

Last Revised: September 2021

### COURSE INFORMATION

**Course Title:** Principles of Chemistry II

**Course Number:** CHEM 102

**Credits:** 4

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

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

**Department:** Science      **Department Head:** S. Girdhar

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

**Pre-requisites (If there are no prerequisites, type NONE):** CHEM 101 or equivalent

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

**Precluded Courses:** N/A

### COURSE DESCRIPTION

In this course students will continue studying the basic concepts of chemistry begun in CHEM 101. Topics include reaction kinetics and mechanisms; organic reaction mechanisms; equilibrium; acids, bases, and solubility; thermochemistry and thermodynamics; redox reactions and electrochemistry.

### 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.
- Speak, write, and listen critically.
- 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 quantitative and qualitative 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 factors governing the kinetics and mechanisms of chemical reactions, both inorganic and organic, and be able to determine them experimentally.
- Comprehend and test the equilibria of various systems, both homo- and heterogeneous, as related to gases, acids, bases, buffers, and solubility.
- Relate the laws of thermodynamics to chemical and related processes.
- Understand the fundamentals of electrochemical reactions and their relationship to the laws of thermodynamics, and be able to test them experimentally by designing and taking measurements of electrochemical cells

**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: 25%	Participation: 5% <i>Specify nature of participation:</i> Weekly attendance and contribution	Project: % <i>Specify nature of project:</i>
Quizzes/Test: %	Midterm Exam: Midterm 1: 15% Midterm 2: 15%	Final Exam: 30% Practice Final: 1%	Other: %

**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>

 Organic Chemistry with a Biological Emphasis (Soderberg). (2021, March 16). University of Minnesota Morris. [https://chem.libretexts.org/Bookshelves/Organic\\_Chemistry/Book%3A\\_Organic\\_Chemistry\\_with\\_a\\_Biological\\_Emphasis\\_v2.0\\_\(Soderberg\)](https://chem.libretexts.org/Bookshelves/Organic_Chemistry/Book%3A_Organic_Chemistry_with_a_Biological_Emphasis_v2.0_(Soderberg))
**COURSE TOPICS**

List topics and sequence covered.

Week	Topic
Week 1	Chemical Kinetics
Week 2	Chemical Equilibrium
Week 3	Acids and Bases
Week 4	<b>MIDTERM 1</b>

Week 5	Acid-Base and Solubility Equilibria
Week 6	Thermochemistry
Week 7	Thermodynamics
Week 8	Spontaneity
Week 9	<b>MIDTERM 2</b>
Week 10	Redox Reactions
Week 11	Electrochemistry
Week 12	Stereochemistry
Week 13	Organic Reaction Mechanisms
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)