Course Outline
College and Career Preparation
Fall, 2017

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: Chemistry 20

Corequisite: MATH 010C

Instructor

Linda Milette
CC-205R
780-791-4830
linda.milette@keyano.ca

Office Hours

Mondays     9:00 – 9:50 AM
Tuesdays    3:00 – 3:50 PM
Wednesdays 9:00 – 9:50 AM & 12:00 – 12:50 PM
Thursdays   3:00 – 3:50 AM

Hours of Instruction

Tuesday Lectures 1:00 PM – 2:50 PM Room CC237
Thursday Lectures 1:00 PM – 2:50 PM Room CC237
Friday Lectures 1:00 PM – 2:50 PM Room CC219

Required Supplies

CHEMISTRY 25 Student Manual (available at the bookstore)

Scientific Calculator – Does not have to be a TI-83 or better.
Course Outcomes

Upon successful completion of this course, students will 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*

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Class assignments</td>
<td>20 %</td>
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<tr>
<td>Quizzes</td>
<td>20 %</td>
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<tr>
<td>Midterm Exam (Unit 1 – 3)</td>
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<tr>
<td>Final Exam (Unit 4 – 6)</td>
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<td><strong>TOTAL</strong></td>
<td><strong>100 %</strong></td>
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* as per the Classroom Policies and Procedures posted on the Moodle Course page: late assignments will receive a grade deduction or a zero grade if submitted after assignments are returned to the class. Quizzes cannot be written at a later date.
The minimum pre-requisite for progression is 1.7 (refer to Grading System below)

Grading System

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<tr>
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<th>4.0 Scale</th>
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<tr>
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<td>3.7</td>
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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)
# Calendar of Important Events

*Dates on the following calendar are tentative; shaded areas indicate no Chemistry 025 classes.*

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<thead>
<tr>
<th>Week</th>
<th>Monday</th>
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<td>Labour Day - College Closed</td>
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<td>Introduction Unit 1A</td>
<td>Unit 1B Matter</td>
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<td>Unit 2B Writing Formulas</td>
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<td>Thanksgiving Day - College Closed</td>
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<td>Review/ Unit 4A Math/ Unit 4B Measurements</td>
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**Please Note:** Date and time allotted to each topic is subject to change.

*Final exam dates are scheduled by the College.*

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.

Laboratory Safety

In the science laboratories, safety is important.

Students must complete the *WHMIS for Students* online training course on Moodle before entering the science laboratories.

Students must comply with the mandatory laboratory safety rules for this course as provided in the laboratory manual. Failure to do so will result in progressive discipline such as a verbal warning, refused entry into the laboratory, or suspension from the College.

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.

Linda Milette, Instructor

Lisa Turner, Chair               Date Authorized

Vincella Thompson, Dean          Date Authorized

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