# NIRMA UNIVERSITY

Institute:	Institute of Technology
Name of Programme:	B.Tech. (Chemical Engineering)
Course Code:	2CH101CC23
Course Title:	Organic Chemistry
<b>Course Type:</b>	Core
Year of introduction:	2023-2024

L	Т	Practical component				С
		LPW	PW	W	S	
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#### **Course Learning Outcomes (CLOs):**

At the end of the course, the students will be able to -

- 1. relate the fundamentals in developing the mechanism for different (BL1) types of organic reaction
- 2. outline the synthesis of various organic compounds (BL2)
- 3. identify the nature of organic compounds on the basis of (BL3) investigations and also utilisation of the material safety data sheet
- comprehend the importance of organic compounds in industries and (BL3) their impact on the global economy

#### Contents

# Teaching Hours (Total 30)

07

- Unit I Alkenes: Geometrical isomerism, Preparation, Chemical properties of alkenes, Markownikoff rule, Antimarkownikoff rule, Types of dienes: preparation and chemical reactions, Polymerisation
- **Unit II** Alkyl halides: General reactions, Mechanisms of nucleophilic 06 substitutions reactions and elimination reactions, Organometallic compounds–Mg and Li derivatives and their general reactions, Fluoroalkanes.
- **Unit III** Chemistry of Selected Organic Compounds: Introduction, 04 Synthesis, Properties and industrial uses of Nitrobenzene, Aniline, Phenol, Benzoic acid, Salicylic acid and Phthalic acid
- **Unit IV Polynuclear Aromatic Compounds:** Naphthalene: Structure, 04 Synthesis, Properties and uses, Naphthols, Naphthylamines; Anthracene: Structure, Properties and uses, Anthraquinone
- Unit V Chemistry of Heterocyclic Compounds: Introduction and 05 nomenclature, Definition of heteroatom and heterocyclic compound, Classification, Preparation and properties of heterocyclic compounds: five membered ring–Furan, Thiophene and Pyrrole, Six membered ring–Pyridine.
- **Unit VI Outlines of Biochemistry**: Carbohydrates: classifications, 04 chemical reactions of glucose, fructose and starch, introduction to enzymes, vitamins and lipids.

# Self-Study:

Self-study contents will be declared at the commencement of the semester. Around 10 % of the questions will be asked from the self-study contents.

## Laboratory Works:

Laboratory work will be based on above syllabus with minimum 12 experiments to be incorporated.

## Suggested Readings/ References:

- 1. Michael B Smit, March's Advanced Organic Chemistry: Reactions, Mechanisms and Structure, Wiley.
- 2. Arun Bahl and B. S. Bahl, A Text book of Organic Chemistry, S.Chand and Company.
- 3. Bhupinder Mehta and Manju Mehta, Organic Chemistry, PHI Learning Pvt. Ltd.
- 4. S. Sengupta, Organic Chemistry, Oxford University Press.
- 5. L. G. Wade, Organic Chemistry, Pearson Education.
- 6. Norman and Coxon, Principles of Organic Synthesis, Blackie Academics & Professional.
- 7. I.L.Finar, Organic Chemistry Vol. I & II, Longmans Green & Co.

#### **Suggested List of Practical**

Sr.	Practical	Number of Hours
1	To identify the given unknown solid organic acidic compounds by using qualitative analysis methods	02
2	To identify the given unknown neutral organic solvents by using qualitative analysis methods	02
3	To identify the given unknown solid organic basic compounds by using qualitative analysis methods	02
4	To identify the given unknown solid organic neutral compounds by using qualitative analysis methods	02
5	To prepare acetanilide from aniline	02
6	To prepare acetanilide from aniline (Green Method)	02
7	To prepare phenyl-azo- $\beta$ -naphthol (an azo dye)	02
8	To determine the percentage of Aspirin in the given Tablet	02
9	To carry out the microwave assisted preparation of organic acid anhydride	02
10	To prepare Aspirin(acetylsalicylic acid) from salicylic acid	02
11	Virtual Lab: Systematically identify the functional groups in the given organic compound and perform the confirmatory tests after identifying the functional groups.	02
12	Virtual Lab: To determine the amount of aspirin in the whole of the given solution.	02