

	<p>SCHOOL OF ARTS & SCIENCE CHEMISTRY AND GEOSCIENCE DEPARTMENT</p> <p>CHEM 120-003</p> <p>2012 Winter</p>
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A. General Information

Instructor: John Lee

Office: Fisher 344a (Ph:3446) **Email:** leejohn@camosun.bc.ca **twitter:** *johnatcamosun*

Email/twitter are my preferred methods of communication, rather than phone. Any problems with course material/questions should be addressed in person.

Lectures: Monday (F302), 6.30 pm – 9.20 pm

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

Office Hours: Monday, Wednesday, and Friday 10.30 am to 11.30 am, Monday 1.20 to 2.20 pm, any other times by appt.

Important Dates: January 23th Fee deadline, February 16th & 17th : Reading Break/Connections Day (College closed). March 13th: Last day to withdraw without a failing grade. Good Friday April 6th, College closed; Easter Monday, April 9th College closed. April 16th - 21st and April 23rd -24th 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 2009 Edition (Neil Meanwell)

Recommended Materials for the Course

Chemistry 100, Camosun College course pack is a good source of review material for those students who may have been away from Chemistry for a while.

C. 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.

- 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.
- Use standard chemistry lab equipment, including burets, pipets, Buchner filters, and volumetric glassware in the correct manner.
- 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.

D. 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. Properties of liquids, phase changes, heating curves, critical temperature and pressure, vapour pressure, boiling point. Phase diagrams, structures of solids.	6	10
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

E. Course Content and Schedule

The course includes:

- 4 in-class review quizzes.
- A 3 hour written midterm test.
- A 3 hour written final examination at the end of the course on all the material in the course.

Notes

- There are recommended questions for 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.
- The midterm test will be on material covered in the first half of the course. It will take place during the scheduled lab period, Wednesday February 29th.
- 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. Quiz dates (preliminary) January 30th, February 20th, March 12th, April 4th.
- At least 2 of the 14 evenings designated for Lab classes may be used for additional lectures or reviews. Sufficient notice will be given.

F. Basis of Student Assessment (Weighting)

The course mark will be derived in the following manner:

4 Quizzes	(5% each) = 20 %
1 Midterm test	20 %
Final	35 %

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.

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.

G. 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.

H. The Grading System

Grading System, Standard (GPA)

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

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 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. <i>(For these courses a final grade will be assigned to either the 3rd course attempt or at the point of course completion.)</i>
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.

1. You must score a minimum of 50 % on laboratory work to be permitted to take the final exam and participate in 6 of 8 lab classes.

2. You must pass both the **lecture portion and the laboratory portion in order to pass 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.

Winter 2012 – Chem 120-003 Provisional Lab Schedule

Chem 120 (003) – Wednesdays, 6:30-9:20 pm in Fisher 356

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

Week Number Begins on	Activity & Experiment Number	Actual Date of Lab Wednesday
I Jan 9th	Lab Safety Attendance Mandatory unless previous lab credit has been granted	Jan 11th
II Jan 16th	Expt. 2 Densities of Solids & Liquids	Jan 18th
III Jan 23rd	Group A Expt. 3 Stoichiometry of Chem. Rxns	Jan 25th
IV Jan 30th	Group B Expt. 3 Stoichiometry of Chem. Rxns	Feb 1st
V Feb 6th	Expt. 4 The Spectroscopic Determination of Nickel in Aqueous Solution	Feb 9th
VI Feb 13th	Expt. 5 Colorimetric Determination of Iron in a Vitamin Tablet	Feb 15th
VII Feb 20th	[Class instead of Lab]	Feb 22nd
VIII Feb 27th	Midterm Test	Feb 29th
IX Mar 5th	Expt. 6 Determination of Copper Using Atomic Absorption Spectroscopy	Mar 7th
X Mar 12th	Expt. 8 VSEPR and gases lab	Mar 14th
XI Mar 19th	[Class instead of lab]	Mar 22nd
XII Mar 26th	Expt. 9 The Preparation of Potassium Tris(oxalato)Ferrate(III)	Mar 28th
XIII Apr 2nd	Expt. 10 Analysis & Uses of Potassium Tris(oxalato)Ferrate(III)	Apr 4th
XIV Apr 9th	[Material review]	Apr 11th
Final Exam Period	Final Exams Apr 16th to Apr 21st and Apr 23rd to Apr 24th	