Third Semester

PC-301: Pharmaceutical Analysis

Unit - I: Profile of a quality control laboratory for chemical division in pharmaceutical unit, routes of drug administration, structure activity relationship, adverse drug effect, LD₅₀ and ED₅₀ (a brief idea only).

Unit - II: General Chemistry, mode of action and method of analysis of drugs belonging to following classes:

(a) Antipyretics & analgesics: Paracetamol, Aspirin and Ibuprofen
(b) Antibiotics: Amoxicillin, Amoxicillin and Cloxacillin
(c) Antifungal agents: Clotrimazole and Miconazole

Unit - III: (a) Sulpha drugs: Sulphamethoxazole, Sulphaguanidine and Sulphadiazine
(b) Antitubercular drugs: Isoniazide and Rifampicin
(c) Expectorants: Codeine phosphate and Papaverine hydrochloride

Unit - IV: (a) Bronchodilators: Ephedrine, Salbutamol and Theophylline
(b) Hypnotics and Sedative: Phenobarbitone
(c) General Anesthetic: Benzocaine

Unit - V: A brief chemistry and mode of action of following drugs (method of analysis excluded)

(a) Cardiac glycosides: Digoxin and Digitoxin
(b) Antihypertensive: Clonidine and Methyl Dopa
(c) Antileprotic drugs: Dapsone and Clofazimine
(d) Anticancer agents: Alkylating agents only

Books Recommended

PC - 302: Principles of Pharmacology

Unit 1: Pharmacokinetics I
Physicochemical factors in transfer of drugs across membranes. Drug absorption, bioavailability and routes of administration, Distribution of drugs.

Unit 2: Pharmacokinetics II
Excretion of drugs, Metabolism of drugs Clinical pharmacokinetics, Clearance-distribution, Half-life, Extent and rate of bioavailability, Therapeutic drug monitoring.

Unit 3: Pharmacodynamics
Mechanism of drug action, Drug receptors, Receptors for physiological regulatory molecules, Physiological receptors: Structural and functional families. Regulation of receptors, Quantitation of drug-receptor interactions and effects.

Unit 4: Membrane Transportation

Unit 5: Pharmacogenetics
Importance of pharmacogenetics to variability in drug response, Genomic basis of pharmacogenetics, Pharmacogenetic study-design consideration, pharmacogenetic phenotypes, Pharmacogenetic and drug development.

Books Recommended

PC - 303: Principles of Drug Development

Unit I: Evaluation of the Evidence
Clinical trials, Observational studies, Drug history, Disease-induced alterations in pharmacokinetics.

Unit II: Interaction between drugs
Pharmacokinetics interactions caused by diminished drug delivery to the site of action, Pharmacokinetic interaction that increase drug delivery to the site of action.

Unit III: Pharmacokinetics interactions
Pharmacokinetics interactions, Age as a determinant of response to drugs, Genetic determination of the response to drugs, Pharmacodynamic characteristics of a drug that determine its use in therapy, Pharmacodynamic variability, Therapeutic Index.

Unit IV: Adverse drug reaction and drug toxicity
Advance drug reaction and drug toxicity, Therapeutic drug monitoring, Drug development and its regulation. Role of clinician in adverse reaction.

Unit V: Structural features and pharmacologic activity
Optical and geometric isomerism and pharmacologic activity, Influence of optical isomerism on pharmacological activity, Influence of geometrical isomerism on pharmacologic activity, conformational isomerism and pharmacological activity, Effect of conformational isomerism on biological activity of drugs.

Books Recommended

Unit - I – Diffraction Techniques


Unit - II - Industrial Process Instruments and Automatic Analysis

Overall analytical procedures for analysis of an organic and inorganic material, industrial process analyzer, infrared process analyzer. On-line potentiometric analyzer, process gas chromatography, on-line GC/Mass and GC/IR, continuous on-line process control, automatic chemical analysis, automatic elemental analyzer.

Unit III: Immunology and Immunological Preparation: Immune system, cellular humoral immunity, antigen and haptens, antigen and antibody reactions and their applications. Hypersensitivity. Active and passive immunization; Vaccines- their preparation, sterilization and storage.

Unit IV: Genetic Recombination & Antibiotics: Transformation, conjugation, transduction, protoplast fusion, gene cloning and their applications. Development of hybridoma for monoclonal antibodies. Study of drugs produced by biotechnology such as Actinase, Humulin. Historical development of antibiotics. Anti microbial agents, sulfadururs, Penicillins broad spectrum antibiotics and methods used for their standardization.


Books Recommended