

# Syllabus

## M.Sc. (Chemistry) Programme

### (SEMESTER – IV)

#### ***Organic Synthesis (Compulsory )***

***Programme Code- (MSCCH -21)***

***Course Code – (MSCCH -606 )***

#### **Unit 1 Organometallic Reagents**

Principle, preparations, properties and applications of the following in organic synthesis: Group I and II metal organic compounds Li, Hg and Zn compounds. Transition metals, Pd, Ni, Fe, Ti, Cu, Rh and Cr compounds; Other elements, S, Si and B compounds. Metallocenes, Nonbenzenoid Aromatics and Polycyclic Aromatic Compounds General considerations, synthesis and reactions of some representative compounds.

#### **Unit 2 Oxidation:**

Introductin. Different oxidative processes.

Hydrocarbons-alkenes, aromatic rings, saturated C-H groups (activated & unactivated).

Alcohols, diols, aldehydes, ketones, ketals and carbosylic acids.

Amines, hydrazines and sulphides.

Oxidation with ruthenium tetraoxide, iodobenzenediacetate and thallium (III) nitrate.

#### **Unit 3 Reduction:**

Introduction, Different reductive process.

Hydrocarbons-alkanes, alkenes, alkynes and aromatic rings.

Carbonyl compounds-aldehydes, ketones, acids and their derivatives.

Epoxides ,Nitro, nitroso, azo and oxime groups. Hydrogenolysis.

#### **Unit 4 Disconnection Approach**

An introduction to synthons and synthetic equivalents, disconnection approach, functional group interconversions, the importance of the order of events in organic synthesis, one group C-X and two group C-X disconnections, chemoselectivity, reversal of polarity, cyclisation reactions and amine synthesis. One group and two group C-C disconnections. Alcohol and carbonyl

compounds, regioselectivity, alkene synthesis and aliphatic nitro compounds in organic synthesis.

### **Unit 5 Protecting group**

Principle of protection of alcohol, amine, carbonyl and carboxyl groups.

### **Unit 6 Ring Synthesis:**

Saturated heterocyclic, synthesis of 3-,4-,5- and 6-membered rings, aromatic heterocyclic in organic synthesis.

### **Books Suggested**

1. Modern Synthetic Reaction, H.O. House, W.A. Benjamin.
2. Some Modern Methods of Organic Synthesis. W. Carruthers, Cambridge Univ. Press.
3. Advanced Organic Chemistry, Reactions Mechanisms and Structure. J. March, John Wiley.
4. Principles of Organic synthesis, R.O.C. Norman and J.M. Coxon, Blackie Academic & Professional.
5. Advanced Organic Chemistry Part B F.A. Carey and R.J. Sundberg. Plenum Press.
6. Rodd's Chemistry of Carbon Compounds, Ed. S. Coffey, Elsevier.
7. Designing Organic Synthesis, S Warren, Wiley.
8. Organic Synthesis- Concept, Jagdamba Singh and LDS Yadav Vol. II Methods and Starting Materials J. Fuhrhop and G. Penzillin, Verlage VCH.
9. Modern Synthetic Reactions, H.O. House, W.A. Benjamin.