Division: Science/Mathematics
Area: Chemistry

Course Number: CHEM 152
Course Name: General College Chemistry II

Prerequisite: CHEM 151
Corequisite: NONE

Hours Required: Class: 45  Lab: 45  Credits: 4 (four)

Course Description/Purpose

A continuation of Chemistry 151 which includes obtaining and applying quantitative information in laboratory to the basic interrelationships among solution chemistry, chemical thermodynamics, chemical kinetics, chemical equilibria and electrochemistry. Course requires laboratory work.

Major Units

• Precision in Measurement, Oxidation-Reduction Reactions, and Reaction Rates
• Gaseous Chemical Equilibrium and Acids and Bases
• Acid-Base and Precipitation Equilibria
• Acid-Base Equilibria and Complex Ions and Coordination Compounds
• Spontaneity of Reaction and Electrochemistry

Laboratory Topics

• Precision in Volumetric Measurements
• Endothermic and Exothermic Reactions
• Vapor Pressure of Liquids
• The Determination of Metallic Aluminum in Mold-Topping Preparations by Gas Evolution
• The Gravimetric Determination of SiO₂ in BOP Slag
• The Volumetric Determination of FeO in BOP Slag
• Acid Rain
• Titration Curves of Strong and Weak Acids and Bases
• Acid-Base Titration
• The Energy Content of Foods
• The Energy Content of Fuels
• Hess’s Law
• Rate Law Determination of the Crystal Violet Reaction

Educational/Course Outcomes

Student learning will be assessed by a variety of methods, such as, quizzes and tests, journals, essays, papers, projects, laboratory/clinical exercises and examinations, presentations, simulations, portfolios, homework assignments, and instructor observations.

Cognitive Each student will be expected to Identify/Recognize . . .

• the relationships between chemical composition, chemical reactions and their application to the production and use of chemical species.

Performance Each student will be expected to Demonstrate/Practice . . .

• and predict the tendency for change in a chemical system based on the thermodynamic properties of the system;

Performance Each student will be expected to Demonstrate/Practice . . . [continued]
• and predict about the kinetics of a chemical system using laboratory observations, rate laws, rate constants, and reaction mechanisms;

• application of the interrelationships involving the thermo-dynamic, kinetic, equilibrium, and electrochemical states of a chemical system;

• use of the concepts of electrochemistry to make predictions about a chemical system in a voltaic or an electrolytic cell;

• use of analytical laboratory techniques to obtain quantitative information about chemical systems;

• use of quantitative information from the laboratory to develop useful relationships with respect to chemical systems.