MANGALORE UNIVERSITY

DEPARTMENT OF CHEMISTRY

M. SC. ORGANIC CHEMISTRY

OC H 552: Medicinal 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 understand the classification, nomenclature, source and deficiency diseases and biological functions of various vitamins, chemistry of penicillins,cephalosporin C, streptomycin, chlorampthe knowledge of nomenclaturehenicol and tetracyclins.
- Students will acquire knowledge about nomenclature, classification and biological role of prostaglandins, Structural elucidation, stereochemistry and total synthesis of prostaglandins.

UNIT-I: **[15 Hours]**

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

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

General Anesthetics: Introduction and classification, synthesis of methoxyfluorane,Thiopental sodium and Fentanyl citrate, Mode of action.

Local anesthetic: Introduction and classification, synthesis of benzocaine, α-Eucaine,Lignocaine hydrochloride and Dibucaine hydrochloride, Mode of action.

UNIT-II: **[15 Hours]**

Cardiovascular drugs: Introduction, classification, Synthesis of Hydralazine, Methyldopa,Diazoxide, Procainamide, Propranolol, Bretylium tosylate, Isoxsupurine, Prenylamine & their mode of action.

Antimalarials: Introduction and classification, Synthesis of Chloroquine phosphate, Pamaquine, Meparine hydrochloride, Proguanil hydrochloride, pyrimethanine and dapsone, Mode of action.

Antineoplastic agents: Introduction and classification, Synthesis of Mechlorethaminehydrochloride, Busalfan triethylenemelamine, Methotrexate, Mercaptopurinum and Flurouracil, Mode of action.

Antiviral drugs: Introduction, classification, mechanism of action study of somerepresentative drugs like Methisazone, Idoxuridine, Amantidine hydrochloride.

UNIT-III: **[15 Hours]**

Vitamins: Introduction, Classification and Nomenclature-Source and Deficiency diseases,Biological, functions of Vitamins, Study of Vitamin A1, Vitamin B1, B2 and B6, Vitamin H, Vitamin C, Vitamin E, Vitamin K1.

Antibiotics: Introduction, Classification, Chemistry of Pencillin V, Cephalosporine C,Streptomycin, Chloramphenicol and Tetracyclin.

Prostaglandins: Introduction, Nomenclature, Classification and Biological role ofProstaglandins, Structural elucidation and stereochemistry of PGE1, PGE2 and PGE3. Total synthesis of PGE1 (Corey's method & Up John's synthesis).

References:

1. Medicinal Chemistry- Ashutosh Kar (New Age.) 2005,
2. Medicinal Chemistry- G. R.Chatwal (Himalaya) 2002.
3. Natural Products Chemistry, Vol-I & II- G. R. Chatwal (Himalaya) 1990.

4. Principles of Drug Action, II ed.- A.G oldstein Lewis Arnold & Suner M. Kalman (Wiley Int. Ed.)

5. Organic Chemistry, Vol I & II, I.L.Finar (Longmann ELBS, London) 1973.
6. Chemistry of Natural Products, Vol-I & II – O. P. Agarwal (Goel Gorakhpur) 1985.

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