**REFERENCES:**
1. D. K. Chakrabarty, Solid state chemistry (New Age) 1996.
2. H.V.Keer, Principles of the solid state ( Wiley Eastern ) 1993.
3. A.R.West, Solid state chemistry and its applications (Wiley) 1984.
4. L.Smart and E. Moore, Solid State Chemistry –An Introduction (Chapman &Hall)1992.
5. L. Azaroff, An Introduction to Solids (Mc Graw Hill).
6. V. Raghavan, Material science and Engineering (3rd Ed), (Prentice Hall India)1993.
7. Thermotropic Liquid Crystals, Ed. G.W. Gray, Wiley.
8. S. Chandrasekhar, Liquid Crystals, Cambridge University Press (2nded), 1994.
9. Chemical Kinetics, K. J. Laidler, Pearson Education, Anand Sons(India) 3rd edition (2008)
10.Physical Chemistry at surfaces, 6th ed., A.W Adamson and A P Gast, John Wiley, Canada,
1997.
11.C.P.Poole and F.K.Owens Introduction to Nanotechnology, (2004).
12.T.Pradeep, Nano: The Essential, Tata McGraw Hill Publishing Company Ld., New Delhi, (20080.

## CH S 504: Medicinal and Natural Products Chemistry

**COURSE OUTCOME:**

- Students will gain an understanding on the classification and nomenclature of drugs, modern theories of drug action and drug design.
- Students will able to know classification, synthesis and mode of action of antipyretic analgesis drugs, general anesthetics, local anesthetics, cardiovascular drugs, antineoplastic agents and antiviral drugs with suitable examples.
- Students will get a good understanding of isolation, classification,
- methods of structure elucidation and synthesis of various types of alkaloids, terpenoids and steroids with suitable examples.

**UNIT- I:** **[12 Hours]**

**Drugs:** Introduction, Classification and nomenclature of drugs. Theories of drug action-Occupancy theory, Induced fit theory and Perturbation theory. Analogues and Prodrugs, Factors governing drug design. Rational approach to drug design, Variation method of drug designing, Physico-Chemical factors, stereochemistry and biological activities. Factors governing the ability of drugs.

**Antipyretic Analgesics:** Classification, synthesis & mode of action of Phenacetin, Aspirin, Cinchophen, Phenazone and Mefenamic acid.

**General Anesthetics:** Introduction and classification, synthesis & mode of action of methoxy fluorane, Thiopental sodium and Fentanyl citrate.

**Local anesthetics:** Introduction and classification, synthesis & mode of action of benzocaine, α-Eucaine, Lignocaine hydrochloride and Dibucaine hydrochloride.

**UNIT- II:** **[12 hours]**

**Cardiovascular drugs:** Introduction & classification, Synthesis & mode of action of Hydralazine, Methyldopa, Diazoxide, Procainamide, Propranolol, Prenylamine.

**Antimalarials:** Introduction and classification, Synthesis & mode of action of Chloroquinephosphate, Pamaquine and pyrimethanin.

**Antineoplastic agents:** Introduction and classification, Synthesis & mode of action of Mechlorethamine hydrochloride, Busalfan triethylenemelamine, Methotrexate and

Flurouracil. **Antiviral drugs:** Introduction, classification, Synthesis & mechanism of action of Methisazone, Idoxuridine and Amantidine hydrochloride.

**UNIT- III:** **[12 Hours]**

**Alkaloids**: Isolation, classification and general methods of structure elucidation. Structure and synthesis of Papaverine, Adrenaline and Reserpine.

**Terpenoids**: Introduction, classification, isoprene rule and methods of structure determination. Structure and synthesis of Geraniol, Menthol, α-Pinene, Camphor and Zingiberene.

**Steroids:** Introduction, Blanc's rule, Chemistry of Cholesterol, Oestrone, Progesterone and Androsterone.

**REFERENCES:**


1. Medicinal Chemistry- Ashutosh Kar (New Age.), 2005,
1. Medicinal Chemistry- G. R.Chatwal (Himalaya) 2002.
2. Principles of Drug Action- II Ed. A.Goldstein Lewis Arnold & Suner M.Kalman (Wiley Int.Ed.).
3. Natural Products Chemistry, Vol-I & II- G.R.Chatwal (Himalaya), 1990.
4. Organic Chemistry, Vol I & II, I.L.Finar (Longmann ELBS, London), 1973.
5. Chemistry of Natural Products – Vol-I & II – O. P. Agarwal (Goel Gorakhpur), 1985.

Chemistry of Natural Products: A Unified Approach-N R Krishnaswamy (University Press) 1999


## CH S 505: BIOORGANIC CHEMISTRY

**COURSE OUTCOME:**

Students will be able to:

- Understand the configuration and conformation of monosaccharides, chemistry of important derivatives of monosaccharides, structure, synthesis, industrial and biological applications of disaccharides, general methods of determination of polysaccharide structures, photosynthesis, fermentation, structure and industrial applications of polysaccharides.
- Explain the peptide bond formation, synthetic protocol for peptides, solution and solid phase peptide synthesis, Methods of peptide structure determination, different types protein structures, non-steroidal hormones, nucleosides, nucleotides,
- Synthesis of nucleosides, nucleotides and polynucleotides, structure and functions of nucleic acids.
- Learn the classification, nomenclature, sources, deficiency diseases, biological functions and chemistry of Vitamin A1, B3, B5, C and K1.
- Know the classification and chemistry of antibiotics like Penicillin V, Streptomycin, chloramphenicol and tetracyclins

**UNIT I** **[12 Hours]**

**Carbohydrates** Configuration and conformation of (D & L) monosaccharides, Hudsons rule, Mutarotation, Anomeric effect, Epimerization. Chemistry of important derivatives of monosaccharides: Glycosides (ethers, esters, acetals, ketals), deoxysugars, aminosugars, Structure of disaccharides-maltose, cellobiose and sucrose, Industrial & biological applications. General methods of structural degradation of polysaccharides- methylation &