

# COURSE SYLLABUS



COURSE TITLE: CHEM-070: College Prep Chemistry

CLASS SECTION: 001

TERM: Fall 2022

COURSE CREDITS: 4

DELIVERY METHOD(S):

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://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

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NAME: Neil Meanwell

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

OFFICE: F 348 B

HOURS: Mon, Wed, Thurs: 12.30 pm – 1.30 pm; Tues, Thurs: 11.30 am – 12.30 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. On completion of the course, students will have an appreciation for chemistry in everyday life and the role it has on the environment, society and human health. They will be able to apply the scientific method of investigation, communicate effectively in the language of chemistry, and collect and manipulate scientific data and handle chemicals in a safe and effective manner.

## PREREQUISITE(S):

One of:

- C in Math 10
- B in MATH 039
- C in MATH 053
- C in MATH 057

CO-REQUISITE(S): Not Applicable

## EXCLUSION(S):

Not Applicable

## COURSE LEARNING OUTCOMES / OBJECTIVES

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CHEM 070 encompasses the Core Topics for Chemistry: Advanced Level (11) 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. Measurement

- Demonstrate the concepts of precision and accuracy and how they differ, utilizing significant figures
- Perform calculations using scientific notation
- Perform conversions with the SI system

### B. Properties of Substances

- Differentiate between the phases of matter
- Identify chemical or physical properties of substances
- Describe Dalton's Atomic Theory and the Law of Constant Composition

### C. Periodic Trends

- Use the periodic table to determine atomic composition of isotopes
- Use the periodic table to predict electron arrangement of chemical families in order to predict trends in ion charge, reactivity, ionization energy, electronegativity, atomic radii, and ionic radii

### D. Atomic Structure

- Analyze the historical development of atomic theory
- Describe the Bohr and Wave Mechanical model of the atom and cite evidence for these models including absorption and emission spectra and their use in modern technology

### E. Mole Concept

- Define a mole and its significance
- Perform calculations including molar and formula mass, mole to mass conversions, and percent composition by mass of compounds

### F. Bonding

- Define covalent and ionic bonding
- Construct the formulas of compounds

- Use electronegativity to predict bond types
- Draw Lewis structures, predict molecular shapes, and determine polarity

#### G. Nomenclature

- Write names for compounds given the formulae and write formulae for compounds given the names for the following types of compounds: Covalent compounds, ionic compounds, compounds containing polyatomic ions, compounds containing transition metals and acids

#### H. Chemical Reactions

- Balance equations
- Classify and predict single and double replacement reactions, combustion reactions, and acid- base neutralizations
- Classify synthesis, decomposition, exothermic and endothermic reactions
- Perform stoichiometric calculations including mass-to-mass, limiting reagent, and percent yield

#### I. Solutions

- Predict solubility and conductivity of polar and non-polar compounds
- Define Arrhenius acids and bases
- Relate the pH scale to acids and bases
- Perform calculations involving dilutions
- Perform stoichiometric calculations involving solutions including titrations

#### J. Organic Chemistry

- Classify substances as organic
- Differentiate the various types of bonding between carbon atoms
- Write names and draw structures of hydrocarbons
- Categorize organic compounds based on their functional groups

#### K. Gases

- Account for the general characteristics of the gas, liquid, and solid states
- Perform gas law calculations

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

## REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

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The following materials are required. All are available for purchase at the Camosun Bookstore:

- (a) CHEM 070 Notes and Problem Sets (David Stuss) (\$35.50)
- (b) CHEM 070 Lab Manual (David Stuss) (\$16.95)
- (c) Safety glasses (\$25.99)
- (d) Laboratory coat
- (e) A basic scientific calculator (e.g., Sharp EL-510R).

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

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

Lectures (in F 210): Tuesdays, 9.30 – 11.20 am, Wednesdays, 9.30 – 11.20 am, Thursdays, 9.30 – 11.20 am.

Laboratories (in F 300): Wednesdays, 10.30 am– 12.20 pm.

### Lecture Schedule

WEEK or DATE RANGE	ACTIVITY or TOPIC	OTHER NOTES
1	Chapter 1 Measurements and Calculations	
2	Chapter 2 Introductory Terminology	
3	Chapter 3 Chemical Formulas and Names	
4	Chapter 4 Calculations Based Upon Formula	
5	Chapter 5 Stoichiometry	
6	Chapter 5 Stoichiometry	Term Test 1
7	Chapter 6 Periodic Table and Electron Distribution	
8	Chapter 6 Periodic Table and Electron Distribution	
9	Chapter 7 Chemical Bonding	
10	Chapter 7 Chemical Bonding/ Chapter 8 Gases	
11	Chapter 9 Liquids and Solutions	Term Test 2
12	Chapter 10 Organic Chemistry	
13	Chapter 10 Organic Chemistry/ Chapter 11 Radioactivity	
14	Chapter 11 Radioactivity/Review	

## Schedule for Laboratory Work

Date of Lab (Wednesdays)	Experiment	Lab Report Due Date*
Week #1 Sept. 7 <sup>th</sup>	Laboratory Safety	N/A
Week #2 Sept. 14 <sup>th</sup>	Experiment 1 - Density	Sept. 18 <sup>th</sup>
Week #3 Sept. 21 <sup>st</sup>	Experiment 2 – Identifying Liquids	Sept. 25 <sup>th</sup>
Week #4 Sept. 28 <sup>th</sup>	Experiment 3 – Separating Mixtures	Oct. 2 <sup>nd</sup>
Week #5 Oct. 5 <sup>rd</sup>	Experiment 4 – Heat of Combustion	Oct 16 <sup>th</sup>
Week #6 Oct. 12 <sup>th</sup>	Term Test 1	N/A
Week #7 Oct. 19 <sup>th</sup>	Experiment 5 – Recycling Copper	Oct. 23 <sup>rd</sup>
Week #8 Oct. 26 <sup>th</sup>	Experiment 7 – Copper & Silver Nitrate	Oct. 30 <sup>th</sup>
Week #9 Nov 2 <sup>nd</sup>	No Lab - Lecture	N/A
Week #10 Nov. 9 <sup>th</sup>	Experiment 9 – Chemical Reactivity	Nov. 20 <sup>th</sup>
Week #11 Nov. 16 <sup>th</sup>	Term Test 2	N/A
Week #12 Nov. 23 <sup>rd</sup>	Experiment 10 – Volume of a Gas	Nov. 27 <sup>th</sup>
Week #13 Nov. 30 <sup>th</sup>	Experiment 12 – Neutralization	Dec. 4 <sup>th</sup>
Week #14 Dec. 7 <sup>th</sup>	No Lab	N/A

\*Submit online by 9.00 pm on the due date.

## EVALUATION OF LEARNING

DESCRIPTION	WEIGHTING
Assignments (online)	10%
Quizzes (online)	10%
Two term tests (@ 15%)	30%
Final Exam	30%
Laboratory Work	20%
<b>TOTAL</b>	<b>100%</b>

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>

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>

## COURSE GUIDELINES & EXPECTATIONS

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- 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.
- d. You can miss no more than TWO laboratory classes during the course 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 midterm 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 five days past the deadline.

## SCHOOL OR DEPARTMENTAL INFORMATION

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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 will be available Monday to Friday; 9:00 to 4:30 (closed for lunch 12:30 to 1:00).

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 other chemistry students.

## 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.