

COURSE SYLLABUS



COURSE TITLE: CHEM-121: College Chemistry 2

CLASS SECTION: 002

TERM: Winter 2022

COURSE CREDITS: 4

DELIVERY METHOD(S): In person

Camosun College campuses are located on the traditional territories of the Lək̓ʷəŋən and W̱SÁNEĆ peoples. We acknowledge their welcome and graciousness to the students who seek knowledge here.

Learn more about Camosun's [Territorial Acknowledgement](#).

For COVID-19 information please visit <https://legacy.camosun.ca/covid19/index.html>

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable explanation in advance, you will be removed from the course and the space offered to the next waitlisted student.

INSTRUCTOR DETAILS

NAME: Neil Meanwell

EMAIL: meanwen@camosun.bc.ca

OFFICE: F 348B

HOURS: Mon, Tues, Wed, Thurs: 11.30 am -12.30 pm; Fri:1.30 pm – 2.30 pm. They will be given online using the Course Room on Blackboard Collaborate on D2L. In person meetings should be made by appointment.

As your course instructor, I endeavour to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me. Camosun College is committed to identifying and removing institutional and social barriers that prevent access and impede success.

CALENDAR DESCRIPTION

This course is a continuation of CHEM 120 and covers the following: chemical kinetics, acids and bases, thermodynamics, electrochemistry and provides an introduction to organic chemistry. The laboratory experiments provide practical experience in each area covered in lectures.

PREREQUISITE(S):

All of:

- C in CHEM 120

CO-REQUISITE(S):

EXCLUSION(S):

COURSE LEARNING OUTCOMES / OBJECTIVES

Upon completion of this course a 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.

REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

- (a) Principal Text: CHEMISTRY, The Central Science: a Broad Perspective Bursten, Murphy, Woodward, Langford, Sagatys and George, 3rd Edition (2014) or Camosun Custom Edition. Publisher: Pearson. Hard Copy or ebook. If you have previously purchased the ebook the 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.
- (b) Chemistry 121 Laboratory Manual, 2020 Edition (In-house).
- (c) Safety glasses and a laboratory coat.

COURSE SCHEDULE, TOPICS, AND ASSOCIATED PREPARATION / ACTIVITY / EVALUATION

The following schedule and course components are subject to change with reasonable advance notice, as deemed appropriate by the instructor.

4. Course Content and Schedule

- (a) Scheduled lectures: Tues, Wed and Thurs, 8.30 am to 9.20 am (F 262)

Brief Outline of Course Material:

Subject	Material Covered	Classes (approximate)
Organic Chemistry (Selected topics) Ch. 22-28	Alkanes, alkenes and alkynes, structure and properties, including naming simple cycloalkanes/ cycloalkenes, reactions and stereochemistry. Aromatic compounds. Functional groups and some reactions. Polymers.	12
Chemical Kinetics Ch. 15	Rates of chemical reactions, temperature and rate, differential and integrated rate laws, reaction mechanisms and catalysis	5
Thermochemistry Ch. 14	Energy, first law of thermodynamics, enthalpy concept, calorimetry, Hess' Law, enthalpies of formation	3
Thermodynamics Ch. 14	Spontaneity, entropy concept, second law of thermodynamics, Gibbs Free Energy, free energy and temperature, free energy and equilibrium	3
Equilibrium Ch. 16	Equilibrium condition, equilibrium constants, heterogeneous equilibria, working with equilibrium constants	4
Acids and Bases Ch. 17	Acids and bases, theories of acids and bases, pH scale, K_a and K_b , auto-ionization of water, acid strength of ions	4
Aqueous equilibria Ch. 18	Titrations, common ion effect, buffers, solubility equilibrium	2
Electrochemistry Ch. 19	Redox reactions, balancing redox equations, half cells and the Nernst equation	3

b) Laboratory: Mon, 12.30 pm to 3.20 pm (F 356)

Chem 121-D01 Winter 2021 Laboratory Schedule

Week # (Date)	Activity/Experiment	Lab Report Due Date (by 5 pm)
1. January 10 th	Laboratory Orientation	
2. January 17 th	Expt 1 Synthesis of Aspirin	January 24 th
3. January 24 th	Expt 2 Extraction of Caffeine	January 31 st
4. January 31 st	Expt 3 Synthesis of Banana Oil	February 7 th
5. February 7 th	Expt 4 Analysis of an Unknown Acid	February 18 th
6. February 14 th	Term Test 1	
7. February 21 st	Reading Break	
8. February 28 th	Expt 5 Reaction Rate of Bleach with Blue Dye	March 7 th
9. March 7 th	Expt 6 Thermochemistry	March 14 th
10. March 14 th	Expt 7 Equilibrium Constants	March 25 th
11. March 21 st	Term Test 2	March 28 th
12. March 28 th	Expt 8 pH Measurements and pK_a of Acetic Acid	April 4 th
13. April 4 th	Expt 9 Redox Reactions	April 11 th

- c) Worksheets for in-class problem solving.¹
- d) Online problem sets (MyLab and Mastering Chemistry).²
- e) Two term tests (each 2 hours).³
- f) A three-hour written final examination at the end of the course on all the material in the course.⁴

Notes

1. Worksheets are handed out at regular intervals during the semester. Most are worked out in class but, in any case, solutions are posted online. Most worksheets also have list of end-of-chapter questions which you are recommended to try. Solutions are also posted online. Note that you are **not asked to submit** solutions to worksheets for marking.

2. You will be required to periodically complete problem sets online using MyLab and Mastering Chemistry. **Note that you do receive credit for these problem sets.**

3. Tentatively scheduled for **weeks six** and **eleven** of the semester. These are written during the lab period.

4. The final will be set for the exam period following the end of classes. The date and time will be posted on MyCamosun in February.

Students registered with the Centre for Accessible Learning (CAL) who complete quizzes, tests, and exams with academic accommodations have booking procedures and deadlines with CAL where advanced noticed is required. Deadlines scan be reviewed on the [CAL exams page](http://camosun.ca/services/accessible-learning/exams.html). <http://camosun.ca/services/accessible-learning/exams.html>

EVALUATION OF LEARNING

DESCRIPTION	WEIGHTING
Online Assignments	15%
Term Test 1	15%
Term Test 2	15%
Final Examination	30%
Laboratory Work	25%
TOTAL	100%

If you have a concern about a grade you have received for an evaluation, please come and see me as soon as possible. Refer to the [Grade Review and Appeals](http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf) policy for more information. <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf>

COURSE GUIDELINES & EXPECTATIONS

- a. Students **must** attend the first laboratory meeting which is on safety in the laboratory and general laboratory procedure.
- b. You must wear safety glasses and a laboratory coat at all times while an experiment is in progress. You will not be allowed to perform an experiment if you are not wearing the required safety equipment.
- c. If you **miss an experiment** you will be given a mark of **zero** for the experiment unless you have a valid medical reason or family emergency, in which case supporting documentation must be supplied.
- d. You must submit a minimum of **SEVEN laboratory reports** in order to obtain a passing mark for the laboratory portion of the course.
- e. You **must pass both the lecture and laboratory** portions of the course separately in order to obtain a passing grade overall.
- f. If you miss a term test the weighting from that test will be transferred to the final exam. The only exception will be for a valid medical problem or family emergency, in which case supporting documentation must be supplied and an alternative test will be arranged.
- g. If it is advantageous to the student, if either, or both, the term test marks are inferior to the final exam mark, the weighting will be replaced by an equal weighting from the final exam.
- h. Late submissions of laboratory reports and/or assignments will be penalized and none accepted if more than **seven days** past the deadline.

SCHOOL OR DEPARTMENTAL INFORMATION

The following is a link to the Science Help Centre:

<https://camosun.ca/services/academic-support/help-centres/science-help-centres>

The Science Help Centre hours will be posted on notice boards around the Department soon.

Chemistry and Geoscience also has a study room adjacent to the F 356 laboratory equipped with networked computers and a printer. It is a great place to study with fellow chemistry students.

STUDENT RESPONSIBILITY

Enrolment at Camosun assumes that the student will become a responsible member of the College community. As such, each student will display a positive work ethic, assist in the preservation of College property, and assume responsibility for their education by researching academic requirements and policies; demonstrating courtesy and respect toward others; and respecting expectations concerning attendance, assignments, deadlines, and appointments.

SUPPORTS AND SERVICES FOR STUDENTS

Camosun College offers a number of services to help you succeed in and out of the classroom. For a detailed overview of the supports and services visit <http://camosun.ca/students/>.

Academic Advising	http://camosun.ca/advising
Accessible Learning	http://camosun.ca/accessible-learning
Counselling	http://camosun.ca/counselling
Career Services	http://camosun.ca/coop
Financial Aid and Awards	http://camosun.ca/financialaid
Help Centres (Math/English/Science)	http://camosun.ca/help-centres
Indigenous Student Support	http://camosun.ca/indigenous
International Student Support	http://camosun.ca/international/
Learning Skills	http://camosun.ca/learningskills
Library	http://camosun.ca/services/library/
Office of Student Support	http://camosun.ca/oss
Ombudsperson	http://camosun.ca/ombuds
Registration	http://camosun.ca/registration
Technology Support	http://camosun.ca/its
Writing Centre	http://camosun.ca/writing-centre

If you have a mental health concern, please contact Counselling to arrange an appointment as soon as possible. Counselling sessions are available at both campuses during business hours. If you need urgent support after-hours, please contact the Vancouver Island Crisis Line at 1-888-494-3888 or call 911.

Academic Accommodations for Students with Disabilities

The College is committed to providing appropriate and reasonable academic accommodations to students with disabilities (i.e. physical, depression, learning, etc). If you have a disability, the [Centre for Accessible Learning](#) (CAL) can help you document your needs, and where disability-related barriers to access in your courses exist, create an accommodation plan. By making a plan through CAL, you can ensure you have the appropriate academic accommodations you need without disclosing your diagnosis or condition to course instructors. Please visit the CAL website for contacts and to learn how to get started:

<http://camosun.ca/services/accessible-learning/>

Academic Integrity

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.13.pdf> for policy regarding academic expectations and details for addressing and resolving matters of academic misconduct.

Academic Progress

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.1.pdf> for further details on how Camosun College monitors students' academic progress and what steps can be taken if a student is at risk of not meeting the College's academic progress standards.

Course Withdrawals Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.2.pdf> for further details about course withdrawals. For deadline for fees, course drop dates, and tuition refund, please visit <http://camosun.ca/learn/fees/#deadlines>.

Grading Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf> for further details about grading.

Grade Review and Appeals

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf> for policy relating to requests for review and appeal of grades.

Mandatory Attendance for First Class Meeting of Each Course

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable reason in advance, you will be removed from the course and the space offered to the next waitlisted student. For more information, please see the "Attendance" section under "Registration Policies and Procedures"

(<http://camosun.ca/learn/calendar/current/procedures.html>) and the Grading Policy at <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf>.

Medical / Compassionate Withdrawals

Students who are incapacitated and unable to complete or succeed in their studies by virtue of serious and demonstrated exceptional circumstances may be eligible for a medical/compassionate withdrawal. Please visit

<http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.8.pdf> to learn more about the process involved in a medical/compassionate withdrawal.

Sexual Violence and Misconduct

Camosun is committed to creating a campus culture of safety, respect, and consent. Camosun's Office of Student Support is responsible for offering support to students impacted by sexual violence. Regardless of when or where the sexual violence or misconduct occurred, students can access support at Camosun. The Office of Student Support will make sure students have a safe and private place to talk and will help them understand what supports are available and their options for next steps. The Office of Student Support respects a student's right to choose what is right for them. For more information see Camosun's Sexualized Violence and Misconduct Policy: <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.9.pdf> and camosun.ca/sexual-violence. To contact the Office of Student Support: oss@camosun.ca or by phone: 250-370-3046 or 250-3703841

Student Misconduct (Non-Academic)

Camosun College is committed to building the academic competency of all students, seeks to empower students to become agents of their own learning, and promotes academic belonging for everyone. Camosun also expects that all students to conduct themselves in a manner that contributes to a positive, supportive, and safe learning environment. Please review Camosun College's Student Misconduct Policy at <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.5.pdf> to understand the College's expectations of academic integrity and student behavioural conduct.

Changes to this syllabus: Every effort has been made to ensure that information in this syllabus is accurate at the time of publication. The College reserves the right to change courses if it becomes necessary so that course content remains relevant. In such cases, the instructor will give the students clear and timely notice of the changes.