COURSE SYLLABUS

COURSE TITLE: CHEM-070-College Chemistry 1
CLASS SECTION: 001

TERM: 2024F

COURSE CREDITS: 3

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

Camosun College respectfully acknowledges that our campuses are situated on the territories of the Lək̓ʷəŋən (Songhees and Kosapsum) and WSÁNEĆ peoples. We honour their knowledge and welcome to all students who seek education here.

INSTRUCTOR DETAILS

NAME: Neil Meanwell

EMAIL: meanwen@camosun.ca

OFFICE: F 348 B

OFFICE HOURS: Mon, Tues, Wed, Thurs: 1.30 – 2.30 pm. Thurs: 4.30 – 5.30 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

For both university and technology students, this course starts with atomic structure and periodic properties and leads to a discussion of chemical bonding, thermochemistry, molecular structure, intermolecular structure, colligative properties, intermolecular forces of attraction and their role in environmental issues. The experiments include chemical synthesis and analysis by titration and spectroscopy.

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

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

Text	Required: Chem 070 Course Notes / Problem Sets, Department of Chemistry & Geoscience, Camosun College—available from Camosun Bookstore.
Other	1. Chem 070 Lab Manual, Department of Chemistry & Geoscience, Camosun College—available from Bookstore. 2. Safety glasses and lab coat (mandatory) 3. Scientific calculator. [If you are taking math courses at Camosun, you will need to buy a certain Sharp model (scientific calculator with statistic functions). Please check with our Math Department or Bookstore.]

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.

Lectures: Tuesday 6.00 – 8.50 pm, Thursday: 6.00 -6.50 pm F 302
Laboratories: Thursday: 7.00 – 8.50 pm, F 300

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	

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 can be reviewed on the CAL exams page.
https://camosun.ca/services/academic-supports/accessible-learning/academic-accommodations-exams

LABORATORY SCHEDULE

Date of Lab (Thursdays)	Experiment	Lab Report Due Date*
Week #1 Sept. 5th	Laboratory Safety Talk/Quiz	N/A
Week #2 Sept. 12th	Expt 1 Accuracy and Precision	Sept. 17th
Week #3 Sept. 19th	Expt 2 Density	Sept. 24th
Week #4 Sept. 26th	Expt 3 Heat of Combustion	Oct 1st
Week #5 Oct. 3rd	**No Lab - Test 1**	N/A
Week #6 Oct. 10th	Expt 5 Saponification Expt 6 Recycling Copper (Part 1)	Oct 15th
Week #7 Oct. 17th	Expt 6 Recycling Copper (Parts 2-6)	Oct 22nd

Week #8 Oct. 24th	Expt 7 Iron and Copper Sulfate Reaction	Oct 29th
Week #9 Oct 31st	Expt 4 Geometry of Molecules	Nov 5th
Week #10 Nov. 7th	Experiment 8 Volume of a Gas	Nov. 12th
Week #11 Nov. 14th	**No Lab - Test 2**	N/A
Week #12 Nov. 21st	Expt 9 Magnesium and Hydrochloric Acid Reaction	Nov 26th
Week #13 Nov 27th	Expt 10 Neutralization	Dec. 3rd
Week #14 Dec. 5th	**No Lab – Lecture/Review**	N/A

* Lab reports must be submitted by 6.00 pm on the date stated.

EVALUATION OF LEARNING

DESCRIPTION	WEIGHTING
Assignments[1]	15%
Laboratory work [2]	20%
Test 1[3]	17.5%
Test 2[3]	17.5%
Final Exam[4]	30%
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 policy for more information:https://camosun.ca/sites/default/files/2021-05/e-1.14.pdf

Notes

1. Assignments will be posted periodically on D2L and must be completed by the posted deadline.
2. Additional information supplied at the first laboratory meeting.
3. Both term tests are fully written and scheduled for the laboratory periods in weeks 5 and 11.
4. The final exam is a comprehensive, fully written, three-hour exam, scheduled the exam period following the end of classes.

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.

d. You must submit a minimum of SIX laboratory reports in order to pass 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.

g. If it is advantageous to the student, if any of 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

Science Help Centres (SHC): https://camosun.ca/services/academic-supports/help-centres/science-helpcentres. Tutors are available in Fisher 264 to assist you in chemistry, biology and physics. The schedule will be posted on D2L.

Student Learning Success Guides: All Guides
https://camosun.libguides.com/CSSCHome/Images_HOME?preview=8c8156761f510434e998e6240e396088

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 camosun.ca/services.

Support Service	Website
Academic Advising	camosun.ca/services/academic-supports/academic-advising
Accessible Learning	camosun.ca/services/academic-supports/accessible-learning
Counselling	camosun.ca/services/health-and-wellness/counselling-centre
Career Services	camosun.ca/services/co-operative-education-and-career-services
Financial Aid and Awards	camosun.ca/registration-records/financial-aid-awards
Help Centres (Math/English/Science)	camosun.ca/services/academic-supports/help-centres
Indigenous Student Support	camosun.ca/programs-courses/iecc/indigenous-student-services
International Student Support	camosun.ca/international
Learning Skills	camosun.ca/services/academic-supports/help-centres/writing-centre-learning-skills
Library	camosun.ca/services/library
Office of Student Support	camosun.ca/services/office-student-support
Ombudsperson	camosun.ca/services/ombudsperson
Registration	camosun.ca/registration-records/registration
Technology Support	camosun.ca/services/its
Writing Centre	camosun.ca/services/academic-supports/help-centres/writing-centre-learning-skills

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

Academic Integrity

Students are expected to comply with all College policy regarding academic integrity; which is about honest and ethical behaviour in your education journey. The following guide is designed to help you understand your responsibilities: https://camosun.libguides.com/academicintegrity/welcome
Please visit https://camosun.ca/sites/default/files/2021-05/e-1.13.pdf for Camosun's Academic Integrity policy and details for addressing and resolving matters of academic misconduct.

Academic Accommodations for Students with Disabilities

Camosun College is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging appropriate academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you are a student with a documented disability and think you may need accommodations, you are strongly encouraged to contact the Centre for Accessible Learning (CAL) and register as early as possible. Please visit the CAL website for more information about the process of registering with CAL, including important deadlines: https://camosun.ca/cal

Academic Progress

Please visit https://camosun.ca/sites/default/files/2023-02/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 https://camosun.ca/sites/default/files/2021-05/e-2.2.pdf for further details about course withdrawals. For deadline for fees, course drop dates, and tuition refund, please visit https://camosun.ca/registration-records/tuition-fees#deadlines.

Grading Policy

Please visit https://camosun.ca/sites/default/files/2021-05/e-1.5.pdf for further details about grading.

Grade Review and Appeals

Please visit https://camosun.ca/sites/default/files/2021-05/e-1.14.pdf for policy relating to requests for review and appeal of grades.

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 (see Medical/Compassionate Withdrawals policy). Please visit https://camosun.ca/services/forms#medical to learn more about the process involved in a medical/compassionate withdrawal.

Sexual Violence

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 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 Policy: https://camosun.ca/sites/default/files/2021-05/e-2.9.pdf and camosun.ca/services/sexual-violence-support-and-education.

To contact the Office of Student Support: oss@camosun.ca or by phone: 250-370-3046 or 250-370-3841

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 https://camosun.ca/sites/default/files/2021-05/e-2.5.pdf to understand the College's expectations of academic integrity and student behavioural conduct.

Looking for other policies?

The full suite of College policies and directives can be found here: https://camosun.ca/about/camosun-college-policies-and-directives

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.