

GUJARAT TECHNOLOGICAL UNIVERSITY

B.Pharm SEMESTER: III

Subject Name: Pharmaceutical Chemistry-IV (Organic Chemistry – I)

Subject Code: 2230004

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

Theory

Sr. No	Course content	Proposed Hours
1	Structure and Properties : Introduction to organic chemistry, quantitative analysis of elements, determination of molecular weight and molecular formula, Atomic structure, atomic orbitals, molecular orbital theory, molecular orbitals, bonding and antibonding orbitals.	08
2	Chemical bonding and Properties : Introduction, covalent bond, hybridization and hybrid orbitals, intermolecular and intramolecular forces, bond dissociation energy, electronegativity, polarity of bonds, polarity of molecules, resonance, hyperconjugation	08
3	Reactive intermediates of carbon: Carbocation, carbanion, free radical, carbenes, nitrenes, reaction involving these intermediates	04
4	Structure, properties, nomenclature, preparation and reactions of the following class of functional groups <ul style="list-style-type: none">Alkanes, alkenes, alkynes, dienes, alkyl halides, alcohols, ethers,Benzene,Polynuclear aromatic compounds, [naphthalene, anthracene.	25

PRACTICAL – 22300P4

1.	Introduction to safe working in organic chemistry laboratory.
2.	Systemic qualitative analysis of organic compounds and preparation of their derivatives { Various examples of organic compounds include, Acidic: Oxalic acid, succinic acid, tartaric acid, citric acid, benzoic acid, salicylic acid, cinnamic acid, p-nitrobenzoic acid, acetyl salicylic acid, Phthalic acid etc; Strong acidic Amphoteric: p-aminobenzoic acid, o-aminobenzoic acid, sulphanilic acid etc.; Weak acidic amphoteric: Sulphanilamide etc.; Phenolic: α -naphthol, β -naphthol, Phenol, Resorcinol, Catechol, o/m/p-nitrophenol, o/m/p-cresol etc.; Basic: Aniline, N-methyl aniline, N,N-dimethyl aniline, o/m/p-anisidine, o/m/p toluidine, o/m/p chloroaniline, diphenyl amine, o/m/p-nitroaniline etc.; Neutral: Isopropyl alcohol, tert. Butyl alcohol, Acetophenone, benzophenone, acetaldehyde, benzaldehyde, m-dinitrobenzene, nitrobenzene, o/m/p/-nitrotoluene, acetanilide, benzanilide, benzamide, acetamide, urea, thiourea, naphthalene, anthracene, chlorobenzene, bromobenzene, ethylacetate, benzyl alcohol, methanol, ethanol, diethyl

	ether, toluene etc.; * Salt: Sodium benzoate, Sodium salicylate }:
2.1	Preliminary test for given organic compounds. (3)
2.2	Nature identification of given organic compounds (Category: Salts, Acidics, Strong acidic amphoteric, Phenolics, Weak acidic amphoteric, Basics, Neutrals* (6)
2.3	Element detection for given organic compounds(3)
2.4	Oxidizability and bromination test for selected category(3)
2.5	Functional group test for following functional groups: <ul style="list-style-type: none"> • Carboxylic acids and phenols. (3) • Basic compounds and amino carboxylic acids. (3) • Aldehyde, ketone, ester, ether, alcohol, amide, acetamido, halogenated and non-halogenated hydrocarbon and nitro compounds (including nitrocarboxylic acid and nitro phenol) (6) • Melting point and Boiling point determination of given organic compound (3) • Derivatization of functional groups for above selected functional groups(6)
2.6	Identification of given unknown organic compounds for above compounds (9)

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.