Chemistry (CHEM) 217

Chemical Principles I (Revision 10)

Status:	Replaced with new revision, see the **course listing** for the current revision
Delivery mode:	**Individualized study online** with a **Home Lab**. You can order the **Laboratory Kit** online. CHEM 217 has a **lab exemption** This course is charged a **lab fee**
Credits:	3
Area of study:	Science
Prerequisites:	Chemistry 30 or an equivalent high school chemistry course is strongly recommended but not required. This course is open only to students with previous chemistry experience.
Precluded:	CHEM 209 (CHEM 217 may not be taken for credit if credit has already been obtained for CHEM 209.)
Challenge:	CHEM 217 is not available for challenge.
Faculty:	**Faculty of Science and Technology**

Notes:	Note: Home Lab Kits can be shipped within Canada only. Students who live outside Canada are required to attend **supervised laboratories** on site at Athabasca University, Alberta.

Overview

CHEM 217 provides an introduction to chemistry from both a theoretical and practical point of view. Topics in CHEM 217 include chemical reactions and equations; energy in chemical systems; and the structure and properties of atoms, molecules, gases, liquids, solids, and solutions. The combination of CHEM 217 and **CHEM 218** is the equivalent to first-year university chemistry.

Learning outcomes

Upon successful completion of this course, you should be able to

- name chemical compounds and interpret chemical formulae.
- solve problems in chemical stoichiometry.
- describe the properties of gases and perform calculations using gas laws.
- use thermochemical data to solve chemical problems involving heat, work, and enthalpy.
- detail the quantum mechanical model of the atom and the historical atomic models that preceded it.
- recognize the periodic properties of the elements and explain them using the quantum–mechanical model of the atom.
- discuss chemical bonds using the Lewis theory, valence bond theory, and molecular orbital theory, and predict molecular shapes using the valence shell electron pair repulsion theory.
- describe intermolecular forces and apply them to explain the properties of liquids, solids, and gases.

- summarize the properties of solutions in terms of intermolecular forces and perform calculations involving the colligative properties of solutions.
- perform qualitative and quantitative chemical experiments and record and interpret results.

Evaluation

To **receive credit** for CHEM 217, you must complete all of the course work, and achieve at least 50 percent on each of the two examinations, and an overall course composite grade of at least **D (50 percent)** . The weighting of the composite grade is as follows:

Activity	Weight
Midterm Examination	20%
Final Examination	40%
Assignments 1 to 4	20%
Laboratory Work	20%
Total	**100%**

The **final examination** for this course must be requested in advance and written under the supervision of an AU-approved exam invigilator. Invigilators include either ProctorU or an approved in-person invigilation centre that can accommodate online exams. Students are responsible for payment of any invigilation fees. Information on exam request deadlines, invigilators, and other exam-related questions, can be found at the **Exams and grades** section of the Calendar.

To learn more about assignments and examinations, please refer to Athabasca University's **online Calendar** .

Materials

Digital course materials

Links to the following course materials will be made available in the course:

Tro, N. J., Fridgen, T. D., Shaw, L. E. (2020). *Chemistry: A Molecular Approach* (3rd Canadian Ed.) Pearson.

Mastering Chemistry is an online platform that accompanies your eText. It provides a variety of resources that may help you learn and practice the material presented in CHEM 217. It also contains the *Selected Solutions Manual*.

Other Resources

The Athabasca University course resources also include an online Study Guide and Course Orientation, as well as a Home Lab Kit (to be borrowed from the AU Science Lab) with a Home Laboratory Manual.

The items listed below are not supplied; you should purchase them before you begin to work on the course. You will need

- an electronic calculator capable of handling logarithms and exponentials. **Remember:** Take your calculator with you whenever you write an examination or attend a laboratory session.
- other stationery, including paper for assignments, pens, pencils, a ruler, etc.

Special Instructional Features

You must complete 32 hours of laboratory work, using a Home Lab Kit, to obtain credit in this course. Order the **laboratory kit** online. If you cannot make your request online, please request the Home Lab Kit from the Science Lab (**sciencelab@athabascau.ca**).

Note that your laboratory work accounts for 20% of your overall course mark. You must satisfactorily complete and write up a specified minimum number of experiments in order to obtain credit for this course.

Note: You must submit Assignment 1 before requesting the Home Lab Kit.

Important links

- **Academic advising**
- **Program planning**

- **Request assistance**
- **Support services**
- **Chemistry Lab Resources**
- **Chemistry Lab Exemptions**

Athabasca University reserves the right to amend course outlines occasionally and without notice. Courses offered by other delivery methods may vary from their individualized study counterparts.

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View **previous revision**