



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:	Neil Meanwell		
(b)	Office Hours:	Mon: 3.00 pm – 4.00 pm. Tues, Wed, Thu, Fri: 12.30 pm – 1.30 pm.		
(c)	Location:	F 348B		
(d)	Phone:	370-3448	Alternative Phone:	(250)729-3838
(e)	Email:	meanwen@camosun.bc.ca or chemhelp@shaw.ca		
(f)	Website:	N/A		

Prerequisite: Principles of Math 10, or Foundations of Math and Pre-calculus, or Math 053, or Math 057, or assessment.

Important Dates: Thanksgiving Day, Monday, October 10th; last day to withdraw without receiving a failing grade for the course Tuesday, November 8th; Remembrance Day, Friday, November 11th.

2. Intended Learning Outcomes

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 (available from the Camosun Bookstore, Lansdowne Campus)

- (a) Principal Text: **CHEM 100 Course Pack** (Includes Course Notes, Lab Manual and Supplementary Problem Sets) by Les Waye (In-house).
- (b) Safety Glasses (compulsory for laboratory work).

4. Course Content and Schedule

- a) Lectures: Wed, 8.30 am – 10.20 pm (F 202); Fri, 8.30 am – 10.20 am (F 202)
- b) Laboratory sessions: Mon, 1.00 pm – 2.50 pm (Fisher 300)
- c) Written reports on laboratory work.
- d) End-of-Chapter Exercises¹
- e) Six assignment sets distributed at regular intervals during the semester.
- f) Two 2-hour written midterm tests.³
- g) A three-hour written final examination at the end of the course on **all** the material in the course.

Notes

1. These exercises sets will not be marked but solutions will be posted outside my office at regular intervals during the term.
2. The assignments are taken in for marking and given credit towards the overall course mark.
3. The midterms are set for **week seven** and **week eleven** and will run in the laboratory time slots for those weeks. The first midterm will be on all the material covered in the course during the first six weeks. The second midterm will be on all the material covered from week six to week eleven

5. Basis of Student Assessment (Weighting)

- (a) Assignments: 2.5% each, 15% in total.
- (b) Exams: Midterm Exams (@ 15%): 30%; Final Exam: 35%
- (c) Lab work: 20%

Notes

1. If it is advantageous to the student any quiz or midterm mark which is inferior to the final exam mark will be replaced by an equal weighting from the final exam.
2. You must pass the lecture and lab portions **separately** in order to pass the course.

6. Grading System

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.

8. Brief Summary of Course Content

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

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.

3. Chemical Formulas and Names Composition of a compound, number of units of a compound, formulas for compounds, naming compounds, chemical formulas for some common compounds.

4. Calculations Based upon Chemical Formulas Molecular and formula masses, percentage by mass composition, the Mole concept, interconversions between moles and grams, moles of molecular and ionic substances, calculations involving numbers of particles, grams and moles, mass of an atom in grams.

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

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.

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.

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.

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.

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.

9. Laboratory Schedule

Week Number and Date (Monday)	Experiment # and Title
1. (5 th September)	No Lab – Labour Day
2. (12 th September)	Introduction: Safety in the Chemistry Laboratory/Lecture
3. (19 th September)	#1 Density
4. (26 th September)	#2 Identifying Liquids
5. (3 rd October)	#3 Separating Mixtures
6. (10 th October)	No lab Thanksgiving Day
7. (17 th October)	No Lab - Midterm #1
8. (24 th October)	#4 Heat of Combustion
9. (31 st October)	#5 Recycling Copper
10. (7 th November)	#9 Chemical Reactivity
11. (14 th November)	No Lab – Midterm #2
12. (21 st November)	#7 The Copper and Silver Nitrate Reaction
13. (28 th November)	#11 The Reaction Between Magnesium and Hydrochloric acid
14. (5 th December)	#13 Synthesis of Aspirin