



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

**CHEM-090-D01**  
**College Prep Chemistry 2**  
**Fall 2020**

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## **COURSE OUTLINE**

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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.

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### **1. Instructor Information**

(a) Instructor	David Stuss
(b) Office hours	Monday, Wednesday, Thursday 3:30 – 4:30 <i>or by appointment</i>
(c) Location	F350A – <i>Office hours will be held online</i>
(d) Phone	(250) 370-3438 <b>Alternative:</b> _____
(e) E-mail	stussd@camosun.bc.ca

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

CHEM 090 encompasses the Core Topics for Chemistry: Provincial Level (12) outlined in the 2018-2019 BC ABE Articulation Handbook.

#### **A. Reaction Kinetics**

- Describe the collision model of chemical reactions
- Describe activation energy, endo- and exothermic reactions using potential and kinetic energy diagrams
- Describe the factors that affect reaction rate including temperature, concentration, surface area, and catalysts

#### **B. Equilibrium**

- Explain the nature of chemical equilibrium using examples
- Apply Le Chatelier's Principle
- Calculate equilibrium constants of homogenous and heterogeneous systems and equilibrium concentrations from equilibrium constants
- Use K<sub>sp</sub> values to calculate solubility

#### **C. Acid-Base**

- Describe Bronsted-Lowry acids and bases including acid-base pairs
- Predict the relative strengths of acids
- Calculate [H<sup>+</sup>], [OH<sup>-</sup>], pH, and pOH from any one known
- Calculate pH from K<sub>a</sub>
- Describe the characteristics of a buffer system

#### D. Oxidation-Reduction

- Assign oxidation states to elements in compounds
- Identify oxidizing and reducing agents
- Balance redox equations
- Describe the components of electrochemical and electrolytic cells
- Predict the voltage,  $E^{\circ}$ , of electrochemical and electrolytic cells
- Describe the applications of oxidation-reduction to everyday and industrial processes

#### E. Gas Laws

- Use the appropriate units and conversions for pressure, volume, and temperature
- Apply Boyle's, Charles', Guy-Lussac's, and the Combined Gas Laws to predict pressure, volume, or temperature
- Describe an ideal gas and make calculations using the Ideal Gas Law

#### Laboratories\*

Chemistry laboratories are an essential component of the study of chemistry. During laboratories, students reinforce theory through practice. Laboratories develop skills in safety, procedures, techniques, data collection, analysis, and communication.

In the laboratory exercises, students will:

- List the safety and protective equipment available in a laboratory setting
- Demonstrate the appropriate procedures and techniques for dealing with particular hazards and hazardous materials
- Follow instructions and procedures
- Handle appropriate equipment for measuring mass, volume, and temperature
- Prepare solutions
- Perform titrations
- Collect and record data effectively
- Analyze and interpret data
- Communicate results and conclusions
- Write formal laboratory reports

\*Laboratory exercises during Fall 2020 will be simulated online.

### 3. Required Materials

- (a) CHEM 090 Course Notes & Lab Manual - *Available online (D2L)*
- (b) Scientific Calculator
- (c) Internet Access – *Lectures, labs & tutorials all conducted online. Computer preferred*

### 4. Course Content and Schedule

	Time	Location
Lecture	Monday 6:00 –8:50 PM Wednesday 6:00 –6:50 PM	Online via D2L
Lab (Virtual)	Wednesday 7:00 – 9:00 PM	Online via D2L

## Lecture Plan

Unit	Topic
0	Introductory Review
1	Reaction Kinetics
2	Equilibrium
3	Acids & Bases
4	Oxidation & Reduction
5	Gas Laws

Lecture topics will be covered at pace of ~2.5 weeks per unit (except for Review).

## Lab & Exam Schedule

Week	Lab Date	Lab No.	Lab Name
1	9 Sep	1	Common Lab Techniques
2	16 Sep	7	Precipitation Reactions
3	23 Sep	2	Reaction Rates
4	30 Sep	3	Equilibrium
5	7 Oct	-	<b>Midterm Test 1</b>
6	14 Oct	4	Titration
7	21 Oct	5	Solubility Equilibrium
8	28 Oct	6	pH of Salt Solutions
9	4 Nov	-	<b>Midterm Test 2</b>
10	11 Nov	-	<i>Remembrance Day</i>
11	18 Nov	10	Redox Couples
12	25 Nov	11	Gas Laws
13	2 Dec	-	<b>Midterm Test 3</b>
14	9 Dec	-	<i>Review</i>

## 5. Basis of Student Assessment (Weighting)

Labs (9)	20%
Quizzes (~1 per week)	10%
Midterm Tests (3 x 15%)	45%
Final Exam (comprehensive)	25%

1. To write the final exam you must achieve a minimum final score of **50%** on laboratory work.
2. You must pass **both** the lecture portion and the laboratory portion in order to pass the course.
3. There will be no make-up quizzes or midterm test. The weight a missed midterm test will be reassigned to the final exam.
4. Lab exercises will primarily involve watching videos and working through the lab exercise. Lab reports will be completed during the lab period and can be submitted online by the end of the day.

## 6. Grading System

- Standard Grading System (GPA)
- Competency Based Grading System

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

The Camosun Student Success Centre offers many support services including online Learning Skills Guides, Learning Circles, and one-one-one appointments. Students are encouraged to explore what is available here: <http://camosun.ca/services/writing-centre/learning-skills.html>

## 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.