

## NIRMA UNIVERSITY

<b>Institute:</b>	Institute of Technology
<b>Name of Programme:</b>	B. Tech. (Chemical Engineering)
<b>Course Code:</b>	2CH101
<b>Course Title:</b>	Organic Chemistry
<b>Course Type:</b>	Core
<b>Year of introduction:</b>	2023-2024

L	T	Practical component				C
		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 types of organic reaction (BL1)
2. outline the synthesis of various organic compounds (BL2)
3. identify the nature of organic compounds on the basis of investigations and also utilisation of the material safety data sheet (BL3)
4. comprehend the importance of organic compounds in industries and their impact on the global economy (BL3)

### Syllabus:

**Total Teaching hours: 30**

Unit	Syllabus	Teaching hours
<b>Unit I</b>	<b>Alkenes:</b> Geometrical isomerism, Preparation, Chemical properties of alkenes, Markownikoff rule, Antimarkownikoff rule, Types of dienes: preparation and chemical reactions, Polymerisation	07
<b>Unit II</b>	<b>Alkyl halides:</b> General reactions, Mechanisms of nucleophilic substitutions reactions and elimination reactions, Organometallic compounds–Mg and Li derivatives and their general reactions, Fluoroalkanes.	06
<b>Unit III</b>	<b>Chemistry of Selected Organic Compounds:</b> Introduction, Synthesis, Properties and industrial uses of Nitrobenzene, Aniline, Phenol, Benzoic acid, Salicylic acid and Phthalic acid	04
<b>Unit IV</b>	<b>Polynuclear Aromatic Compounds:</b> Naphthalene: Structure, Synthesis, Properties and uses, Naphthols, Naphthylamines; Anthracene: Structure, Properties and uses, Anthraquinone	04
<b>Unit V</b>	<b>Chemistry of Heterocyclic Compounds:</b> Introduction and 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.	05
<b>Unit VI</b>	<b>Outlines of Biochemistry:</b> Carbohydrates: classifications, chemical reactions of glucose, fructose and starch, introduction to enzymes, vitamins and lipids.	04

**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 10 experiments to be incorporated.

**Suggested Readings/ References:**

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

**Suggested List of Practical (not restricted to the following) only for information**

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