CHEM-102 – Fundamentals of Chemistry 2

University Arts and Science

Effective Term & Year: Winter 2026
Course Outline Review Date: 2031-09-01

Program Area: Math and Sciences

Description:

Together with CHEM 101, CHEM 102 provides a solid foundation in fundamental chemical principles. Topics include equilibrium, thermodynamics, kinetics, electrochemistry, chemistry of the main group elements and the chemistry of organic and biomolecules. The associated laboratory exercises emphasize proper experimental technique, data collection and analysis, safety and technical writing skills.

Program Information:

CHEM 101 and CHEM 102 can be used as lab science credits in an Associate of Arts (AARTS) or an Associate of Science (ASc) degree at College of the Rockies.

This course is designed for students seeking a degree or diploma in a field of science or technology. It is also suitable as an elective course for General Studies or Arts students.

Delivery Methods: On-campus (Face-to-Face)

Credit Type: College of the Rockies Credits

Credits: 3

Course type/s: Lab Sciences, Sciences

Instructional Activity and Hours:

Activity	Hours

Classroom, Directed Studies or Online Instruction	45
Seminar/Tutorials	
Laboratory/Studio	45
Practicum/Field Experience	
Co-op/Work Experience	
Other	
Total	90

Course Requisites:

- Completed at least 1 of the following:
  - CHEM101 – Fundamentals of Chemistry 1 (3)
  - CHEM115 – Chemistry for Engineering (3)

Prior Learning and Recognition: Yes

Students are able to request formal recognition of their prior learning or experience outside the classroom. Challenge examination, portfolio-assisted assessment, work-based assessment or a combination of assessments that is appropriate to identify, assess, and recognize prior skills, competencies, and knowledge to achieve course credit. Tuition fees apply, refer to Policy 2.5.5 Prior Learning Assessment and Recognition (PLAR) or contact an education advisor for more information.

Course Transfer Credit:

For information about receiving transfer credit for courses taken at either British Columbia or Alberta institutions, please see https://www.bctransferguide.ca/ or https://transferalberta.alberta.ca . For more transfer credit information, please visit https://www.cotr.bc.ca/Transfer

All requests for course transfer credit from institutions in British Columba or elsewhere should go to the College of the Rockies Enrolment Services office.

Textbook Resources:

Textbook selection varies by instructor and may change from year to year. At the Course Outline Effective Date the following textbooks were in use:

Petrucci, Herring, Madura and Bissonnette. *General Chemistry: Principles & Modern Applications*. 11th ed. Prentice Hall.

Course Manual for Chemistry 102. (available in COTR Bookstore)

Lab Coat (available in COTR Bookstore)

A scientific calculator is required, but **programmable** calculators are **not allowed on exams.**

Please see the instructor's syllabus or check COTR's online text calculator https://textbook.cotr.bc.ca/ for a complete list of the currently required textbooks.

Learning Outcomes:

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

- use chemical knowledge to build connections between course content and the broader branches of science;
- apply the qualitative principles of equilibrium, thermodynamics and kinetics to make quantitative predictions about chemical reactions;
- solve quantitative problems involving equilibrium, thermodynamics and kinetics;
- explain and apply the concepts of aqueous equilibrium to problems involving salt solubility, the behaviour of electrolytes, pH and buffers;
- use a knowledge of electrochemistry to construct an electrochemical cell and predict the cell potential;
- explain the significance of electrochemistry in industrial processes and corrosion;
- predict the structures and chemical properties of main-group compounds and explain their industrial and biological significance;
- use a knowledge of valence bond theory to describe the structures of organic molecules;
- use IUPAC nomenclature to name organic molecules with various functional groups;
- predict the products of simple organic reactions;
- work both collaboratively and independently in a chemistry laboratory setting to perform procedures efficiently, safely, precisely and accurately; and
- precisely record laboratory data, correctly perform associated calculations and present the results in a professional format;

Course Topics:

- Equilibrium
- Thermodynamics
- Kinetics
- Qualitative and quantitative aspects of aqueous solutions
- Electrochemistry
- Main group chemistry

- Introduction to organic chemistry
- Introduction to biomolecules

See instructor syllabus for the detailed outline of weekly readings, activities and assignments.

Evaluation and Assessments

Assessment Type: On-Campus (face-to-face)

Assessment Type	% of Total Grade
Assignments	5%
Midterm Tests	40%
Final Examination	32%
Laboratory Reports	13%
Laboratory Test	7%
Quizzes & Assignments	3%
Total	100%

Grade Scheme

A+	A	A-	B+	B	B-	C+	C	C-	D	F
>=90	89-85	84-80	79-76	75-72	71-68	67-64	63-60	59-55	54-50	<50

Pass requirements:

A passing average (50% or higher) in both the theory and practical components.

Evaluation Notes: A grade of “D” grants credit, but may not be sufficient as a prerequisite for sequential courses.

Exam Attendance:

Students must attend all scheduled exams at the appointed time and place. Instructors may approve an alternate exam to accommodate an illness or personal crisis. Department heads will consider other written requests. Any student who misses a scheduled exam without prior approval will receive a “0” on the exam.

Academic Policies:

College of the Rockies policies related to courses can be found at https://cotr.bc.ca/about-us/college-policies/ and include the following:

- Policy 2.1.4 Course Audit

- Policy 2.4.1 Credential Framework
- Policy 2.4.3 Students with Documented Disabilities
- Policy 2.4.4 Student Rights, Responsibilities and Conduct
- Policy 2.4.8 Academic Performance
- Policy 2.4.9 Student Feedback and Concerns
- Policy 2.4.11 Storage of Academic Works
- Policy 2.5.3 Student Appeal
- Policy 2.5.5 Prior Learning Assessment and Recognition (PLAR)

Course Changes:

The College of the Rockies updates course outlines regularly to meet changing educational, employment and marketing needs. The instructor will notify students in writing of any updates to this outline during the semester. The instructor reserves the right to revise, add or delete material while meeting the learning outcomes of this course outline.