Chemistry (CHEM) 218

Chemical Principles II (Revision 9)

Status:	Replaced with new revision, see the **course listing** for the current revision
Delivery mode:	**Individualized study online** with 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

Overview

CHEM 218 is a continuation of **CHEM 217** . Topics covered include chemical kinetics, chemical equilibrium, acid-base and solubility equilibria, thermodynamics, electrochemistry, radioactivity and 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

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.
- express the structures, basic properties, and chemical reactivity of organic compounds.

- perform qualitative and quantitative chemical experiments and record and interpret results.

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 the midterm and final examinations. The exams for this course are multiple choice and invigilated online. The Midterm has 40 questions and covers Units 13 to 16 and the Final has 60 questions and covers Units 13 to 21. The weighting of the composite grade is as follows:

Activity	Weight
Midterm Exam	20%
Final Exam	40%
Tutor-marked Assignments	20%
Laboratory Work	20%
Total	**100%**

The **midterm and final examinations** 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.

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 218. It also contains the *Selected Solutions Manual*.

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

Note: In-person laboratory sessions are postponed indefinitely during the COVID-19 health emergency. Students will be provided with sample data with which to complete their lab reports.

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

- **Academic advising**

- Program planning
- Request assistance
- Support services at AU
- 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**