



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

**CHEM-121-001**  
**College Chemistry 2**  
**Winter 2020**

## **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**

<b>(a) Instructor</b>	Silvija Smith
<b>(b) Office hours</b>	Posted on D2L or by appointment
<b>(c) Location</b>	P233
<b>(d) Phone</b>	250-370-3372 <b>Alternative:</b> _____
<b>(e) E-mail</b>	smiths@camosun.bc.ca (Preferred)
<b>(f) Website</b>	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. Utilize the specialized vocabulary and nomenclature based on the IUPAC system of organic compounds to name and draw structures for many simple organic compounds containing the common functional groups.
2. Write chemical reactions to illustrate numerous transformations between organic functional groups.
3. Draw structural and stereoisomers of organic compounds and name stereoisomers based upon the IUPAC system of nomenclature.
4. Demonstrate an understanding of the factors that influence the rate of a chemical reaction, deduce the rate of a chemical reaction from time/concentration data, and utilize rate laws to perform kinetic calculations.
5. Apply the laws of thermodynamics and account for the factors that lead to spontaneous physical and chemical changes.
6. Explain how and why reactions attain equilibrium positions and perform calculations pertaining to equilibrium systems.
7. Describe redox reactions, use electrochemical data to predict the spontaneity of redox reactions, and comprehend the structures of electrochemical cells.
8. Describe various acid-base theories and apply these theories to acid-base reactions in aqueous solution.
9. Perform experiments in the areas of preparative organic, preparative inorganic, physical and analytical chemistry and use the various associated pieces of laboratory equipment.

### 3. Required Materials

- (a) Chemistry 121 Laboratory Manual.
- (b) Safety glasses and a laboratory coat for use in the laboratory.
- (c) My Lab Mastering Chemistry course course.

Recommended materials: Chemistry, The Central Science, Brown, Le May. Custom Camosun Edition. Hardcopy or Ebook.

### 4. Course Content and Schedule

Subject	Material Covered	Classes (approximate)
<b>Organic Chemistry</b>	Alkane/Alkenes structure and properties, including naming simple cycloalkanes/ cycloalkenes, reactions and stereochemistry, functional groups and some reactions. Polymers depending on schedule.	<b>3 (9 hrs)</b>
<b>Chemical Kinetics</b>	Reaction rates, change in concentration with time, temperature and rate, reaction mechanisms and catalysis	<b>2 (6 hrs)</b>
<b>Thermochemistry</b>	Energy, first law of thermodynamics, enthalpy, calorimetry, Hess' Law, enthalpies of formation	<b>1 (3 hrs)</b>
<b>Thermodynamics</b>	Spontaneity, second law of thermodynamics, entropy, Gibbs Free Energy, free energy and temperature, free energy and equilibrium	<b>1 (3 hrs)</b>
<b>Equilibrium</b>	Equilibrium constants, heterogeneous equilibria, working with equilibrium constants	<b>1 (3 hrs)</b>
<b>Solubility</b>	Titration, common ion effect, buffers, solubility equilibrium	<b>1 (3 hrs)</b>
<b>Acids and Bases</b>	Acids and bases, pH scale, $K_a$ and $K_b$ , auto-ionization of water, acid strength of ions	<b>2 (6 hrs)</b>
<b>Electrochemistry</b>	Redox reactions, balancing redox equations, half cells and the Nernst equation	<b>2 (6 hrs)</b>

**Lecture: Mondays, Tuesdays, and Thursdays 2:30 pm – 3:20 pm**

**Laboratory: Mondays 8:30 am – 11:30 am in F 356**

Note: No Class during Monday February 17<sup>th</sup> – Friday February 21<sup>st</sup> (Reading Break).

## Laboratory Schedule

Note: This is only a preliminary lab schedule and changes will be made due to equipment &/or scheduling. Lab coat and eye protection are both mandatory and **ARE NOT PROVIDED BY THE DEPARTMENT**. Failure to wear one or all of the safety equipment will result in being dismissed from the lab and a mark of zero will be given.

Date of Lab (Mondays)	Activity/Experiment	Lab Report Due Date
Jan. 6	Safety and Review	-
Jan. 13	No lab	-
Jan. 20	Ex 1 – Synthesis of Aspirin	Feb. 3
Jan. 27	Ex 2 – Extraction of Caffeine	Feb. 3
Feb. 3	Ex 3 – Synthesis of Banana Oil	Feb. 24
Feb. 10	Midterm I	-
Feb. 17	Reading Week	-
Feb. 24	Ex 4 – Analysis of Unknown Acid	Mar. 2
Mar. 2	Ex 5 – Reaction Rate of Bleach with Blue Dye	Mar. 9
Mar. 9	Ex 6 - Thermochemistry	Mar. 23
Mar.16	Midterm II	-
Mar. 23	Ex 7 – Equilibrium Constants	Mar. 30
Mar. 30	Ex 8 – pH Measurements and pKa of Acetic Acid	Apr. 6
Apr. 6	Ex 9 – Redox Reactions	Apr. 6 @ end of class

## 5. Basis of Student Assessment (Weighting)

The course mark will be derived in the following manner:

- Laboratory component: 25 %
- Mastering chemistry assignments: 15 %
- Midterm I: 10 % (Mon. Feb. 10, 2020)
- Midterm II: 20 % (Mon. Mar. 16, 2020)
- Final exam (cumulative): 30 % (TBA)

If it is advantageous to the student, if the final exam mark is greater than the mark of either or both midterm exam marks, the midterm exam weight will be carried over to the final exam. Mastering chemistry assignment marks may not be carried over. 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. There are no make-up dates for midterm exams.

## The Laboratory Mark

The breakdown of the Laboratory mark is as follows:

Arriving punctually, prepared to do a lab, familiar with the procedure <b>and having the correct safety gear.</b> Ability to work competently and confidently with good attitude. Leaving work space clean and tidy.	10 %
Pre-lab assignments (completed prior to starting the lab class).	10 %
<b>Quality of Lab Reports/Assignments</b>	<b>80 %</b>

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 will miss a laboratory class.

A student that attends the laboratory class but does not present a written report will receive a (maximum) score of 40%.

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. If a student fails to wear safety equipment, the student may be asked to leave. In the event of this happening, a mark of zero will be given for the missed laboratory experiment. No alternative date for the laboratory experiment will be granted.

Laboratory reports need to be written using an electronic processor (otherwise a mark of zero will be given). Pre-laboratory assignments must be completed in pen (otherwise a mark of zero will be given). Lab reports and pre-laboratory assignments are due at the beginning of the lab period before the experiment starts for that day. No late lab reports will be accepted.

A student must pass the laboratory component to be eligible to write the final exam. A student must pass the laboratory component to be eligible to pass the course. A student must pass the final exam to be eligible to pass the course. A student must pass both the lecture component and the laboratory component to pass the course.

## 6. Grading System

- 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	<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.