



**School of Arts & Science**  
**CHEMISTRY AND GEOSCIENCE DEPARTMENT**  
**CHEM 150-X01A, -X01B, -X02A, -X02B**  
**Engineering Chemistry**  
**2009Q4**

## COURSE OUTLINE

The Approved Course Description is available on the web @ \_\_\_\_\_

Ω 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:	Daniel Donnecke		
(b)	Office Hours:	Tuesdays 9:30-10:30 and Thursdays 12:30-13:30		
(c)	Location:	Tec 232		
(d)	Phone:	250 370 4447	Alternative Phone:	
(e)	Email:	donnecked@camosun.bc.ca		
(f)	Website:	Course material is available on D2L		

### 2. Intended Learning Outcomes

(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.)

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

1. Calculate outcomes of chemical reactions based on stoichiometric quantities in general and in aqueous solutions in particular.
2. Describe the electronic configuration of atoms and explain why some atoms have unusual configurations.
3. Determine the shape and symmetry of molecules based on atomic, molecular, and hybrid orbitals.
4. Explain the impacts of bond polarity on molecular interactions on the physical states (phases) of molecules.
5. Determine the properties of polymers, ceramics and other engineering materials based on bonding and molecular interactions.
6. Calculate the properties of ideal gases. Describe the differences between ideal and non-ideal gases.
7. Calculate physical properties of solutions.
8. Determine rate constants, order of reaction and activation energy for simple chemical reactions.
9. Determine concentrations of participating molecules in chemical equilibria, in particular, aqueous equilibria. Determine the pH of dilute aqueous solutions of acids and bases.
10. Explain the importance of total energy, enthalpy, entropy and free energy in chemical processes.
11. Balance redox reactions. Determine the voltages of simple electrochemical cells. Describe the role of electrochemistry in corrosion and corrosion control.
12. Use orbital theory to describe the properties of metals and semiconductors.

### 3. Required Materials

- (a) No text is required, but it is *highly recommended* that you have a first year university chemistry text, either used or from the library.
- (b) You need to bring a pair of **safety glasses** and a **lab coat**. You will not be allowed in the lab without safety glasses.

### 4. Course Content and Schedule

Lectures:	Sections X01A and X01B: Monday, Tuesday, Wednesday, Thursday and Friday 10:30 – 11:20, Tech 173 Sections X02A and X02B: Monday, Tuesday, Wednesday, Thursday and Friday 11:30 – 12:20, Tech 173
Laboratory:	Sections X01A Thursday, 14:30 - 17:30, Tech 230 Sections X01B Friday, 13:30 - 16:30, Tech 230 Sections X02A Tuesday, 14:30 - 17:30, Tech 230 Sections X02B Wednesday, 14:30 - 17:30, Tech 230

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#### Detailed outline (subject to availability of equipment)

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Week	Activity
1	Lab safety <b>EVERYONE ATTENDS</b> 01 July, Canada Day, College closed
2	<i>Lab 1</i> Densities
3	<b>Review test</b> (50 min, during lecture time) <i>Lab 2</i> Stoichiometry
4	<i>Lab 3</i> Spectrophotometric Determination of Nickel
5	<i>Lab 5</i> Distillation <b>Term Test 1</b> (50 min, during lecture time)
6	<i>Lab 4</i> Thermochemistry 03 August, British Columbia Day, College closed
7	<b>Midterm</b> (90 min, during scheduled lab time in Tec 230)
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9 Lab 7 Bromination of Acetone

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10 Lab 6 Determination of Chloride  
**Term Test 2** (50 min, during lecture time)

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11 Review of the course material during lab sections  
07 September, Labour Day, College closed

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**September 14-18: Final Examination Period**

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

*(Should be linked directly to learning outcomes.)*

<b>Review test</b>	<b>7 %</b>
<b>Term Tests (two)</b>	<b>10 % each</b>
<b>Midterm</b>	<b>18 %</b>
<b>Lab</b>	<b>20 %</b>
<b>Final</b>	<b>35 %</b>

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**6. Grading System**

*(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.)*

**Standard Grading System (GPA)**

<b>Percentage</b>	<b>Grade</b>	<b>Description</b>	<b>Grade Point Equivalency</b>
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>d</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 on the College web site in the Policy Section.

ADDITIONAL COMMENTS AS APPROPRIATE OR AS REQUIRED