Outline of Instruction

Division: Science/Mathematics  Area: Chemistry
Course Number: CHEM 251  Course Name: Organic Chemistry I
Prerequisite: CHEM 152  Corequisite: NONE

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

Course Description/Purpose
The preparation, properties, structures and reactions of aliphatics, alcohols, ethers, aldehydes, ketones and carboxylic acids. Laboratory develops basic organic chemistry techniques as well as instrumental methods, including chromatography and spectroscopy. The course includes three hours of lecture and three hours of laboratory each week.

Major Units
- Structure and Bonding in Organic Compounds
- Reaction Pathways and Isomerism
- Nucleophilic Substitution and Elimination
- Unsaturated Aliphatic Compounds
- Infrared and Nuclear Magnetic Resonance Spectroscopy
- Alcohols and Ethers
- Compounds that Contain the Carbonyl Group

Laboratory Topics
- Check in, laboratory notebooks, safety, microscale methods; Isolation of the Active Ingredient in an Analgesic Drug
- Acetylsalicylic Acid
- Separation of Food Colors Using Prepared TLC Plates
- Gas Chromatographic Analysis of Gasoline
- Isolation of Caffeine from Tea
- Isopentyl Acetate (Banana Oil)
- Essential Oils from Spices: Oil of Cloves
- Isolation of Chlorophyll and Carotenoid Pigments from Spinach
- IR Spectrum of Eugenol from Cloves
- n-Butyl Bromide (SN2)
- t-Pentyl Chloride (SN1)
- Ethanol from Sucrose
- Methyl Salicylate (Oil of Wintergreen)
Educational/Course Outcomes

Student learning will be assessed by a variety of methods, including, but not limited to, 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* . . .
- a pure organic compound using an organic chemistry qualitative analysis scheme.
- organic substances and reactions in terms of structure and bonding;
- organic substances and reactions in terms of functional groups and families;
- organic substances and reactions in terms of nomenclature;
- organic substances and reactions in terms of physical and chemical properties;
- organic substances and reactions in terms of laboratory and industrial syntheses;
- organic substances and reactions in terms of stereochemistry;
- organic substances and reactions in terms of kinetic and thermodynamic control;
- organic substances and reactions in terms of reaction mechanisms;
- organic substances and reactions in terms of infrared spectroscopy.

**Performance**
Each student will be expected to *Demonstrate/Practice* . . .
- proper handling and assembling of organic laboratory equipment;
- separation of mixtures of organic chemicals employing simple physical separation techniques;
- carry out organic preparations and operations in the laboratory including simple analysis of products.