CAMOSUN COLLEGE	**School of Arts & Science** **CHEMISTRY AND GEOSCIENCE DEPARTMENT** **CHEM 121-001** **College Chemistry 2** **2014P**

COURSE OUTLINE

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

W *Please note: the College electronically stores this outline for five (5) years only.*
*It is **strongly recommended** you keep a copy of this outline with your academic records.*
You will need this outline for any future application/s for transfer credit/s to other colleges/universities.

1. Instructor Information

(a)	Instructor:	Steve McKinnon		
(b)	Office Hours:	Tues, Wed, and Thur. 10:30 or by appointment		
(c)	Location:	F348A		
(d)	Phone:	370-3472	Alternative Phone:	
(e)	Email:	mckinnons@camosun.bc.ca		
(f)	Website:	D2L		

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) Texts: CHEMISTRY, The Central Science: a Broad Perspective, by Brown, Lemay, Bursten, Langford, Sagatys, and Duffy. Prentice Hall. Australian edition 2nd edition (blue).
The 1st edition (purple/green) is acceptable along with the 10th and 11th US editions.

(b) Lab Manual: Chemistry 121 Laboratory Manual, Fall 2007 Edition (From the bookstore)

(c) Safety glasses are mandatory for laboratory activities. These can be purchased at the campus bookstore.

4. Course Content and Schedule

Subject	Material Covered	Classes (approximate)	Textbook chapters*
Organic Chemistry	Alkane /Alkenes structure and properties, including naming alkanes / alkenes, reactions and stereochemistry, functional groups and some reactions.	**6**	**21 to 26. Selected topics.**
Chemical Kinetics	Reaction rates, change in concentration with time, temperature and rate, reaction mechanisms and catalysis	**3**	**12**
Thermochemistry	Energy, 1st law of thermodynamics, enthalpy, calorimetry, Hess' Law, enthalpies of formation	**2**	**4**
Thermodynamics	Spontaneity, 2nd law of thermodynamics, entropy, Gibbs Free Energy, free energy and temperature, free energy and equilibrium	**2**	**4**
Equilibrium	Equilibrium constants, heterogeneous equilibria, working with equilibrium constants	**3**	**13**
Acids and Bases	Acids and bases, pH scale, Ka and Kb, auto-ionization of water, acid strength of ions	**3**	**14**
Aqueous equilibria	Titrations, common ion effect, buffers, solubility equilibrium	**1**	**15**
Electrochemistry	Redox reactions, balancing redox equations, half cells and the Nernst equation	**1**	**3, 16**

***textbook chapters are from Brown, LeMay, Bursten; 2nd Australian edition**

Important Dates

Week

III May 19 (Mon): Victoria Day

IV May 26 (Mon): **Test I in Lab from 9:00 to 11:00 am**

V Jun 5 (Thurs): Last Day to Withdraw or Change to Audit…

VI Jun 9 (Mon): **Test II in Lab from 9:00 to 11:00 am**

Jun 23-25: Exam Period for Spring 2014

5. Basis of Student Assessment (Weighting)

(a) Midterm Test I (20%) - Learning Outcomes 1-3

(b) Midterm Test II (20%) - Learning Outcomes 4-5

(c) Final Exam (35%) - Comprehensive

(d) Laboratory (25%)

6. Grading System

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	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** 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, 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 3rd course attempt or at the point of course completion.)*
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.

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.

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 the College web site in the Policy Section.

Steve McKinnon - Spring 2014 Lab Schedule:
Chem 121 (001) - Mondays and Fridays, 8:30 - 11:20 am in Fisher 356

Activity & Experiment Number	Actual Date of Lab
Lab Orientation - attendance mandatory	May 5th (M)
Exp. 1 Preparation of Xylenesulfonic acid	May 9th (F)
Group A Exp. 3 Preparation of Benzoic acid	May 12th (M)
Group B Exp. 3 Preparation of Benzoic acid	May 16th (F)
Victoria Day (no lab)	May 19th (M)
Exp. 4 Banana Oil	May 23rd (F)
Midterm I	May 26th (M)
Exp. 6 The Rate of Bromination of Acetone	May 30st (F)
TBA	June 2nd (M)
Exp. 10 Thermochemistry	June 6th (F)
Midterm II	June 9th (M)
TBA	June 13th (F)
Exp. 2 Analysis of an unknown acid	June 16th (M)
Exam Info & Review	June 20th (F)
Final Exams June 24th – 26th	

Chem 121-001 **Lab Report Guidelines**

The following are the general report guidelines for Chem 121-001. Specific instructions will be given the day of each experiment. Not all reports will require all of the parts listed below.

Title of the experiment: State the title of the experiment you have just carried out.

Date: When you did the experiment.

Name: Your name and lab partner's name (if applicable)

Objective: State what you want to achieve by doing the experiment in one or two sentences. Be very brief and to the point.

Procedures: You can write the following: Please refer to Chem. 120 lab manual, 2009 Edition. pp. xx-xx. Record any changes to the given procedures.

Data: Organize any data, whether numerical or descriptive, in a **neat table** (or tables if applicable). Report such things as **unknown numbers**, **concentrations** of solutions, **masses** of reactants and products. Any relevant data recorded on a rough data sheet should be copied here. Do not forget to write **chemical equations** here.

Discussion and Calculations: In this part of the report, you will make sense out of the data you have obtained. If you obtain a product, calculate the **percentage yield**. Provide a physical description of your product. Answer any questions posed in the procedure. Show **all** the calculations you do, but there is no need to be repetitive. For example, if you perform 3 or 4 titrations using the same two solutions, then you only need to show the calculation for one trial. In cases where you have not obtained the results you were hoping for, provide a very brief explanation.

Conclusion: In **one or two sentences**, state your results.

* Lab reports should be written in **ink, including all calculations** or typed. If you are not using a computer to graph data, use graph paper.

* Lab reports are normally due at the time of the next experiment. You will be informed in advance if there are any changes to the due date. A penalty of 25% will be deducted for any late reports. Late reports will not be accepted once marked reports for that experiment have been handed back.

Notes on graphing data:

*Data should be plotted on graph paper (1mm square), or using a graphing program (MS Excel). When using graph paper, make sure your plot takes up the entire page with the appropriate range for each axis.

*Make sure to include a descriptive title (what is the graph for?). Avoid using "vs" or "as a function of" in titles plot titles. For example, "Calibration curve for the determination of…"

*Label the x and y axes including the appropriate units (either as: **/units** or **(units)**).

*Data points should be clearly shown on the graph, with a best-fit line drawn through them. Don't force your best fit line through the origin.

*When extracting data from a plot, either interpolate with lines or use the equation of the line and clearly show your work with a sample calculation (example below).

Example: a graph of Beer's Law (Absorbance $\propto$ concentration) using **y = mx + b**.

y is your dependent variable (Absorbance)

x is your independent variable (concentration)

If you know the absorbance of an unknown sample you can then figure out the concentration of that sample. Substitute the absorbance in for y and solve for x.

(Absorbance - b)/m = concentration