

# COURSE SYLLABUS



COURSE TITLE: CHEM-090: College Prep Chemistry 2

CLASS SECTION: 003

TERM: Fall 2021

COURSE CREDITS: 4

DELIVERY METHOD(S): In-person lectures and labs

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](#).

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For COVID-19 information please visit <https://camosun.ca/about/covid-19-updates>

*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

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NAME: David Stuss, M.Sc.

EMAIL: [stussd@camosun.bc.ca](mailto:stussd@camosun.bc.ca)

OFFICE: F350A

HOURS: Monday – Thursday 11:00 AM – 12:00 PM

*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

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Students will obtain the pre-requisite Chemistry knowledge that will provide a basis for further academic and career/vocational education and training. Students will be able to apply new concepts, including reaction kinetics, equilibrium, and reduction-oxidation to explain why reactions occur and the extent to which they proceed. They will be able to apply these concepts to their environment. They will be able to collect, analyze, and interpret scientific data, communicate effectively in the language of chemistry, and handle chemicals in a safe and effective manner.

### PREREQUISITE(S):

One of:

- C in Chemistry 11
- C in CHEM 070

And one of:

- C in Apprenticeship and Workplace Mathematics 11 or Foundations of Math 11 or Pre-calculus 11
- C in MATH 073

- C in MATH 077

- C in MATH 075

CO-REQUISITE(S):

Not Applicable

EXCLUSION(S):

Not Applicable

## COURSE LEARNING OUTCOMES / OBJECTIVES

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

Upon successful completion of this course a student will be able to:

- Obtain the prerequisite body of knowledge and skills that will provide a basis for further academic and career / vocational education and training
- Demonstrate an awareness of chemistry in everyday life
- Demonstrate an awareness of chemistry in solutions to environmental challenges
- Apply scientific method to investigate phenomena
- Communicate effectively using the language of chemistry
- Carry out all duties in an ethical, professional manner, including the collection and treatment of data
- Work independently and also as part of a team, where appropriate
- Handle equipment and chemicals in a safe and effective manner with regard to personal safety and the safety of others

Core Topics

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  $K_{sp}$  values to calculate solubility

C. Acid-Base

- Describe Bronsted-Lowry acids and bases including acid-base pairs
- Predict the relative strengths of acids
- Calculate  $[H^+]$ ,  $[OH^-]$ , pH, and pOH from any one known
- Calculate pH from  $K_a$
- 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,  $E_o$ , 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

#### REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

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(a) Online Textbook & Lab Manual : Chem 090/110 Digital Access (Top Hat)

- Access available for 1 semester or 1 year (by student preference)

(b) Scientific Calculator (required)

(c) Uvex Safety glasses (required)

## 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.

ACTIVITY	TIME	LOCATION
Lecture	Mon - Thurs 12:30 - 1:20 PM	F336
Lab	Tues 1:30 – 3:20 PM	F300

WEEK	ACTIVITY or TOPIC	LAB (Wednesday)
1	Review & Basic Concepts	Orientation
2		7 - Precipitation Reactions
3	Reactions in Aqueous Solutions	8 - The Chemical Detective
4		1 - Common Lab Techniques
5	Chemical Kinetics	<b>Test I</b>
6		2 – Reaction Rates
7	Equilibrium	3 – Equilibrium
8		4 – Titration
9	Acids & Bases	<b>Test II</b>
10		6 – pH of Salt Solutions
11	Oxidation-Reduction	5 – Solubility Equilibrium
12		10 – Redox Couples
13	Gas Laws	<b>Test III</b>
14		11 – Gas Laws

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 notice is required. Deadlines can 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

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DESCRIPTION	WEIGHTING
Labs (10)	25
Midterms (3 x 15%)	45
Final Exam (Cumulative)	30
	<b>TOTAL</b>
	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](#) policy for more information.

<http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf>

## COURSE GUIDELINES & EXPECTATIONS

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1. You must pass both the lecture portion and the laboratory portion with a score of 50% in order to pass the course.
2. There will be no make-up midterm tests. There is no penalty for missing a midterm; the weight of the test will be reassigned to the final exam.
3. If a higher grade is obtained on the final exam than the combined three midterms, the difference will be added to the combined midterm mark.
4. Lab reports are due at the end of the lab period (unless otherwise noted by the instructor).
5. Lab activities will mainly be done in pairs. Each student is expected to submit their own independent work.

## SCHOOL OR DEPARTMENTAL INFORMATION

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The School of Arts and Science offers a Science Help Centre. Tutors are available in Fisher 264 everyday to assist you in chemistry, biology and physics. The service begins in week three, and the schedule will be posted on D2L for you at this time.

## STUDENT RESPONSIBILITY

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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

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

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.

## COLLEGE-WIDE POLICIES, PROCEDURES, REQUIREMENTS, AND STANDARDS

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### 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](http://camosun.ca/services/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](http://camosun.ca/sexual-violence). To contact the Office of Student Support: [oss@camosun.ca](mailto: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.