



MANGALORE UNIVERSITY
DEPARTMENT OF CHEMISTRY
M.Sc. CHEMISTRY

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 be able to know classification, synthesis and mode of action of antipyretic analgesic 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 methoxyfluorane, 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, Busulfan 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,
2. Medicinal Chemistry- G. R.Chatwal (Himalaya) 2002.
3. Principles of Drug Action- II Ed. A.Goldstein Lewis Arnold & Suner M.Kalman (Wiley Int.Ed.).
4. Natural Products Chemistry, Vol-I & II- G.R.Chatwal (Himalaya), 1990.
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.
7. Chemistry of Natural Products: A Unified Approach-N R Krishnaswamy (University Press)