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

CHEM-121-002
College Chemistry 2
Winter 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	Dr. Ryan Fradette		
(b) Office hours	M 12:30-1:30, Thurs 1-2, or by appointment		
(c) Location	F344A		
(d) Phone	250-370-3446	**Alternative:**	
(e) E-mail	fradetter@camosun.bc.ca		
(f) Website			

2. Intended Learning Outcomes

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) **Mastering Chemistry Course Code**. A My lab Mastering Chemistry Access Code can be purchased from the Camosun Bookstore. **Your Course code is valid for multiple courses for 2 years from purchase. So if you already have a code (from Chemistry 120) there is no need to get another.**
If you have previously purchased a new textbook (Custom Camosun Edition) or ebook (see below) then this includes a My Lab Mastering Chemistry Course Code.

(b) **Chemistry 121 Laboratory Manual.**

Other Recommended Materials for the Course

Chemistry, The Central Science, Brown, le May, Bursten. *Custom Camosun Edition.* $145. (For hard copy, ebook access and My lab Mastering Chemistry course code). ebook and My lab Mastering Chemistry course code only $114.
The 2nd and 1st Australian editions of this textbook are also acceptable. **Note: New textbooks come with a My Lab Mastering Chemistry Code.**

4. Course Content and Schedule

Lecture: Mon, Thurs, Fri 9:30-10:20 am F310

Subject	Material Covered	Classes (approximate)
Organic Chemistry (Selected topics)	Alkane/Alkenes structure and properties, including naming simple cycloalkanes/ cycloalkenes, reactions and stereochemistry, functional groups and some reactions. Polymers depending on schedule.	**12**
Chemical Kinetics	Reaction rates, change in concentration with time, temperature and rate, reaction mechanisms and catalysis	**5**
Thermochemistry	Energy, first law of thermodynamics, enthalpy, calorimetry, Hess' Law, enthalpies of formation	**3**
Thermodynamics	Spontaneity, second law of thermodynamics, entropy, Gibbs Free Energy, free energy and temperature, free energy and equilibrium	**3**
Equilibrium	Equilibrium constants, heterogeneous equilibria, working with equilibrium constants	**4**
Acids and Bases	Acids and bases, pH scale, Ka and Kb, auto-ionization of water, acid strength of ions	**3**
Aqueous equilibria	Titrations, common ion effect, buffers, solubility equilibrium	**2**
Electrochemistry	Redox reactions, balancing redox equations, half cells and the Nernst equation	**3**

Lab: Fri 1:30-4:20 pm F356

Date (Friday labs)	Activity
Jan. 11	Lab Orientation
Jan. 18	Expt. 1 Synthesis of Aspirin
Jan. 25	Expt. 2 Synthesis of Banana Oil
Feb. 1	Expt. 3 Extraction of Caffeine
Feb. 8	Expt. 4 Analysis of an Unknown Acid
Feb. 15	Midterm I
Feb. 22	Reading Break
Mar. 1	Expt. 5 Rxn Rate of Beach with blue dye
Mar. 8	Expt. 6 Thermochemistry
Mar. 15	Expt. 7 Gravimetric Determination of Chloride
Mar. 22	Expt. 8 pH & pKa of Acetic Acid
Mar. 29	Midterm II
Apr. 5	Expt. 9 Preparation of CuCl
Apr. 12	Review

5. Basis of Student Assessment (Weighting)

The course mark will be derived in the following manner:

My Lab Mastering Chemisty Assignments	15%
Midterm I – February 15, 2019 (2 hr) **Midterm II – March 29, 2019 (2 hr)**	15% 15%
Lab	25%
Final Exam (Cumulative) – April TBA	30%
	100%

If it is advantageous to the student the theory mark will be solely derived from the final examination, or a combination of midterm(s) and final. Missed Mastering Chemistry assignment marks may not be carried over. The due dates for these assignments will not be extended.
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 midterm.

The Laboratory Mark

The breakdown of the Laboratory mark is as follows:

Quality of Lab Reports/Data sheets/Prelabs	**90 %**
Performance and Professionalism	**10 %**

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 arrange to obtain data from a partner (this

borrowed data must be attributed). It is essential that you give your lab instructor the courtesy of an email in the event that you 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.

6. Grading System

[X] Standard Grading System (GPA)

[ ] Competency Based Grading System

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

Additional copies of Chemistry The Central Science are available in the library reserve room

Older edition of the book are available on the book shelf in F358

Help is also available at the Science Help Center in Young 302

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.