**APPLIED ARTS DIVISION**
**CHEM 050**
**3 Credit Course**
**Fall, 2019**


# COURSE OUTLINE

# CHEMISTRY 050

# INTRODUCTION TO CHEMISTRY I

# 3 CREDITS

PREPARED BY: Tom McBee, Instructor
DATE: June 26, 2019

APPROVED BY:
DATE:

APPROVED BY ACADEMIC COUNCIL: June 29, 2015
RENEWED BY ACADEMIC COUNCIL

**APPLIED ARTS DIVISION**
**CHEM 050**
**3 Credit Course**
**Fall, 2019**

**APPLIED ARTS DIVISION**
**CHEM 050**
**3 Credit Course**
**Fall, 2019**

# INTRODUCTION TO CHEMISTRY I

---

**INSTRUCTOR:** Tom McBee

**OFFICE HOURS:** Monday 12:00 noon to 1:00 pm
Wednesday 1:00 pm to 2:00 pm

**OFFICE LOCATION:** Room A2314

**CLASSROOM:**
Lectures: M/T/W/Th T1083
Labs: W A2803

**E-MAIL:** tmcbee@yukoncollege.yk.ca

**TIME:**
Lectures: 10:30 am to 11:55 am
Labs: 10:30 am to 12:55 pm

**TELEPHONE:** (867) 668-8831

**DATES:** September 4 to December 19

## COURSE DESCRIPTION

Chemistry 050 involves the study of SI measurements, matter and energy, atomic theory to the present day, chemical formulas, nomenclature, bonding, including molecular shape, reactions and equations, stoichiometry, liquids and solutions, acid base chemistry and chemistry of hydrocarbons

## PREREQUISITES

High school Mathematics 11 (with Algebra) or Yukon College Math 050 or any college equivalent is a co-requisite. It is recommended that students complete Math 050 prior to enrolling in Chemistry 050. High school Science 10 or Yukon College Science 030 is also recommended.
As formal laboratory reports are a course requirement a demonstrated writing ability is also required. Successful completion of Yukon College English 030 would be considered the minimum.

## RELATED COURSE REQUIREMENTS

Safety classes are required to be worn at all times during the laboratories. Safety classes are provided, however, in the interest of comfort, students may wish to purchase their own. Students may also wish to purchase their own lab coat.

## EQUIVALENCY OR TRANSFERABILITY

Yukon College Chemistry 050 is articulated as Advanced Chemistry in the Adult Basic Education system (ABE) in British Columbia and Yukon.
ABE Advanced Chemistry is considered equivalent to Chemistry 11 by the British Columbia Ministry of Education.
Please refer to the BC Adult Basic Education Articulation Handbook which may be found at http://www.bctransferguide.ca/"

**LEARNING OUTCOMES**

Upon completion of Chemistry 050, students will be able to

- meet the competencies as stated for ABE Advanced Level Chemistry located in the BC Adult Basic Education BC Articulation Handbook
- obtain the prerequisite body of knowledge and skills that will provide a basis for further academic and career/vocational training
- 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**

There are approximately 71 hours of class time in addition to 27 hours of laboratory time. The laboratories will generally be scheduled about every other week for at least two and a half hours each

**ASSESSMENTS**

Attendance & 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 are two midterm examinations in this course. Each midterm accounts equally for 25% of the course mark.

Laboratories

There are nine 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.**

**EVALUATION**

| | | |
|---|---|---|
| Assignments | 20% | |
| Laboratory mark* | 30% | ***Students must achieve a minimum of 50% on the laboratory component to pass the course.** |
| Midterm 1 | 25% | |
| Midterm 2 | 25% | |
| Total | 100% | |

Rewrites
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.

**REQUIRED TEXTBOOKS AND MATERIALS**
Zumdahl, Steven S. (2004). Introductory Chemistry: A Foundation, (5th ed.) supplied
McBee, Tom. (2015). Yukon College Chemistry 050 Laboratory Manual.
Scientific calculator.

**ACADEMIC AND STUDENT CONDUCT**
Information on academic standing and student rights and responsibilities can be found in the current Academic Regulations that are posted on the Student Services/ Admissions & Registration web page.

**PLAGIARISM**
Plagiarism is a serious academic offence. Plagiarism occurs when a student submits work for credit that includes the words, ideas, or data of others, without citing the source from which the material is taken. Plagiarism can be the deliberate use of a whole piece of work, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material according to an accepted manuscript style (e.g., APA, CSE, MLA, etc.). Students may use sources which are public domain or licensed under Creative Commons; however, academic documentation standards must still be followed. Except with explicit permission of the instructor, resubmitting work which has previously received credit is also considered plagiarism. Students who plagiarize material for assignments will receive a mark of zero (F) on the assignment and may fail the course. Plagiarism may also result in dismissal from a program of study or the College.

**ATTENDANCE AND PARTICIPATION**
It is the student's responsibility to attend classes. Students who miss classes are responsible for any work missed except for laboratories as detailed in "ASSESSMENTS".

**ELECTRONIC DEVICES**
In order to be successful in classes and minimize distractions for others, cell phones, iPods and other electronic devices must be turned off while students are in class. In an emergency situation, the instructor may give a student permission to use a device.

**APPROPRIATE LANGUAGE**
In all areas of the college environment, students are responsible to show respect for others, swearing, or language that is discriminatory or derogatory in relation to race, sex, ethnic background, religious beliefs, age and physical condition is not appropriate.

**YUKON FIRST NATIONS CORE COMPETENCY**
Yukon College recognizes that a greater understanding and awareness of Yukon First Nations history, culture and journey towards self-determination will help to build positive relationships among all Yukon citizens. As a result, to grand from ANY Yukon College program, you will be required to achieve core competency in knowledge of Yukon First Nations. For details, please see www.yukoncollege.yk.ca/yfnccr.

**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 College Academic Regulations (available on the Yukon College website). It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, he/she should contact the Learning Assistance Centre (LAC): lac@yukoncollege.yk.ca.

**TOPIC OUTLINE**

Chemistry 050 covers the Core Topics as stated for ABE Advanced Level Chemistry located in the BC Adult Basic Education Articulation Handbook which may be found at http://www.bctransferguide.ca/

A. Measurement
- Demonstrate the concepts of precision and accuracy and how they differ, utilizing significant
- figures
- Perform calculations using scientific notation
- Perform conversions with the SI system

B. Properties of Substances
- Differentiate between the phases of matter
- Identify chemical or physical properties of substances
- Describe Dalton's Atomic Theory and the Law of Constant Composition

C. Periodic Trends
- Use the periodic table to determine atomic composition of isotopes
- Use the periodic table to predict electron arrangement of chemical families in order to predict
- trends in ion charge, reactivity, ionization energy, electronegativity, atomic radii, and ionic radii

D. Atomic Structure
- Analyze the historical development of atomic theory
- Describe the Bohr and Wave Mechanical model of the atom and cite evidence for these
- models including absorption and emission spectra and their use in modern technology

E. Mole Concept
- Define a mole and its significance
- Perform calculations including molar and formula mass, mole to mass conversions, and percent
- composition by mass of compounds

F. Bonding
- Define covalent and ionic bonding
- Construct the formulas of compounds
- Use electronegativity to predict bond types
- Draw Lewis structures, predict molecular shapes, and determine polarity

G. Nomenclature

- Write names for compounds given the formulae and write formulae for compounds given the names for the following types of compounds:
    - Covalent compounds
    - Ionic compounds
    - Compounds containing polyatomic ions
    - Compounds containing transition metals
    - Acids

H. Chemical Reactions

- Balance equations
- Classify and predict single and double replacement reactions, combustion reactions, and acid-base neutralizations
- Classify synthesis, decomposition, exothermic and endothermic reactions Perform stoichiometric calculations including mass-to-mass, limiting reagent, and percent yield

I. Solutions

- Predict solubility and conductivity of polar and non-polar compounds
- Define Arrhenius acids and bases
- Relate the pH scale to acids and bases
- Perform calculations involving dilutions
- Perform stoichiometric calculations involving solutions including titrations

J. Organic Chemistry

- Classify substances as organic
- Differentiate the various types of bonding between carbon atoms
- Write names and draw structures of hydrocarbons
- Categorize organic compounds based on their functional groups