



COURSE OUTLINE

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

- * 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:	Silvija Smith
(b)	Office Hours:	Mondays and Wednesdays 16:00-17:00 or by appointment
(c)	Location:	F344D
(d)	Phone:	250-370-3506
(e)	Email:	SmithS@camosun.bc.ca

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. Use dimensional analysis, metric and SI units in performing chemical calculations.
2. Utilize the specialized vocabulary and nomenclature of chemistry and name chemical compounds, and identify and construct chemical formulas.
3. Summarize the characteristics of electrons, protons and neutrons, and identify their roles as components of atoms, ions and isotopes, including radioisotopes.
4. Describe atomic structure, the differences between elements, and the role of the periodic table in organizing elements within a coherent theoretical and empirical system.
5. Describe and account for the periodic table trends concerning atomic number, atomic radius, ionization energy and electronegativity.
6. Compare the formation and characteristics of ionic and molecular compounds.
7. Perform mathematical calculations involving chemical formulas, molecular weights, moles, Avogadro's number and Molarity.
8. Balance chemical equations, including use of the mole concept, and solve stoichiometry problems.
9. Account for the general characteristics of the gas, liquid, and solid states.
10. Conduct experiments in basic chemistry, utilizing common chemistry laboratory equipment with an enhanced knowledge and practice in basic lab skills.

3. Required Materials

(a)	Text: Coursepack	Mandatory	Chemistry 100 Course Notes, Lab Manual, and Problem Sets, 2016 Edition. Camosun College Publications.
(b)	Scientific Calculator	Mandatory	Available in bookstore
(c)	Safety Glasses	Mandatory	Bookstore has "Uvex" safety eyewear – please check if using others
(d)	Covered Footwear	Mandatory	Exposed feet (e.g. sandals, flip-flops) are not permitted in the lab during experiments
(e)	Lab Coat	Recommended	Bookstore has cloth coats available – please check if using others

4. Course Content and Schedule

(This section can include: class hours, lab hours, out of class requirements and/or dates for quizzes, exams, lectures, labs, seminars, practicums, etc.)

Locations & Times

	Time	Location
Lecture	Monday 17:30 – 20:20 Wednesday 17:30 – 18:20	Fisher Building, Room F336
Lab	Sec 01 Wednesday 18:30 – 20:20 Sec 04A Thursday 9:30 – 11:30	Fisher Building, Room F300

Lecture Plan

Unit	Topic
1	Measurements & Calculations
2	Introductory Terminology
3	Chemical Formulas & Names
4	Calculations Based Upon Formulas
5	Stoichiometry
6	Periodic Table & Electron Distributions
7	Chemical Bonding
8	Gases
9	Liquids & Solutions
10	Organic Chemistry
11	Radioactivity

Lectures, homework exercises, and assignments will follow the course pack at a pace of approximately one unit per week.

Laboratory Schedule

Week	Date (Wednesday)	Experiment #	Title
1	Jan. 13		Introduction: Safety in the Chemistry Laboratory
2	Jan. 20	1	Density
3	Jan. 27	4	Heat of Combustion
4	Feb. 3	3	Separating Mixtures
5	Feb. 10		Midterm I (No lab)
6	Feb. 17	5 & 15	Recycling Copper – Part I & Accuracy and Precision Mini-Experiment
7	Feb. 24	5	Recycling Copper – Part II
8	Mar. 2	5 & 6	Recycling Copper – Part III & The Iron and Copper Sulfate Reaction
9	Mar. 9	7	The Copper and Silver Nitrate Reaction
10	Mar. 16		Midterm II (No lab)
11	Mar. 23		Molecular geometry and polarity (model kits)
12	Mar. 30	11	The Magnesium and Hydrochloric Acid Reaction
13	Apr. 6	12	Neutralization
14	Apr. 13		Final Exam Review

5. Basis of Student Assessment (Weighting)

(This section should be directly linked to the Intended Learning Outcomes.)

Lab	20%
Assignments	20%
Midterm I	15%
Midterm II	15%
Final Exam (comprehensive)	30%

The Laboratory Mark

The lab mark is based on attendance and the laboratory report. A student that actively participates in a laboratory class without completing the lab report will receive a minimum score of 50% on that lab (a report must still be submitted).

Students must watch an introductory Lab Safety video in the first lab class before they can begin any experiments. In the event of missing the Lab Safety presentation students are responsible for watching the safety DVD.

Wearing of safety goggles is mandatory in all labs. Students who forget or refuse to wear safety goggles will not be allowed to participate and complete the lab.

Attendance in all the lab and review periods is mandatory. There are no exceptions other than an official doctor's note. Missed labs without adequate reason will result in a mark of zero for that lab. Permissions for an exception must be documented by email permission from the instructor and by a submitting the doctor's note.

Laboratory reports can usually be completed during the lab period, but are otherwise due at the beginning of the following experimental lab period. The lab manual has been designed to allow students to hand in the completed pages taken directly from the manual. Each lab partner must hand in a separate report even though lab partners are expected to share equally in experimental work.

General Notes:

1. If it is advantageous to the student, any midterm mark which is inferior to the final exam mark, will be replaced by an equal weighting from the final exam.
2. To write the final exam you must have a minimum final score of 50% on laboratory work.
3. You must pass the lecture and lab portions separately in order to pass the course.
4. There will be no make-up midterm exams. The weight of a missed midterm will be reassigned to the final exam.
5. No late assignments will be accepted. Assignments are due at the beginning of class on the assigned due date. No exceptions will be made. All work must be shown to receive full credit for the solution. The lowest assignment mark will be dropped in calculating the final assignment grade.

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. <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.
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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.

Students may not use recording devices in the classroom without the prior permission of the instructor. However, the instructor's permission is not required when the use of a recording device is sanctioned by the College's Resource Centre for Students with Disabilities in order to accommodate a student's disability and when the instructor has been provided with an instructor notification letter which specifies the use of a recording device. Recordings made in the classroom are for the student's personal use only, and distribution of recorded material is prohibited.

ADDITIONAL COMMENTS AS APPROPRIATE OR AS REQUIRED

8. Brief Summary of Course Content

Unit 1 – Measurements and Calculations

SI units, SI prefixes, metric conversions, scientific notation, measurements, calculations using measurements, density calculations, energy and energy calculations.

Unit 2 – Introductory Terminology

The scientific method, physical and chemical changes, elements and compounds, mixtures, metals and non-metals, Dalton's atomic theory, atoms and molecules, subatomic particles, the nuclear atom, isotopes, ions, and atomic masses.

Unit 3 – Chemical Formulas and Names

Composition of a compound, number of units of a compound, formulas of compounds, naming compounds, chemical formulas for some common compounds.

Unit 4 – Calculations Based upon Chemical Formulas

Molecular and formula masses, percentage by mass composition, the Mole concept, conversions between moles and grams, moles of molecular and ionic substances, calculations involving numbers of particles, grams and moles, mass of an atom in grams.

Unit 5 – Stoichiometry

Writing balanced equations, interpreting and using equations, stoichiometry calculations using equations, limiting reactant concepts, percentage yield, heat and chemical reactions.

Unit 6 – The Periodic Table and Electronic Distributions in Atoms

Chemical families, electron energy levels, energy sublevels and orbitals, electron arrangements in atoms, electron dot formulas, atomic size and periodic trends, ionization energy and periodic trends, chemical properties of elements and periodic trends.

Unit 7 – Chemical Bonding

Ionic compounds and the ionic bond, molecular compounds and the covalent bond, multiple bonds, electronegativity concept and bond polarities, molecular geometry and polarity.

Unit 8 – Gases

Why gases exist, gas volume and pressure, units of pressure, gas volume and temperature, absolute temperature and the Kelvin scale, standard temperature and pressure (STP), partial pressures, relating gas volumes to the number of molecules, reaction stoichiometry for gases.

Unit 9 – Liquids and Solutions

The liquid state, hydrogen bonding, vapour pressure and boiling point, liquid solutions, solubility, concentrations of liquid solutions, dilution of a solution, electrolytes, ion concentrations, ionization, pH scale, stoichiometry of reactions in solution.

Unit 10 – Organic Chemistry

Why so many organic compounds? Structural formulas, isomers, hydrocarbons, alkanes, condensed structural formulas, alkenes, alkynes, cycloalkanes, aromatic hydrocarbons, alcohols, selected chemical reactions, polymerization reactions.

Unit 11 - Radioactivity

Radioactive substances, Alpha, Beta and Gamma rays, Alpha decay, Beta decay, Gamma decay, production of radioactive substances, dating of objects, medical use of radioisotopes.