



CHEM-201 – Organic Chemistry 1

University Arts and Science

Effective Term & Year: Fall 2024
Course Outline Review Date: 2029-03-01

Program Area: Math and Sciences

Description:

CHEM 201 is an introductory course in organic chemistry that includes the study of the structures and reactions of aliphatic and aromatic hydrocarbons and their derivatives. The laboratory stresses the techniques associated with the preparation, purification and identification of organic compounds.

Program Information:

CHEM 201 and CHEM 202 can be used as required 2nd year science credits within the Associate of Science (ASc) and as science credits in the Associate of Arts (AA) degree.

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	60

Practicum/Field Experience	
Co-op/Work Experience	
Other	
Total	105

Course Requisites:

- Completed the following:
 - CHEM101 – Fundamentals of Chemistry 1 (3)
 - CHEM102 – Fundamentals of Chemistry 2 (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 Columbia 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:

1. *Organic Chemistry; A Tenth Edition*, J. McMurry, <https://openstax.org/details/books/organic-chemistry> (2023).
2. Course Manual for Chemistry 201. COTR

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:

This course places heavy emphasis on the application and integration of chemical knowledge, which should assist you in developing effective problem solving skills for application in other science courses and in your future career.

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

- illustrate the application of modern theories of chemical bonding and the various theories of acids and bases to predict the stabilities and behavior of organic molecules, ions and radicals;
- identify and name constitutional and stereoisomers of a wide variety of organic compounds;
- reproduce and use the mechanisms of nucleophilic substitution, elimination and free radical reactions to evaluate reaction feasibility and to predict which products will result from these reactions;
- predict and describe the chemical and physical properties of alkanes, alkenes, alkynes, haloalkanes, alcohols, ethers and organometallics, and apply the predictions to problems of chemical identification and synthesis;
- discuss the basis of IR and UV spectroscopy and the phenomenon of colour and apply this knowledge to problems of structural determination;
- perform complex problem solving involving a large number of interconnected steps;
- visualize chemical reactions in association with a 3-D reaction coordinate diagram;
- work with potentially hazardous chemicals in a safe and prudent manner;
- recognize and efficiently utilize typical organic chemistry laboratory equipment without instructor assistance;
- operate delicate and expensive equipment in a confident and careful manner; and
- assemble and organize information obtained through experimentation so that the

information may be utilized in the future by yourself or others

Course Topics:

- Fundamental Knowledge for Organic Chemistry: chemical bonding, Lewis- and Brønsted concepts of acidity, molecular geometry, Lewis structures, molecular orbital theory and hybridization
- Classes of Hydrocarbons and Other Functional Groups
- Classification of Isomers
- Nomenclature of Organic Compounds (including stereochemical descriptors)
- Stereochemistry of Organic Molecules (including use of the Cahn-Ingold-Prelog system, Newman projections and Fischer projections)
- Alkyl Halides and SN1, SN2, E1 and E2 Reaction Mechanisms
- Free Radical Reactions
- Alcohols and Organometallic Reagents in Syntheses
- Ethers and Epoxides
- Alkenes and Alkynes
- IR and UV-Vis Spectroscopy

See instructor's 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	30%
Laboratory Reports	17%
Laboratory Test	5%
Quizzes and 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.

Evaluation Notes Comments:

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 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.