



School of Arts & Science
CHEMISTRY AND GEOSCIENCE DEPARTMENT

CHEM 060-02
College Chemistry 1
2010F

COURSE OUTLINE

The Approved Course Description is available on the web @ _____

✦ *Please note: this outline will be electronically stored for five (5) years only.
It is strongly recommended students keep this outline for your records.*

1. Instructor Information

(a)	Instructor:	Neil Meanwell		
(b)	Office Hours:	Mon, Fri: 11.30 am – 12.30 pm. Mon, Tues, Wed, Fri: 1.30 pm -2.30 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: Monday, October 11th, Thanksgiving Day; Tuesday, November 9th, last day to withdraw without receiving a failing grade for the course; Thursday, November 11th, Remembrance Day.

2. Intended Learning Outcomes

Upon completion of this course the student will be able to:

1. Utilize the specialized vocabulary and nomenclature of chemistry.
2. Use metric and SI units in performing chemical calculations.
3. Describe the experimental discovery of subatomic particles, summarize the characteristics of electrons, protons and neutrons, and identify their roles as components of atoms, ions and isotopes including radioisotopes.
4. Communicate an understanding of 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. Demonstrate an ability to name chemical compounds, and identify and construct chemical formulas.
7. Compare the formation and characteristics of ionic and molecular compounds.
8. Demonstrate an ability to perform mathematical calculations involving chemical formulas, molecular weights, moles, Avogadro's number and Molarity.

9. Balance chemical equations, demonstrate an understanding of the information they provide chemists and solve stoichiometry problems.
10. Identify and account for the general characteristics of the gas state and solve mathematical problems involving Boyle's Law, Charles' Law, Gay-Lussac's Law and Avogadro's Law.
11. Use basic organic chemistry nomenclature and structural representations associated with simple organic molecules and common functional groups.
12. Conduct experiments in basic chemistry utilizing common chemistry laboratory equipment with a knowledge and practice in basic chemical safety procedures.

3. Required Materials (available from the Camosun Bookstore, Lansdowne Campus)

- (a) Principal Text: **CHEM 060 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) Scheduled lectures: Mon, 2.30 – 3.20 pm (F 302); Tues, 2.30 – 4.20 pm (F 202); Wed, 2.30 – 3.20 pm (F 302)
- b) Laboratory sessions (biweekly): Fri, 2.30 – 4.20 pm (F 300)
- c) End-of-Chapter Exercises¹
- d) Five term quizzes set at regular intervals during the semester.²
- e) A 2-hour written midterm test.³
- f) 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. Tentatively scheduled for **weeks three, five, seven, eleven** and **thirteen** of the term.
3. The midterm test will be given in **week nine**. It will cover all the material in the course covered during the first eight weeks. It will take place during the lab period of **week nine**.

5. Basis of Student Assessment (Weighting)

- (a) Quizzes: 3% each, 15% in total.
- (b) Exams: Midterm Exam: 25%; Final Exam: 40%
- (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 on 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.

11. Radioactivity Radioactive substances, alpha, beta and gamma radiation, alpha decay, beta decay and gamma decay, synthesis of radioactive substances, dating of objects using radioactivity, medical uses of radioisotopes.