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

CHEM-150-DX03
Engineering Chemistry
Fall 2020

COURSE OUTLINE

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

 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.

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1. Instructor Information

(a) Instructor	Steve McKinnon		
(b) Office hours	TBA		
(c) Location	Online		
(d) Phone		**Alternative:**	
(e) E-mail	mckinnons@camosun.bc.ca		
(f) Website	D2L		

2. Intended Learning Outcomes

(If any changes are made to this part, then the Approved Course Description must also be changed and sent through the approval process.)

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) Scientific calculator.

4. Course Content and Schedule

Lecture Plan (approximate hours in brackets)

Unit 1: Review (5)
Unit 2: Introduction to Quantum Mechanics (3)
Unit 3: Periodic Properties (2)
Unit 4: Basic Concepts of Bonding (3)
Unit 5: Molecular Geometry and Bonding Theories (3)
Unit 6: Gases (3)
Unit 7: Intermolecular Forces (3)
Unit 8: Kinetics (4)
Unit 9: Thermochemistry (5)
Unit 10: Thermodynamics (3)
Unit 11: Equilibrium (3)
Unit 12: Solubility (3)
Unit 13: Acids and Bases (4)
Unit 14: Electrochemistry (3)
Unit 15: Materials (2)

Lab Schedule (Friday, 12-2:20) – Preliminary schedule, subject to change

Week I	9/11	Lab intro and Safety, Ex 1 – Density
Week II	9/18	No Lab - Tutorial
Week III	9/25	Ex 2 – Stoichiometry
Week IV	10/2	No Lab - Tutorial
Week V	10/9	No Lab – Test 1
Week VI	10/16	Ex 3 – Spectroscopic Determination of Ni
Week VII	10/23	Ex 4 – Molecular Models
Week VIII	10/30	No Lab - Tutorial
Week IX	11/6	No Lab – Test 2
Week X	11/13	Ex 7 – Bleach and Blue Dye
Week XI	11/20	No Lab - Tutorial
Week XII	11/27	Ex 8 – Thermochemistry
Week XIII	12/4	No Lab - Tutorial
Week XIV	12/11	No Lab - Review

Important Dates

Oct 9 - Midterm I, 12 – 2:00 pm Friday
Oct 12 - Thanksgiving Holiday
Nov 6 - Midterm II, 12 – 2:00 pm Friday
Nov 11 - Remembrance Day
Dec 14 to 22 - Final Exam Period (TBA)

5. Basis of Student Assessment (Weighting)

(a) Laboratory – 20% (5 lab reports; 4% each)
(b) Quizzes – 20%
(c) Midterm I – 15 % (Fri, Oct 9, 12 – 2:00 pm)
(d) Midterm II – 15% (Fri, Nov 6, 12 – 2:00 pm)
(e) Final Exam – 30 % (comprehensive, TBA)

a. To be eligible to write the final exam a student must achieve a minimum final score of 50% on the laboratory component.

b. A student must pass both the lecture component and the laboratory component of the course in to be eligible to pass the course.

c. There are no make-up (alternative) dates for midterm exams. The weight of a missed midterm will be reassigned to the final exam.

d. If the score on the final exam is higher than one or both midterm exam marks, the final exam mark will replace the inferior midterm mark(s).

e. The midterm I exam covers material from units 1-5. (D2L)

f. The midterm II exam covers material from units 6-10. (D2L)

g. The final exam covers material from units 1-15, More heavily weighted to units 11-15. (D2L)

h. No late lab reports will be accepted and a mark of zero will be assigned.

6. Grading System

(If any changes are made to this part, then the Approved Course description must also be changed and sent through the approval process.)

[X] Standard Grading System (GPA)

[ ] Competency Based Grading System

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

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	*Incomplete*: 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	*In progress*: 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	*Compulsory Withdrawal*: 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.