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

CHEM-070-D04
College Prep Chemistry
Fall Semester, 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.*

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1. Instructor Information

(a) Instructor	Jamie Doran, Ph.D.
(b) Office hours	Mondays 12:30 – 1:20 PM Wednesdays 10:30 – 11:20 PM Wednesdays 4:30 – 5:20 PM Thursdays 2:30 – 3:20 PM Fridays 2:30 – 4:20 PM *It may be helpful to make an appointment.*
(c) Location	Room 350C, Fisher Building, Lansdowne Campus, Camosun College, 3100 Foul Bay Road, Victoria, BC V8P 5J2 Canada
(d) Phone	250.370.3441(voice-mail available)
(e) E-mail	jdoran@camosun.ca (available evenings and weekends throughout the semester)

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) Course Notes

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 bookstore.

(b) Laboratory Manual

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 bookstore.

(c) Devices & Other Supplies

Computer — Each student is required to have a computer or other device for use in on-line classes and office hours. It is highly recommended that this device be a computer or tablet fitted with a keyboard. A mobile phone may be used but it is expected that students can work very effectively on-line when participating in term tests and the final exam

Calculator — A basic scientific calculator is *required* at times for work involving experimental procedures and lecture material, and may be required during term tests and the final exam. Each student is *required* to provide her or his own calculator. Cell phone-based, tablet-based, or computer-based calculators are sufficient during this on-line offering of the course. Graphing calculators are not to be used during term tests or the final exam.

Molecular Model Kit — A molecular model building kit will be of benefit in terms of understanding molecular geometry and polarity. These kits are available from the Lansdowne Campus bookstore.

4. Course Content and Schedule

Credits	4 credits
In-class workload	6 hours per week in a synchronous offering scheduled by the College There are four 50-min lectures per week (please see below). Term test review periods will be scheduled into an appropriate lecture periods prior to each term test. Laboratory periods will be used to discuss experimental techniques in biochemistry. These are conducted during most of the 1 h & 50 min scheduled laboratory periods. These scheduled times are also used to host two term tests (please see 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.
Lectures	Monday, 8:30 AM - 9:20 AM on-line Wednesday, 8:30 AM - 9:20 AM on-line Thursday, 8:30 AM - 9:20 AM on-line Friday, 8:30 AM - 9:20 AM on-line

Laboratory Periods & Term Test Times — *Please refer to the laboratory and term test schedule, below.*
Wednesday, 1:30 PM to 3:20 PM

Lecture Outline

A detailed outline of the lecture material is provided in the Table of Contents of *Chemistry 070 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 or 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 Periods, Quizzes and Midterm Exam 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.

Week 1. *Wednesday, September 9th* Laboratory Safety Orientation & Safety Quiz (*Quiz 1*)

Week 2. *Wednesday, September 16th* Experiment 1. *Density*

Week 3. *Wednesday, September 23rd* *Quiz 2* 1:30 – 2:20 PM
Experiment 4. *Heat of Combustion* 2:30 – 3:20 PM

Week 4. *Wednesday, September 30th* Experiment 3. *Separating Mixtures*

Week 5. *Wednesday, October 7th* *Quiz 3*

Week 6. *Wednesday, October 14th* Experiment 5. *Recycling Copper*

Week 7. *Wednesday, October 21st* *Quiz 4* 1:30 - 2:20 PM
Midterm review 2:30 – 3:20 PM

Week 8. *Wednesday, October 28th* *Midterm Exam* 1:30 PM – 3:20 PM

Week 9. *Wednesday, November 4th* Experiment 7. *Copper & Silver Nitrate Reaction*

Week 10. *Wednesday, November 11th* Remembrance Day

Week 11. *Wednesday, November 18th* *Quiz 5* 1:30 - 2:20 PM

Week 12. *Wednesday, November 25th* Experiment 12. *Neutralization*

Week 13. *Wednesday, December 2nd* *Quiz 6* 1:30 - 2:20 PM
Mini-Experiment 15. *Accuracy and Precision of Experimental Results* 2:30 – 3:20 PM

Week 14. *Wednesday, December 9th* *Quiz 7* 1:30 - 2:20 PM
Midterm review 2:30 – 3:20 PM

Final Exam The date and time will be published by the College during the semester.

5. Basis of Student Assessment (Weighting)

(a) Quizzes

Six quizzes of equal value will be held at appropriate times during the lab period schedule. 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

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Quiz 1. Laboratory Safety Quiz
Quiz 2. Material from Chapters 1 & 2 *Wednesday, September 23rd*
Quiz 3. Material from Chapters 2 & 3 *Wednesday, October 7th*
Quiz 4. Material from Chapters 4 & 5 *Wednesday, October 21st*
Quiz 5. Material from Chapters 6 & 7 *Wednesday, November 18th*
Quiz 6. Material from Chapter 8 *Wednesday, December 2nd*
Quiz 7. Material from Chapter 9 *Wednesday, December 9th*

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.

(b) Exams

Midterm Exam

The midterm exam will contribute to **20%** of the final grade. The delineation of material students will be responsible for will be provided in class about one week before the midterm exam.

This midterm exam is scheduled for Wednesday, November 4th in the laboratory period (1:30 PM to 3:20 PM)

If the midterm exam is missed due to illness, or similarly justifiable reason, with supportive documentation the percentage value of the exam (20%) will be added to percentage value of the final exam.

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%**.

(Please note that neither the exam time nor date will not be changed by the College to accommodate vacation plans.)

The date and time of the on-line 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.

(c) Other

On-line lecture attendance and participation contributes **5%** to the final grade.

On-line laboratory period attendance is mandatory. Laboratory reports are due in the following laboratory period, unless a quiz or midterm exam is scheduled in the following week. The value the lab reports and attendance contribute to the final grade is **15%.**

6. Grading System

[X] Standard Grading System (GPA)

[ ] Competency Based Grading System

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

Please refer to the required course package and laboratory manual described above. Links to videos relevant to experiments in chemistry will be provided during the course.

Within D2L are tutorials that provide instruction on the use of Brightspace and Blackboard Collaborate Ultra.

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	*Incomplete*: 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	*In progress*: 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	*Compulsory Withdrawal*: 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 School of Arts & Science guide on academic honesty: http://camosun.ca/learn/school/arts-science/images/Arts%20and%20Science%20Academic%20Honesty%20Guidelines.pdf

Based on College policy, the outcome of an incident of academic honesty on an evaluation (quiz, exam, lab report) is a **failing grade** for that evaluation.

Please Note:

Students may **not** use recording devices 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 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 all recording devices turned off and put away while in lectures.