Course Title: Organic Chemistry-I
Code: CH-370
Credit Hours: 3-1
Pre-requisite: Nil

Course Objectives

1. Students will gain knowledge about the stereochemical behavior of organic moleculesand acquire an ability to do literature survey related tasks.

Course Contents

2. Stereochemistry: Conformation Analysis The concept of energy profile, transition state andintermediate. The concept of conformational analysis in ethane, propane, n-butane, cyclohexane, substituted cycloalkanes and decalins.

a. Optical isomerism: Configuration, Chirality and symmetry, optical isomerism up to threechiral carbon atoms, enantiomers and diastereomers, R and S nomenclature, Racemates, Racemization and Resolution of racemates, epimerization. Walden inversion, Stereoisomerism in biphenyls, allenes and spiro compounds.

b. Geometrical isomerism: Cis & Trans, and Z & E conventions, Determination ofconfiguration, Geometrical isomerism in cyclic compounds.

Active Methylene Compounds: Introduction to Active methylene compounds and their synthetic applications including various name reactions.

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Course Outcomes

5. After studying this course, students will have idea about the stereochemical aspects oforganic molecules and also acquire an ability to do literature survey related tasks.

Text book

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

7. Recommended Books:
   a. John, E. M., Organic Chemistry, 8th ed., Brooks/Cole Publishing Co, USA,(2012).
   b. Morris, D. G., Stereochemistry (Basic Concepts in Chemistry), Wiley-RSC,(2002).
   c. Mislow, K., Introduction to Stereochemistry, Dover Publications Inc.,(2003).
   d. Organic Chemistry, Volume I (6th ed.) & II (5th ed.) by I.L. Finar, Pearson Education (Singapore) Pvt. Ltd, (2008).
   e. March's Advanced Organic Chemistry: Reactions, Mechanisms, and Structure, 6thed. by Michael B. Smith, Jerry March, Wiley, (2007).
   f. Brown, W. H., Fotte, C. S., Iverson, B. L. and Anslyn, E. V., Organic Chemistry,6th ed., Brooks/ Cole Cengage Learning, (2012).
   g. Eames, J. and Peach, J. M., Stereochemistry at a Glance, Blackwell Science, Ltd.,(2003).
   h. Eliel, E. L. and Wilen, S. H., Stereochemistry of Organic Compounds, John-Wiley& Sons, Inc., (1994).

8. CH-370 Lab
   a. Experiments using polarimeter such as to determine optical activity of a sugar solution and to determine sugar concentration by polarimeter,

isomerization of maleic acid. (4 labs)

b. Experiments involving aliphatic addition, elimination and substitution reactions, e.g., synthesis of cyclohexene from cyclohexanol, addition reaction to

cyclohexene etc. Synthesis of a chalcone explaining the concept of condensationand dehydration, N-Alkylation of phthalimide, etc. (11 labs)

9. Recommended Books

a. Advanced Practical Organic Chemistry (2nd ed.) by N. K. Vishnoi, VikasPublishing House Pvt Ltd, India, 1996.
b. John, E. M., Organic Chemistry, 8th ed., Brooks/Cole Publishing Co, USA,(2012).
c. Daniel R. Palleras, Experimental Organic Chemistry, John Willey & Sons Inc.,2000.
4. James A. Moore, Experimental methods in Organic Chemistry , Holt-Saunders Int., 1983.
d. 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).
e. Mohan J., Organic Analytical Chemistry, Theory and Practice, 1st ed.Alpha Science International, Ltd. (2003).
f. Seiler, J. P., Good Laboratory Practice: The Why and the How, 2nd ed., Springer, (2005).
g. Brown, W. H., Fotte, C. S., Iverson, B. L. and Anslyn, E. V., Organic Chemistry, 6th ed., Brooks/ Cole Cengage Learning, (2012).
h. Pavia, D. L., Kriz, G. S., Lampman, G. M. and Engel, R. G., A Micro scale Approach to Organic Laboratory Techniques, 5th ed., Brooks/ Cole Cengage Learning, (2013).

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