CHEM 101 Course Syllabus Fall 2023

University of Victoria Department of Chemistry

Welcome to CHEM 101! Students are responsible for reading and understanding the content of this document and all other information provided on the CHEM 101 Brightspace sites.

Territory Acknowledgment: *We acknowledge and respect the lək̓ʷəŋən peoples on whose traditional territory the university stands and the Songhees, Esquimalt and W̱SÁNEĆ peoples whose historical relationships with the land continue to this day.*

Prerequisites: Students should not register in CHEM 101 unless they have successfully completed both BC high school Chemistry 11 and one of the following: Pre-calculus 12 or Principles of Mathematics 12 or UVic MATH 120 (or equivalent). It is the responsibility of the student to ensure that they have completed these prerequisites and have the necessary experience and background to be successful in this course.

CHEM 101 Topics

Background Topics From Prerequisite Courses: These are listed in Chapters 1-4 of the free OpenStax textbook *Chemistry 2e* (https://openstax.org/details/books/chemistry-2e) by Flowers, Theopold, Langley, and Robinson. This assumed knowledge/content from Chemistry 11 is not reviewed in CHEM 101, but is necessary for success in CHEM 101.

Electronic Structure and Periodic Properties of Elements

- Electromagnetic energy
- Bohr model of the hydrogen atom
- Development of quantum theory
- Electronic structure of atoms
- Periodic variations in element properties

Chemical Bonding and Molecular Geometry

- Ionic bonding
- Covalent bonding
- Lewis symbols and structures
- Formal charges and resonance
- Strengths of ionic and covalent bonds
- Valence Shell Electron Pair Repulsion (VSEPR) Theory
- Molecular structure and polarity

Advanced Theories of Covalent Bonding

- Covalent bonding and orbital overlap
- Hybrid orbitals
- Multiple bonds
- Molecular orbitals
- Metallic bonding
- Metals, semi-conductors and insulators

Organic Chemistry

- Hydrocarbons
- Alcohols and ethers
- Aldehydes, ketones, carboxylic acids, and esters
- Amines and amides
- Chirality

Intermolecular Forces, Liquids, Solids, and Materials

- Intermolecular forces
- Solids
- Liquids
- Materials

Grading components for CHEM 101

Two In-term Tests	2 × 15%	30
Seven Quizzes	7 × 1%	7
Final Examination		40
Lecture Participation		3
Laboratory Exercises		20
Total		100

The grade for CHEM 101 is calculated as described above unless the student is awarded an excused absence as described under "Absences" below.

Requirements to Pass CHEM 101: A student must be registered in both a CHEM 101 lab and a CHEM 101 lecture section in the current term. Additionally, if a student does not meet the following minimum requirements, the student will fail the course.

a) obtain an overall grade of at least 50% for the laboratory component
b) obtain an overall grade of at least 50% for the lecture component (the combined tests, quizzes, participation, and final examination)
c) complete at least 4 laboratory exercises (see the laboratory section of the syllabus for what constitutes a complete laboratory exercise)
d) write at least 1 of 2 in-term tests
e) write the final exam

The official grade records of the course are the Course Coordinator and Senior Laboratory Instructor's spreadsheets, which supersede any grade posted in Brightspace if there is a difference.

Absences: If a student does not participate in a scheduled quiz, in-term test, final exam, or lab exercise, a grade of zero will be recorded for those activities.

- There are no extensions, excused absences, or makeup assignments on quizzes.
- There are no extensions or makeup assignments on in-term tests or on laboratory exercises or assignments.

- A student may apply for an **excused absence** for an in-term test or laboratory exercise if the reason the student did not participate in the test or exercise is one of the following.
    - illness, trauma or bereavement, personal or family affliction (including responsibility to care for a family member)
    - indigenous cultural or community obligations
    - service in the armed forces or emergency services
    - representing the university* at an academic event, a varsity athletic competition, an or artistic performance
    - representing the province or the country at an academic event, an athletic competition, or an artistic performance

    How to apply:

    In-Term Tests: The student may apply for an excused absence within one week of the missed test. To apply, the student must email the Course Coordinator (chemcoco@uvic.ca), providing their name and V number, and explaining the reason for the missed test. Students may be asked to provide supporting documentation. An excused absence will only be considered for a maximum of one in-term test. If a student misses both in-term tests, they should withdraw from the course. If the student does not withdraw, the student will fail the course (see requirements for passing, above). If an excused absence for an in-term test is approved, the weight of the excused test will be redistributed to the final exam. Students who write a test are not eligible to apply for an excused absence for that test. The moment a student begins a test they are considered to have written the test.

    Laboratory Exercises: The student may apply for an excused absence within four days of the scheduled laboratory exercise. To apply, the student must email the Senior Lab Instructor (firstchemlab@uvic.ca), providing their name and V number, and explaining the reason for the missed lab. Students may be asked to provide supporting documentation. An excused absence does not count as a completed laboratory exercise (see requirements for passing). There are no opportunities for redistribution of marks on laboratory exercises or assignments.

** Because these are university events, there is also an option for a UVic coach or equivalent to invigilate your exam. Contact the course coordinator at chemcoco@uvic.ca if you have a UVic event that clashes with a midterm exam.*

- If a student does not write the Final Exam for reasons outlined in the University Calendar, appropriate documentation for the missed exam should be submitted with a "Request for Academic Concession (Deferred exam)" to the Undergraduate Records Office as described in the University Calendar and this video. Students who write the final exam are not eligible to apply for a deferred exam. The moment a student begins the exam they are considered to have written the exam.

Academic Integrity: Students are responsible for adhering to the academic regulations of the University of Victoria, and must review the Policy on Academic Integrity. Students must work independently on In-term Tests, Quizzes, Laboratory Exercises and the Final Examination, without

help from others. All work and answers to questions must be the student's own. In CHEM 101 open book means: students can use the CHEM 101 data sheet, textbook, lecture book, syllabus and their own notes, but no other resources while completing an assessment.

Examples of academic misconduct include, but are not limited to:

- receiving or giving help on Tests, Quizzes, Laboratory Exercises or the Final Exam
- using resources other than those permitted for use on an assessment
- submitting in-lab notes and reports for laboratory exercises that were not performed by the student (this is falsification of data)

Technology Requirements: It is the responsibility of the student to ensure that they have access to a reliable computer and browser, and stable internet access such that the student can complete online assessments without issue. Browser or smartphone access is required for lecture participation marks.

Quizzes: Seven quizzes (total grade value of 7%) will be available on Brightspace. Students must start the quiz during the time period indicated on Brightspace. Students have four hours to complete each quiz once they have started it, but each quiz is designed to be completed within one hour. Students must submit the quiz in Brightspace or a mark of zero (0) will be recorded for the quiz. Quizzes are open book, but all work and answers must be the student's own. Each student must do the quiz individually, without help from others.

In-term Tests: Two in-term tests (grade value of 15% each) are scheduled for all students to write at the same time (6-7 pm on October 13 and 6-7 pm on November 17). Students are required to write the tests at the scheduled times. The moment a student begins a test they are considered to have written the test. The tests are multiple choice. Each student must do the tests individually, without help from others. The tests are closed book, with the SHARP EL-510 calculator being the only permitted calculator. Students arriving more than thirty minutes after the scheduled start time will not be allowed to write the test. Detailed instructions will be communicated via Brightspace.

Final Exam: The date and time of the CHEM 101 Final Examination (grade value 40%) will be finalized by the University in October. Students are required to write the Final Examination at the time scheduled by the Registrar. The moment a student begins the final exam they are considered to have written the exam.

The teaching team will make a decision on whether the exam will be in-person or online closer to the time of the exam. The delivery method will depend on the public health situation, university guidelines and other factors. The exam delivery method and instructions will be communicated via Brightspace. Each student must do the exam individually, without help from others.

- An in-person exam is closed book, with the SHARP EL-510 calculator being the only permitted calculator. Students arriving more than thirty minutes after the scheduled start time will not be allowed to write the in-person exam.
- An online exam is open book but all work and answers must be the student's own. Students must submit the exam in Brightspace or a mark of zero will be recorded for the exam. If a student does not start the exam within fifteen minutes after the scheduled start time, the student will not be allowed to write the online exam.

Lecture Participation: Student participation in lecture (grade value 3%) is measured through in-class questions that are answered by the student using Echo360 (in the CHEM 101 Brightspace site or through the Echo360 app). The answers are recorded each lecture and marks are assigned based on the percentage of questions a student answers during the term (questions do NOT need to be answered correctly; this activity is to help your learning). Full marks are obtained by participating in 80% of questions (so a student answering 60% of the questions will score 60/80 = 75% for this component of the course, and get 2.25 of the available 3 marks).

Laboratory: It is the responsibility of the students to ensure that:

- they can work with Word documents on their computer
- they can convert these documents to pdf format
- they have secure and reliable internet access.

Only students wearing the required clothing and safety gear (as outlined on the Welcome page of their Brightspace lab site) are allowed in the lab.

Only in-lab notes and reports that use the supplied templates and that are submitted as readable pdf files on Brightspace by the due time are marked. In order to submit the report, students must submit their in-lab notes, completed on the provided template, by the due time. Students are required to show the email received on submission of their in-lab notes to their TA before they leave the lab. All data used in the report must be documented in the in-lab notes.

Mark review requests must be submitted to the Senior Lab Instructor by the due dates indicated on the student's CHEM 101 lab Brightspace site. All marks reviews will include a review of all the mark components and can result in an increase or decrease in the overall mark.

Students are responsible for completing laboratory exercises on the dates and times scheduled for their lab section. The schedule of the laboratory exercises is provided on the Brightspace site for their registered lab section.

A laboratory exercise is considered complete when the experimental procedure has been performed and completed in the teaching lab during their scheduled lab period.