COURSE SYLLABUS

COURSE TITLE: CHEM-100-Introductory Chemistry
CLASS SECTION: 001
TERM: 2024F
COURSE CREDITS: 3
DELIVERY METHOD(S): in-person

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: ARMANDO JARDIM
EMAIL: jardima@camosun.ca
OFFICE: F348D

HOURS:

	Monday	2:30 - 3:30 pm
	Wednesday	2:30 - 3:30 pm
	Thursday	2:30 - 3:30 pm
	Friday	8:30 – 9:30 am

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 basic introduction to chemistry and is intended for students with little or no background in chemistry. Topics include: chemical formulae and equations, simplest formula, atomic mass, mole concept, molarity, periodic table, molecules and chemical bonding, and some descriptive chemistry. Experiments will emphasize basic lab techniques.

PREREQUISITE(S):

One of:

C in Math 10

C in MATH 053

C in MATH 057

C in MATH 075

CO-REQUISITE(S):

EQUIVALENCIES:

COURSE LEARNING OUTCOMES / OBJECTIVES

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

Use dimensional analysis, metric and SI units in performing chemical calculations.

Utilize the specialized vocabulary and nomenclature of chemistry and demonstrate an ability to name chemical compounds, and identify and construct chemical formulas.

Summarize the characteristics of electrons, protons and neutrons, and identify their roles as components of atoms, ions and isotopes including radioisotopes.

Communicate an understanding of atomic structure, the differences between elements, and the role of the periodic table in organizing elements within a coherent theoretical and empirical system.

Describe and account for the periodic table trends concerning atomic number, atomic radius, ionization energy and electronegativity.

Compare the formation and characteristics of ionic and molecular compounds.

Perform mathematical calculations involving chemical formulas, molecular weights, moles, Avogadro's number and Molarity.

Balance chemical equations, demonstrate an understanding of the mole concept and solve stoichiometry problems.

Account for the general characteristics of the gas, liquid, and solid states.

Conduct experiments in basic chemistry utilizing common chemistry laboratory equipment with an enhanced knowledge and practice in basic lab skills.

REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

Course Notes Package

Chemistry 100 Course Notes (with Additional Problem Sets), 2019 Edition. Camosun College Publications. This course package is *required* for this course. A copy is posted on D2L, yet a hardcopy is very useful during classes as this course package also serves as a workbook. A copy may be purchased from the Lansdowne Campus bookstore.

Laboratory Manual

Chemistry 100 Laboratory Manual, 2019 Edition. Camosun College Publications. This laboratory manual is *required* for this course. A copy may be purchased from the Lansdowne Campus bookstore. Also, a copy is posted on D2L.

General Materials and Supplies

Safety glasses Safety glasses are **required** when handling hazardous chemicals, and are recommended when handling laboratory glassware. Each student is required to provide her or his own pair of safety glasses. Students lacking safety glasses when they are required will not be permitted in the laboratory. Prescription eyeglasses will suffice.

Lab coats Lab coats are *highly recommended* for all experimental work in the laboratory. Each student must provide her or his own lab coat.

Latex gloves Latex or other 'non-allergenic' gloves are available if a student has certain allergies, and are to be used when appropriate to protect the skin from potentially allergenic chemicals or biochemicals.

Calculator A basic scientific calculator is required for work involving experimental procedures and lecture material, and is required during quizzes, the term tests and the final exam. Each student is required to provide their own calculator. Cell phone-based, tablet-based, computer-based or graphing calculators are not to be used during quizzes, the term tests or the final exam.

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

Course Times:

Monday	9:30 am - 10:20 am Fisher, 344 Lecture
Tuesday	9:30 am - 10:20 am Fisher, 310 Lecture
Wednesday	9:30 am - 10:20 am Fisher, 310 Lecture
Friday	9:30 am - 10:20 am Fisher, 206 Lecture
Tuesday	10:30 am - 12:20 am Fisher, 300 Laboratory

Course Length: 14 weeks

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

WEEK or DATE RANGE	ACTIVITY or TOPIC	OTHER NOTES
Week 1 Sept 3- 6	Course orientation & organization. An introduction to some common chemical elements and their names and symbols. A brief introduction to the periodic table. SI units. Other units. SI prefixes. Metric conversions. Scientific notation. Exact & inexact numbers. *Lab, Tuesday, September 3th* Course Organization, and *Laboratory & Safety Orientation.*	

WEEK or DATE RANGE	ACTIVITY or TOPIC	OTHER NOTES
Week 2 Sept 9 - 13	Significant figures. Rounding off. Density calculations. Rearranging equations. Endothermic & exothermic reactions. Energy calculations. Scientific method. Physical & chemical changes. Elements & compounds. Mixtures. Metals and non-metals. *Lab, Tuesday, September 10th* Experiment 1. *Density*	
Week 3 Sept 16 - 20	Dalton's Laws of Definite Composition & Conservation of Mass, Dalton's Atomic Theory, Subatomic particles. The atomic nucleus: Protons, Neutrons, Electrons. Atomic Number. Mass Number. Isotopes. Ions. Calculation of averaged weighted atomic mass. Chemical formulae and names. Composition of a compound. Units of a compound. *Lab, Tuesday, September 17th* Experiment 4. *Heat of Combustion*	
Week 4 Sept 23 -27	Formulae and names for binary molecular compounds and binary ionic compounds. Names and formulae for tertiary ionic compounds containing polyatomic ions. Practice, practice, practice. **Quiz 1.** *Lab, Tuesday, September 24nd* Experiment 3. *Separating Mixtures* Experiment 5. *Recycling Copper, Part 1 (start)*	
Week 5 Sept 30 –Oct 4	Names and formulae for binary ionic compounds containing metal ions of variable charge. Names and formulae for binary & tertiary acids. Calculating molecular and formula masses. Review for term test 1. **Monday September 30, 2024 (closed) National Day for Truth and Reconciliation** *Lab, Tuesday, October 1th* ***Term Test 1***	
Week 6 Oct 7 - 11	Percent composition. Introduction to the Mole. Converting moles to grams, and grams to moles. Moles of molecular & ionic substances and their masses. Balancing chemical equations. **Quiz 2.** *Lab, Tuesday, October 8th* Experiment 5. *Recycling Copper, Parts 2 to 5*	
Week 7 Oct 14 - 18	Stoichiometry defined. Interpreting chemical equations. Stoichiometry moles to moles problems. Stoichiometry grams to moles problems. Stoichiometry grams to grams problems. Stoichiometry limiting reactant problems. Percent yield calculations. **Monday October 14, 2024 (closed) Thanksgiving** *Lab, Tuesday, October 15th* Experiment 5. *Recycling Copper, Part 6 (completion)*	

WEEK or DATE RANGE	ACTIVITY or TOPIC	OTHER NOTES
	Experiment 7. *Copper & Silver Nitrate Reaction*	
Week 8 Oct 21 -25	Limiting reactant stoichiometry. Heat and chemical reactions related to stoichiometry. Organization of the periodic table. Chemical families. Electron major energy levels. Electron energy sub-levels. Electron distribution in atoms. Electron (Lewis) dot diagrams. Bohr diagrams. Trends in the Periodic Table in atomic size, ionization energy & chemical reactivity. **Quiz 3.** *Lab, Tuesday, October 22th* Molecular Model Activity: *Molecular Geometry & Polarity*	
Week 9 Oct 28 –Nov 1	Chemical bonding. Formation of ionic compounds. Introduction to the geometry of small molecular compounds. Geometry of molecular compounds & the sharing of electrons (covalent bonds). Applying electron dot diagrams to determining the geometry of small molecules. Molecular geometry and polarity of small linear molecules including molecules with multiple bonds. Determination of the geometry of small molecules with angular, pyramidal and tetrahedral geometry. Electronegativity, bond polarities, and molecular geometry & polarity of linear, planar, triangular, pyramidal and tetrahedral molecules. The nature of gases. Why gases are gaseous? Review for term test 2. **Quiz 4.** *Tuesday, October 29th* Experiment 15. *Accuracy and Precision of Experimental Results*	
Week 10 Nov 4 - 8	Properties of an Ideal Gas. Units of gas pressure. Boyle's law of gases. Boyle's law equation. Charles' gas law. Charles' Law Equation. Absolute Temperature and the Kelvin scale. Standard Temperature and Pressure (STP). The Combined Gas Law Equation. *Tuesday, November 5th* ***Term Test 2***	
Week 11 Nov 11 -15	Dalton's Law of Partial Pressures. Gas Volume and Number of Molecules. Gases, gas laws and scuba diving. Liquids and Solutions: Why liquids are liquids? Hydrogen bonding. Vapour pressure, boiling point, & normal boiling point. Solutes & solvents. Solubility. Miscible & immiscible. Solution Concentrations: %w/w, %w/v, %v/v, ppm & ppb, molarity (mol/L, M) (9.6). Diluting a Solution (C1V1=C2V2). **Monday November 11, 2024 (closed) Remembrance Day** *Lab, Tuesday, November 12th* Experiment 10. *Volume of a Gas*	
Week 12 Nov 18 - 22	Electrolytes. Dissociation Equations & Ion Concentrations. Ionization. pH Scale. Solution Stoichiometry. Isomers of small hydrocarbons and small organic compounds containing a hydroxyl group. **Quiz 5.** *Lab, Tuesday, November 19th*	

WEEK or DATE RANGE	ACTIVITY or TOPIC	OTHER NOTES
	Experiment 12. *Neutralization*	
Week 13 Nov 25 - 29	Naming simple organic compounds: alkanes, alkenes, alkynes, cycloalkanes & alcohols. **Quiz 6.** *Lab, Tuesday, November 26th* Final lab report drop-off.	
Week 14 Dec 2 - 6	Final exam review. December 6th	
Final exam period	**Final Exam** The time and location will be published by the College during the winter semester.	

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

EVALUATION OF LEARNING

DESCRIPTION	WEIGHTING
Quizzes Six quizzes of equal value will be held at appropriate times* during the lab (Safety Quiz) or lecture (Quizzes 1 to 6) periods. The best six marks from the seven quiz marks will be used to calculate a total mark out of 30. In total, the quizzes contribute **30%** to the final grade. Quiz 1. Chapters 1 & 2 Quiz 2. Chapters 3 & 4 Quiz 3. Chapter 5 Quiz 4. Chapters 6 & 7 Quiz 5. Chapter 9 Quiz 6. Chapter 10 *Typically, quizzes will be scheduled a few days to a week following the completion of lectures concerning the Chapter(s) from which material is to be tested. Attempts will be made to schedule quizzes on days when students do not have other tests. *If any quiz is missed due to illness or similarly justifiable reason, with accompanying documentation the percentage value of that quiz will be added to the value of the final exam.*	30%
Term Test 1 This term test covers relevant material from approximately the first four weeks of the course. The delineation of material that students are responsible for will be provided in class about one	15%

DESCRIPTION	WEIGHTING
week prior to the date of the test. This test that will be written during the lab period on **Tuesday October 1th** from **10:30 to 12:20 pm** in F300. If this term test is missed due to illness, or a similarly justifiable reason, with accompanying documentation the percentage value of this term test will be added to the value of the final exam.	
Term Test 2 This term test covers relevant material from approximately the second four to five weeks of the course. The delineation of material that students are responsible for will be provided in class about one week before the date of the test. This test will be written during the lab period on **Tuesday, November 5th** from **10:30 to 12:20 pm** in F300. If this term test is missed due to illness, or a similarly justifiable reason, with accompanying documentation the percentage value of this term test will be added to the value of the final exam.	15%
Laboratory Experiments Laboratory performance and lab reports contribute 2**0%** to the final grade. **Attendance in the lab periods is mandatory.** No laboratory experiment can be missed without an acceptable reason submitted in writing, such as a letter from a MD. As part of achieving the learning outcomes, students must pass the lab portion of the course in order to pass this course. *Please come to each lab period prepared for the experiment.* Creating a simple flowchart prior to each experiment is recommended. Each lab partner must hand in a separate report even though lab partners should share equally in experimental work. The lowest lab report mark will not be counted in the final grade.	20%
Final exam The final exam is a comprehensive exam of the material covered in the lecture portion of the course, including the overlap between the lecture component and the laboratory component of the course. The value this exam contributes to the final grade is **20%**. The time and location of the final exam will be published by the College during the semester. **Attendance at the final exam is mandatory.** Appropriate documentation must accompany an explanation for absence if an incomplete grade (I grade) is warranted.	20%
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

COURSE GUIDELINES & EXPECTATIONS

Students may **not** use recording devices in the classroom without the prior permission of the instructor or the Centre for Accessible Learning. The instructor's permission is not required when the use of a recording device is sanctioned by the College's Centre for Accessible Learning in order to accommodate a student's disability, *and* when the instructor has been provided with an instructor notification letter which

specifies the use of a recording device. Such recordings made in the classroom are for the student's personal use only, and distribution of recorded material is prohibited. Recordings made during the course would include statements, questions and comments made by students in the class, and these are not to be disseminated or repeated in any manner based on the recordings. Otherwise, **please have cell phones turned off and put away while in lectures.** *Thank you.*

SCHOOL OR DEPARTMENTAL INFORMATION

Here is a link to the Science Help Centre.
https://camosun.ca/services/academic-supports/help-centres/science-help-centres

The schedule for the Chem Tutors will be posted during the semester.

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

Support Service	Website
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.