GUJARAT TECHNOLOGICAL UNIVERSITY

B.Pharm

SEMESTER: IV

Subject Name: Pharmaceutical Chemistry – VI (Organic Chemistry – II)
Subject Code: 2240004

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	Theory		Practical	
				External	Internal	External	Internal
3	0	3	6	80	20	80	20

Sr. No.	Course contents	Proposed Hours
1	**Stereochemistry:** • Chirality • Optical activity (dextro and leavo rotation concept) • Stereoisomerism • Enantiomers, Diastereomers, Mesomers with physical, chemical and biological properties of the same. • Geometrical isomers and its nomenclature. Physical and chemical properties of the same • Racemic mixture and its resolution methods. • Specification of configuration: Relative configuration (L and D), Absolute configuration (R and S) (CIP Rules) • Axial Chirality: Stereochemistry of Allene, spiran and Biphenyl. • Conformational isomers: Alkanes and Cyclohexane	08
2	**Structure, properties, nomenclature, preparation and reactions of following class of functional groups** • amines, • phenols, • aldehydes and ketones, • carboxylic acids and their derivatives.	22
3	**Unsaturated carbonyl compounds, Nucleophilic aromatic substitution**	02
4	**Heterocyclic compounds: Chemistry, preparation and properties of** • Furan, thiophene, pyrrol and pyridine • Pyrrazole, imidazole, oxazole, isoxazole and thiazole • Pyrazine, pyridazine and pyrimidine • Quinoline, isoquinoline and indole	10
5	**Introduction, principles and applications of:** • nanochemistry, • microwave synthesis and • green chemistry.	03

PRACTICAL – 22400P4

1.	Qualitative analysis of unknown organic compound according to the following list of organic compounds : 1.1 – Identification and characterization of given unknown organic compound (Salts/Acids/Strong acidic Amphoterics) 1.2 – Identification and characterization of given unknown organic compound (Phenolics/Basics) 1.3 – Identification and characterization of given unknown organic compound (Neutrals) 1.4 – Identification and characterization of given unknown organic compound (Salts/Acids/Strong acidic Amphoterics/Phenolic/Basics Neutrals) 1.5 – Identification and characterization of given unknown organic compound (Salts/Acids/Strong acidic Amphoterics/Phenolic/Basics/Neutrals) List of organic compounds: a. **Salts:** Sodium benzoate, Sodium salicylate etc. b. **Acidics:** Benzoic acid, Salicylic acid, Cinnamic acid, Acetyl salicylic acid, Phthalic acid etc. c. **Strong acidic Amphoterics:** p-Aminobenzoic acid, o-Aminobenzoic acid, Sulphanilic acid etc. d. **Weak acidic Amphoterics**: Sulphanilamide etc. e. **Phenolics**: o/m/p-nitrophenol, alpha/beta-naphthol, o/m/p-cresol etc. f. **Basics**: Anliine, N-Methyl aniline, N,N-Dimethyl aniline, o/m/p-Anisidine, o/m/p-Nitroaniline, p-Chloroaniline, o/m/p toluidine etc. g. **Neutrals**:Acetophenone, Benzaldehyde, m-Dinitrobenzene, Nitrobenzene, Chlorobenzene, Bromobenzene, Acetanilide, Benzamide, Anthracene, Napthalene, Benzophenone isopropyl alcohol, tert butyl alcohol etc.	15
2	Introduction and detailed demonstration to various synthetic techniques and apparatus used therein: 2.1 Heating and cooling methods, distillation, reaction work-up, filtration and extraction. 2.2 Purification and identification	06
3	3.1 Synthesis and purification of selected organic compounds: 1. Synthesis of p-nitroacetanilide from acetanilide (Nitration) 2. Synthesis of p-bromoacetanilide from acetanlide (Halogenation) 3. Synthesis of p-nitroanline from p-nitroacetanlide (Hydrolysis) 4. Synthesis of P-bromoanline from p-bromoacetanlide (Hydrolysis) 5. Synthesis of benzil from benzoin (Oxidation) 6. Synthesis of benzylidene acetophenone (Chalcone) from acetophenone and benzaldehyde (Condensation reaction) 7. Synthesis of Magnesone-II from p-nitroaniline (Diazotization). Monitoring progress of reaction by Thin Layer Chromatography (TLC) with the help of any one of above selected reaction**.**	21
4	Introduction to the use of stereomodels	03

Reference Books:

1. Organic Chemistry, Robert T. Morrison and Robert N. Boyd, 6th Ed., Pearson Education, 2002.
2. Organic Chemistry, G. Marc Loudon, 4th Ed., Oxford University Press, 2004.
3. Organic Chemistry, Vol I and II by I. L. Finar, 6th Ed., Pearson Education, 2000.
4. Advanced Organic Chemistry, Jerry March, 4th Ed., Wiley India, 2007.
5. Vogel's textbook of practical organic chemistry, 5th Edition, Pearson Education Ltd., 2005
6. "Experimental Organic Chemistry" L. M. Harwood, L. J. Moody, J. M. Percy, 2nd Edition, Blackwell Science, 2005.
7. Techniques and Experiment of Organic Chemistry, Addison Ault, 6th Edition, University Science Books, 1998.
8. Introduction to Organic Laboratory Techniques, A Microscale Approach, Donald L. Pavia, Gary M. Lampman, George S. Kriz, 3rd Edition, Harcourt College Pub., 4th Edition, 2007.