



Applied Arts

CHEM 060
Introduction to Chemistry II
Winter, 2022

3 Credits

Course Outline

INSTRUCTOR	Andy Roebuck (PhD)	OFFICE HOURS	Via Zoom: Tuesdays 1:00-3:00 pm or by appointment
OFFICE		CLASSROOM	A2101, A2803 (Lab)
E-MAIL	aroebuck@yukonu.ca	CLASS TIME	Monday (Lab): 1:00 – 4:00 Tuesday, Friday: 10:30 – 12:00
TELEPHONE	n/a	CRN	20026

Liberal Arts office: Ayamdigut Campus A2501, liberalarts@yukonu.ca, 867-668-8770

COURSE DESCRIPTION

Chemistry 060 involves the study of organic chemistry, biochemistry, gases, acids and bases, equilibrium, electrochemistry, and nuclear chemistry.

COURSE REQUIREMENTS

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

EQUIVALENCY OR TRANSFERABILITY

Yukon University Chemistry 060 is articulated as Provincial Chemistry in the Adult Basic Education system (ABE) in British Columbia and Yukon.

ABE Provincial Chemistry is considered Equivalent to Chemistry 12 by the British Columbia Ministry of Education.

For more information, please refer to the BC Adult Basic Education Articulation Handbook which may be found at <http://www.bctransferguide.ca/>

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

Delivery format

This course is delivered on campus, in person. Students are expected to attend class and may be required complete assignments and/or activities online or individually. There may be no facility for including students at a distance.

There are either 3 one-and-a-half hour classes per week (Monday, Tuesday, Friday) **or** two one-and-a-half hour classes (Tuesday, Friday) and a two-and-a-half hour lab per week (Monday).

EVALUATION

Engagement and Participation

The collection of data for most laboratories must be done in the laboratory, therefore students must attend the laboratory sessions in order to submit a report. Students arriving late to a laboratory session may be refused entry.

Assignments

An assignment will be submitted for each chapter covered in the course. The assignments account for 20% of the course mark.

Tests

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

Rewrites

www.yukonu.ca

A rewrite for a failing grade on an examination (less than 50%) may be permitted at the instructor's discretion. These examinations will be written no earlier than two weeks after the date of the original examination. The mark will be recorded whether it is higher or lower than the original. However, a maximum mark of 65% will be awarded.

"No Shows"

A student who misses an examination will receive a mark of zero for that examination but may be permitted a rewrite. Exceptions may be made if a student receives prior permission from the instructor or faces an emergency. Some form of documentation of the emergency may be required.

Labs

There are 7 laboratory sessions and 8 laboratories in this course, most of which require a detailed report. The laboratories account for 30% of the course mark. **Students must achieve a minimum of 50% on the laboratory component to pass the course.**

Assignments	20 %
Labs	30 %
Midterm	20 %
Final	30 %
Total	100%

TEXTBOOKS & LEARNING MATERIALS

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

McBee, Tom. (2020). Yukon College Chemistry Laboratory Manual.

Scientific calculator

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. Specific withdrawal dates vary, and students should become familiar with the withdrawal dates of their program. See withdrawal information at www.yukonu.ca/admissions/money-matters

Refer to the YukonU website for important dates: www.yukonu.ca/admissions/important-dates

Refunds may be available. See the Refund policy and procedures at www.yukonu.ca/admissions/money-matters

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 (updated bi-annually) for further details about academic standing, and student rights and responsibilities: www.yukonu.ca/policies/academic-regulations

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, chronic condition or any other grounds specified in section 8.0 of the Yukon University Academic Regulations (available on the Yukon University website at www.yukonu.ca/policies/academic-regulations)

It is the student's responsibility to seek these accommodations by contacting the Learning Assistance Centre (LAC): 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, $[H^+]$, $[OH^-]$, 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° Calculations