



## CHEM-100 – Introduction to Environmental Chemistry

University Arts and Science

**Effective Term & Year:** Fall 2024

**Course Outline Review Date:** 2029-03-01

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**Program Area:** Math and Sciences

**Description:**

This course is an introduction to the fields of environmental studies and environmental chemistry. Qualitative and quantitative aspects of environmental processes are studied. Topics include atmospheric processes (including those involving carbon dioxide and ozone), air pollution, acid rain, natural waters, dissolved oxygen and the fate of chemical compounds in the environment. Where possible, examples involving local issues and current events are studied. The associated laboratory exercises emphasize proper experimental techniques, data collection and analysis, safety and technical writing skills.

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**Program Information:**

This course is designed for non-science majors. It is a required course for the Environmental Studies Certificate, a laboratory-science elective for the Teacher Education Program, and an elective course for other Arts majors with an interest in environmental issues. This course can also be used as an elective in the Bachelor of Business Administration Degree Program.

Note: CHEM 100 does not meet the requirements for a science major and therefore cannot be substituted for CHEM 101 or CHEM 102.

**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:**

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

**Course Requisites:**

None

**Flexible Assessment:** No**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:

Freeman, B., *Environmental Science – A Canadian Perspective*. 6th ed. Dalhousie University Libraries Digital Editions (2018)

*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:

- evaluate differing opinions of contemporary environmental issues;
- discuss the significance of integrating traditional knowledge perspectives and wisdom within scientific exploration, particularly concerning chemical principles;
- demonstrate an understanding of how traditional knowledge fosters a more inclusive approach to learning and problem-solving;
- apply a basic knowledge of chemistry, physics and mathematics to understand and quantify environmental processes;
- state the important elements and compounds in Earth's atmosphere;
- explain atmospheric processes and describe the structure of the atmosphere;
- apply knowledge of electromagnetic radiation to explain the greenhouse effect and formation of ozone in the stratosphere;
- discuss the characteristics that define scientific rigour;
- describe the mechanism which results in formation of acidic precipitation and state the consequences of it;
- recognize the sources and sinks of important chemical species;
- compare and contrast the benefits and drawbacks of using various forms of energy;
- discuss sources of air pollution;
- discuss sources of water pollution and treatment of drinking water;
- apply knowledge of kinetics to evaluate transport phenomena;
- apply chemical knowledge and critical thinking skills to integrate knowledge gained in other courses and support learning in future courses;
- recall laboratory procedures and the names and uses of laboratory equipment to allow the safe and efficient performance of a variety of chemical experiments; and
- make use of careful measurement techniques and correct handling of data to solve typical problems of environmental importance.

## Course Topics:

- Stratospheric Ozone and the Processes that Lead to Its Formation and Destruction
- Carbon Dioxide and Other Gases Associated with Global Warming
- Sources and Effects of Various Air Pollutants
- Water and Its Role in the Transportation and Transformation of Chemical Species
- Water Pollution and Water Treatment
- The Roles of Nitrogen and Phosphorus in Soils

*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	10%
Midterms	35%
Final Exam	30%
Laboratory Reports	15%
Laboratory Test	7%
Laboratory 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.

### 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 2.4.3 Students with Documented Disabilities
- Policy 2.4.4 Student Conduct (plagiarism, other cheating, behavioral misconduct)
- Policy 2.5.8 Academic Performance
- Policy 2.5.3 Grade Appeal
- Policy 2.4.9 Student Concerns Re Faculty

### **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.