

# Chemistry (CHEM) 218

**Chemical Principles II** (Revision 8)

**Delivery Mode:** Individualized Study Online [↗](#) with eText [↗](#), and a Supervised Lab [↗](#). CHEM 218 has a lab exemption [↗](#). This course is charged a lab fee [↗](#).

**Credits:** 3

**Area of Study:** Science

**Prerequisites:** CHEM 217. Concurrent registration in CHEM 217 and 218 is not permitted. To avoid unnecessary delays, the course professor will normally grant permission for students to register in CHEM 218 as soon as the final examination in CHEM 217 has been written.

**Precluded:** CHEM 209 (CHEM 218 may not be taken for credit if credit has already been obtained for CHEM 209)

**Challenge:** CHEM 218 is not available for Challenge.


**Faculty:** Faculty of Science and Technology [↗](#)

**Status:** Replaced with new revision, see the [course listing](#) [↗](#)

for the current revision 

## Overview

### Overview

CHEM 218 is a continuation of [CHEM 217](#) . Topics covered include chemical kinetics, chemical equilibrium, acid-base and solubility equilibria, thermodynamics, electrochemistry, the chemistry of metals and nonmetals, nuclear chemistry, and an introduction to organic chemistry. The experiments performed in the lab component of the course complement the material studied in the theoretical part of the course and provide students with the opportunity to use many of the skills developed in CHEM 217. The combination of CHEM 217 and CHEM 218 is the equivalent to first-year university chemistry.

## Learning Outcomes

### Learning Outcomes

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

- measure chemical reaction rates, formulate rate laws, and determine reaction mechanisms from kinetic data.
- discuss chemical equilibria, predict how reaction conditions can shift an equilibrium, and calculate equilibrium concentrations of reactants and products.
- describe acid-base and other aqueous equilibria in terms of molecular properties, and perform calculations on those equilibria.



- define and apply the concepts of entropy, enthalpy, and Gibbs free energy to chemical thermodynamics problems.
- identify electrochemical reactions and solve electrochemistry problems involving cell potential, reactant concentrations, and applied current.
- describe and balance nuclear reactions, calculate rates of radioactive decay, and describe aspects of nuclear fission and nuclear fusion.
- detail the chemistry of non-metals and transition metals in quantitative terms.
- express the structures and basic properties of organic compounds and biological molecules.
- perform qualitative and quantitative chemical experiments and record and interpret results.


## ➤ Evaluation


### Evaluation

The assessment of students in this course is based on examinations, tutor-marked assignments, and laboratory work. To **receive credit** [↗](#) for CHEM 218, you must complete all of the course work, and achieve an overall (composite) mark of at least **D (50 percent)** [📄](#), and at least 50 percent on each of the two examinations. The weighting of the composite grade is as follows:

Activity	Weight
Midterm Exam	20%
Final Exam	40%
Tutor-marked Assignments	20%
Laboratory Work	20%


Activity	Weight
<b>Total</b>	<b>100%</b>


The **midterm and final examinations** for this course must be taken online with an AU-approved exam invigilator at an approved invigilation centre. It is your responsibility to ensure your chosen invigilation centre can accommodate online exams. For a list of invigilators who can accommodate online exams, visit the [Exam Invigilation Network](#) .

To learn more about assignments and examinations, please refer to Athabasca University's [online Calendar](#) .



## Materials

### Materials

Brown, T. L., LeMay, H. E., Bursten, B. E., Murphy, C. J., & Woodward, P.M. (2012). *Chemistry: The Central Science* (Volume 2, 3<sup>rd</sup> custom edition for Athabasca University). Boston: Pearson Learning Solutions.  (eText)

Hill, J. C. & Wilson, R. (2012) *Student Guide and Solutions* (Volume 2, 3<sup>rd</sup> custom edition for Athabasca University). Boston: Pearson Learning Solutions.  (eText)

### eTexts

Registration in this course includes electronic textbooks. For more information on [electronic textbooks](#) , please refer to our [eText Initiative site](#) .

### Other Resources

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.
- the lab manual. Only an e-copy is provided, which you print off and bring to the supervised lab.

All other learning resources will be available online.

## Special Instructional Features

CHEM 218 has a compulsory laboratory component which includes two days of supervised laboratory sessions. Credit may be obtained for equivalent laboratory work carried out within the last five years at a recognized college or university. Speak with the Lab Coordinator for more information.

Laboratory sessions are normally scheduled in Edmonton and Calgary.

Up-to-date information regarding the laboratory schedule can be found on the [Centre for Science](#) website.

### Important Links

## Important Links

- > [Academic Advising](#) 
- > [Program Planning](#) 
- > [Request Assistance](#) 
- > [Support Services](#) 
- > [Chemistry Lab Dates and Locations](#) 
- > [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.

*Opened in Revision 8, November 13, 2013*

*Updated December 13, 2021, by Student & Academic Services*

View [previous revision](#) 

