



**School of Arts & Science
CHEMISTRY AND GEOSCIENCE DEPARTMENT**

**CHEM 120-01
College Chemistry 1
Winter 2008**

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:	Graham Shorthill		
(b)	Office Hours:	Tues: 11.30 am -12.30 pm, Fri: 9.30 am – 10.30 am		
(c)	Location:	F 348A		
(d)	Phone:	370-3472	Alternative Phone:	
(e)	Email:	shorthg@camosun.bc.ca		
(f)	Website:	N/A		

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 Chemistry: The Central Science, Brown, Lemay, Bursten, Prentice Hall, Australian Edition
- (b) Other Chemistry 120 lab manual (in-house)

4. Course Content and Schedule

Lectures: Mon, Tues, Thurs: 12.30 – 1.20 pm

Laboratory: Fri: 10.30 am -1.20 pm

Course content

Review: For chapters 1 to 3, the topics below will be covered in class. In addition students are responsible for the reviewing the remainder of these chapters independently; they contain material covered in Chemistry 11 and 12 or Camosun's Chem 060 and 080 /110

Chapters 1,2 &3

- **Why do we study chemistry?**
- **Classification of matter**
- **Units of measurement**
- **The atomic theory of matter**
- **Atomic structure**
- **Isotopes, atomic numbers and mass numbers**
- **The periodic table**
- **Molecules and molecular compounds**
- **Ions and ionic compounds**
- **Patterns of chemical reactivity**
- **The mole**
- **Empirical formulas and combustion analysis**
- **Limiting reagents**
- **Chemical reactions**
- **Concentrations of solutions**
- **Solution stoichiometry**

Gases

Chapter 9

- 9-1 Characteristics of gases**
- 9-2 Pressure**
- 9-3 The gas laws**
- 9-4 The ideal gas equation**
- 9-5 Application of the ideal gas equation**
- 9-6 Gas mixtures and partial pressures**
- 9-7 Kinetic theory of gases**
- 9-8 Effusion and diffusion**

Atomic structure:

Chapter 5

- 5-1 The wave nature of light**
- 5-2 Quantized energy and photons**
- 5-3 Bohr's model of the atom**
- 5-4 The wave behavior of matter**
- 5-5 Quantum mechanics and atomic orbitals**
- 5-6 Orbital shapes**
- 5-7 The many-electron atom**
- 5-8 Electronic configurations**
- 5-9 The periodic table**

Periodic properties:

Chapter 6

- 6-2 Atomic sizes**
- 6-3 Ionization energy**
- 6-4 Electron affinities**
- 6-5 Metals, non-metals and metalloids**
- 6-6 Group trends for groups 1 and 2**
- 6-7 Group trends for non metal groups**

Bonding:

Chapter 7

- 7-1 Chemical bonds, symbols and the octet rule**
- 7-2 Ionic bonding**
- 7-3 Sizes of the ions**
- 7-4 Covalent bonding**
- 7-5 Bond polarity and electronegativity**
- 7-6 Drawing Lewis structures**
- 7-7 Resonance structures**
- 7-8 Exceptions to the octet rule**

Chapter 8

- 8-1 Molecular shapes**
- 8-2 The V.S.E.P.R. model**
- 8-3 Polarity of polyatomic molecules**
- 8-4 covalent bonding and orbital overlap**
- 8-5 Hybrid orbitals**
- 8-6 Multiple bonds**

Intermolecular forces

Chapter 10

10-2 Intermolecular forces of attraction

10-1 A molecular comparison between liquids and solids

9-9 Real gases and deviations from ideal behavior

10-3 Properties of liquids

10-4 Phase changes

10-5 Vapour pressure

10-6 Phase diagrams

10-8 Bonding in solids

Solutions:

Chapter 12

12-1 The solution process

12-2 Solubility

12-3 Changes in solubility

12-4 Different ways of expressing concentration

12-5 Colligative properties

The Environment:

Chapter 16

16-1 The earth's atmosphere

16-2 Sunlight and photochemistry

16-3 The ozone layer

16-4 Chemistry of the troposphere

16-5 The oceans

16-6 Fresh water

5. Basis of Student Assessment (Weighting)

(Should be linked directly to learning outcomes.)

(a) Assignments: end-of-chapter questions. Assigned but not marked.

(b) Quizzes: Quiz 1: 10%
Quiz 2: 25%

(c) Exams: Comprehensive Final: 40%

(d) Other (e.g., Attendance, Project, Group Work): Laboratory: 25%

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
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D	Minimum level of achievement for which credit is granted; a course with a "D" grade cannot be used as a prerequisite.	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 E-1.5 at camosun.ca for 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, due to design may require a further enrollment in the same course. No more than two IP grades will be assigned for the same course. (For these courses a final grade will be assigned to either the 3 rd course attempt or at the point of course completion.)
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.

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.

ADDITIONAL COMMENTS AS APPROPRIATE OR AS REQUIRED