

# **Syllabus**

## **M.Sc. (Chemistry) Programme**

### **(SEMESTER – IV)**

*Medicinal Chemistry (Elective)*  
*Programme Code- (MSCCH -21)*  
*Course Code – (MSCCH -608)*

#### **Unit 1 Drug Design**

Development of new drugs, procedures followed in drug design, concepts of lead compound and lead modification, concepts of prodrugs and soft drug, structure-activity relationship (SAR), factors affecting bioactivity. Theories of drug activity: general discussion. Quantitative structure activity relationship. History and development of QSAR. Concepts of drug receptors. Elementary treatment of drug receptor interactions. Physico-chemical parameters: Lipophilicity, partition coefficient, electronic ionization constants, steric, Shelton and surface activity parameters and redox potentials. Free-Wilson analysis, Hansch analysis, relationships between Free-Wilson and Hansch analysis. LD-50, ED-50 (Mathematical derivations of equations excluded).

#### **Unit 2. Pharmacokinetics & Pharmacodynamics**

Introduction to drug absorption, disposition, elimination using pharmacokinetics, important pharmacokinetic parameters in defining drug disposition and in therapeutics. Mention of uses of pharmacokinetics in drug development process. Introduction, elementary treatment of enzyme stimulation, enzyme inhibition, sulphonamides, membrane active drugs, drug metabolism, xenobiotics, biotransformation, significance of drug metabolism in medicinal chemistry.

#### **Unit 3. Antineoplastic Agents**

Introduction, cancer chemotherapy, special problems, role of alkylating agents and antimetabolites in treatment of cancer. Mention of carcinolytic antibiotic and mitotic inhibitors. Synthesis of mechlorethamine, cyclophosphamide, melaphalan, uracil, mustards and 6-mercaptopurine. Recent development in cancer chemotherapy. Hormone and natural products.

#### **Unit 4. Cardiovascular Drugs**

Introduction, cardiovascular diseases, drug inhibitors of peripheral sympathetic function, central intervention of cardiovascular output. Direct acting arteriolar dilators. Synthesis of amyl nitrate, sorbitrate ,verapamil, atenolol.