



School of Academic & Skill Development

**CHEM 060**

**Introduction to Chemistry II**

**Term: Winter 2023**

**Number of Credits: 3**

## Course Outline

<b>INSTRUCTOR</b>	Inderjeet Kaur	<b>OFFICE HOURS</b>	By appointment
<b>OFFICE</b>		<b>CLASSROOM</b>	A2204
<b>E-MAIL</b>	Inderjeetkaur@yukonu.ca	<b>CLASS TIME</b>	Monday – 1:00-4:00 (lab) Wednesday – 1:00 – 2:20 Friday – 10:30- 12:00
<b>PHONE</b>	867-333-6922	<b>CRN</b>	20070

### COURSE DESCRIPTION

This course covers structure of molecules, introduction to organic chemistry, the gaseous state, reactions in water, ionic equations, oxidation-reduction equations, acids and bases, and chemical equilibrium and kinetics. Includes eight laboratory sessions.

### COURSE REQUIREMENTS

Prerequisite(s): Minimum grade of B- in CHEM 050 or equivalent.

\*Students must also register in the mandatory lab component of the course, CHEM 060L

### EQUIVALENCY OR TRANSFERABILITY

Receiving institutions determine course transferability. Find further information at:

<https://www.yukonu.ca/admissions/transfer-credit>

### LEARNING OUTCOMES

Upon successful completion of the course, students will be able to:

- Obtain the prerequisite body of knowledge and skills that will provide a basis for further academic and career/vocational training.
- Appreciate and apply the chemistry of everyday life.
- Appreciate and apply the scientific method to investigations of all phenomena.
- Communicate effectively, particularly to the scientific community using the language of chemistry.
- Carry out all duties in an ethical, professional manner, including the collection of data.

- Work effectively as a member of a team.
- Handle equipment and chemicals in a safe and effective manner with regard to their own safety and the safety of others.

## **COURSE FORMAT**

### **Weekly breakdown of instructional hours**

Students are expected to attend 1.5 hr lectures twice a week, for a total of approximately 42 hrs. Homework and assignments are completed outside of class time, and it is expected these will require an additional 3-4 hrs of work per week. It is important to note that the time required for successful course completion will vary by individual.

The 8 mandatory laboratory sessions will occur about every other week for at least 2.5 hrs each. Lab reports will require an additional 1-2 hrs to complete.

### **Delivery format**

This course and the lab are delivered with set meeting times in-person on campus (synchronous face-to face). A hybrid format delivered both in-person on campus and by Zoom may be available on request for distance students.

## **EVALUATION**

### **Engagement and Participation**

Regular attendance and engagement, including completing homework and assignments, will provide the best opportunity for success in the course.

Laboratories include carrying out experiments and the collection of data required to submit results and a written report; therefore students must attend the labs. Missed labs will not be repeated. Students arriving late to lab sessions may be refused entry for safety and disruption purposes.

### **Assignments**

Short, question-based assignments will be assigned for each chapter covered in the course. Assignments account for 20% of the course mark.

### **Quizzes and Tests**

There is a midterm and cumulative final examination. The examinations are "closed book" though data sheets will be provided.

### **Laboratories**

There are 8 labs in the course, most of which require the submission of results and a detailed lab report. The labs account for 30% of the course mark. **Students must achieve a minimum of 50% on the laboratory component of the course in order to pass the course.**

## Summary

Laboratories	30 %
Assignments	20 %
Mid-term	20 %
Final exam	30 %
Total	100%

## COURSE WITHDRAWAL INFORMATION

Students may officially withdraw from a course or program without academic penalty up until two-thirds of the course contact hours have been completed. Last day to withdraw or change to audit from winter term academic courses without academic penalty is Thu, Mar 9 2023.

See withdrawal information at [www.yukonu.ca/admissions/money-matters](http://www.yukonu.ca/admissions/money-matters)

Refer to the YukonU website for important dates: [www.yukonu.ca/admissions/important-dates](http://www.yukonu.ca/admissions/important-dates)

Refunds may be available. See the Refund policy and procedures at [www.yukonu.ca/admissions/moneymatters](http://www.yukonu.ca/admissions/moneymatters)

## TEXTBOOKS & LEARNING MATERIALS

Zumdahl, S. 2004. Introductory Chemistry: A Foundation (5th ed.)

- on reserve at the YukonU Library for full-term loan. You must return the textbook or face a hold on your account preventing you from accessing transcripts or registering for further courses.

McBee, Tom. (2020). Yukon University Chemistry 060 Laboratory Manual

- supplied as a PDF on Moodle, and printed copies available.

Scientific calculator

## ACADEMIC INTEGRITY

Students are expected to contribute toward a positive and supportive environment and are required to conduct themselves in a responsible manner. Academic misconduct includes all forms of academic dishonesty such as cheating, plagiarism, fabrication, fraud, deceit, using the work of others without their permission, aiding other students in committing academic offences, misrepresenting academic assignments prepared by others as one's own, or any other forms of academic dishonesty including falsification of any information on any Yukon University document.

Please refer to Academic Regulations & Procedures for further details about academic standing and student rights and responsibilities.

## ACADEMIC ACCOMMODATION

Reasonable accommodations are available for students requiring an academic accommodation to fully participate in this class. These accommodations are available for students with a documented disability, [www.yukonu.ca](http://www.yukonu.ca)

chronic condition or any other grounds specified in section 8.0 of the Yukon University Academic Regulations (available on the Yukon University website). It is the student's responsibility to seek these accommodations by contacting the Learning Assistance Centre (LAC): [LearningAssistanceCentre@yukonu.ca](mailto:LearningAssistanceCentre@yukonu.ca).

## TOPIC OUTLINE

Chemistry 060 covers the Core Topics for Provincial Chemistry in the BC Adult Basic Education Articulation Handbook which may be found at <http://www.bctransferguide.ca/>

More Specifically:

### Organic Chemistry

- Carbon bonding
- Alkanes
- Isomerism
- Nomenclature, Synthesis and Reactions of: Alkanes, Substituted alkanes, Alkenes, Alkynes, Aromatics, Alcohols, Ethers, Aldehydes, Ketones, Carboxylic Acids, Esters, Amines, Amides
- Polymerization

### Biochemistry

- Proteins: Structure and Functions
- Carbohydrates
- Nucleic Acids
- Lipids

### Gases

- Boyle's Law, Charles's Law, Guy-Lussac's Law, Combines Gas Law
- Avogadro's Law
- Ideal Gas Law
- Partial Pressures
- Kinetic Molecular Theory
- Gas Stoichiometry

### Acids and Bases

- Definitions
- Strength
- Calculations: pH, pOH, [H<sup>+</sup>], [OH<sup>-</sup>], strong acids

- Buffers

## Equilibrium

- Reaction Kinetics and Energetics
- Reaction Rates
- Equilibrium Constant
- Le Châtelier's Principle
- Solubility:  $K_{sp}$  including common ion effect,  $K_a$ , pH of weak acids, buffers

## Electrochemistry

- Oxidation States
- Balancing; Half-Cell Method in Acid Medium
- Electrochemical and Electrolytic Cells
- $E^\circ$  Calculations