

# Alexandria Technical and Community College

## CHEM 1406: Fundamentals of Chemistry

### A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: 3

Lab Hours/Week: 1

OJT Hours/Week: \*.\*

Prerequisites:

This course requires any of these 11 prerequisites

GSDV 0426 - Preparatory Math for Health Sciences

MATH 0000 - Preparatory Math for Health Sciences (Number of Years Valid: 5)

A score of 1150 on test MN Comprehensive Assessment Math

A score of 18 on test ACT Math

A score of 2 on test Arithmetic

A score of 58 on test Accuplacer Intermediate Algebra

A score of 63 on test Accuplacer Elementary Algebra

A score of 74 on test Accuplacer Arithmetic

A score of 250 on test Accuplacer NG Arithmetic

A score of 249 on test Accuplacer NG Quantitative Reasoning

A score of 236 on test Accuplacer NG Advanced Algebra Functions

Corequisites: None

MnTC Goals: Goal 02 - Critical Thinking, Goal 03 - Natural Science

This course meets Minnesota Transfer Curriculum (MnTC) goal areas 2 and 3. This course provides the learner with an understanding of the principles and theories of chemistry. It includes concepts of inorganic chemistry, basic rules of valence, atomic and molecular structure, laws of chemical combination, types of reactions, and gas laws. It also introduces the learner to concepts of solutions, acids and bases and chemical equilibrium. Lab experience is included.

**B. COURSE EFFECTIVE DATES:** 01/08/2018 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Measurements, Significant Figures and Metric System
2. 10. Acid/Base Chemistry and Buffers
3. 11. Solutions, Concentrations and Solubility
4. 12. Lab Component reinforcing content
5. 2. Intuitive and numerical problem solving
6. 3. Elements, Atomic Theory and The Periodic Table
7. 4. Ionic and Covalent Compounds
8. 5. Polarity and VSEPR Theory
9. 6. Writing, Balancing, and Identifying Chemical Reactions
10. 7. Thermodynamics, Reaction Rates and Equilibrium
11. 8. Stoichiometry
12. 9. Gas Properties and Laws

#### **D. LEARNING OUTCOMES (General)**

1. 1. The learner will demonstrate knowledge of scientific measurement, conceptual problem visualization skills, and analytical and numerical problem solving skills, applied to the field of Chemistry and some fields of Applied Science.
2. 2. The learner will demonstrate knowledge of matter and change, the periodic table, compounds and their bonds.
3. 3. The learner will exhibit knowledge of inorganic chemical reactions, chemical quantities and concentrations and gases.
4. 4. The learner will demonstrate knowledge of chemical equilibrium, acids and bases and an introduction to organic chemistry nomenclature.

#### **E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

##### Goal 02 - Critical Thinking

1. Gather factual information and apply it to a given problem in a manner that is relevant, clear, comprehensive, and conscious of possible bias in the information selected.
2. Analyze the logical connections among the facts, goals, and implicit assumptions relevant to a problem or claim; generate and evaluate implications that follow from them.
3. Recognize and articulate the value assumptions which underlie and affect decisions, interpretations, analyses, and evaluations made by ourselves and others.

##### Goal 03 - Natural Science

1. Demonstrate understanding of scientific theories.
2. Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
3. Communicate their experimental findings, analyses, and interpretations both orally and in writing.

#### **F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

#### **G. SPECIAL INFORMATION**

None noted