

**Swami Rama Himalayan University,  
Swami Ram Nagar, Jolly Grant, Dehradun-248016**

**Subject Code: PHDPH110**

**Subject Name: Advances in Pharmacology & Therapeutics**

**100 Marks**

**TIME: 3 HRS**

**Unit I**

**General Pharmacology:**

- Pharmacology –history and development
- Pharmacokinetics
- Pharmacodynamics
- Adverse drug reactions
- Drug interactions and iatrogenic disorders
- Pharmacogenetics & genomics

**Autonomic nervous system:**

**6 hours**

- Anatomical and physiological considerations of the autonomic nervous system
- Cholinergic system- Cholinergic agonists, Anticholinesterases and Antimuscarinic drugs
  
- Adrenergic system- Adrenergic drugs, Alpha adrenergic blocking agents, Beta adrenergic blocking agents
- Pharmacotherapy of glaucoma
- Recent advances in ANS Pharmacology

**Autacoids & related drugs**

**5 hours**

- Histamine & antihistaminics
- Pharmacology of serotonin & drug therapy of migraine
- Prostaglandins & prostaglandin analogues
- Analgesics-NSAIDs
- Pharmacotherapy of rheumatoid arthritis & gout

**Unit II**

**7 hours**

**Nervous system- peripheral & central:**

- Physiology and pharmacology of neurohumoral transmission in the central nervous system

- Drugs used in anaesthesia
  - Skeletal muscle relaxants- peripherally & centrally acting
  - Local anaesthetics
  - General anaesthetics
- Opioids and related drugs
- Psychopharmacology- Antipsychotics & antimanic; Antidepressant & Antianxiety drugs
- Pharmacotherapy for Parkinson's disease
- Sedative-hypnotics
- Antiepileptics
- CNS stimulants & cognition enhancers & recent advances in CNS Pharmacology

### **Cardiovascular system**

**7 hours**

- Basic physiology of cardiovascular system including electrophysiology of the heart, mechanics of myocardial contraction and RAAS system
- Anti hypertensive agents including diuretics
- Antiarrhythmic drugs
- Drugs for CHF
- Angina pectoris & MI
- Hypolipidemic drugs
- Drugs acting on coagulation system
- Antiplatelet drugs
- Recent advances in CVS Pharmacology

### **Endocrinology:**

**7 hours**

- Anterior pituitary hormones
- Antidiabetic drugs
- Thyroid and anti thyroid drugs
- Corticosteroids
- Sex Steroids & related drugs
- Drugs affecting calcium homeostasis
- Drugs acting on uterus
- Recent advances in Endocrine Pharmacology

### **UNIT III**

**7 hours**

#### **Chemotherapy**

- Introduction to mechanism of action and principles of anti microbial therapy
- Antimicrobial agents
  - Antibacterial agents
  - Antifungal agents

- Antiviral agents
- Antimycobacterial agents
- Antimalarial agents
- Antiamoebic and antihelminthic agents
- Antineoplastic agents & immunomodulators
- Recent advances in antimicrobial and antineoplastic pharmacology

### **Respiratory Pharmacology**

**3 hours**

- Respiratory physiology in relation to pharmacological actions of drugs & drug targets
- Drugs used in Bronchial Asthma
- Drugs used in the treatment of cough

### **GIT Pharmacology**

- Physiology of GI system in relation to pharmacological actions of drugs & drug targets
- Antiulcer drugs
- Antiemetics & prokinetics
- Drugs used in diarrhea & constipation

### **Unit IV**

**6 Hours**

#### **Clinical & Applied Pharmacology**

- Clinical pharmacokinetics, concentration effect relationship, pharmacokinetic parameters, target concentration strategies, plateau principle and population pharmacokinetics
- Bioavailability & Bioequivalence studies
- Therapeutic drug monitoring
- ADR monitoring and prevention
- Pharmacoeconomics and pharmacoepidemiology
- Principles of rational drug therapy with emphasis on antimicrobial chemotherapy
- Concept of essential drugs
- Drug therapy in extremes of age ( Neonatal/Geriatric)
- Drug therapy in pregnancy and lactation
- P drug & P-medicine
- Prescription auditing and critical evaluation of research papers, promotional materials / drug advertising materials etc.
- Evidence based medicine

### **Unit V**

**4 Hours**

#### **Research Methods in Pharmacology**

- Keeping and breeding of laboratory animals
- Drug regulations

- Bioassay and its importance
- Drug development ( Pre clinical and clinical)
- Drug discovery & evaluation through pharmacological assays
- Screening methods in pharmacology for evaluation of drug activities
- Acute/ subacute and chronic toxicity studies on animals
- Clinical trials
  - Design, implementation and evaluation
  - Phase 0, I, II, III, IV
  - Ethical and legal aspects in clinical trials and drug therapy
- Basic Biostatistics
- Research protocol and thesis writing, offline and online literature search and basics of MS-PowerPoint

## REFERENCES

1. Goodman LS, Laurence L. Brunton . Goodman and Gilman's The Pharmacological Basis of Therapeutics: McGraw-Hill; 12th edition.
2. Laurence, Bennet & Brown, Clinical Pharmacology: Churchill Livingstone; 11th ed./2012
3. Katzung BG, Masters SB, Trevor AJ, editors. Basic & Clinical Pharmacology. New York, NY, USA: Lange Medical Books/McGraw-Hill; 13<sup>th</sup> edition/2015.
4. Rang HP, Ritter JM, Flower RJ, Dale MM, Moore PK. Rang & Dale's Pharmacology: Elsevier health sciences, 8<sup>th</sup> edition.2016
5. Sharma HL, Sharma KK. Principles of Pharmacology: Jaypee publishers. 3rd ed./2017
6. Vogel HG, Maas J, Gebauer A, Drug Discovery and Evaluation: Methods in Clinical Pharmacology, Springer; 2<sup>nd</sup>/2011 edition
7. Rowland M, Tozer TN, Clinical Pharmacokinetics Concept and Applications; Bi Waverly Pvt. Ltd. 4<sup>th</sup> edition/2007
8. Friedman LM, Furberg CD, DeMets D. Fundamentals of Clinical Trials 4th ed. 2010.