



School of Arts & Science  
CHEMISTRY AND GEOSCIENCE DEPARTMENT  
CHEM 100-03  
Introductory Chemistry  
2013F

## 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. Nasr Khalifa		
(b)	Office Hours:	T, W, Th 9:30am-10:30am and M, T, W, Th 11:30am-12:30pm		
(c)	Location:	F348C		
(d)	Phone:	250-370-3201	Alternative Phone:	
(e)	Email:	khalifa@camosun.bc.ca		
(f)	Website:	<a href="http://faculty.camosun.ca/nasrkhalifa">http://faculty.camosun.ca/nasrkhalifa</a>		

#### Course description:

*This course is a basic introduction to chemistry and is intended for students with little or no background in chemistry. Topics include: chemical formulae and equations, simplest formula, atomic mass, mole concept, molarity, periodic table, molecules and chemical bonding, and some descriptive chemistry. Experiments will emphasize basic lab techniques.*

Credits: 4

**Mode and Hours of Delivery: 4 hours of lectures and 2 hours of labs.**  
**Duration: 15 weeks, estimated out-of-class: at least 4 hours per week.**

#### Pre-requisites:

**“C” in Principles of Math 10, or Foundations of Math & Pre-calculus 10, or MATH 053, or 057, or assessment.**

Prior Learning Assessment Available: Yes

### 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)	Texts	Required: Chemistry 100 Course Notes / Lab Manual / Problem Sets, Department of Chemistry & Geoscience, Camosun College. June 2012. (Available at the Camosun bookstore)
(b)	Other	Safety glasses are mandatory. Lab coats are recommended.

### 4. Course Content and Schedule

#### Detailed Course Outline:

#### 1. Measurements and Calculations:

- SI units, Si prefixes, metric conversions, scientific notation
- measurements, calculations using measurement, 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 of compounds
- naming compound, chemical formulas for some common compound

#### 4. Calculations Based on 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 The Distribution of Electrons 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 temperatures and the Kelvin scale
- standard temperature and pressure (STP)
- partial pressures, relating gas volume 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 Reactions:

- why so many organic compounds
- structural formulas, condensed structural formulas, isomers
- hydrocarbons, alkanes, alkenes, alkynes, cycloalkanes, aromatic compounds, alcohols
- selected organic chemical reactions
- polymerization reactions

## 5. Basis of Student Assessment (Weighting)

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

(a)	Assignments	Lab Experiments	25%
(b)	Quizzes	Quiz #1 (September 23) Quiz #2 (October 21) Quiz #3 (November 18)	5% 5% 5%
(c)	Exams	Test #1(Oct. 7 <sup>th</sup> , 2 hours) Test #2 (Nov. 4 <sup>th</sup> , 2 hours) Final Exam (December, 3 hours)	15% 15% 30%
(d)	Other		

## Chem. 100 Lab Schedule (Fall 2013) (Subject to change)

Sept. 9	No labs. Safety introduction
Sept. 16	Experiment 1: Density
Sept. 23	Experiment 2: Identifying liquid compounds
Sept. 30	Experiment 3: Separating mixtures
Oct. 7	<b>Test #1 (test will be written during the lab period)</b>
Oct. 14	<b>Thanksgiving Holiday</b>
Oct. 21	Experiment 4: Heat of combustion
Oct. 28	Experiment 5: Recycling copper
Nov. 4	<b>Test #2 (test will be written during the lab period)</b>
Nov. 11	<b>Remembrance Day</b>
Nov.18	Experiment 7: The copper and silver nitrate reaction
Nov. 25	Experiment 11: The magnesium and hydrochloric acid reaction
Dec. 2	Experiment 13: Synthesis of Aspirin
Dec. 9	No labs

\*Final exam at the end of the course will cover **all** course material.

\*At least a passing grade on lab marks must be achieved in order to write the final exam.

\*You must pass both the lecture portion and the lab portion in order to pass the course.

\*You must provide your own **safety glasses**. Prescription glasses are OK, but sunglasses are NOT. You must wear these safety glasses at all times while you are in the lab. You will not be allowed to carry out experiments without safety glasses.

\*Office hours are posted on the door. You can, however, drop by the office any time.

You will not be wasting my time if you come for help. I'm here to help you learn.

## 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](http://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 3<sup>rd</sup> 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.

## 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](http://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.  
<http://camosun.ca/about/policies/policies.html>