

Chemistry 2062

February 2006

Catalog Description:

CHEM 2062 Organic Chemistry II 5 CR FALL, SPR Aromaticity and reactions of aromatic compounds; heterocyclic compounds; polynuclear aromatic compounds; carbonyl polyfunctional compounds (aldehydes, ketones, carboxylic acids, carboxylic acid derivatives); enol and enolate chemistry; carbohydrates; synthetic polymers; amino acids, and proteins. Lecture four hours, lab four hours.

Prerequisites:

CHEM 2061 or CHEM 2058 with consent of instructor

Outline of Major Content Areas:

1. Conjugated Systems, Orbital Symmetry, and Ultraviolet Spectroscopy
2. Aromatic Compounds
3. Reactions of Aromatic Compounds
4. Ketones and Aldehydes
5. Carboxylic Acids
6. Carboxylic Acid Derivatives
7. Alpha Substitutions and Condensations of Enols and Enolate Ions
8. Carbohydrates
9. Synthetic Polymers
10. Amines
11. Amino Acids, Peptides and Proteins

Requirements:

Reading assignments, questions and problems from the textbook: *Organic Chemistry*, 6th edition, by Wade. Completion of laboratory assignments.

Course Objectives and Learning Outcomes:

1. The student will learn the reactions and methods of preparation of a variety of organic compounds. (Goal Two, Critical Thinking, Competencies a, b, c; Goal Three, Natural Sciences, Competency b)
2. The student will learn the mechanisms by which many organic reactions occur. (Goal Three, Natural Sciences, Competency a)
3. The student will learn to develop synthetic methods used to prepare various classes of organic compounds. (Goal Three, Natural Sciences, Competency c)
4. The student will become familiar with the chemistry of natural products and compounds containing a variety of functional groups.
5. The student will receive the necessary background to take additional courses in organic chemistry and biochemistry.

Experiments:

1. Isolation of Caffeine from Tea
2. Diels-Alder Synthesis of cis-1,2,3,6-Tetrahydrophthalic Anhydride
3. Oxidation of Toluene (Preparation of Benzoic Acid)
4. Friedel-Crafts Synthesis of p-Tert-butylphenol
5. Grignard Synthesis of Triphenylmethanol
6. Reduction of Acetophenone (Preparation of 1-Phenylethanol)
7. Aldol Synthesis of Tetraphenylcyclopentadienone
8. Micro-scale Knoevenagel Condensation Synthesis of Cinnamic Acid
9. Column Chromatography (Isolation of β -Carotene and Chlorophyll from Spinach)
10. Carbohydrates (Qualitative Analysis and Polarimetry)

11. Synthesis of Nylon and Polystyrene
12. Synthesis of Methyl Orange
13. Synthesis of Luminol

Methods of Evaluation:

1. Four or five one-hour exams
2. Questions and homework problems
3. Laboratory experiments (13 lab sessions)
4. Laboratory notebook
5. Comprehensive final exam

Grades:

A – 90% B – 80% C – 70% D – 50%

Assessment:

During the semester a number of assessments will be performed in order to monitor students' progress, provide students the feedback, and to identify areas that require additional attention.