HIBBING COMMUNITY COLLEGE
COURSE OUTLINE

COURSE TITLE & NUMBER: Organic Chemistry 2: CHEM 2720
CREDITS: 5 (4 Lec/1 Lab)
PREREQUISITES: CHEM 2710: Organic Chemistry 1

CATALOG DESCRIPTION:
This course is a continuation of Organic Chemistry 1. The chemistry of carbon compounds emphasizing the theories and mechanisms which account for their physical and chemical properties is again studied. Techniques of purification, separation, and synthesis are practiced in the laboratory. Organic Chemistry 2 is meant for students planning to major in biology, chemistry, chemical engineering, pharmacy, and certain medical fields.

OUTLINE OF MAJOR CONTENT AREAS:
1. Conjugated unsaturated systems
   A. Allylic substitution and the allyl radical
   B. Alkadienes and polyunsaturated hydrocarbons
   C. The stability of conjugated dienes
   D. The Diels-Alder reaction
2. Aromatic compounds
   A. Structure and properties of benzene
   B. Nomenclature
   C. Huckel's Rule
   D. Other aromatic compounds
   E. Electrophilic aromatic substitution reactions
3. Alcohols and phenols
   A. Nomenclature and physical properties
   B. Reactions and synthesis
   C. Spectroscopy
4. Ethers and epoxides
   A. Nomenclature and physical properties
   B. Reactions and synthesis
   C. Spectroscopy
5. Aldehydes and ketones
   A. Nomenclature and physical properties
   B. Reactions and synthesis
   C. Spectroscopy
6. Carboxylic acids and nitriles
   A. Nomenclature and physical properties
   B. Reactions and synthesis
   C. Spectroscopy
7. Carboxylic acid derivatives
   A. Nomenclature and physical properties
   B. Reactions and synthesis of acid halides

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C. Reactions and synthesis of acid anhydrides
D. Reactions and synthesis of esters
E. Reactions and synthesis of amides
F. Spectroscopy

8. Carbonyl alpha substitution reactions
9. Carbonyl condensation reactions
   A. Aldol reaction
   B. Claisen condensation reaction

10. Amines
    A. Nomenclature and physical properties
    B. Reactions and synthesis
    C. Spectroscopy

COURSE GOALS/OBJECTIVES/OUTCOMES:
1. Students will predict the products of Diels-Alder reactions.
2. Students will describe the physical properties of aromatics, alcohols, phenols, ethers, epoxides, aldehydes, ketones, carboxylic acids, nitriles, acid halides, acid anhydrides, esters, amides and amines.
3. Students will describe synthesis routes for aromatics, alcohols, phenols, ethers, epoxides, aldehydes, ketones, carboxylic acids, nitriles, acid halides, acid anhydrides, esters, amides and amines.
4. Students will describe the chemical reactions of aromatics, alcohols, phenols, ethers, epoxides, aldehydes, ketones, carboxylic acids, nitriles, acid halides, acid anhydrides, esters, amides and amines.
5. Students will use the IUPAC system to name simple examples of aromatics, alcohols, phenols, ethers, epoxides, aldehydes, ketones, carboxylic acids, nitriles, acid halides, acid anhydrides, esters, amides and amines.
6. Students will perform laboratory experiments pertaining to classroom topics.

HCC COMPETENCIES MET:
Thinking Creatively & Critically

METHODS FOR EVALUATING STUDENT LEARNING:
The final grade is determined by the average of exams, lab write ups and a final exam.

ADDITIONAL INFORMATION
Hazardous chemicals will routinely be used in laboratory. Students will be supplied with pertinent information relating to these materials at the appropriate time.

AASC APPROVAL DATE: November 15, 2017
REVIEW DATE: November 2022