Course Outline

College and Career Preparation

Winter, 2018

CHEM 025A, Chemistry 025
6 credits, 6 hours lecture

Chemistry 025 begins with an introduction to elements and the Periodic Table, followed by atomic theory and periodicity chemical bonding and types of compounds, chemical bonding and types of compounds, chemical nomenclature, and chemical reactions. The remainder of the course focuses on calculations involving measurements in chemistry, the metric systems (SI), and scientific notation as applied to gases, solutions (including acids and bases), and stoichiometry.

Alberta Education Course Equivalency: Science 10 (Chemistry unit) and Chemistry 20
Corequisite: MATH 010C or permission from the Program Chair

Instructor

Chithra Duraiswamy
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Office Hours

Tuesdays	10:00 – 10:50 AM
Fridays	10:00 – 10:50 AM

Hours of Instruction

Monday	11:00 AM – 12:50 PM	Room S112
Tuesday	11:00 AM – 12:50 PM	Room S112
Friday	11:00 AM – 12:50 PM	Room S218

Required Supplies

CHEMISTRY 25 Student Manual (available at the bookstore)
Basic Scientific Calculator – Does not have to be a TI-83 or better.

Course Outcomes

Upon successful completion of this course, the student shall be able to:

- Recognize the main branches of Science and explain the scientific method
- List the five branches of Chemistry
- Describe the basic particles that make up the underlying structure of matter
- Explain the Atomic Theories leading to the modern structure of the atom (Dalton, Thomson, Rutherford and Bohr)
- Describe the three subatomic particles which make up the atom.

- Explain the division of elements in the periodic table
- Identify and characterize of elements in groups and periods
- Explain the chemical bonding and properties of compounds
- Classify and explain the structure of compounds.
- Write names and formulas for compounds
- Apply VSEPR theory to predict molecular shapes for molecules
- Explain the types of intermolecular forces
- Recognize the systematic chemical name of binary, ternary and higher compounds
- Recognize the difference between precision vs accuracy, types of errors and significant digits
- Employ the measurement system for unit conversion and density problems.
- Apply the mole concept for calculation of molar mass, moles of elementary units, and molar volume of gas
- Explain molecular behavior, using models of the gaseous state of matter.
- Investigate solutions, describing their physical and chemical properties
- Describe molar concentration, molar concentration of ions in solution, and dilutions
- Describe acidic and basic solutions qualitatively and quantitatively
- Explain how balanced chemical equations indicate the quantitative relationships between reactants and products involved in chemical changes.
- Use stoichiometry in quantitative analysis.

Evaluation

Class assignments	20 %
Quizzes	20 %
Midterm Exam (Unit 1 – 3)	30 %
Final Exam (Unit 4 – 6)	30 %
TOTAL	100 %

Grading System

Descriptor	4.0 Scale	Percent
	4.0	96 – 100
Excellent	4.0	90 – 95
	3.7	85 – 89
	3.3	81 – 84
Good	3.0	77 – 80
	2.7	73 – 76
	2.3	69 – 72
Satisfactory	2.0	65 – 68
Minimum Prerequisite	**1.7**	**60 – 64**
Poor	1.3	55 – 59
Minimum Pass	1.0	50 – 54
Failure	0.0	0 – 49

The minimum pre-requisite for progression is 1.7

Proposed Schedule of Topics

Unit I—Matter and Atomic Structure

Section A: Introduction to Chemistry
Section B: Basic Concepts of Matter
Section C: The Structure of the Atom
Section D: Introduction to the Periodic Table

Unit II—Structure of Compounds

Section A: The Structure of Compounds
Section B: Writing Formulas for Ionic and Molecular Compounds
Section C: Intermolecular Forces

Unit III—Chemical Nomenclature

Section A: Valence and Oxidation Numbers
Section B: Chemical Nomenclature

MIDTERM EXAM (Units I – III)

Unit IV—Calculations in Chemistry as applied to Gases

Section A: Mathematics in Chemistry
Section B: Measurements in Chemistry
Section C: The Mole Concept
Section D: Gas Laws

Unit V—Calculations in Chemistry as applied to Solutions

Section A: Characteristics of Solutions
Section B: Preparing Solutions
Section C: Acids and Bases

Unit VI—Chemical Reactions and Stoichiometry

Section A: Writing and Balancing Chemical Equations
Section B: Stoichiometry

FINAL EXAM (Units IV – VI)

Please Note:

Date and time allotted to each topic is subject to change.

Performance Requirements

Student Responsibilities

It is your responsibility as a student to contact the Office of the Registrar to complete the forms for Withdrawal or Change of Registration, and any other forms. Please refer to the list of important dates as noted in the Academic Schedule in the Keyano College credit calendar.

More specific details are found in the Student Rights and Student Code of Conduct section of the Keyano College credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Student Code of Conduct Policies.

Student Attendance

Class attendance is useful for two reasons. First, class attendance maximizes a student's learning experience. Second, attending class is a good way to keep informed of matters relating to the administration of the course (e.g., the timing of assignments and exams). Ultimately, you are responsible for your own learning and performance in this course.

It is the responsibility of each student to be prepared for all classes. Students who miss classes are responsible for the material covered in those classes and for ensuring that they are prepared for the next class, including the completion of any assignments and / or notes that may be due.

Academic Misconduct

Students are considered to be responsible adults and should adhere to principles of intellectual integrity. Intellectual dishonesty may take many forms, such as:

- Plagiarism or the submission of another person's work as one's own
- The use of unauthorized aids in assignments or examinations (cheating)
- Collusion or the unauthorized collaboration with others in preparing work
- The deliberate misrepresentation of qualifications
- The willful distortion of results or data
- Substitution in an examination by another person
- Handing in the same unchanged work as submitted for another assignment
- Breach of confidentiality.

The consequences for academic misconduct range from a verbal reprimand to expulsion from the College. More specific descriptions and details are found in the Student Rights and Student Code of Conduct section of the Keyano College credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Student Code of Conduct Policies.

In order to ensure your understanding of the concept of plagiarism, **you must successfully complete the online tutorial** found on ilearn.keyano.ca. Then print the certificate, sign it, and show it to each of your instructors. Your course work will not be graded until you show this signed certificate.

Specialized Supports

Counselling and Accessibility Services

Counselling Services provides a wide range of specialized counselling services to prospective and registered students, including personal, career and academic counselling.

SKILL Centre

The SKILL Centre is a learning space in the Clearwater Campus at Keyano College where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff.

The SKILL Centre, through a variety of delivery methods, provides assistance in skill development to Keyano students. Assistance is provided by instructors, staff and student tutors. Individuals wishing to improve their mathematics, writing, grammar, study, or other skills, can take advantage of this unique service.

Authorization

This course outline has been reviewed and approved by the Program Chair.

Chithra Duraiswamy, Instructor

Lisa Turner, Chair — Date Authorized

Vincella Thompson, Dean — Date Authorized

Signed copies to be delivered to:
Instructor
Registrar's Office