**DEPARTMENT OF CHEMISTRY**

**SHRI G. S. INSTITUTE OF TECHNOLOGY AND SCIENCE, INDORE**

**COURSE COMPLETION UNIT PLAN**

**Course: M.Sc. (Applied Chemistry) Semester III**

**Paper: CH91305 Chemistry of Drug (Natural)**

**Name of Faculty: Dr. Urmila Raghuvanshi**

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| **Lecture No.** | **Brief description of Topic to be taught** | **Reference/Remarks** |
|  | **Unit I**  **Alkaloids** | **Books**  (1) L. F. Fieser and sM. Feiser. Steroids. (Reinhold Publishing Corporation, New York)  (2) Sewald N, Hans-Dieter Jakubke Peptides: Chemistry and Biology. (Wiley-VCH publisher).  (3)Li JJ, Corey EJ, Total Synthesis of Natural Products: At the Frontiers of Organic Chemistry, (Wiley-VCH publisher).  (4) Finar I.L., Organic Chemistry Vol.I and II (ELBs and Longman Ltd. New Delhi)  (5) Lednicer D, Steriod chemistry at a glance (Wiley publisher).  (6) Dewick P.M., Medicinal natural products (Wiley publisher).  **Journals**  1. The Journal of Antibiotics.  2. Pharmaceutical Chemistry Journal.  4. Medicinal chemistry Journals.  5. Chemistry - A European Journal. |
| 1 | Introduction and different definition of alkaloids, Nomenclature of alkaloids, Classification of alkaloids. |
| 2 | Properties and isolation process of alkaloids from plants, Method of determination of molecular formula of alkaloids. |
| 3 | General method of determination of different functional group present in alkaloids. |
| 4. | Introduction, properties, isolation, structure determination and sar of nicotine and atropine. |
| 5. | Introduction, properties, isolation and structure determination and sar of cocaine and conine. |
| 6 | Introduction, properties, isolation and structure determination and sar of morphine and papaverine. |
| 7 | Introduction, properties, isolation and structure determination and sar of quinine and reserpine. |
| 8 | Introduction, properties, isolation and structure determination and sar of strychnine and ephedrine. |
|  | **Unit-II**  **Antibiotics** |
| 9 | Definition, classification, properties and importance of antibiotics. |
| 10 | Introduction, properties, mechanism of action, therapeutic uses and SAR of penicillin. |
| 11 | Introduction, properties, mechanism of action, therapeutic uses and SAR of cephalosporin and aminoglycoside. |
| 12 | Introduction, properties, mechanism of action, therapeutic uses and SAR of tetracyclines and macrolides. |
| 13 | Introduction, properties, mechanism of action, therapeutic uses and SAR of lincomycins and polypeptide. |
| 14 | Introduction, properties, mechanism of action, therapeutic uses and SAR of polyenes, griseofulvin and vancomycin. |
| 15 | Commercial production, constitution, properties and biological significance of penicillin and streptomycin. |
| 16 | Commercial production, constitution, properties and biological significance of tetracyclines and chloramphenicol. |
|  | **Unit III**  **Steroids(Sterols and Adreno)** |
| 17 | Introduction, classification of sterols and their role in biochemistry. |
| 18 | Introduction, properties and structure elucidation of cholesterol. |
| 19 | Introduction, properties and structure elucidation of bile acids. |
| 20 | Relation of structure of cholesterol and bile acids. |
| 21 | Introduction, study of biological significance and chemical structure of hormones. |
| 22 | Introduction, study of biological significance and chemical structure of cortisone. |
| 23 | Introduction, study of biological significance and chemical structure of cortisol. |
| 24 | Introduction, study of biological significance and chemical structure of adrenaline. |
|  | **Unit IV**  **Sex hormones and Pituitary hormones** |
| 25 | General introduction of sex hormone and their biological significance. |
| 26 | Introduction,study of biological significance and chemical constitution of oestrogens. |
| 27 | Introduction, study of biological significance and chemical constitution of androgens. |
| 28 | Introduction, study of biological significance and chemical constitution of progesterone. |
| 29 | General introduction of pituitary hormones and their biological significance. |
| 30 | Classification of pituitary hormones. |
| 31 | Biological significance and chemical constitution of anterior pituitary hormones. |
| 32 | Biological significance and chemical constitution of posterior pituitary hormones. |
|  | **Unit V**  **Proteins, Enzyme, Purines and Nucleic Acid** |
| 33 | Introduction, classification and biological significance of proteins and synthesis of peptide linkage. |
| 34 | Study of primary, secondary and tertiary structure of proteins and biosynthesis of protein. |
| 35 | General study of oxytocin and insulin,introduction of enzyme and their nomenclature and cofactor. |
| 36 | Mechanism of action of enzyme and enzyme inhibitors. |
| 37 | Study of chemical constitution and biological significance of uric acid, purine derivative and xanthine bases. |
| 38 | Study of chemical constitution, isolation and biological significance of nucleosides and nucleotides. |
| 39 | Study of chemical constitution, isolation and biological significance of RNA and DNA. |
| 40 | Chemical and enzymatic synthesis of polynucleotides. |