COURSE INFORMATION

Course Prefix/Number: CHM 101
Course Title: General Chemistry I
Lecture Hours/Week: 3.0
Lab Hours/Week: 3.0
Credit Hours/Semester: 4.0

VA Statement/Distance Learning Attendance
Textbook Information
Student Code and Grievance Policy
Attendance Statement (3-30-4000.1)

COURSE DESCRIPTION

This is the first of a sequence of courses in fundamental principles of chemistry. Topics include atomic and molecular structure, nomenclature, formulas and equations, common substances and reactions, stoichiometry, states of matter, solutions, and equilibria.

COURSE COMPETENCIES

Upon successful completion of this course students should be able to:

Module 1: Measurements, Energy, and Matter
- Use key terminology of the units used in the metric and American measurement system appropriately.
- Explain the concept of measured numbers and Significant Figures. Explain the use of Significant Figures in calculations.
- Use the metric prefixes to make measurements of length, volume, and mass. Write and use conversion factors.
- Show proficiency in problem solving.
- Use the concept of density and specific gravity to determine the volume and mass of various objects.
- Explain the concept of energy in chemistry and in nutrition.
- Convert temperatures between Celsius, Fahrenheit, and Kelvin scales. Explain the concept of Specific Heat.
- Explain the concepts of States of Matter and changes between the states.
- Perform a scientific experimental procedure. Collect and analyze data.
- Write a proper scientific laboratory report.

Module 2: Atoms, Elements, Compounds and Their Bonds
- Explain the classification of matter.
- Use the terminology of the elements and their symbols. Explain the Periodic Table and Periodic Trends.
- Write the atomic structure of several elements
- Show proficiency in the use of the concepts of Atomic and Mass number. Explain the concept of isotopes.
- Write the electronic configurations of the electrons in the atoms. Explain what is meant by valence electrons, ions, and the octet rule.
- Show proficiency in writing the names and formulas of ionic, covalent, and polyatomic compounds.
- Explain the concept of electronegativity, bond polarity, and the shape of molecules.

**Module 3: Chemical Reactions, Quantities, and Gases**
- Describe the differences between physical and chemical changes. Write balanced chemical equations for various chemical reactions. Explain the classification of chemical reactions.
- Show which chemical is oxidized and which is reduced in oxidation-reduction reactions.
- Explain the concept of the mole in chemistry.
- Show proficiency in the use of molar mass in calculating chemical quantities. Diagram the flow of energy in chemical reactions.
- Conduct a chemical reaction in the laboratory and calculate the %Yield. Identify the properties of gases.
- Describe the gas laws and their use in calculations. Determine the molar volume of a gas in the laboratory.

**Module 4: Solutions, Acids, Bases, and Nuclear Radiation**
- Describe the properties of solutions, electrolytes, and non-electrolytes. Show proficiency in calculating the concentrations of solutions. Explain the properties of acids and bases.
- Show proficiency in calculations involving the ionization of water, pH, and pOH.
- Write and balance neutralization reactions.
- Calculate molarity and percent concentration in neutralization reactions. Explain how buffers work.
- Conduct a titration reaction in the laboratory and determine the amount of acid or base present.
- Describe the origin of natural radioactivity and balance nuclear equations. Show proficiency in half-life calculations.
- Explain the different uses of radiation in medicine.
- Explain the difference between nuclear fusion and fission.

**MINIMAL STANDARDS**

Minimal standards for performance of course competencies are indicated by achieving a 60 percent average accuracy level on evaluation instruments used in the course.

**COURSE REQUIREMENTS**

**Withdrawal from a Course**
A student may withdraw from a course after the drop/add period until midterm with a grade of “W” (withdrawn). Students who withdraw after midterm may receive a “W” at the discretion of the instructor if performance has been satisfactory to the point of withdrawal. Otherwise, such withdrawals will receive a grade of “WF.”
Academic Integrity
The policies stated in the York Technical College Handbook will be enforced. Any student violating these policies will be subject to academic discipline.

EVALUATION STRATEGIES/GRADING

The competencies of each module may be evaluated by any of the following methods: examination (written or oral), presentation, written report, written assignment, daily quiz, laboratory quiz, homework, or other appropriate instruments. The grading scale for the course will be as follows:

- Module 1: 15%
- Module 2: 15%
- Module 3: 15%
- Module 4: 15%
- Final Exam (Comprehensive): 15%
- Laboratory Grade (Participation and Documentation): 25%

Grade Scale

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<thead>
<tr>
<th>Grade</th>
<th>Range</th>
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<tbody>
<tr>
<td>A</td>
<td>90 - 100</td>
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<tr>
<td>B</td>
<td>80 - 89</td>
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<tr>
<td>C</td>
<td>70 - 79</td>
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<td>D</td>
<td>60 - 69</td>
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<tr>
<td>F</td>
<td>Below 60</td>
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The above requirements and topics are standard and required for the course. Individual instructors will provide statements of additional requirements and/or policy.

ENTRY LEVEL SKILLS

A student entering this course should possess reading comprehension and writing skills on at least the 10th grade level.

PREREQUISITES

MAT 155, MAT 101, or equivalent is recommended.

CO-REQUISITES

None

DISABILITIES STATEMENT

Any student who feels s/he may need an accommodation based on the impact of a disability should contact the Special Resources Office (SRO) at 803-327-8007 in the 300 area of Student Services. The SRO coordinates reasonable accommodations for students with documented disabilities.