

Course Title: Fundamentals of Organic Chemistry
Code: CH-270
Credit Hours: 3-1
Prerequisite: Nil

Course Objectives

1. Students will acquire knowledge about basic concepts of Organic Chemistry, Chemistry of hydrocarbons, functional groups and the mechanism of organic reactions. Such information will be useful for qualitative analysis and synthesis of organic compounds.

Course Content

2. Bonding and hybridization localized and delocalized bonding, structure-aromaticity, inductive effect, dipole moment, resonance and its rules, hyper-conjugation, Cross Conjugation, Hydrogen bonding and its effects on various properties of organic compounds, Tautomerism

Nomenclature: classification and nomenclature of organic compounds including IUPAC system, Chemistry of various functional groups e.g. unsaturated hydrocarbons, Alcohols, phenols, Ether and amino groups, carbonyl compounds and their derivatives with focus on synthesis and applications.

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Course Outcomes

5. After studying this course students will be able to name the famous functional groups in organic chemistry and applications of these in daily life.

6. **Text book**

- a. Solomons, T. W. G. and Fryhle, C. B., Organic Chemistry, 10th ed., John- Wiley & Sons, Inc., (2011).

7. **Recommended Books**

- a. Brown, W. and Poon, T., Introduction to Organic Chemistry, 3rd ed., John- Wiley & Sons, Inc., (2005).16
- b. John, E. M. Organic Chemistry, 8th ed., Brooks/Cole Publishing Co, USA, (2012).
- c. Robert, T. M. and Robert, N. B., Organic Chemistry, 6th ed., Prentice Hall, New Jersey, (1992).
- d. Sykes, P., A Guide Book to Mechanism in Organic Chemistry, 6th ed., Pearson Education Limited, England, (1986).

8. **CH-270 Lab**

- a. Qualitative analysis of compounds with different functional groups. (7 labs)
- b. Synthesis of organic compounds using as a tool for understanding techniques like reflux, distillation, filtration, recrystallization and yield calculation(3 labs).
- c. Organic syntheses may include preparation of benzanilide from benzoyl chloride, succinic anhydride from succinic acid, phthalimide from phthalic anhydride, oximes and hydrazones from carbonyl compounds, esterification by using a carboxylic acid and alcohol etc.(5 labs).

9. **Recommended Books**

- a. John, E. M. Organic Chemistry, 8th ed., Brooks/Cole Publishing Co, USA, (2012).
- b. Solomons, T. W. G. and Fryhle, C. B., Organic Chemistry, 10th ed., John- Wiley & Sons, Inc., (2011).
- c. Furniss, B. S., Hannaford, A. J., Smith, P. W. G., Tatchell, A. R., Vogel's Textbook of Practical Organic Chemistry, 5th ed., Longman, UK, (1989).

- d. Pavia, D. L., Kriz, G. S., Lampman, G. M. and Engel, R. G., A Microscale Approach to Organic Laboratory Techniques, 5th ed., Brooks/ Cole Cengage Learning, (2013).
- e. Mayo, D. W., Pike, R. M. and Forbes, D. C., Microscale Organic to Laboratory with Multistep and Multiscale Syntheses, 5th ed., John-Wiley & Sons, Inc., (2011).
- f. Gilbert, J. C. and Martin, S. F., Experimental Organic Chemistry: A Mini-scale and Microscale Approach, 5th ed., Brooks/ Cole Cengage Learning, (2010).
- g. Brown, W. H., Fotte, C. S., Iverson, B. L. and Anslyn, E. V., Organic Chemistry, 6th ed., Brooks/ Cole Cengage Learning, (2012).