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| <b>Subject Code: 1SC2030401</b> | <b>Subject Title: ORGANIC CHEMISTRY-V</b> |
| <b>COURSE TYPE: CORE COURSE</b> |                                           |

**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 |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>I</b>   | <b><u>Antibiotics:</u></b><br>Introduction, classification.<br>a) $\beta$ -lactam antibiotics: penicillin, Classification (early, resistant, broad spectrum, broad spectrum, adverse effects of penicillins. SAR of penicillin, Synthesis: ampicillin, pivampicillins,<br>b) cephalosporins: Classification and SAR Synthesis: cephalexin, 7- amino cephalosporonic acid,<br>c) tetracyclines: introduction and SAR, Synthesis: methacycline, doxycycline             | 25%       |
| <b>II</b>  | <b><u>Introduction to Medicinal Chemistry:</u></b><br>History of Medicinal Chemistry, Classification of drugs, Important Terminology used in Medicinal Chemistry,<br><b>Pharmacokinetics:</b> Introduction to drug absorption, disposition, drug metabolism, elimination , important pharmacokinetic parameters in defining drug disposition and in therapeutics, mention of uses of pharmacokinetics in drug development process, concept of pro drug and soft drug. | 25%       |
| <b>III</b> | <b><u>Antimalarial and Antituberculosis drugs</u></b><br>Antimalarials: Modern chemotherapy of malaria, 4-amino and 8-amino quinolins, 9-amino acridine.<br>Synthesis of mefloquines, chloroquine, primaquine and daraprim. Mode of action of antimalarial agents<br>SAR of antimalarial agents Anti tuberculosis: Synthesis of only the following drugs: Isoniazid (INH), Ethionamide, Ethambutol, DDS (Dapsone)                                                     | 25%       |

|           |                                                                                                                                                                                                                                                                   |             |
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| <b>IV</b> | <b><u>Pharmacodynamics:</u></b><br>Introduction, principles of drug action, mechanisms of drug action, introduction to the concept of receptors and drug receptor interactions, Dose-response relationships, drug potency and efficacy, combined effect of drugs. | <b>25 %</b> |
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### **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. Medicinal Chemistry, A. Burger Vols. I to V Ed. M. E. Wolff, John Wiley (1994).
2. Goodman & Gilman. Pharmacological Basis of Therapeutics, McGraw-Hill (2005).
3. S. S. Pandeya & J. R. Dimmock. Introduction to Drug Design, New Age International. (2000).
4. D. Lednicher. Strategies for Organic Drug Synthesis and Design, John Wiley (1998).
5. Graham & Patrick. Introduction to Medicinal Chemistry (3rd edn.), OUP (2005).
6. Medicinal Chemistry — A molecular and Biochemical Approach, Thomas Nogrady and Donald F. Weaver
7. Principles of Medicinal Chemistry, W. O. Foye
8. Wilson and Gisvolds Text book of Medicinal Chemistry
9. The Organic Chemistry of the Drug Design and Drug Action, Richard B. Silverman
10. Analogue based Drug Discovery, János Fischer and C. Robin Ganellin
11. Goodman and Gilman's Text book of Pharmacology.
12. Chemoinformatics - Concepts, Methods, and Tools for Drug Discovery, Jürgen Bajorath
13. A. Kar, Textbook of Medicinal Chemistry; Asian Age Publication.
14. Sriram D and Yogeshwari P, Medicinal Chemistry; Pearson Education.
15. Ahluwalia V K, Chopra Madhu, Medicinal Chemistry; Ane Books India.

