SANKALCHAND PATEL UNIVERSITY
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FACULTY OF SCIENCE
M.Sc. (Chemistry) (Semester-4)
In Effect from Academic Year 2017-18

Subject Code: 1SC2030402	Subject Title: ORGANIC CHEMISTRY-VI
COURSE TYPE: CORE COURSE	

Course Objective: To impart knowledge and training in chemistry at advanced level, make aware with recent analytical technique, use of reagents and reactions in laboratory, synthesis and study of materials, the exploration of their properties and development of ways to use the mineral life.

Teaching scheme (hours) per week		Credit		Theory Marks		Practical Marks		Total
Theory	Practical	Theory	Practical	University Assessment	Cont. Assessment	University Assessment	Cont. Assessment	
4	-	4	-	60	40	-	-	100

UNIT	DISCRIPTION IN DETAIL	WEIGHTAGE
I	**Free Radical Reaction.** Types of free radical reactions, free radical substitution mechanism, mechanism at an aromatic substrate, neighboring group assistance. Reactivity of aliphatic and aromatic substrate at a bridgehead. Reactivity in the attacking radicals. The effect of solvent on reactivity. Allylic halogenation(NBS), oxidation of aldehydes to carboxylic acids, auto-oxidation, coupling of alkynes and arylation of aromatic compounds by diazonium salts. Sandmeyer reaction. Free radical rearrangement. Hundsdiecker reaction.	25%
II	**Green synthesis/reaction:** Green starting materials Green reagents Green solvents and reaction conditions Green catalysis Green synthesis- Real world cases (Traditional processes and green ones) Synthesis of Ibuprofen, Adipic acid etc and selected examples from US Presidential Green Chemistry Challenge Award Winners	25%
III	**Proteins and enzymes** Proteins: properties and conventions of common amino acids, stereoisomerism in α -amino acid, peptides: formation, compositions and sizes of protein separation, purification and characterization, sequencing of peptides, sanger's method, edman degradation, outline of other methods, protein sequences and evolution. Oxygen binding proteins, haemoglobin and myoglobin in oxygen transport and storage. Enzymes: classification, nomenclature and extraction factors	25%

	affecting catalytic activity and specificity in action, regulation of enzyme activity, enzyme inhibition, illustrative enzymatic reactions using chymotropsin, hexokinase, enolase and lysozyme, Stereospecificity and rate enhancement in enzyme catalysed reactions. Discussion on non-availability of electrophilic sites in enzymes and their presence in coenzymes.	
IV	**Bioorganic chemistry** General comparision of organic reactions carried out in laboratory and organic reactions observed in biological systems. Nature of biomolecular interactions, physical concepts Following reactions will be discussed (comparing the usual mechanism to enzyme catalysed mechanism) : hydrolysis of esters, amides, phosphoesters, etc. C-C and C=C bond formation, oxidation,reduction and decarboxylation. Remote functionalisation cyclisation reactions. Biomimetic reactions. Hydrophobicity,organizedassemblies. Supramolecular structure.	**25%**

Learning Outcomes

Students can understand the atomic and molecular basis of organic chemistry. They can know the impact of organic chemistry on the fields of medicine, pharmacy and its impact on the global economy. They can understand the fundamental principles of molecular structure and shape as they relate to organic molecules and their properties. They can identify organic molecules by functional group: alkane, alkene, alkyne, haloalkane, alcohol, thiol, ether, sulfide, amine, aldehyde, ketone, carboxylic acid and carboxylic acid derivatives.

BOOKS:

1. Green Chemistry: Theory and Practice. P.T. Anastas and J.C. Warner. OxfordUniversity Press.
2. Green Chemistry: Introductory Text. M. Lancaster Royal Society of Chemistry(London).
3. Introduction to Green Chemistry. M.A. Ryan and M.Tinnesand, American ChemicalSociety (Washington).
4. Real world cases in Green Chemistry, M.C. Cann and M.E. Connelly. AmericanChemical Society (Washington).
5. Real world cases in Green Chemistry (Vol 2) M.C. Cann and T.P.Umile. AmericanChemical Society (Washington)
6. .Advanced organic chemistry, Part B, Carey A and Sundberg R.J., Plenum Press.
7. Advanced organic chemistry: Reactions, mechanism and stereochemistry, March J.,John Wiley.
8. Theoretical organic chemistry, Parkanyi C., Elsevier
9. Strategic applications of named reactions in organic synthesis, Kurti L. and CzakoB., Academic Press, 2005.
10. Organic synthesis, Smith M.B., McGraw Hill, 2002.
11. Organic synthesis: The disconnection approach, Warren S., John Wiley & Sons.