

CAMOSUN COLLEGE
DEPARTMENT OF CHEMISTRY AND GEOSCIENCE
Chemistry 120-03, College Chemistry I
Course Outline Winter 2011

A. General Information

Instructor: John Lee

Office - Fisher 352. Telephone: 3909 Email: leejohn@camosun.bc.ca

Email is my preferred method of communication however any problems with course material/questions should be addressed in person.

Lectures: Monday (F 210), 6.30 pm – 9.20 pm

Lab: Wednesday (F 356): 6.30 pm – 9.20 pm

Office Hours: TBA

Important Dates: January 24th Fee deadline, February 24th & 25th : Reading Break/Connections Day (College closed). March 14th: Last day to withdraw without a failing grade. April 18th - 21st and April 26th -29th Exam period.

B. Required Materials for the Course

Principal (Only) Text suitable for this course: CHEMISTRY, The Central Science: a Broad Perspective, by Brown, Lemay, Bursten, Langford, Sagatys, and Duffy. Prentice Hall. Australian edition 2nd edition (blue).

The 1st edition (purple/green) is acceptable along with the 10th and 11th US editions.

Lab Experiments: Chemistry 120 Laboratory Manual, Fall 2007 Edition (From the bookstore)

Recommended Materials for the Course

Chemistry 060 Camosun College is recommended for students that have not previously taken Chemistry 060 at Camosun and/or haven't studied chemistry for an extended period.

C. Summary of Lecture Material with Chapter References (Subject to revision and timing)

Subject	Material Covered	Lecture Hours (approximate)	Textbook chapters
Intro and Review	Classification of matter, units of measurement, significant figures, atoms, protons, neutrons, electrons, isotopes, atomic masses. Compounds, nomenclature, the mole, molar mass and percent composition by mass, chemical equations, reaction stoichiometry, solution concentration.	3	1,2, 3 and 4
Electronic Structure of Atoms	Light, quanta and photons, atomic spectra and energy levels, wave properties of electrons. Atomic orbitals, quantum numbers, electron spin, electronic structure of the hydrogen atom. Many-electron atoms, electron configurations of atoms and ions,	6	5
Periodic Properties	Development of the periodic table, effective nuclear charge, atomic and ionic radius, ionisation energy, electron affinity.	3	6
Chemical Bonding	Ionic bonds, Lewis symbols, lattice energy, properties of ionic compounds. Covalent bonds, octet rule and Lewis structures. Polyatomic species, resonance and formal charge. Exceptions to the octet rule. Electronegativity and bond polarity. Bond enthalpies	5	7
Molecular Geometry	Molecules: shape, size, and bond strength. Shapes of molecules and ions, VSEPR theory. Charge distribution in molecules, polar bonds and polar molecules. Bond strengths and bond lengths. Orbitals, hybridization and bonding. Molecular Orbitals (hydrogen atom) and Metallic Bonding	5	8
Intermolecular Forces, Liquids and Solids	Comparison of liquids and solids, intermolecular forces, ion-dipole, dipole-dipole, London dispersion forces, hydrogen bonding.	6	10

	Properties of liquids, phase changes, heating curves, critical temperature and pressure, vapour pressure, boiling point. Phase diagrams, structures of solids.		
Properties of Solutions	Solution process, solubility, factors affecting solubility, Henry's law, colligative properties.	3	11
Gases	Nature of gases, atmospheric pressure. Gas laws, ideal gas law, gas reaction stoichiometry, gas density, Daltons Law of partial pressures, kinetic molecular theory. Real gases, limitations of ideal gas law	5	9
Chemistry of the Environment	Structure of Earth's atmosphere, ozone layer and its depletion, tropospheric pollution, greenhouse effect and photochemical smog. Oceans and freshwater.	6	18

D. Course Content and Schedule

The course includes:

- a) 6 in-class review quizzes.
- b) One 2 hour written midterm test.
- c) A 3 hour written final examination at the end of the course on all the material in the course.

Notes

1. There are recommended questions found after each chapter. These problem sets will not be marked but solutions to the red questions may be found at the end of the textbook or the accompanying CD. Answers to any of the questions in black may be given on request.
2. The midterm test will be on material covered in the half of the course. It will take place during the lab period of week
3. The in class quizzes will be on material covered in the previous 2 weeks. They will be given at the start of class, answers will be given after the quiz.
4. At least 2 of the 14 evenings designated for Lab classes may be used for additional lectures or reviews. Sufficient notice will be given

E. Basis of Student Assessment (Weighting)

The course mark will be derived in the following manner:

6 Quizzes	(3% each) = 18 %
1 Midterm test	18 %
Final	39 %
Laboratory work	25 %

If it is advantageous to the student the theory mark will be solely derived from the final examination, or a combination of midterm/quizzes with the final.

Quiz dates (preliminary) January 31st February 14th, 28th, March 14th, 28th, April 6th.

In the event of a quiz or midterm test being missed due to illness/other commitments the weight of the missed quiz/test will be carried over to the final. There are no make-up dates for quizzes or midterm.

F. The Laboratory Mark

Detailed information will be presented at the first laboratory class. Students must pass BOTH the laboratory section and the lecture section of the course to obtain a passing grade.

No more than 2 laboratory classes may be missed, during the course. In the event of a student being unable to attend a laboratory class it is advised that the student attempt to obtain data from a partner or perform the class with another section.

The lab mark is based on attendance and the laboratory report. A student that attends the laboratory class but does not present a written report will receive a score of 40%.

Students are responsible for obtaining their own safety glasses and laboratory jacket from the bookstore.

G. The Grading System

The following scale is used by Camosun College:

>90 A+ 77-79 B+ 65-69 C+ 50-59 D 0-49 F

85-89 A 73-76 B 60-64 C

80-84 A- 70-72 B-

H. 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.

I. 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, Registrar=s Office or the College web site at <http://www.camosun.bc.ca>

ACADEMIC CONDUCT POLICY **{tc \15 "ACADEMIC CONDUCT POLICY}**

There is an Academic Conduct Policy. It is the student=s responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, Registration, and on the College web site in the Policy Section.

www.camosun.bc.ca/divisions/pres/policy/2-education/2-8

John Lee Winter Lab Schedule:

Note: Everybody will do Expt. 2 in Week II. Half of the class (14-16 students) will do Expt. 3 in Week III and the other half of the class will do Expt. 3 in Week IV.

Chem 120 (03) - Tuesdays, 6:30-9:20 pm in Fisher 356

Week Number Begins on	Activity & Experiment Number	Actual Date of Lab Wednesday
I Jan 10th	Review & Lab Orientation— attendance mandatory	Jan 12th
II Jan 17th	Expt. 2 Densities of Solids & Liquids	Jan 19th
III Jan 24th	Group A Expt. 3 Stoichiometry of Chem. Rxns	Jan 26th
IV Jan 31st	Group B Expt. 3 Stoichiometry of Chem. Rxns	Feb 2nd
V Feb 7th	Expt. 4 The Spectroscopic Determination of Nickel in Aqueous Solution	Feb 9th
VI Feb 14th	Expt. 5 Colorimetric Determination of Iron in a Vitamin Tablet	Feb 16th
VII Feb 21st	Lecture	Feb 23rd
VIII Feb 28th	Test	Mar 2nd
IX Mar 7th	Expt. 6 Determination of Copper Using Atomic Absorption Spectroscopy	Mar 9th
X Mar 14th	Expt. 7 Determination of the Total Hardness of Water Using E.D.T.A.	Mar 16th
XI Mar 21st	Expt. 9 The Preparation of Potassium Tris(oxalato)Ferrate(III)	Mar 23nd
XII Mar 28th	Expt. 10 Analysis & Uses of Potassium Tris(oxalato)Ferrate(III)	Mar 30th
XIII Apr 4th	lecture	Apr 6th
XIV Apr 11th	Exam Info & Review	Apr 13th

Note: This is only a preliminary lab schedule, changes will be made due to equipment &/or glassware problems, or rescheduling of tests... Lab coat and eye protection are both mandatory!!

