

**M.Sc. Semester-III**  
**Organic Chemistry Paper –IV**  
**Selected Topics IN Organic Chemistry**  
**CHNN-604-(O)**

**Unit-1: Heterocyclic Chemistry-I** **25% (15 Hours)**

Introduction of Heterocyclic Compounds, Nomenclature and Classification of Heterocyclic Compounds, Monocyclic Diheteroatomic Compounds (5 & 6 members) Synthesis and Chemical Reactivity of Pyrazole, Isoxazole, Isothiazole, Imidazole, Oxazole, thiazole.

**Unit-2: Heterocyclic Chemistry-II** **25% (15 Hours)**

Reaction and Synthesis of Bicyclic Heterocyclic Compounds Quinoline and Isoquinoline, Nucleophilic Substitution with Displacement of Halide, Reactions with Reducing Agents, Grignard's Reaction. Electrophilic substitution reactions of substituted Quinoline and Isoquinoline.

Synthesis of Quinolone: Skraup Synthesis, Knorr Synthesis, Isoquinoline: Bischner-Napieralski Synthesis, Heterocyclic System Containing Two Nitrogen Atoms: Synthesis of Cinnoline, Quinolone, Quinoxaline, Phthalazine.

**Unit-3: Application of Oxidation Reagents:** **25% (15 Hours)**

$\text{Na}_2\text{Cr}_2\text{O}_7$ ,  $\text{KMnO}_4$ ,  $\text{CF}_3\text{COOH}$ ,  $\text{MnO}_2$ ,  $\text{Ag}_2\text{CO}_3$ ,  $\text{NaIO}_4$ ,  $\text{SeO}_2$ ,  $\text{H}_2\text{O}_2$ ,  $\text{Al}(\text{O}-i\text{Pr})_3$ ,  $\text{Al}(\text{O}-t\text{Bu})_3$

**Unit-4: Application of Reduction Reagents:** **25% (15 Hours)**

$\text{LiAlH}_4$ ,  $\text{Fe}+\text{HCl}$ ,  $\text{NH}_2\text{NH}_2$ ,  $\text{BH}_3$ ,  $\text{NaBH}_4$ ,  $\text{NaBH}_4+\text{CeCl}_3 \cdot 7\text{H}_2\text{O}$ ,  $\text{Pd}/\text{H}_2$ ,  $\text{Ni}/\text{H}_2$ ,  $\text{Pt}/\text{H}_2$ , Diisobutyl Aluminum Hydride(DIBAL-H), Sodium Cyano Borohydride and Sodium triacetoxy Borohydride,

**Basic Text & Reference Books:**

1. Heterocyclic Chemistry II Volume I,II, III R R Gupta, M Kumar, V Gupta, Springer R. K. Bansal
2. Modern Methods of Organic Synthesis 4<sup>th</sup> Edition by W. Caruthers, Iain Coldham
3. Heterocyclic Chemistry, 4<sup>th</sup> Edition by J. A. Joule & K. Mills, Published by Chapman & Hall (1995)

4. Principles of Modern Heterocyclic Chemistry, Edited by Leo A. Paquette, Published by Pearson Benjamin Cummings (1968)
5. Heterocyclic Chemistry, 3<sup>rd</sup> Edition by Thomas L. Gilchrist, Published by Prentice Hall (1997)
6. The Structure & Reactions of Heterocyclic Compounds, Edited by Michael Henry Palmer, Published by Edward Arnold (1967)
7. Heterocyclic Chemistry by V. K. Ahluwalia, Narosa Publishing House.