



## COURSE OUTLINE

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

Ω Please note: the College electronically stores this outline for five (5) years only.  
It is **strongly recommended** you keep a copy of this outline with your academic records.  
You will need this outline for any future application/s for transfer credit/s to other colleges/universities.

### 1. Instructor Information

|     |               |   |
|-----|---------------|---|
| (a) | Instructor:   | David Stuss, M.Sc.                              |
| (b) | Office Hours: | Tues - Fri 2:00 – 3:30 <i>or by appointment</i> |
| (c) | Location:     | Fisher F350A                                    |
| (d) | Phone:        | (250) 370-3438                                  |
| (e) | Email:        | stussd@camosun.bc.ca                            |

### 2. Intended Learning Outcomes

(No changes are to be made to these Intended Learning Outcomes as approved by the Education Council of Camosun College.)

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

1. Identify, describe and account for the general characteristics of gases, liquids and solids - interionic and intermolecular forces; vaporization and condensation; melting and freezing; specific characteristics of water.
2. Utilize solution terminology, account for and compare the solubilities of ionic and molecular compounds, and describe the impact of temperature and pressure on solubility.
3. Describe the characteristics of solubility equilibria and use mathematical techniques employed in dealing with this phenomenon.
4. Describe and account for the colligative and osmotic properties of aqueous solutions.
5. Account for differences in the rates of chemical reactions, apply Le Chatelier's Principle to equilibrium processes, and explain how catalysts influence reaction rates.
6. Apply mathematics and equilibrium constant expressions to descriptions of reversible reactions and chemical equilibria.
7. Identify Arrhenius, Bronsted and Lewis acids and bases, and describe the chemical properties of each type of substance.
8. Describe the ionization of water, the pH scale, weak and strong acids and bases, neutralization and the actions of buffer solutions.
9. Perform mathematical calculations involving pH, hydronium ion concentrations and acid-base titrations.
10. Define oxidation and reduction and assign oxidation numbers to the elements of substances involved in oxidation-reduction reactions. Demonstrate the ability to use oxidation numbers in balancing redox reactions.
11. Demonstrate an understanding of electrochemistry and account for the characteristics and uses of the standard hydrogen electrode, standard reduction potentials, electrolytic and voltaic cells.
12. Describe the characteristics of the major types of organic compounds – alkanes, alkenes, alkynes, aromatic hydrocarbons, alcohols, ethers, aldehydes and ketones, carboxylic acids and esters, amines and amides.

### 3. Required Materials

|     |   |  |
|-----|---|--|
| (a) | Textbook                                    | "Chemistry, The Central Science" by Brown, LeMay & Bursten, 3 <sup>rd</sup> Australian Edition. (Also required for students going on to CHEM 120/121). |
| (b) | Lab Manual<br><b>(Mandatory)</b>            | CHEM 110 Lab Manual, Camosun College Publications.   |
| (c) | Safety Glasses<br><b>(Mandatory)</b>        | Bookstore has "UVEX" safety eyewear – please check if using others   |
| (d) | Lab coat<br><b>(Optional)</b>               | Bookstore has cloth coats available – please check if using another type   |
| (e) | Scientific Calculator<br><b>(Mandatory)</b> | Smartphones / PDAs or similar devices cannot be used during tests & exams.   |

All required materials are available at the Camosun College Bookstore.

### 4. Course Content and Schedule

|                        |                                     |                        |                             |
|------------------------|-------------------------------------|------------------------|-----------------------------|
| <b>Credits</b>         | 4 credits                           | <b>Number of weeks</b> | 14                          |
| <b>Workload / week</b> | 3 h lecture<br>3 h lab<br>6 h study | <b>Pre-requisite</b>   | CHEM 100 or<br>Chemistry 11 |

#### Locations & Times

|                | <b>Time</b>             | <b>Location</b>            |
|----------------|-------------------------|----------------------------|
| <b>Lecture</b> | Tuesday 6:00 – 8:50 PM  | Fisher Building, Room F214 |
| <b>Lab</b>     | Thursday 6:00 – 8:50 PM | Fisher Building, Room F354 |

#### Lecture Plan

| <b>Unit</b> | <b>Topic</b>           | <b>Unit</b> | <b>Topic</b>          |
|-------------|------------------------|-------------|-----------------------|
| 1           | States of Matter       | 6           | Acid-Base Chemistry   |
| 2           | Thermochemistry        | 7           | Oxidation & Reduction |
| 3           | Solutions & Solubility | 8           | Electrochemistry      |
| 4           | Chemical Kinetics      | 9           | Organic Compounds     |
| 5           | Chemical Equilibrium   |             |                       |

#### Important Dates

| <b>Date</b>                                  | <b>Event</b>                    |
|--|---------------------------------|
| Thursday Oct. 12 <sup>th</sup>               | Term Test #1 – Room F100        |
| Thursday Nov. 16 <sup>th</sup>               | Term Test #2 – Room F100        |
| December 11 <sup>th</sup> – 19 <sup>th</sup> | Final Exam Week (Exam date TBA) |

## Lab & Test Schedule

| Week Number | Lab Date (Thursdays) | Experiment No. | Experiment                    |
|-------------|----------------------|----------------|-------------------------------|
| 1           | Sep 7                | -              | Lab Safety & Orientation      |
| 2           | Sep 14               | 4              | Precipitation Reactions       |
| 3           | Sep 21               | 6              | Acid-Base Titrations          |
| 4           | Sep 28               | 1              | Energy Changes                |
| 5           | Oct 5                | 2              | Reaction Rates                |
| 6           | <b>Oct 12</b>        | -              | <b>Term Test I</b>            |
| 7           | Oct 19               | 3              | Shifting Equilibria           |
| 8           | Oct 26               | 7              | Vitamin C, Aspirin, Magnesia  |
| 9           | Nov 2                | -              | <i>Tutorial</i>               |
| 10          | Nov 9                | 8              | Acid-Base Titration Curves    |
| 11          | <b>Nov 16</b>        | -              | <b>Term Test 2</b>            |
| 12          | Nov 23               | 10             | Oxidation-Reduction Reactions |
| 13          | Nov 30               | 12             | Electrochemistry              |
| 14          | Dec 7                | -              | Exam Review                   |

### 5. Basis of Student Assessment (Weighting)

|                            |     |
|----------------------------|-----|
| Labs (8 x 2.5%)            | 20% |
| Midterm Tests (2 x 20%)    | 40% |
| Final Exam (comprehensive) | 40% |

- To write the final exam you must achieve a minimum final score of **50%** on laboratory work.
- You must pass **both** the lecture portion and the laboratory portion in order to pass the course.
- There will be no make-up midterm tests. The weight of a missed midterm will be reassigned to the final exam.
- In the theory section of the course, if the percent score on the final exam mark is higher than the combined midterm mark, it will replace the combined midterm mark.

### The Laboratory Mark

- Each lab has 2 components, the Pre-Lab Assignment and the Lab Report.
- Pre-Lab Assignments can be found in the lab manual, and can be completed after reading through the lab protocol. They must be submitted at the **beginning** of the lab period or are considered late. Late pre-labs will receive a late penalty (-10% per day). Each pre-lab is worth 20% (5/25) of the marks for a given lab.
- Lab Report worksheets will be provided online (via D2L) for students to print off **prior** to the lab period. Lab reports can usually be completed in-class but are otherwise due one week later (i.e. the following lab period). Lab partners must hand in their own separate reports even though they are expected to share equally in experimental work. Each lab report is worth 80% (20/25) of the marks for a given lab.
- Wearing of **safety goggles** is **mandatory** in all labs. Students who forget safety goggles or fail to wear them will **not be allowed** to complete the lab. Students will have the option to store labeled goggles with the instructor in between labs. Covered footwear is also required.
- Punctual attendance in all the lab periods is mandatory.** There are no exceptions other than an official doctor's note. Missed labs without adequate reasons will result in a mark of zero for that lab. *Permissions for an exception must be documented by email permission from the instructor and by a submitting the doctor's note.*

## 6. Grading System

(No changes are to be made to this section unless the Approved Course Description has been forwarded through the Education Council of Camosun College for approval.)

### 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     | Minimum level of achievement for which credit is granted; a course with a "D" grade cannot be used as a prerequisite. | 1                       |
| 0-49       | F     | Minimum level has not been achieved.  | 0                       |

### 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 E-1.5 at [camosun.ca](http://camosun.ca) 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, due to design may require a further enrollment in the same course. No more than two IP grades will be assigned for the same course. (For these courses a final grade will be assigned to either the 3 <sup>rd</sup> course attempt or at the point of course completion.) |
| 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.  |

## 7. Recommended Materials or Services to Assist Students to Succeed Throughout the Course

### LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College calendar, at Student Services, or the College web site at [camosun.ca](http://camosun.ca).

### STUDENT CONDUCT POLICY

There is a Student Conduct Policy **which includes plagiarism**. It is the student's responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, at Student Services, and the College web site in the Policy Section.