



Course description:

This is an introductory organic chemistry course reviews the basic principles of chemical bonding as they apply to organic molecules. It focuses on the basic principles to understand the structure and reactivity of organic molecules. It introduces the concepts of functional groups, nomenclature, stereochemistry, and reaction mechanisms. It also covers the basic chemistry of alkanes, alkenes, alkynes, aromatics, halides, alcohols, ethers, aldehydes and ketones, amines, cyclic aliphatic compounds, phenols, acids and halogen derivatives, carboxylic acids and its derivatives also.

Aims of the theoretical part of the course:

On successful completion of this course, students will be able to undertake the following:

- Draw valence bond and Lewis dot structure for organic species
- Draw skeletal structures for organic compounds
- Apply acid-base concepts to organic systems
- Name alkanes, alkenes, polyenes, alkynes, alkyl halides, aromatic compounds, carbonyl compounds, amines using systematic (IUPAC) nomenclature
- Provide common names for some key chemicals
- Draw reaction mechanisms for some key reactions.
- Recognize stereochemistry
- Comprehend many of the reactions of alkanes, alkenes, polyenes, alkynes, aromatic, carbonyl, and amine compounds. They will be able to predict reactions involving these functional groups.

Intended Learning Outcomes: (ILOs):

A. Knowledge and Understanding

A1. Concepts and Theories: students should be able to demonstrate knowledge of concepts and principles of basic organic chemistry.

A2. Contemporary Trends, Problems and Research: Students should be able to



apply the theoretical information and lab techniques studied to carry out practical experiments.

A3. Professional Responsibility: Students majoring in health related sciences should actively be concerned with the health and welfare of co-workers, consumers, and the community.

B. Subject-specific skills

B1. Problem solving skills: develop skills to interpret experimental observations. Recognition of which functional group will undergo reactions under certain experimental conditions.

B2. Modeling and Design: Not applicable

B3. Application of Methods and Tools: Students should be able to use the IUPAC rules to name organic compounds. They should be able to predict reaction products and differentiate between structural isomers and stereoisomers..

Critical-Thinking Skills

• **C1. Analytic skills:** Students will develop better understanding of the reactions of organic compounds and use the reactivity of functional groups to predict whether a reaction will take place or not. When they conduct an experiment in the lab they will use their analytical skills to explain observations.

C2. Strategic Thinking: when solving a reaction problem, students should look at the functional groups in the compound and depending on their reactivities, they should be able to recognize which group will undergo a reaction. Additionally, when conduction experiments the students will learn the reason behind carrying out each step in the order given and how if they miss a step the experiment will fail.

C3. Creative thinking and innovation: by apply their knowledge of the properties of organic compounds they will be able to devise methods to solve reaction problems.

C. General and Transferable Skills (other skills relevant to employability and



personal development)

D.

- D1. **Communication: ability to extract information from a variety of sources in a clear and organized manner. Discussing their results with their lab partners will help them understand why they obtained these results and whether their results are correct or not. Students are encouraged to ask questions and participate in class discussions.**

Course structures:

Week	Credit Hours	ILOs	Topics	Teaching Procedure	Assessment methods
1-2		A1, A2, A3, B3	Bonding and isomerism	Power point presentation	homework/test I, final exam
3-4		A1,B1	Alkanes and Cycloalkanes		homework/test I and final exam
5-6		A1,B1, C1,C2, C3,B3, D1	Alkenes, polyenes and alkynes		Homework/test I, and final exam
7-8		A1,A1, B1,C1, C2, C3,B3, D1	Aromatic Compounds		homework/test II and final exam
9		A1,B1, C1,C2, C3,B3, D1	Organic Halogen Compounds		homework/test II and final exam
10-11		A1,B1, C1,C2, C3,B3, D1	Alcohols and Phenols		homework/test II and final exam
12			Ethers and Epoxides		homework and final exam



13			Aldehydes and Ketones		homework and final exam
14			Carboxylic Acids and Their Derivatives		homework and final exam

References:

A. Main Textbook: Organic Chemistry: A short course, by Hart/Crain and Hart, 13th edition.

B. Organic chemistry :by Morison and Boyd

Assessment Methods:

Methods	Grade	Date
Test I	25%	
Test II	25%	
Final Exam	50%	
Total	100%	

