

	<p><b>School of Arts &amp; Science</b>  <b>CHEMISTRY AND GEOSCIENCE DEPARTMENT</b></p> <p><b>CHEM 120-05</b>  <b>College Chemistry 1</b>  <b>Fall 2012</b></p>
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## 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:	Larry Lee, Ph.D		
(b)	Office Hours:	M, W: 1:30-3:00 T 11:30-12:30 Thr 11:30-1:30		
(c)	Location:	F 348D		
(d)	Phone:	250-370-3463	Alternative Phone:	
(e)	Email:	<a href="mailto:leel@camosun.bc.ca">leel@camosun.bc.ca</a>		
(f)	Website:	<a href="http://online.camosun.ca">http://online.camosun.ca</a> (D2L)		

### 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 2<sup>nd</sup> Edition
- (b) Other Chemistry 120 lab manual (in-house)

#### 4. Course Content and Schedule

Lectures: M (F322) W (F322), F (F216) 11.30 – 12.20 pm

Laboratory: Thurs: 2.30 pm -5:20 pm F356

#### Chem120 Laboratory Schedule: (Fall 2012) (subject to change)

Period	Experiment	Marks
Week of Sept 3	Lab orientation	10
Week of Sept 10	Expt 2: Density of solids and liquids	20
Week of Sept 17	Expt 3 Stoichiometry Group A	20
Week of Sept 24	Expt 3 Stoichiometry Group B	
Week of Oct 1	Expt 4 Spectroscopy of Nickel	25 Full report
Week of Oct 8	Test in Lab	Term test
Week of Oct 15	Expt 5 Colorimetry of Iron	20
Week of Oct 22	Expt 6 Determination of Copper	20
Week of Oct 29	Expt 8 Molecular shapes and VSEPR	20
Week of Nov 5	Remembrance day	No lab
Week of Nov 12	Test in Lab	Term Test
Week of Nov 19	Expt 9. Preparation of Iron salt	20
Week of Nov 26	Expt 10 Analysis of Iron salt	20
Student Evaluation	preparation/safety/cleanliness	<u>20</u>
		210 total

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

**Do not** make travel arrangements for the final exam period. Only valid excuses will be allowed exam deferral.

- 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 experiments without safety glasses.
- Prelab quiz must be submitted before the start of a lab. No exceptions.
- Student lab bench must be spotless and data signed before student may leave the lab.
- Lab reports are due one week (unless indicated by the instructor) after the completion of the experiment (at the beginning of next lab period). Late labs will be given a 10% deduction for each day. No late labs are graded after the seventh day. No labs will be graded when labs have been returned.
- Lab grade consists of 9 labs, lab orientation, and student evaluation for preparation, safety, and cleanliness
- Students are expected to come to lab on time – late arrivals will be penalized.
- All lab reports must be typed and bound in a duo tang folder.

**Personal evaluation breakdown:**  
Late arrival -2 marks for each late  
Safety glasses - 2 marks for each reminder  
Unsafe operation – 10 marks  
Preparation – -1 per prelab that is not submitted on time  
Tidiness - -2 each lab  
Open toe shoes -2 for each infraction.  
Wrong disposal of chemicals, glassware... -3 for each infraction.

## 5. Basis of Student Assessment (Weighting)

- (a) Assignments: end-of-chapter questions. Assigned but not marked.
- (b) Three take home assignments: 10%  
Term test 1 (2 hours) in lab: 15% Thurs Oct 11, 2012 (2:30 p.m. Fisher 356)  
Term test 2 (2 hours) in lab: 15% Thurs Nov 15, 2012 (2:30 p.m. Fisher 356)
- (c) Exams: Comprehensive Final: 35%
- (d) Laboratory reports (full and tabulated): 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](http://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 <sup>rd</sup> 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](http://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**

## Course content

**Review:** For chapters 1 to 3 and 9, **not all** the topics below will be covered in class. Students are responsible for the reviewing the remainder of the 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*
- *Stoichiometry, limiting reagents, excess reagent*
- *Concentrations of solutions*

### Chapter 9 Gases

- 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*

*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 The solution process*
- 12-2 Solubility*
- 12-3 Changes in solubility*
- 12-4 Different ways*                      *10-8 Bonding in solids*

*Chapter 16 (the environment)*

- 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*