



Fundamentals of Chemistry 2 - CHEM 102

University Studies Program

Course Outline

COURSE IMPLEMENTATION DATE: Pre 1998
OUTLINE EFFECTIVE DATE: January 2021
COURSE OUTLINE REVIEW DATE: September 2026

GENERAL COURSE 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 (AA) or an Associate of Science (ASc) degree at COTR.

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: This course is delivered face-to-face.

COTR Credits: 3

Hours for this course: 90 hours

Typical Structure of Instructional Hours:

Instructional Activity	Duration
Lecture Hours	45
Seminars / Tutorials	
Laboratory / Studio Hours	45
Practicum / Field Experience Hours	
Other Contact Hours	
Total	90

Practicum Hours (if applicable):

Type of Practicum	Duration
On-the-job Experience	N/A
Formal Work Experience	N/A
Other	N/A
Total	

Course Outline Author or Contact:

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Signature

APPROVAL SIGNATURES:

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Department Head Signature

Dean Signature

EDCO

Valid from: January 2021-September 2026

Education Council Approval Date

COURSE PREREQUISITES AND TRANSFER CREDIT:

Prerequisites: CHEM 101 or CHEM 115 or equivalent

Corequisites: None

Flexible Assessment (FA):

Credit can be awarded for this course through FA

Yes No

Learners may request formal recognition for flexible assessment at the College of the Rockies through one or more of the following processes: External Evaluation, Worksite Assessment, Demonstration, Standardized Test, Self-assessment, Interview, Products/Portfolio, Challenge Exam. Contact an Education Advisor for more information.

Transfer Credit: For transfer information within British Columbia, Alberta and other institutions, please visit <http://www.cotr.bc.ca/Transfer>.

Students should also contact an academic advisor at the institution where they want transfer credit.

Prior Course Number: N/A

Textbooks and Required 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*. 10th ed. Prentice Hall.

Course Manual for Chemistry 102. (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 <http://go.cotr.bc.ca/tuition/tCalc.asp> for a complete list of the currently required textbooks.

LEARNING OUTCOMES:

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

- apply chemical knowledge to integrate knowledge gained in other courses and to better make the connections between the various branches of science;
- utilize the terminology and concepts of chemistry to acquire and communicate scientific information and to solve basic chemical problems;
- 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;
- perform several common laboratory procedures safely, efficiently and accurately; and
- recognize random and systematic errors in experimental procedures; precisely record laboratory data, correctly perform associated calculations and present the results in a professional format.

This course should help students

- use written and oral communication skills effectively, employing methods appropriate to message and content;
- think clearly and critically, fusing experience, knowledge and reasoning into considered judgment;
- identify, interpret and solve problems, effectively implementing and evaluating proposed strategies;
- set goals and priorities in academic and personal life;
- set high performance standards;

- demonstrate initiative, motivation, and persistence to get the job done;
- comprehend and interpret detailed scientific and/or technical information from text;
- critically evaluate information for accuracy, relevance and importance;
- make generalizations (transfer knowledge and training to new situations);
- apply a variety of mathematical techniques with the degree of accuracy required to solve problems and make decisions;
- transfer the use of mathematical strategies from one situation to another;
- work effectively with others in a laboratory situation;
- receive, comprehend and interpret a sequence of instructions;
- plan and efficiently perform a number of overlapping activities;
- use equipment requiring careful procedures; and
- draw reasonable conclusions from observations.

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 ASSESSMENT:

Assignments		% Of Total Grade
Lecture	- Assignments	5%
	- Midterm Tests	40%
	- Final Examination	32%
Laboratory	- Laboratory Reports	13%
	- Laboratory Test	7%
	- Quizzes & Assignments	<u>3%</u>
Total		100%

Please see the instructor syllabus for specific classroom policies related to this course, such as details of evaluation, penalties for late assignments, and use of electronic aids.

Note: Attendance at all laboratory sessions and exams is required. However, arrangements can be made for documented illness or bereavement. Lecture attendance is strongly recommended and students are responsible for all course material covered in lecture and assigned readings. In order to pass the course, a passing grade (50% or greater) is required for both the laboratory portion and lecture portion of the course.

EXAM POLICY:

Students must attend all required scheduled exams that make up a final grade at the appointed time and place.

Individual instructors may accommodate for illness or personal crisis. Additional accommodation will not be made unless a written request is sent to and approved by the appropriate Department Head prior to the scheduled exam.

Any student who misses a scheduled exam without approval will be given a grade of "0" for the exam.

COURSE GRADE:

Course grades are assigned as follows:

Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F
Mark (Percent)	≥ 90	89-85	84-80	79-76	75-72	71-68	67-64	63-60	59-55	54-50	< 50

A grade of "D" grants credit, but may not be sufficient as a prerequisite for sequential courses.

ACADEMIC POLICIES:

See www.cotr.bc.ca/policies for general college policies related to course activities, including grade appeals, cheating and plagiarism.

COURSE CHANGES:

Information contained in course outlines is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational, employment and marketing needs. The instructor endeavours to provide notice of changes to students as soon as possible. The instructor reserves the right to add or delete material from courses.