



## Organic Chemistry 1 - CHEM 201

### University Studies Program

### Course Outline

COURSE IMPLEMENTATION DATE: Pre 1998  
OUTLINE EFFECTIVE DATE: September 2019  
COURSE OUTLINE REVIEW DATE: March 2024

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#### GENERAL COURSE DESCRIPTION:

CHEM 201 is an introductory course in organic chemistry including the structure and reactions of aliphatic and aromatic hydrocarbons and their derivatives. The laboratory stresses the techniques of preparation, purification and identification of organic compounds.

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**Program Information:** CHEM 201 and CHEM 202 can be used as components of 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 could also be suitable as an elective course for General Interest or Arts students who have previously completed CHEM 101 and CHEM 102.

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**Delivery:** This course is delivered face-to-face.

**COTR Credits:** 3

**Hours for this course:** 105 hours

#### Typical Structure of Instructional Hours:

Instructional Activity	Duration
Lecture Hours	45
Seminars / Tutorials	
Laboratory / Studio Hours	60
Practicum / Field Experience Hours	
Other Contact Hours	
<b>Total</b>	105

#### Practicum Hours (if applicable):

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

**Course Outline Author or Contact:**

David G. Dick, BSc, Ph.D

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Signature

**APPROVAL SIGNATURES:**

Department Head  
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Department Head Signature

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Dean Signature

EDCO

Valid from: September 2019 – March 2024

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Education Council Approval Date

**COURSE PREREQUISITES AND TRANSFER CREDIT:**

**Prerequisites:** CHEM 101, CHEM 102 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 or 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:

J. McMurry. *Organic Chemistry*. 7<sup>TH</sup> ed. Brooks/Cole.

*Laboratory Experiments and Worksheets for Chemistry 201*. COTR

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.

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## 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, you will be able to

- illustrate the application of modern theories of chemical bonding and the various theories of acids and bases to the prediction of stabilities and behavior of organic molecules, ions and radicals;
- name structural, geometric and stereoisomers of a wide variety of organic compounds;
- utilize the mechanisms of nucleophilic substitution, elimination and free radical reactions to evaluate reaction feasibility and to predict product identities;
- describe and predict the chemical and physical properties of alkanes, alkenes, alkynes, alkyl halides, 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 color and apply this knowledge to problems of structural determination;
- perform complex problem solving involving a large number of interconnected steps;
- visualize chemical reactions occurring in 3 dimensions;
- 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.

This course should help you

- 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 judgement;
- 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;
- search for information in the professional literature;
- 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;
- draw reasonable conclusions from observations;
- visualize abstract concepts; and
- perform mental manipulations in 3 dimensions.

#### COURSE TOPICS:

- Bonding, Acidity/Basicity, Molecular Geometry, Molecular Orbitals, Functional Groups
- Alkanes, Isomers and Nomenclature
- Stereochemistry of Alkenes and Cycloalkanes, Geometric Isomers and Chirality
- Alkyl Halides, Substitution and Elimination Reaction Mechanisms
- Free Radical Reactions
- Alcohols and Organometallic Reagents in Syntheses
- Ethers and Epoxides
- IR and UV-Vis Spectroscopy
- Alkenes and Alkynes

*See instructor's 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	30%
Laboratory	- Laboratory Reports	17%
	- Laboratory Test	5%
	- Quizzes and Assignments	<u>3%</u>
Total		100%

*Please see the instructor's 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.

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#### 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.

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#### 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.

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#### ACADEMIC POLICIES:

See [www.cotr.bc.ca/policies](http://www.cotr.bc.ca/policies) for general college policies related to course activities, including grade appeals, cheating and plagiarism.

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#### 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 will endeavour to provide notice of changes to students as soon as possible. The instructor reserves the right to add or delete material from courses.