

VEER NARMAD SOUTH GUJARAT UNIVERSITY
M.Sc. Semester-IV (ORGANIC CHEMISTRY)
SYLLABUS TO BE EFFECTIVE FROM JUNE 2019

PAPER-III (Advance Organic Synthesis)

Max. Marks: 100 (External - 70 + Internal - 30)

Total Periods: 45

UNIT-I PROTECTING GROUPS

(12 Periods)

Need of protecting groups - Protection of alcohols, Carbonyl, Carboxylic acid and amino groups, Synthetic equivalent groups and examples on transformations

UNIT-II DISCONNECTION APPROACH

(11 Periods)

Introduction to disconnection, Concept of synthon, Synthetic equivalent, Functional group interconversion

(i) One group disconnection:

Disconnection and synthesis of alcohols, olefins, simple ketones, acids and its derivatives

(ii) Two groups disconnection:

Disconnections in 1,3-dioxygenated skeletons, preparation of β -hydroxy carbonyl compounds, α,β -unsaturated carbonyl compounds, 1,3-dicarbonyls, 1,5-dicarbonyls and use of Mannich reaction

(iii) Pericyclic reactions:

Disconnections based on Diels-Alder reaction and electrocyclic reaction: Its use in organic synthesis

UNIT-III RING SYNTHESIS

(11 Periods)

Introduction to ring synthesis

(i) Synthesis of saturated heterocycles: Synthesis of 3 and 4 membered rings

(ii) heterocycles in organic synthesis:

Synthesis of alkanes and cycloalkanes from thiophene, Synthesis of alkenes and cycloalkenes from pyridines,

Synthesis of Aromatic compounds from pyrilium salts, pyridazine, thiophenes and furan

UNIT-IV ORGANOMETALLIC COMPOUNDS AND THEIR APPLICATIONS (11 Periods)

(i) Carbon-metal bonds in organometallic compounds, Synthesis and applications of Organolithium, Organozinc and Lithium diorganocuprate.

(ii) Basic concept of organoboranes, Preparation of organoboranes, Stereochemistry of hydroboration, Mechanism of hydroboration - oxidation, Synthetic applications.

Reference Books Recommended:

1. Organic synthesis using transition metals-Roderick Bates (Wiley).
2. Organic chemistry - J. Clayden, N. Greeves, S. Warren and P. Wothers (Oxford Press).
3. Some modern methods of organic synthesis - W. Carruthers (Cambridge)
4. Organic synthesis - Michael B. Smith.
5. Advanced organic chemistry, Part B - F. A Carey and R. J. Sundberg, 5th edition (2007).

6. Guidebook to organic synthesis-R K Meckie, D M Smith and R A Atken.
7. Organic synthesis- Robert E Ireland.
8. Strategic Applications of named reactions in organic synthesis-Laszlo Kurti and Barbara Czako.
9. Organic Synthesis, Jagdamba Singh & L.D.S. Yadav, 6th edition, Pragati Prakashan (2010).
10. Reaction Mechanism in Organic Chemistry by S. M. Mukherji and S. P. Singh (McMillan India Ltd., 1976).
11. Advance Organic Chemistry, Reaction Mechanism and Structure by Jerry March, 4th ed. John Wiley & Sons, 1992.
12. Designing Organic Synthesis – A Programmed Introduction to the Synthron Approach, Stuart Warren, John Wiley & Sons (1994).
13. Organic Synthesis: The disconnection approach, Stuart Warren, John Wiley & Sons (1994).
14. Selected Organic Synthesis, Ian Fleming, John Wiley & Sons (1977).
15. Principles of Organic Chemistry by R.O.C. Norman (Chapman and Hall, 1986).
16. Organometallic Chemistry by P. L. Pauson (Edward Arnold, 1968).
17. Principles of Organometallic Chemistry by Coats, Green, Powell & Wade (Chapman and Hall, 1977).