

Course Outline
CHEM 1023: General Chemistry 2, Winter 2023

Lectures			Location
WI01:	John Murimboh	M/W/F: 8:30am – 9:30am	ELL 207
WI02:	Amitabh Jha	M/W/F: 9:30am – 10:30am	ELL 207
WI03:	Cathy Murimboh	M/W/F: 10:30am – 11:30pm	BAC 234
WI04:	Bobby Ellis	M/W/F: 11:30pm – 12:30pm	ELL 207

Office Hours	Instructor	Email	Location
Mon: 2:00-5:00	Cathy Murimboh	catherine.murimboh@acadiau.ca	ELL 211
Tues: 2:00-5:00	Bobby Ellis	bobby.ellis@acadiau.ca	ELL 115
Wed: 2:00-5:00	Amitabh Jha	amitabh.jha@acadiau.ca	ELL 120
Thur: 2:00-5:00	John Murimboh	john.murimboh@acadiau.ca	KCIC LL33
Labs	Ashely Parsons	ashley.parsons@acadiau.ca	ELL 215

Chemistry Help Centre	Location
Mon/Tue/Wed: 6:00 – 9:00 pm	ELL 303

Textbook
Chemistry: A Molecular Approach (3 rd Canadian Edition) Tro, Nivaldo J., Travis Fridgen, and Lawton Shaw Pearson Canada, 2019 Note: older editions are also acceptable
Alternate Textbooks
1. Principles of General Chemistry v1.0 (Averill and Eldredge) [HTML] 2. Chemistry Virtual Textbook (Stephen Lower, Simon Fraser University) [HTML] 3. Any first-year chemistry textbook

LEARNING, TEACHING, AND ASSESSMENT INFORMATION

Assessment		
Labs	20%	
Assignments	10%	Best 10 Assignments
Midterm 1	10%	Thur, Feb 2, 2023, 7:00 pm
Midterm 2	10%	Thur, Mar 2, 2023, 7:00 pm
Midterm 3	10%	Thur, Mar 23, 2023, 7:00 pm
Final Exam	40%	TBA
Total	100%	

Students with a valid excuse (e.g. illness) must contact their instructor at least one hour prior to the start of the midterm, complete the [Declaration of Cause](#) form, and submit to the Registrar's Office in person, by fax, by mail, or by email. The weight of the midterm will be transferred to the final exam. **Students who miss all three midterms, regardless of the reason, will receive a failing grade in the course.**

Labs

Instructor: Ashley Parsons, ashley.parsons@acadiau.ca ELL 215

Monday – Friday: 1:00 – 4:00pm (ELL 204, 206)

Prelab (ELL 207)

Attendance is required for all scheduled laboratories. This includes all laboratory activities, including pre-lab meetings. Absences during laboratory time will be categorized as either 'excused' or 'unexcused'. Unexcused absences will result in a grade of zero for that laboratory session. A student who is absent for three (3) labs, with any combination of excused and/or unexcused absences per course, will receive a failing laboratory grade. The laboratory is an integral part of the course. **You must earn a passing grade in the laboratory to pass the course.**

The penalty for late lab reports is a deduction of 10% to a maximum of 4 days.

See the lab ACORN page [CHEM 1020L/1120L WI01 CHEM 1023 Laboratory 2023 Winter](#) for more details.

Lab Manual and Safety Glasses: Purchase from the Chemistry Club (Elliott Hall Lobby)
Jan. 9 – 18, 12:30 – 1:00pm, lab manuals: \$10, safety glasses: \$5, oversize safety glasses: \$7

Lab Coats and Notebooks: Available at the Acadia University Bookstore.

Assignments

Due: Thursdays at 11:30pm (NO EXCEPTIONS)

Late assignments automatically receive a grade of zero. There are no exceptions, including illness or power failures. i.e. Do not wait until the last minute to work on the assignments!

Course Description

An introductory treatment of chemical kinetics and equilibria, thermochemistry, entropy and free energy, electrochemistry, phase equilibria and properties of solutions, structure and properties of solids, and organic chemistry.

Assessment will be by assignments, examination, and submission of laboratory reports.

Topics

Unit 1: Kinetics

Unit 2: Thermochemistry

Unit 3: Spontaneity

Unit 4: Chemical Equilibrium

Unit 5: Electrochemistry

Unit 6: Phase Equilibrium and Solutions

Unit 7: Solids

Unit 8: Organic Chemistry

Learning Outcomes

Content-Specific

- a. Calculate the relative rates of change of reactant/product concentrations
- b. Determine reaction order using the method of initial rates
- c. Use integrated rate laws to calculate reactant concentrations or time elapsed
- d. Use the Arrhenius equation to determine rate constants at a different temp.
- e. Calculate heat transfer, work, and total internal energy of a system
- f. Calculate $\Delta_r H^\circ$ using Hess' Law, bond dissociation enthalpies, and stoichiometry
- g. Use coffee cup calorimetry and bomb calorimetry
- h. Calculate entropy change and Gibbs energy change
- i. Predict the direction of a reaction under a given set of conditions
- j. Predict the effects on the equilibrium position of changing concentrations or temperature
- k. Use ICE tables to calculate concentrations or K
- l. Calculate the solubility of a salt and determine the effect of common ions and pH on solubility
- m. Balance redox reactions
- n. Interconvert between E° , ΔG° and K; E , ΔG and Q
- o. Calculate E_{cell} for an electrochemical cell with non-standard concentrations
- p. Understand and label phase diagrams
- q. Quantify colligative properties: vapour pressure lowering, boiling point elevation, freezing point depression, osmotic pressure
- r. Identify different types of solids and their properties
- s. Calculate lattice energy or $\Delta_f H$ for ionic compounds using the Born-Haber cycle.
- t. Recognize functional groups, name organic compounds
- u. Rank organic acid and base strength

Scientific Practices and Critical Thinking Skills

- v. Formulate strategies for solving a problem and investigating the properties of a chemical system.
- w. Draw conclusions that are appropriate given the information provided, for example, by recognizing whether calculations or conclusions "make sense".
- x. Combine knowledge of different chemical processes to understand and characterize chemical systems.
- y. Solve problems in chemistry while following standard practices such as reporting the correct number of significant figures, using appropriate units, notation, and symbols, sketching diagrams, making and stating appropriate approximations and simplifications, and comparing results with other known quantities.
- z. Recognize appropriate methods to analyze data and evaluate the significance of experimental results.

Laboratory and Technical Skills

- a. Practice and identify safety rules and procedures specific to a chemical compound, experimental procedure, or work environment, including wearing personal protective equipment.
- b. Demonstrate care in basic laboratory and chemical handling skills, including following procedures correctly, using balances and common glassware, transferring material with the accuracy and precision required by the experiment, preparing solutions, and identifying potential sources of error.
- c. Dispose of laboratory waste properly and demonstrate knowledge of common waste streams.
- d. Prepare and maintain a laboratory notebook that has enough detail that another person could reproduce the experiment.

Communication Skills

- a. Write about chemistry with clarity and in an organized way; use correct terminology while avoiding unnecessary jargon; and accurately summarize scientific information from relevant and reputable sources.
- b. Present scientific data using graphics and tables so that it is clear, has appropriate units, and accurately represents the data (including error where appropriate).
- c. Work effectively and efficiently with others, for example, by establishing roles and responsibilities.

Professional Skills, Scientific Attitudes, and Learning Strategies

- a. Demonstrate ethical standards in presenting data and work accurately as one's own, for example, by avoiding plagiarizing.
- b. Make informed decisions about contemporary issues related to chemistry by being objective, data-driven, and open to new ideas.
- c. Effectively prepare for in-class and laboratory learning by completing readings, assignments, and other homework and by reviewing course notes from previous lectures.
- d. Review feedback on course assignments to learn from mistakes and to understand where improvement can be made.
- e. Be more confident in discussing and seeking information to better understand chemistry-related issues.
- f. Self-identify as a scientist.

Accessible Learning Services

If you are a student with documentation for accommodations or if you anticipate needing supports or accommodations, please contact Gillian Haste (Accessibility Resource Facilitator) or Marissa McIsaac (Manager) at 902-585-1823, accessible.learning@acadiu.ca. Accessible Learning Services is located in Rhodes Hall, rooms 111-115.

Equity and Diversity

Acadia University is committed to becoming a culturally safe and anti-oppressive community. This can only be achieved where there are simultaneous efforts to eliminate all forms of discrimination and harassment from our campus community, including the elimination of all discrimination, harassment and violence based on one's identity, including but not limited to, gender, race, class, ethnicity, sexual orientation, disability, gender identity, gender expression, and Indigeneity.

The Equity, Diversity and Inclusion Officer is available to **students, staff, and faculty**. The fundamental objective of the Equity Office is to **prevent discrimination, sexual harassment, and personal harassment** from occurring, in part by managing [Acadia's Policy Against Harassment and Discrimination](#). For more information, as well as for resources for students who believe they may have experienced or witnessed discrimination, sexual harassment, or personal harassment please contact Acadia's Equity, Diversity and Inclusion Officer, Polly Leonard, MSW, RSW (she/her/hers) at equity@ACADIAU.CA, and check out the [website](#).

Academic Integrity

It is your responsibility to acquaint yourself with the university policy on academic integrity. Academic dishonesty such as cheating, and plagiarism are not tolerated. Any form of academic dishonesty in examinations, tests, labs, or assignments is subject to serious academic penalty. The full description of the penalties associated with academic dishonesty is outlined in the 2022/2023 Academic Calendar.

- Cheating is copying or the use of unauthorized aids or the intentional falsification or invention of information in any academic exercise
- Plagiarism is the act of presenting the ideas or words of another as one's own. Students are required to acknowledge and document the sources of ideas used in their written work.
- Self-plagiarism is also a form of plagiarism. It is the presentation of the same work in more than one course without the permission of the instructors involved.
- A student who knowingly helps another commit an act of academic dishonesty is equally guilty.
- Penalties are levied in relation to the degree of the relevant infraction. They range from failure on that piece of work, to failure in the course, to dismissal from the university.