

## Master Syllabus

### CHE 1311 - College Chemistry I

**Division:** Science, Mathematics and Engineering

**Department:** Chemistry

**Credit Hour Total:** 4.0

**Lecture Hrs:** 3.0 **Lab Hrs:** 2.0

**Prerequisite(s):** MAT 0100OR MAT 1110OR MAT 1130OR MAT 1445

**Date Revised:** September 2016

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#### Course Description:

A university-parallel course in chemistry for the nonscience major. Atomic theory, periodic law, chemical bonds, chemical reactions, states of matter, solutions, acids and bases and the impact of chemistry upon the world and the environment. Three classroom, two lab hours per week. Traditional testing (proctored or in Testing Center) is used in all online sections.

#### General Education Outcomes:

- Critical Thinking/Problem Solving Competency
- Oral Communication Competency
- Values/Citizenship/Community Competency
- Computer Literacy Competency
- Information Literacy Competency

#### Course Outcomes:

##### Periodic Table

Using the periodic table, describe the properties of the elements and name ionic and covalent compounds.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

70% or above correct answers to exam questions

##### States of Matter

Describe characteristics and properties of three states of matter.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

70% or above correct answers to exam questions

##### Chemistry and Our Environment

Apply chemistry concepts to describe the causes and effects of global warming, air pollution, water pollution and ozone depletion.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

70% or above correct answers to exam questions

**Assessment Method:** Performance appraisals

**Performance Criteria:**

Scores of at least "3" out of "4" in all areas of a rubric

##### Solutions

Describe the properties and terms used to describe different types of solutions including the acidity and basicity.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

70% or above correct answers to exam questions

##### Atoms and Molecules

Using the modern atomic theory, describe the structure of atoms and the formation of covalent and ionic bonds.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

70% or above correct answers to exam questions

##### Chemical Reaction

Describe chemical changes by using the mole concept, balanced equations, rates and equilibrium concepts, and energy changes.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

70% or above correct answers to exam questions

#### Outline:

Introduction--Metric Units, Scientific Method, Density, Unit Conversion  
The Chemical View of Matter--Classification of Matter, States of Matter, Chemical and Physical Changes  
Atomic Theory--Subatomic Particles, Orbitals, Electron Configuration, Electromagnetic

Spectrum  
Periodic Table--Atomic Mass, Atomic Number, Isotopes, Periodic Law, Atomic Radius  
The Chemical Bond--Ionic Bond, Formula Writing, Covalent Bond, Molecular Geometry, Lewis Structure, Inorganic Nomenclature  
Chemical Reactions--The Chemical Equation, Energy Changes, Rates and Equilibrium, Moles  
Water and Solutions--Solubility, Concentration Units, Osmosis, Properties of Water, Water Pollutants, Water Purification  
Acids and Bases--Definitions of Acids and Bases, Neutralization, pH Scale, Buffers  
Application to Society--Sources and Effects of Air Pollution, Ozone Depletion, Effect of UV radiation, Greenhouse Effect, Evidences and Effects of Global Warming, Acid Rain