

PAPER CODE: 1SC2030302

TITLE OF PAPER: ORGANIC CHEMISTRY-II

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	Organometallic chemistry Reaction of metal carbonyls, Dissociative mechanism, Associative mechanism, Metal hydrides/metal carbonyl hydrides, Insertion of alkene and alkyne in metal hydrogen and OMC complexes of alkene, alkyne, alkene, carbene and carbene, Zeise's salt, oxidative addition, Reductive elimination, Migratory insertion, β -hydride syn elimination, coupling reactions: Stille coupling, Suzuki, Sunogashira, Negeshi, Kumada, Hiyama, Heck, Ziegler-Natta catysis, Speier catalysis, Reppe catalysis, Steam reforming, Fischer-trops method, Monosanto acetic acid, oxo process, Wacker's process.	25%
II	Heterocyclic chemistry Systematic nomenclature of monocyclic fused and bridged hetrocycles, Classification of hetrocyclic compounds, Synthesis reactivity and aromatic character of following Heterocycles (1) Furan, Pyrrole, Thiophene, Pyrazole, Imodazole, Indole, Pyrimidine, Pyridine and quinoline (2) Condensed hetrocycles: Benzofuran, brnzothioazole, benzoimidazole, benzothiophene, quinoline, benzoxazole, (3) 1,2,3-triazole. 1,2,4-triazole, 1,2,4-oxadiazole, 1,3,4-oxadiazole.	25%

III	Photochemistry Photochemical reactions, Principle of energy transfer, electronic excitation(Janlonskidiagram), Photosynthesis, Photochemistry of carbonyl compounds, Norrish type-I and II, reaction of cyclic ketones, Peterno-Buchi reaction, Di- π methane rearrangement, Dinone photochemistry, Cis-trans Isomerisation, Photochemistry of conjugated dienes, photo rearrangement. Barton reaction. Fluorescence chemistry and its application.	25%
IV	Disconnection Approach An introduction to synthesis and synthetic equivalents, functional group inter conversion, synthons, one group C-X and two group C-X disconnection, chemoselectivity. One Group C-C Disconnections Alcohols and carbonyl compounds, regioselectivity, alkene synthesis, use of acetylenes and aliphatic Nitro compounds in organic synthesis Saturated heterocycles synthesis of 3,4,5 and 6 membered ring aromatic heterocycles inorganic 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.

LIST OF BOOKS:

- 1) E. V. Anslyn and D. A. Dougherty, **Modern Organic Chemistry**, University Science, 2005.
- 2) A. Pross, **Theory and Physical Principles of Organic Reactivity**, John Wiley, 1995.
- 3) A. Rauk, **Orbital Interaction Theory of Organic Chemistry**, John Wiley, 1994.
- 4) F. A. Cotton, G. Wilkinson, C. A. Murillo and M. Bochmann, **Advanced Inorganic Chemistry**, 6th edition, Wiley, 1999.
- 5) G. Wilkinson, F. G. A. Stone and E. Abel, **Comprehensive Organometallic chemistry**, Pergamon, 1980.
- 6) S. Warren, **Designing Organic Synthesis**, John Wiley and Sons, 1980.
- 7) W. Caruthers, **Some Methods of Organic Synthesis**, Cambridge University Press, 1978.
- 8) H. O. House, **Modern Synthetic Reactions**, 2nd Ed., W.A. Benjamin 1972.

- 9) R.O.C. Norman, ***Principles of Organic Synthesis***, 2nd Edn., Methuen and Co. Ltd., 1972
- 10) **Organic synthesis** – Michael B. Smith
- 11) **Organometallics in organic synthesis** – J. M. Swan and D. C. Black (Chapman and Hall)
- 12) **Advanced organic chemistry**, Part B – F. A Carey and R. J. Sundberg, 5th edition (2007)
- 13) **Guidebook to organic synthesis** – R K Meckie, D M Smith and R A Atken
- 14) Organic synthesis – Robert E Ireland
- 15) **Strategic Applications of named reactions in organic synthesis** – Laszlo Kurti and Barbara Czako
- 16) Kalsi P. S. ***Stereochemistry, conformation and Mechanism***, New Age International Pvt. Ltd.
- 17) Clayden, Greeves, Warren & Wothers, ***Organic Chemistry***, Oxford University.
- 18) Carey F. A. and Sundberg R. J. ***Advanced Organic Chemistry, Part A and Part B***, Springer.
- 19) March J. ***Advanced Organic Chemistry: Reactions, Mechanisms and Structure***, Wiley-India.
- 20) Eliel E. L. and Wilen S. H. ***Stereochemistry of Organic Compounds***, John Wiley & Sons.
- 21) Smith M. B. ***Organic Synthesis***, McGraw-Hill Science.
- 22) Pine H. S. ***Organic Chemistry***, McGraw-Hill.
- 23) Clayden, Greeves, Warren & Wothers ***Organic Chemistry***, Oxford University.
- 24) Carey F. A. and Sundberg R. J. ***Advanced Organic Chemistry, Part A and Part B***, Springer.
- 25) Norman R. O. C. and Coxon J. M. ***Principles of Organic Synthesis***, Nelson Thornes.
- 26) Joule J. A. and Mills K. ***Heterocyclic Chemistry***, Wiley-blackwell.
- 27) Warren S. ***Organic Synthesis: The Disconnection Approach***, Wiley Student Ed