



COURSE OUTLINE

The course description is online @ <http://camosun.ca/learn/calendar/current/web/chem.html>

Ω Please note: the College electronically stores this outline for five (5) years only.
It is **strongly recommended** you keep a copy of this outline with your academic records.
You will need this outline for any future application/s for transfer credit/s to other colleges/universities.

1. Instructor Information

(a)	Instructor:	Dr. Tatiana Popa
(b)	Office Hours:	Monday, Wednesday 4:30-5:30 pm or by appointment
(c)	Location:	Room 106E, Fisher Building, Lansdowne Campus
(d)	Phone:	(250) 370-3374
(e)	Email:	PopaT@camosun.bc.ca
(f)	Website:	D2L

2. Intended Learning Outcomes

(No changes are to be made to these Intended Learning Outcomes as approved by the Education Council of Camosun College.)

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 (Minimum)

(a) **Mastering Chemistry Course Code.** \$50. A Mastering Chemistry Access Code can be purchased from the Pearson Website. <http://www.pearson.com.au/9781442563902> If you choose to purchase a new textbook or ebook (see below) then this includes a Mastering Chemistry Course Code. It is valid for 24 months after activation.

(b) Chemistry 120 Laboratory Manual (Neil Meanwell)

Other Recommended Materials for the Course

Chemistry, The Central Science, Brown, le May, Bursten. Custom Camosun Edition. \$145. (For hard copy and access code). Ebook and access code \$114. Available from the Camosun Bookstore The 2nd and 1st Australian editions are also acceptable if you have a used book. **If you buy a used book that is not the most recent edition you will still need to purchase a Mastering Chemistry access code.**

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.

4. Course Content and Schedule

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.	5	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.	3	18

Lecture Monday 6:00 pm - 8:50 pm Fisher Building - Room 334
 Laboratory Wednesday 6:00 pm – 8:50 pm Fisher Building - Room F356

Test I Wednesday Feb 8th (Lab period)
 Test II Wednesday March 22nd (Lab period)

5. Basis of Student Assessment (Weighting)

- (a) Online Assignments 25%
- (b) Laboratory work 20%
- (c) Test I and II (2x12.5%) 25%
- (d) Final exam 30%

If it is advantageous to the student the theory mark will be solely derived from the final examination, or a combination of midterm with the final. **Online assignment marks may not be carried over so you must complete these before the due date. You usually have several weeks to do these assignments so no excuses will be accepted, no exceptions.**

To write the final exam you must achieve a minimum final score of **50%** on laboratory work, and you must pass **both** the lecture portion and the laboratory portion in order to pass the course.

Students are responsible for obtaining their own safety glasses and laboratory jacket from the bookstore. It is not the responsibility of the College to provide you with safety equipment.

6. Grading System

(No changes are to be made to this section unless the Approved Course Description has been forwarded through the Education Council of Camosun College 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 the College web site in the Policy Section.

ADDITIONAL COMMENTS AS APPROPRIATE OR AS REQUIRED

Laboratory schedule Winter 2017

Week Number	Date of lab	Experiment
I	Wed, Jan 11 th	<i>Laboratory & Safety Orientation</i>
II	Wed, Jan 18 th	Expt 2. Densities of Solids & Liquids
III	Wed, Jan 25 th	Expt 3. Stoichiometry of Chemical Reactions – Gr A
IV	Wed, Feb 1 st	Expt 3. Stoichiometry of Chemical Reactions – Gr B
V	Wed, Feb 8 th	Term Test #1
VI	Wed, Feb 15 th	Reading Break
VII	Wed, Feb 22 nd	Expt 4. The Spectrophotometric Determination of Nickel in Aqueous Solution
VIII	Wed, Mar 1 st	Expt 5. Colorimetric Determination of Iron in a Vitamin Tablet
IX	Wed, Mar 8 th	Expt 6. Determination of Copper Using Atomic Absorption Spectroscopy
X	Wed, Mar 15 th	Expt 7. Hard Water determination
XI	Wed, Mar 22 nd	Term Test #2
XII	Wed, Mar 29 th	Expt 9. The Preparation of Potassium Tris(oxalato)Ferrate(III)
XIII	Wed, Apr 5 th	Expt 10. Analysis & Uses of Potassium Tris(oxalato)Ferrate(III)
XIV	Wed, Apr 12 th	Expt 8. Molecular shapes