

Last Revised: January 2022

Last Reviewed: January 2022

### COURSE INFORMATION

**Course Title:** Introduction to Chemistry with Laboratory

**Course Number:** CHEM 100      **Credits:** 4

**Total Weeks:** 14 (Fall, Spring)  
12 (Summer)      **Total Hours:** 91

**Course Level:**  First Year       Second Year  
 New       Revised Course  
 Replacement Course

**Department:** Sciences

**Department Head:** S. Girdhar

**Former Course Code(s) and Number(s) (if applicable):** N/A

**Pre-requisites (If there are no prerequisites, type NONE):** PREC 12 or MATH 100 or MATH 120 or equivalent. Students with credit for any university chemistry course may not take this course for credit.

**Co-requisite Statement (List if applicable or type NONE):** NONE

**Precluded Courses:** N/A

### COURSE DESCRIPTION

This course introduces the general concepts of chemistry, including atomic structure, stoichiometry, chemical bonding, liquids and solutions, kinetics, and equilibrium. This course includes a laboratory component. No prior knowledge of chemistry is required for this course.

### LEARNING OUTCOMES

Upon successful completion of the course, students will be able to:

- Demonstrate a firm grasp of the knowledge of chemistry, as specified in course syllabus and objectives.
- Identify the relationships between chemistry and other science disciplines, and the applications of chemistry in society. Identify the impact of chemistry on our life and the world around us.
- Solve chemistry problems using mathematical and computational tools.
- Understand and use the correct vocabulary necessary to communicate specific chemical information to other chemists and non-chemists.
- Demonstrate competency in the laboratory skills: knowledge of the appropriate equipment and techniques, and follow the proper procedures and regulations for safe handling when using chemicals.
- Be able to understand the specific instructions given to carry out experiments, make observations and collect the necessary data with the appropriate precision and accuracy, then in a report process the data and determine and assess the results.
- Understand the bases of the electronic structure of atoms and its relationship to the periodic table of the elements.
- Be able to identify the types of molecular bonds and shapes of simple molecules.
- Understand the factors governing the kinetics of chemical reactions.
- Comprehend and test the equilibria of various systems, both homo- and heterogeneous, as related to gases, acids, and bases.
- Understand the fundamentals of oxidation-reduction reactions. Be able to recognize and balance a redox reaction.

**INSTRUCTION AND GRADING**

Instructional (Contact) Hours:

Type	Duration
Lecture	52
Seminars/Tutorials	
Laboratory	39
Field Experience	
Other ( <i>specify</i> ):	
Total	91

**Grading System:** Letter Grades  Percentage  Pass/Fail  Satisfactory/Unsatisfactory  Other 
**Specify passing grade:** 50%

**Evaluation Activities and Weighting** (total must equal 100%)

Assignments: 9% <i>Specify number of, variety, and nature of assignments:</i> 3 problem set assignments	Lab Work: 20%	Participation: 8% <i>Specify nature of participation:</i> Weekly attendance, classroom discussion	Project: % <i>Specify nature of project:</i>
Quizzes/Test: %	Midterm Exams: 32% Midterm 1 15% Midterm 2 15% Practice Midterms 2%	Final Exam: 31% Final 30% Practice Final 1%	Other: % <i>Specify:</i>

**TEXT(S) AND RESOURCE MATERIALS**

Provide a full reference for each text and/or resource material and include whether required/not required.

 OpenStax College. (2021). *Chemistry*. <https://openstax.org/details/books/chemistry-2e>
**COURSE TOPICS**

List topics and sequence covered.

Week	Topic	Chapter
Week 1	Scientific Method, Matter Measurements and Calculations	1
Week 2	Matter, molecules and ions	2
Week 3	Chemical nomenclature	2

Week 4	Modern atomic theory	6
Week 5	Chemical Composition	1, 2, 6
Week 6	Chemical composition	3
Week 7	Chemical equations and types of reactions Midterm 1	4
Week 8	Reaction Stoichiometry and titrations	4
Week 9	Midterm 2	3, 4
Week 10	Energy and heat, calorimetry	5
Week 11	Phase transitions, heating/cooling curves	10
Week 12	Chemical bonding, Lewis structures	7
Week 13	Equilibrium	13
Week 14	<b>FINAL EXAM</b>	

**NOTES**

1. Students are required to follow all College policies. Policies are available on the website at: [Coquitlam College Policies](#)
2. To find out how this course transfers, visit the BC Transfer Guide at: [bctransferguide.ca](http://bctransferguide.ca)

## Lab Experiments:

1. Intro to Lab Equipment/ The Thickness of a Thin Aluminum Sheet
2. Physical Separation of Matter/ Chemical Properties and Change
3. Types of Chemical Reactions
4. Moles of Iron and Copper
5. Calculations with a Chemical Reaction
6. Preparation of Standard Solutions and Use of a Spectrophotometer to Measure the Concentration of an Unknown Solution
7. Factors Affecting Reaction Rate
8. Investigating Chemical Equilibrium
9. Acid-Base Titration
10. Oxidation-Reduction Reactions