ORGANIC CHEMISTRY

Course Code: 13BC1104

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Course Educational Objectives:

Course is intended to understand a basic principles relating to the nature reactivity properties, mechanisims, structures and chemical transformations of organic molecules.

The course covers to the importance of synthetics reagents and their applications and also provide the information on theraputac activity on heterocyclic compounds which are used in drugs.

Course Outcomes:

The student shall be able to apply the knowledge of

- Basic principles of the Organic Chemistry
- Mechanisims of the Organic Reactions
- Synthetic Preparation of various commercially useful compounds.
- Therapeutic activity of heterocyclic compounds used in drugs.
- Synthetic Preparation of differents dies.
- Basic concepts of stereo chemistry usefull in the synthesis of biological active compounds.

UNIT-1 (8 Lectures)

ELECTRON DISPLACEMENT EFFECTS:

Inductive effect-applications

Inductomeric effect

Mesomeric (or) Resonance effect-applications

Electrometric effect

Hyper conjugation-applications

UNIT-II (14 Lectures)

Mechanism and applications of the following named reactions

i) Fridel-Crafts reaction

ii) Rimer-Tiemann reaction

iii) Aldol condensation,

iv) Benzoin condensation

v) Perkins's reaction,

vi) Cannizaro's reaction,

vii) Pinacol-Pinacalone rearrangement

viii) Beckmann rearrangement

UNIT-III (14 Lectures)

ACTIVE METHYLENE COMPOUNDS:

Preparation of Malonic ester, isomerism- Acid hydrolysis of malonic ester. Synthetic uses of malonic ester with reference to synthesis of mono carboxylic acids(n-butyric acid isobutyric acid, and isovaleric acid), dicarboxylic acids (succinic acid, á,-methylsuccinic acid and adipic acid), á, â- unsaturated acid(crotonic acid), amino acid(glycine), ketocarboxylic acid(acetoacetic acid) ketones (ethylmethylketone),alicyclic acids(cyclopropanecarboxylic acid) and heterocyclics(Barbituric acid).

Preparation of Acetoacetic ester, isomerism-tautomerism, and Ketonic and Acid hydrolysis. Synthetic uses of acetoacetic ester with reference to synthesis of mono carboxylic acids (n-butyric acid isobutyric acid and á,-methyl n-butyric acid and â-methyl n-butyric acid), dicarboxylic acids (succinic and adipic acids) , á, â- unsaturated acid(crotonic acid), amino acid(glycine), ketones (3-methyl-2-pentanone), 1, 3 & 1, 4diketones (acetylacetone and acetonylacetone) and alicyclic acids (acetylcyclohexane) and heterocyclics (4-methyluracil).

UNIT-IV (14 Lectures)

HETEROCYCLIC COMPOUNDS:

Nomenclature, preparation, structure, properties and uses of Furan, Pyrrole, Thiophene, Pyridine, Quinoline, Isoquinoline

DYES:

Definition of dye, Classification based on chemical structure and method of application.Witt's theory of color and chemical constitution. Synthesis and uses of the following dyes- Cong red, Bismark brown, Malachite green, Rosaniline and Fluorescein.

UNIT-V (10 Lectures)

STEREO CHEMISTRY:

Configurational isomerism: Optical isomerism, Conditions for an optically active compound, Optical activity of Lactic acid and Tartaric acid. Diastereomerism, Relative and Absolute configuration- Sequence rules, Geometrical isomerism-E & Z system of nomenclature.

Conformational Isomerism: Conformations of ethane, n-butane and 1,2-dihaloethane.Bayer's strain theory-limitations, Sachey and Mohr theory, conformations of cyclohexane

TEXT BOOKS:

1. Arun Bahl & B.S. Bahl *"Advanced Organic Chemistry"* –, Rev. Editiopn S.Chand & Company Ltd, New Delhi 2012
2. T. Morrison and Robert.N. Boyd *"Text book of Organic Chemistry"*, 6th Edition 1992
3. Paula Yurkanis *"Bruice Organic chemistry"*, 3rd Edition ,Pearson publishers,2010

REFERENCES:

1. I.L Finar, *"Organic Chemistry",* Volume I6th Edition, Pearson Education Publishers, New Delhi, 2004.
2. Peter Skyes, *"Reaction mechanism"*, 6th Edition, Orient Longman Ltd. New Delhi, 1997.
3. O.P. Agrawal, *"Reaction and Reagents"*, Rev.Edition, Goel Publishing house, Meerut, 2005
4. Gaurikar and others, *"Polymer science"*, Ist Edition, New Age International Ltd, NewDelhi 1986.

5. O.P. Agrawal, *"Synthetic Organic Chemistry"*, 14th Edition, Goel Publishing house,Meerut, India,2006.

6. C.N.Pillai, *"Organic chemistry"*, University Press, New Delhi, 2009.

7. B.Mehata& M.Mehata, *"Organic chemistry"*, PHI Learning Pvt. Ltd., 2005.

8. P.Bahadur & N.V.Sastry, *"Principles of polymer science"*, Narosa Publishing house, New Delhi 2002.