FacultyofScience

M.Sc. Chemistry (SEM-II)

In Effect from Academic Year 2016-17

SUBJECTCODE:1SC2030202	TITLEOF PAPER: ORGANICCHEMISTRY-II
COURSETYPE: CORECOURSE	

Course Objective: To impart knowledge and training in chemistry at advanced level, make aware with recent analytical technique, use of reagent sand 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	Total	Uni. Assessment	Cont. Assessment	Uni. Assessment	Cont. Assessment	
4	2	4	2	6	60	40	30	20	150

UNIT	DISCRIPTION IN DETAIL	WEIGHTAGE
I	**(a)Aromatic Electrophilic substitution** The arenium ion mechanism, orientation and reactivity, energy profile diagrams. The ortho/para ratio, ipso attack, orientation in other ring systems. Ouantitative treatment of reactivity in substrate and electrophiles. Diazonium coupling, Vilsmeir reaction, Gattermann-koch reaction. **(b)Aromatic Nucleophilic Substitution** The SNAr, SN1, benzyne and SRN1 mechanism. Reactivity- effect of substrate structure,leaving groupand attacking nucleophile. The von Richter, Sommelet-Hauser and Smiles rearrangement.	**25%**
II	**(a)Aliphatic Nucleophilic Substitution** The SN2, SN1, mixed SN1 and SN2 and SET mechanisms. The neihbouring group mechanism, neighbouring group participation by π and σ bonds, anchimeric assistance. Classical and non classical carbocations, phenonium ions, norbornyl system, common carbocation rearrangements. Aplication of NMR spectroscopy in the detection of carbocations. The SNi mechanism: Nucleophilic substitution at an allylic, aliphatic trigonal and a vinylic carbon. Reacativity effects of substrate structure, attacking nucleophile, leaving group and reaction medium, phase transfer catalysis and ultrasound, ambient nucleophile, regioselectivity. **(b) Aliphatic Electrophilic Substitution** Bimolecular mechanism- SE2 and SEi, The SE1 mechanism, electrophilic substitution accompanied by double bond shifts effect of substrate leaving group and the solvent polarity on the reactivity	**25%**
III	**Reagents in Organic Synthesis [Oxidation] :** Cr03, Mn02, KMn04, Se02,Pb(OAc)4, OsO4, HIO4, DMSO, H202, CH3COOAg (Dry & wet),RCOOOH, Ozone, HgO, NBS, K3Fe(CN)6, DDQ, Al(O-t-Bu)3 ; Some Miscellaneous Reagents in Organic Synthesis : LDA, Sharplessepoxidation, wilkinson catalyst ,Grignard Reagent and Gilman reagent.	**25%**
IV	**Reagents in Organic Synthesis [Reduction] :** Al(O-iPr)3, Zn/HCl, N2H4/OH,NaBH4, LiAIH4, Complex Hydrides, Na/NH3, Cat.H2 ,TBTH. Introduction to Green Chemistry, Basic Principles of Green Chemistry ;Importance of PTC, ILs, microwave and ultra sonication in green synthesis.	**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.

PRACTICALS

OrganicChemistry

Mixture analysis: ternary mixture to be given. (S+S+S) or (L+L+L). Type determination. Separation by physical and chemical methods. (Both permitted in case of liquids)

LIST OF BOOKS:

1. Organic Reactions, Stereochemistry and Mechanism: P.S. Kalsi (New Age.)
2. Principles of Organic Synthesis: R.O.C Norman & J.M. Coxon (ELBS)
3. Mechanism in Organic Chemistry: Peter Sykes (Orient Longman)
4. Modern Methods of Organic Synthesis: W. Carruthers (Cambridge)
5. Organic Reaction Mechanism: V.K.Ahluwalia and R.K.Parashar (Narosa)
6. Advanced organic chemistry part-A F.A.Carey and R.G.Sundbreg
7. Stereochemistry of carbon compounds by E.L.Eliel
8. Stereochemistry of organic compounds by Nasipuri
9. Advanced Organic chemistry reacton mechanism and structure by Jerry March
10. Organic chemistry by J. Clayden, Oxford University Press
11. Reaction Mechanism in Organic chemistry by S.M.Mechanism and S.P.Singh
12. Pericyclic reaction by Jagdamba singh
13. Principles of organic synthesis R O C Norman and J.M. Coxon. Blackie academic and Professional
14. A Guide book to Mechanism in organic chemistry, Peter Sykes Longman
15. Organic chemistry by R.T. Morrison and R.N. Boyd, Prentice-Hall.
16. Reaction and mechanism in organic chemistry by P.S. Kalsi, New Age International.