



CAMOSUN COLLEGE
School of Arts & Science
Department of Chemistry & Geoscience

CHEM-070-002
College Prep Chemistry
Winter, 2020

COURSE OUTLINE

The course description is online @ <http://camosun.ca/learn/calendar/current/web/chem.html>

Ω Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.

1. Instructor Information

(a) Instructor	Jamie Doran, Ph.D.
(b) Office hours	Monday, 12:00 PM to 1:00 PM Tuesday, 3:00 PM to 4:00 PM Wednesday, 12:00 PM to 1:00 PM Thursday, 5:00 PM to 6:00 PM Friday, 3:00 PM to 4:00 PM <i>Please make an appointment at other times.</i> Everyone is welcome to contact me by email, including in the evenings and on weekends.
(c) Location	Room 350C, Fisher Building, Lansdowne Campus
(d) Phone	(250) 370-3441 Alternative: _____
(e) E-mail	jdoran@camosun.ca

2. Intended Learning Outcomes

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

3. Required Materials

(a) Text

Course Notes Package

Chemistry 070 Course Notes (with Additional Problem Sets), 2019 Edition. Camosun College Publications. This course package is *required* for this course. A copy may be purchased from the Lansdowne Campus book store.

(b) Other

Laboratory Manual

Chemistry 070 Laboratory Manual, 2019 Edition. Camosun College Publications. This laboratory manual is *required* for this course. A copy may be purchased from the Lansdowne Campus book store.

General Materials and Supplies

Safety glasses Safety glasses are **required** when handling hazardous chemicals. Each student is required to provide her or his pair of safety glasses. Students lacking safety glasses when they are required *will not be permitted* to be in the laboratory.

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 substances.

Calculator A basic scientific calculator is required at times in the laboratory, in lecture, and during term tests and the final exam. Each student is required to provide her or his own scientific calculator. Cell phone-based, tablet-based or computer-based calculators, or graphing calculators, cannot be used during tests or the final exam.

4. Course Content and Schedule

Credits	4 credits
In-class workload	4 h of lectures per week. 2 h lab period per week. The experiments conducted are outlined in the laboratory schedule below.
Out-of-class workload	6 hours per week
Number of weeks	14 weeks
Pre-requisite	One of: C in Apprenticeship and Workplace Mathematics 10, or C in Foundations of Math & Pre-calculus 10, or B in Math 039, or C in MATH 053, or C in MATH 057, or assessment.

Course Times and Locations

Lectures	Monday 1:30 PM to 2:20 PM Fisher Building, Room F360
	Tuesday 1:30 PM to 2:20 PM Fisher Building, Room F360
	Wednesday 1:30 PM to 2:20 PM Fisher Building, Room F360
	Thursday 1:30 PM to 2:20 PM Fisher Building, Room F360

Laboratory Periods Friday
 10:30 AM to 12:20 PM
 Fisher Building, Room F354
 Please refer to the laboratory schedule below.

Lecture Outline

A detailed outline of the lecture material is provided in the Table of Contents of *Chemistry 100 Notes*. Notably, this book has been designed specifically for this course to present many relevant examples of the chemistry of life and the environment including those intended to stimulate interest and curiosity.

1. Measurements and Calculations: SI & other scientific units; SI prefixes; metric conversions; measurements, scientific notation, & significant figures; density calculations; calculations involving energy changes.

2. Introductory Terminology: scientific method; physical & chemical changes; elements, compounds and mixtures; metals and nonmetals; atoms and molecules; protons, neutrons and electrons; ions and isotopes; atomic masses.

3. Chemical Formulas and Names: composition of chemical compounds; formulas and naming of molecular compounds; meaning of ionic formulas and naming of ionic compounds; compounds containing polyatomic ions; formulas and names of acids.

4. Calculations Based Upon Formulas: molecular mass; formula mass; percentage composition; the mole; grams to moles and moles to grams conversions; moles of molecular of ionic compounds; Avogadro's Number.

5. Stoichiometry: balancing chemical equations; stoichiometry - problems based upon chemical equations; limiting reactant calculations; percentage yield calculations; calculations involving exothermic or endothermic chemical reactions.

6. Periodic Table and Electron Distributions: chemical families; electron levels and orbitals (sublevels); electron distribution in atoms; electron dot formulae; trends in atomic radii (size), ionization energies & chemical reactivity.

7. Chemical Bonding: formation of ionic compounds; formation of molecular compounds; electron dot formula representations; electronegativity and bond polarity; molecular geometry and polarity.

8. Gases: general nature of gases; factors affecting gas volume; Boyle's Law - gas pressure & volume; absolute temperature scale; Charles' Law - gas temperature & volume; STP standard conditions of gas temperature and pressure; molar gas volume; partial pressures of gases; gases and diving; basic gas stoichiometry.

9. Liquids and Solutions: general properties of liquids; hydrogen bonding; vapour pressure and boiling point; solubility; solution concentration & diluting solutions; electrolytes, dissociation equations & ion concentrations in solution; pH scale; solution stoichiometry.

10. Organic Chemistry: why so many organic compounds?; structural formulas and isomers; naming of hydrocarbons & alcohols; optional: addition and substitution reactions in organic chemistry.

11. Radioactivity: Radioactive substances; alpha, beta & gamma rays & associated decay; optional: production of radioisotopes; half-life and dating; medical applications.

Laboratory Schedule

Please familiarize yourself in advance with the lab practices and safety information presented on pages 5 & 6 of the Laboratory Manual. Successful completion of a safety quiz following the laboratory safety orientation is required to participate in the experiments.

Week 1. Friday, January 10th **Course Organization, and Laboratory & Safety Orientation**

Week 2. Friday, January 17th **Experiment 1. Density**

Week 3. Friday, January 24th **Experiment 4. Heat of Combustion**

Week 4. Friday, January 31st **Experiment 3. Separating Mixtures**
 Experiment 5. Recycling Copper, Part 1 (brief)

Week 5. Friday, February 7th **Term Test #1**

- Week 6. Friday, February 14th **Experiment 5. Recycling Copper, Parts 2 to 5**
- Week 7. Friday, February 21st **Reading Week Break**
- Week 8. Friday, February 28th **Experiment 5. Recycling Copper, Part 6 (completion)**
Experiment 15. Accuracy and Precision of Experimental Results
- Week 9. Friday, March 6th **Experiment 7. Copper & Silver Nitrate Reaction**
- Week 10. Friday, March 13th **Term Test #2**
- Week 11. Friday, March 20th **Molecular Models: Geometry & Polarity**
- Week 12. Friday, March 27th **Experiment 10. Volume of a Gas**
- Week 13. Friday, April 3rd **Experiment 12. Neutralization**
- Week 14. Friday, April 10th **Good Friday Holiday**

☞ **Final Exam** ☞ The time and location will be published by the College during the semester.

5. Basis of Student Assessment (Weighting)

(a) Assignments

Laboratory Reports

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 Medical Doctor. Laboratory reports are due in the laboratory experimental period following the completion of the previous experiment. Each lab partner must hand in a separate report even though lab partners should share equally in experimental work. The value the lab reports contribute to the final grade is **20%**.

(b) Quizzes

Five quizzes of equal value will be held at appropriate times* during the lecture schedule. The best four marks from the five quiz marks will be used to calculate a total mark out of 20. In total, the quizzes contribute **20%** 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. Chapters 8 & 9

*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 or exams.

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.

(c) Term Tests

There are two term tests. Each test will contribute to **15%** of the final grade. The delineation of material students will be responsible for in each case will be provided in class about one week before the term test.

Term test 1 is scheduled for Friday, February 7th in the laboratory period (10:30 am to 12:20 pm) in F354. If F360 is available, the location will change to this room.

Term test 2 is scheduled for Friday, March 13th in the laboratory period (10:30 am to 12:20 pm) in F354. If F360 is available, the location will change to this room.

If either term test is missed due to illness or similarly justifiable reason, with accompanying documentation the percentage value of that term test (15%) will be added to percentage value of the final exam.

(d) 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 **30%**.

The time and location of the Chem 100 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 I-grade is to be issued. (please don't book air travel ahead of knowing the final exam date)

6. Grading System

Standard Grading System (GPA)

Competency Based Grading System

7. Recommended Materials to Assist Students to Succeed Throughout the Course

Please refer to the required textbook, required course package and supplementary materials described above.

8. College Supports, Services and Policies



Immediate, Urgent, or Emergency Support

If you or someone you know requires immediate, urgent, or emergency support (e.g. illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts @ <http://camosun.ca/about/mental-health/emergency.html> or <http://camosun.ca/services/sexual-violence/get-support.html#urgent>

College Services

Camosun offers a variety of health and academic support services, including counselling, dental, disability resource centre, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit the **STUDENT SERVICES** link on the College website at <http://camosun.ca/>

College Policies

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies. Policies are available on the College website at <http://camosun.ca/about/policies/>. Education and academic policies include, but are not limited to, Academic Progress, Admission, Course Withdrawals, Standards for Awarding Credentials, Involuntary Health and Safety Leave of Absence, Prior Learning Assessment, Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, Student Appeals, Student Conduct, and Student Penalties and Fines.

A. GRADING SYSTEMS <http://camosun.ca/about/policies/index.html>

The following two grading systems are used at Camosun College:

1. Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D		1
0-49	F	Minimum level has not been achieved.	0

2. Competency Based Grading System (Non GPA)

This grading system is based on satisfactory acquisition of defined skills or successful completion of the course learning outcomes

Grade	Description
COM	The student has met the goals, criteria, or competencies established for this course, practicum or field placement.
DST	The student has met and exceeded, above and beyond expectation, the goals, criteria, or competencies established for this course, practicum or field placement.
NC	The student has not met the goals, criteria or competencies established for this course, practicum or field placement.

B. Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy at <http://camosun.ca/about/policies/index.html> for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	<i>Incomplete</i> : A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	<i>In progress</i> : A temporary grade assigned for courses that are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
CW	<i>Compulsory Withdrawal</i> : A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.

Academic Honesty

Please become familiar with the new School of Arts & Science guide on academic honesty: <http://camosun.ca/learn/school/arts-science/images/Arts%20and%20Science%20Academic%20Honesty%20Guidelines.pdf>

Please Note:

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.

Please have cell phones turned off and put away while in lectures. Thank you.

Camosun College is a scent-free institution.

Please refrain from wearing scents. Thank you.