



## 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. Kyle Duncan		
(b)	Office Hours:	Mon 4-5 Tues 4-5		
(c)	Location:			
(d)	Phone:		Alternative Phone:	
(e)	Email:	<a href="mailto:duncank@camosun.bc.ca">duncank@camosun.bc.ca</a>		
(f)	Website:			

### 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

- (a) **Textbook:** Chemistry: the central science, Brown, Lemay, Bursten, Murphy, Woodward, Langford, Sagatys, and George, Australian 3<sup>rd</sup> Edition, © Pearson 2014.
- (b) **Laboratory Manual:** Camosun CHEM 120 Lab manual (in house).

### 4. Course Content and Schedule

Lecture: Monday 5:30PM-8:20PM

Fisher Building – Room 200

## Tentative Course Schedule (subject to change)

Lecture		Laboratory	
January 11	Intro + Review + Gases	January 12	Safety lab
January 18	Gases (Chapter 10)	January 19	Expt 2: Densities of solids and liquids
January 25	Gases + Atomic structure (A1)	January 26	Expt 3: Stoichiometry Group 1
February 1	Atomic structure (Chapter 6)	February 2	Expt 3: Stoichiometry Group 2
February 8	<b>Family Day (no class)</b>	February 9	Expt 4: Spectroscopy of Nickel
February 15	Periodic properties (Chapter 7) (A2)	February 16	<b>TERM TEST 1</b>
February 22	Periodic properties (Chapter 7)	February 23	Expt 5: Colorimetry of Iron
February 29	Bonding (Chapter 8) (A3)	March 1	Expt 6: Copper quantification
March 7	Bonding (Chapter 8 and 9)	March 8	Expt 7: Water hardness
March 14	Molecular geometry (Chapter 9) (A4)	March 15	<b>TERM TEST 2</b>
March 21	Intermolecular forces (Chapter 11)	March 22	Expt 8: Molecular shape
March 28	<b>Easter Monday (no class)</b>	March 29	Expt 9: Iron salt preparation
April 4	Solutions (Chapter 12) (A5)	April 5	Expt 10: Iron salt analysis
April 11	Environmental Chemistry (Chapter 13)	April 12	Final exam review

\* Assignment distribution signified by A#: they are due at the beginning of the next scheduled lecture class

### 5. Basis of Student Assessment (Weighting)

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

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|---|-----|
| (a) Assignments (best 4 of 5, 2.5% each)  | 10% |
| ➤ Assignments are due at the <u>beginning</u> of the next scheduled lecture block from when they are distributed. |     |
| (b) Term tests (2 at 12.5% each)  | 25% |
| (c) Final exam (cumulative and comprehensive)   | 40% |
| (d) Laboratory  | 25% |

## 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. (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.)
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.

### ADDITIONAL COMMENTS AS APPROPRIATE OR AS REQUIRED

## 8. Material Covered

### Review – Chapters 1,2, and 3

Students are responsible for all material contained in introductory chapters.

### Gases – Chapter 10

- 10.1 Characteristics of gases
- 10.2 Pressure and its measurement
- 10.3 The gas laws
- 10.4 The ideal gas equation
- 10.5 Further application of the ideal gas equation
- 10.6 Gas mixtures and partial pressures
- 10.7 Kinetic molecular theory
- 10.8 Molecular effusion and diffusion

### Atomic Structure – Chapter 6

- 6.1 The wave nature of light
- 6.2 Quantized energy and photons
- 6.3 Line spectra and the Bohr model
- 6.4 The wave behavior of matter
- 6.5 Quantum mechanics and atomic orbitals
- 6.6 Representations of orbitals
- 6.7 Many electron atoms
- 6.8 Electron configurations
- 6.9 Electron configurations and the periodic table

### Periodic Properties – Chapter 7

- 7.2 Effective nuclear charge
- 7.3 Sizes of atoms and ions
- 7.4 Ionization energy
- 7.5 Electron affinities
- 7.6 Metals, non-metals and metalloids

### Chemical Bonding – Chapter 8

- 8.1 Chemical bonds, Lewis symbols, and the octet rule
- 8.2 Ionic bonding
- 8.3 Covalent bonding
- 8.4 Bond polarity and electronegativity
- 8.5 Drawing Lewis structures
- 8.6 Resonance structures
- 8.7 Exceptions to the octet rule

### Molecular Geometry – Chapter 9

- 9.1 Molecular shapes
- 9.2 The VSEPR model
- 9.3 Molecular shape and molecular polarity
- 9.4 Covalent bonding and orbital overlap
- 9.5 Hybrid orbitals
- 9.6 Multiple bonds
- 9.7 Molecular orbitals

### Intermolecular Forces – Chapter 11

- 11.1 Intermolecular force comparison of gases, liquids, and solids
- 11.2 Intermolecular forces
- 11.3 Some properties of liquids
- 11.4 Phase changes
- 11.5 Vapour pressure
- 11.6 Phase diagrams

Properties of Solutions – Chapter 12

- 12.1 The solution process
- 12.2 Saturated solutions and solubility
- 12.3 Factors affecting solubility
- 12.4 Ways of expressing chemical concentration

Environmental Chemistry – Chapter 13

- 13.1 Earth's atmosphere
- 13.2 Human activities and Earth's atmosphere
- 13.3 Earth's water
- 13.5 Human activities and Earth's water