
- Molecular Architecture and Polarity:
 - VSEPR theory
 - Molecular polarity, Dipoles, Dielectric constants

4. Gases: (Chapter 10)

- Ideal gases
- Dalton's Law
- Kinetic molecular theory of gases
- Grahams Law
- Real gases, Van der Waals equation
- Liquefaction

5. Intermolecular Forces, Liquids and Solids: (Chapter 11)

- Anion-cation interactions
- Dipole-dipole interactions
- Induced dipoles, London forces, Hydrogen bonding
- Comparison of the state of matter, Classification of solids

- Vapor pressure and changes of state
- phase diagrams

6. Solutions: (Chapter 13)

- Energy changes, solution process
- Factors affecting solubility
- Expressing concentration, molarity, molality, ppm, mole fractions
- Henry's law
- Vapor Pressures of solutions, Raoult's law
- Colligative properties

7. Chemistry of the Environment: (Chapter 18)

- Earth's atmosphere
- The outer regions of the atmosphere
- Ozone and its depletion
- Chemistry of the troposphere; sulfur, carbon monoxide, nitrogen oxides, carbon dioxide
- The world oceans, Desalination
- Fresh water, treatment

Chem. 120-Winter 2007 Lab Schedule: (Subject to Change)

Jan. 10:	Review/preview session
Jan. 17:	Exp. 1 (Safety introduction)
Jan. 24:	Exp.2 (densities of solids and liquids)
Jan. 31:	Test # 1 (2.5hrs)
Feb. 7:	Exp. 3 (Stoichiometry of chemical reactions), group A
Feb. 14:	Exp. 3 (Stoichiometry of chemical reactions), group B
Feb. 21:	Exp. 4 (Spectroscopic determination of nickel in aqueous solutions)
Feb. 28:	Test #2 (2.5hrs)
Mar. 7:	Exp. 5 (Colorimetric determination of iron in a vitamin tablet)
Mar. 14:	Exp. 6 (Determination of copper using atomic absorption)
Mar. 21:	Exp. 8 (Molecular shapes, VSEPR)
Mar. 28:	Test #3 (2.5hrs)
Apr. 4:	Exp. 7 (Determination of total hardness of water using EDTA)
Apr. 11:	No Labs. Review/lecture

Grades:

A+ = 95-100%	B- = 70-74
A = 90-94	C+ = 65-69
A- = 85-89	C = 60-64
B+ = 80-84	D = 50-59
B = 75-79	F = 0-49

Lab experiments	25%
Test # 1, January 31 (2.5 hrs)	15%
Test # 2, February 28 (2.5 hrs)	15%
Test # 3, March 28 (2.5 hrs)	15%
Final Examination (April, 3 hrs)	30%

	100%

*Final exam at the end of the course will cover **all** course material.

*At least a passing grade on lab marks must be achieved in order to write the final exam.

*You must pass both the lecture portion and the lab portion in order to pass the course.

*You must provide your own **safety glasses**. Prescription glasses are OK, but sunglasses are NOT. You must wear these safety glasses at all times while you are in the lab. You will not be allowed to carry out any experiments without safety glasses.

*Office hours are posted on the door. You can, however, drop by the office any time.
 Chem 120 is not an easy course and you might find that you will need help from time to time.
 You will not be wasting my time if you come for help. I'm here to help you learn.

5. Basis of Student Assessment (Weighting)

(Should be linked directly to learning outcomes.)

(a)	Assignments															
(b)	Quizzes															
(c)	Exams	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">Lab experiments</td> <td style="text-align: right;">25%</td> </tr> <tr> <td>Test # 1, January 31 (2.5 hrs)</td> <td style="text-align: right;">15%</td> </tr> <tr> <td>Test # 2, February 28 (2.5 hrs)</td> <td style="text-align: right;">15%</td> </tr> <tr> <td>Test # 3, March 28 (2.5 hrs)</td> <td style="text-align: right;">15%</td> </tr> <tr> <td>Final Examination (April, 3 hrs)</td> <td style="text-align: right;">30%</td> </tr> <tr> <td></td> <td style="text-align: right;">-----</td> </tr> <tr> <td></td> <td style="text-align: right;">100%</td> </tr> </table>	Lab experiments	25%	Test # 1, January 31 (2.5 hrs)	15%	Test # 2, February 28 (2.5 hrs)	15%	Test # 3, March 28 (2.5 hrs)	15%	Final Examination (April, 3 hrs)	30%		-----		100%
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(d)	Other (eg, Attendance, Project, Group Work)															

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.

Organization Of The Lab Report

Title of the experiment: State the title of the experiment you have just carried out.

Date: Write the date on which you did the experiment.

Name: Your name and lab partner's name (if applicable)

Objective: State what you want to achieve by doing the experiment in one or two sentences. Be very brief and to the point.

Procedures: You can write the following: Please refer to Chem. 120 lab manual, 2007 Edition. pp. xx-xx. Record any changes to the given procedures.

Data: Organize any data, whether numerical or descriptive, in a **neat table** (or tables if applicable). Report such things as **unknown numbers**, **concentrations** of solutions, **masses** of reactants and products. Any relevant data recorded on a rough data sheet should be copied here.
Do not forget to write **chemical equations** here.

Discussion and Calculations: In this part of the report, you will make sense out of the data you have obtained. If you obtain a product, calculate the **percentage yield**. Provide a physical description of your product. Show **all** the calculations you do, but there is no need to be repetitive. For example, if you perform 3 or 4 titrations using the same two solutions, then you only need to show the calculation for one trial. In cases where you have not obtained the results you were hoping for, provide a very brief explanation.

Conclusion: In no more than two sentences, state what you have achieved by doing the experiment.

Answers To Questions: In cases where questions are asked during or at end of experimental procedures, provide the answers here.

- * Lab reports should be written in **ink, including all calculations**. The report does not have to be typed. If you are not using a computer to graph data, use graph paper. If your report does not follow the format given above, it may be deemed unacceptable and you may have to resubmit it. The new report will be considered late if it is not submitted on the same due date (see below).
- * Lab reports are normally due one week after the assigned date for the experiment. You will be informed in advance if there are any changes to the due date.
- * The report is marked out of 10. For every day the report is late, you lose 1 (one) mark.
- * Make sure to **staple** the pages of your report together, including any **rough data sheets**. You lose 1 (one) mark if the pages of your report are not stapled together.