



**CAMOSUN COLLEGE**  
**School of Arts & Science**  
**Department of Chemistry & Geoscience**

**CHEM-120-003**  
**College Chemistry 1**  
**Fall 2019**

## **COURSE OUTLINE**

---

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

Ω Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.

---

### **1. Instructor Information**

(a) Instructor	John Lee
(b) Office hours	See posted times on office door and by appointment
(c) Location	F 348 D
(d) Phone	250 370 3436 <b>Alternative:</b> _____
(e) E-mail	leejohn@camosun.ca
(f) Website	D2L

### **2. Intended Learning Outcomes**

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) Texts

**Pearson My Lab and Mastering Course Code.** \$70. A Mastering Access Code can be purchased from the bookstore. If you choose to purchase a new textbook or ebook (see below) then this includes a Mastering Course Code. It is valid for 24 months after activation and you can use it for CHEM 121 as well.

### Other Recommended Materials for the Course

Chemistry, The Central Science, Brown, le May, Bursten. Custom Camosun Edition. \$145. (For hard copy and access code). ebook and access code \$110. Available from the Camosun Bookstore

The 2<sup>nd</sup> and 1<sup>st</sup> Australian editions are also acceptable if you have a used book. **If you buy a used book that is not the most recent edition be advised that it might not come with an access code to the MyLab and Mastering online portal.**

Chemistry 070, Camosun College course pack is a good source of review material for those students who may have been away from Chemistry for a while.

## 4. Course Content and Schedule

Subject	Material Covered	Lecture (approximate)	Hours	Textbook chapters
Electronic Structure of Atoms	Light, quanta and photons, atomic spectra and energy levels, wave properties of electrons. Atomic orbitals, quantum numbers, electron spin, electronic structure of the hydrogen atom. Many-electron atoms, electron configurations of atoms and ions,	6		6
Periodic Properties	Development of the periodic table, effective nuclear charge, atomic and ionic radius, ionisation energy, electron affinity.	3		7
Chemical Bonding	Ionic bonds, Lewis symbols, lattice energy, properties of ionic compounds. Covalent bonds, octet rule and Lewis structures. Polyatomic species, resonance and formal charge. Exceptions to the octet rule. Electronegativity and bond polarity. Bond enthalpies	5		8
Molecular Geometry	Molecules: shape, size, and bond strength. Shapes of molecules and ions, VSEPR theory. Charge distribution in molecules, polar bonds and polar molecules. Bond strengths and bond lengths. Orbitals, hybridization and bonding. Molecular Orbitals (hydrogen atom) and Metallic Bonding.	5		9
Intermolecular Forces, Liquids and Solids	Comparison of liquids and solids, intermolecular forces, ion-dipole, dipole-dipole, London dispersion forces, hydrogen bonding. Properties of liquids, phase changes, heating curves, critical temperature and pressure, vapour pressure, boiling point. Phase diagrams, structures of solids, colligative properties.	5		11
Gases	Nature of gases, atmospheric pressure. Gas laws, ideal gas law, gas reaction stoichiometry, gas density, Daltons Law of partial pressures, kinetic molecular theory. Real gases, limitations of ideal gas law, Graham's Law.	5		10

Chemistry of the Environment	Structure of Earth's atmosphere, ozone layer and its depletion, tropospheric pollution, greenhouse effect and photochemical smog. Oceans and freshwater.	3	18
------------------------------	--	---	----

Lecture Times: Tuesday, Thursday and Friday in F 208: All Lectures at 8.30 am - 9.20 am.

Laboratory class: Wednesday 9.30 to 12.20 pm F 356.

Midterm dates: See the lab schedule below:

**Note: This is only a preliminary lab schedule, changes will be made due to equipment &/or scheduling of other sections... Lab coat and eye protection are both mandatory!!**

Week Number	Activity & Experiment Number	Actual Date of Lab Wednesdays
I	Lab Safety and Quiz: Attendance Mandatory unless previous lab credit has been granted	Sep 4 <sup>th</sup>
II	Expt. 2 Densities of Solids & Liquids	Sep 11 <sup>th</sup>
III	Group A Expt. 3 Stoichiometry of Chem. Rxns	Sep 18 <sup>th</sup>
IV	Group B Expt. 3 Stoichiometry of Chem. Rxns	Sep 25 <sup>th</sup>
V	Expt. 4 The Spectroscopic Determination of Nickel in Aqueous Solution	Oct 2 <sup>nd</sup>
VI	Midterm Test 1	Oct 9 <sup>th</sup>
VII	Expt. 5 Colorimetric Determination of Iron in a Vitamin Tablet	Oct 16 <sup>th</sup>
VIII	Expt. 6 Determination of Copper Using Atomic Absorption Spectroscopy	Oct 23 <sup>rd</sup>
IX	Expt. 7 Hard Water determination	Oct 30 <sup>th</sup>
X	John's Gases lab	Nov 6 <sup>th</sup>
XI	Midterm Test 2	Nov 13 <sup>th</sup>
XII	Expt. 9 The Preparation of Potassium Tris(oxalato)Ferrate(III)	Nov 20 <sup>th</sup>
XIII	Expt. 10 Analysis & Uses of Potassium Tris(oxalato)Ferrate(III)	Nov 27 <sup>th</sup>
XIV	Review	Dec 4 <sup>th</sup>
Final Exam Period	Final Exam TBD Dec 9 <sup>th</sup> to Dec 13 <sup>th</sup>	

## 5. Basis of Student Assessment (Weighting)

The course mark will be derived in the following manner:

Midterm tests	20 % (each 10 %)
Final test	35 %
Laboratory work	25 %
Online Assignments	20 %

If it is advantageous to the student, the theory mark will be solely derived from the final examination, or a combination of midterms with the final and online assignments. Be advised that there are no part marks for partially finished online assignments. Weight from any, or all of the 6 on-line assignments that are missed will be carried onto the final exam.

In the event of a midterm test being missed due to illness/other commitments the weight of the missed test will be carried over to the final.

### The Laboratory Mark

No more than 2 laboratory classes may be missed, during the course. In the event of a student being unable to attend a laboratory class it is advised that the student attempt to obtain data from a partner or perform the class with another section in order to complete the assignment/report. **It is essential that you give your lab instructor the courtesy of an email in the event that you need to miss a laboratory class. Failure to show up to lab, or provide an excuse, will result in no score for that lab class.**

**Students must receive a passing score of 50 % in the laboratory portion of the course, in order to be eligible to receive a passing grade in the course.**

Students are responsible for obtaining their own safety glasses and laboratory jacket from the bookstore. It is not the responsibility of the College to provide you with safety equipment.

## 6. Grading System

Standard Grading System (GPA)

Competency Based Grading System

## 7. Recommended Materials to Assist Students to Succeed Throughout the Course

Your instructor is always the best resource. In the event that office hours do not fit your schedule, please email for an appointment.

The School of Arts and Science also offers The Science Help Centre, which operates out of **Fisher 264**. The hours are posted on the website: <http://camosun.ca/learn/subjects/chemistry/> and on the notice board along the hallway of the chemistry laboratories.

## 8. College Supports, Services and Policies



### Immediate, Urgent, or Emergency Support

If you or someone you know requires immediate, urgent, or emergency support (e.g. illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts @ <http://camosun.ca/about/mental-health/emergency.html> or <http://camosun.ca/services/sexual-violence/get-support.html#urgent>

### College Services

Camosun offers a variety of health and academic support services, including counselling, dental, disability resource centre, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit the **STUDENT SERVICES** link on the College website at <http://camosun.ca/>

## College Policies

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies. Policies are available on the College website at <http://camosun.ca/about/policies/>. Education and academic policies include, but are not limited to, Academic Progress, Admission, Course Withdrawals, Standards for Awarding Credentials, Involuntary Health and Safety Leave of Absence, Prior Learning Assessment, Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, Student Appeals, Student Conduct, and Student Penalties and Fines.

### A. GRADING SYSTEMS <http://camosun.ca/about/policies/index.html>

The following two grading systems are used at Camosun College:

#### 1. 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		1
0-49	F	Minimum level has not been achieved.	0

#### 2. Competency Based Grading System (Non GPA)

This grading system is based on satisfactory acquisition of defined skills or successful completion of the course learning outcomes

Grade	Description
COM	The student has met the goals, criteria, or competencies established for this course, practicum or field placement.
DST	The student has met and exceeded, above and beyond expectation, the goals, criteria, or competencies established for this course, practicum or field placement.
NC	The student has not met the goals, criteria or competencies established for this course, practicum or field placement.

### B. 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 at <http://camosun.ca/about/policies/index.html> 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 are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
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.