Tishk International University Pharmacy Subjects

Clinical Pharmacy

SCOPE:

- The pathophysiology of selected disease states and the rational for drug therapy.
- The therapeutic approach to management of various diseases and controversies in drug therapy.
- The importance of preparation of individualised therapeutic plans based on diagnosis
- Pathophysiology of selected disease states and the rationale for drug therapy:
- The therapeutic approach to management of these diseases including reference to the latest available evidence

Unit I: Introduction to therapeutics and the role of pharmacists in pharmaceutical care. Hospital pharmacy, and its organization, Clinical Pharmacy and OTC Sales.

Unit II: Drug distribution system in a hospital, Therapeutic drug monitoring, Medication adherence and Adverse drug reactions and their reporting.

Unit III: Therapeutic management of the Cardiovascular and CNS discorders.

- Electrophysiology of heart and Arrhythmias, Dyslipidemia and atherosclerotic cardiovascular diseases, Hypertension, CHF, Schizophrenia, and Bipolar Disorders.
- Pharmacy and therapeutic committee, counseling and Prescribed medication order and communication skills.

Unit IV: Therapeutic management of a number of common diseases, including infectious disease, renal diseases, pulmonary diseases, contagious diseases, musculoskeletal diseases, diabetes, Thyroid diseases, Menstrual cycle disorders, Asthma, tuberculosis, Acute and chronic liver disorders. IBS, and Arthritis.

Unit V:

- Therapeutic management of Gastric disorders, Skinn disorders and women health.
- Drug store management and inventory control, Investigational use of drugs, and Interpretation of Clinical Laboratory Tests

References

- Clinical Pharmacy and Therapeutics by Roger Walker.
- A Textbook of Clinical Pharmacy Practice: Essential Concepts and Skills by G. Parthasarathi
- Pharmacotherapy Handbook by Barbara G. Wells
- The Handbook of Clinical Pharmacy Practice by Wargo
- Clinical Pharmacy by Jane Wright

Topics for M pharm Entrance (TIU)

• S. No.	**Chapters**	**Suggested Books**
	Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems Tenth Edition	
1.	Section I. Introduction to Drugs, Drugs Dosage Forms, and Drug Delivery Systems …….2-76	
2.	Section II. Drugs Dosage Form and Drug Delivery System Design……102-166	
	Aulton's Pharmaceutics, The Design and Manufacture of Medicines Fifth Edition	
3.	23. Pharmaceutical preformulation Simon Gaisford 380	
4.	30. Tablets and compaction Göran Alderborn and Göran Frenning 517	
5.	33. Hard capsules Brian E. Jones 597 34. Soft capsules Keith G. Hutchison and Josephine Ferdinando 612	
6.	49. Product stability and stability testing Paul Marshall 862	
	Martin's Physical Pharmacy and Pharmaceutical sciences Sixth Edition	
7.	14. Chemical kinetics and Stability……..318	
8.	15. Interfacial phenomenon…… 355	
9	18. Micromeritics…… 412	
10	19. Rheology …… 469	

DEPARTMENT OF PHARMACEUTICAL CHEMISTRY

Scope: This subject is designed to impart fundamental knowledge on the structure, chemistry, analysis and therapeutic value of drugs. The subject emphasizes on structure activity relationships of drugs, importance of physicochemical properties and metabolism of drugs. The syllabus also emphasizes on chemical synthesis of important drugs under each class.

Course Content: Study of the development of the following classes of drugs, Classification, mechanism of action, uses of drugs mentioned in the course, Structure activity relationship of selective class of drugs as specified in the course and synthesis of drugs.

PHARMACEUTICAL ORGANIC CHEMISTRY

a) Nomenclature of heterocyclic compounds
b) Classification of heterocyclic compounds
c) Chemistry, synthesis, properties, and pharmaceutical applications of Monocyclic rings; Bicyclic rings; and Tricyclic rings.
d) Fundamentals and classification of organic reaction.
e) Reaction intermediates
f) Stereochemistry
g) Study of reaction mechanism, reactivity, and orientation, the effect of substituent groups of the following categories of reactions:
    - ❖ Addition reactions
    - ❖ Elimination reactions
    - ❖ Substitution reactions
    - ❖ Condensation and rearrangement reactions

References

- Organic Chemistry by Morrison and Boyd
- Organic Chemistry by I.L. Finar, Volume-I
- Introduction to Organic Laboratory techniques by Pavia, Lampman and Kriz

PHARMACEUTICAL CHEMISTRY

Unit- I

a) Introduction to basic principles of Medicinal Chemistry.
b) An introduction to stereochemistry, Isomers, Classification of isomers, Structural isomers, Stereoisomers, Conformational isomers, Visualization of conformers, Configurational isomers, Chirality, Enantiomers, Optical activity, Racemic mixture, Diastereomer and mesocompounds.
c) Drugs affecting neurotransmission: i) Drugs acting on cholinergic neurotransmission ii) Drug acting on adrenergic neurotransmission iii) Drug acting on serotonergic neurotransmission iv) Local Anesthetic agents.
d) Drugs affecting the Respiratory System
e) Antihistamines: Histamine and their release and storage, H1 and H2 receptors and their antagonists.

Unit- II

Classification, synthesis of prototype drugs, Structure-activity relationship, Pharmacological/ Biochemical mechanism of action, Therapeutic uses of following category of agents: (special emphasis should be given to prototype drugs)

a) Drugs affecting central nervous system: General Anesthetics; Anti Parkinsonian agents and Spasmolytic agents; Anticonvulsant Agents, Sedatives and Hypnotics, CNS stimulants.
b) Traditional NSAIDs and COX-2 inhibitors, Salicylate derivatives, Synthesis and metabolism of aspirin, Paracetamol, ibuprofen, Pyrazolidinedione Derivatives, PyrazoloneDerivatives, N-arylanthranilic acid derivatives (Fenamates)
c) Narcotics/Opioid analgesics
d) Drugs affecting Hormonal System: Thyroid hormones and Antithyroid agents; Insulin and Oral Hypoglycemic agents; Steroidal agents
e) Drugs affecting Haemopoietic System.
f) Chemistry and physiological importance of water & lipid soluble Vitamins.

Unit- III

a) Drug Design and Development:
b) QSAR: Concept and applications, Theories, Limitations and advantages.
c) Docking: Concept and applications, Softwares used, Theories, Database, and Applications
d) Drugs affecting the Cardiovascular System: i) Antihypertensive agents ii) Antiarrhythmic agents
e) Drugs affecting the Urinary System
f) Chemotherapeutic agents: i) Antibiotics ii) Antiviral including anti-HIV agents. iii) Anti-Tubercular agents iv) Antifungal agents v) Anticancer agents,

References

- Wilson and Giswold's Organic Medicinal and Pharmaceutical Chemistry.
- Foye's Principles of Medicinal Chemistry.
- Burger's Medicinal Chemistry, Vol I to IV.
- Introduction to principles of drug design- Smith and Williams.
- Remington's Pharmaceutical Sciences.

PHARMACEUTICAL INSTRUMENTAL ANALYSIS

a) **UV Visible spectroscopy**

Electronic transitions, chromophores, auxochromes, spectral shifts, solvent effect on absorption spectra, Beer and Lambert's law, Derivation and deviations.

Instrumentation - Sources of radiation, wavelength selectors, sample cells, detectors- Photo tube, Photomultiplier tube, Photo voltaic cell, Silicon Photodiode.

Applications - Spectrophotometric titrations, Single component and multi component analysis

b) **Fluorimetry**

Theory, Concepts of singlet, doublet and triplet electronic states, internal and external conversions, factors affecting fluorescence, quenching, instrumentation and applications

c) **IR spectroscopy**

Introduction, fundamental modes of vibrations in poly atomic molecules, sample handling, factors affecting vibrations. Instrumentation - Sources of radiation, wavelength selectors, detectors - Golay cell, Bolometer, Thermocouple, Pyroelectric detector and applications.

d) **NMR spectroscopy**

Introduction, Instrumentation, and its applications in the characterization of synthetic molecules.

e) **Mass Spectrometry**

Introduction, Instrumentation, various ionization techniques, and applications.

f) **Flame Photometry**-Principle, interferences, instrumentation and applications.

g) **Atomic absorption spectroscopy**- Principle, interferences, instrumentation and applications.

h) **Nepheloturbidometry**- Principle, instrumentation, and applications.

i) **Chromatography**

Adsorption and partition column chromatography-Methodology, advantages, disadvantages, and applications.

Thin layer chromatography- Introduction, Principle, Methodology, Rf values, advantages, disadvantages, and applications.

Paper chromatography-Introduction, methodology, development techniques, advantages, disadvantages and applications

Electrophoresis– Introduction, factors affecting electrophoretic mobility, Techniques of paper, gel, capillary electrophoresis, applications

Gas chromatography- Introduction, theory, instrumentation, derivatization, temperature programming, advantages, disadvantages and applications

High-performance liquid chromatography (HPLC)-Introduction, theory, instrumentation, advantages, and applications.

Ion exchange chromatography- Introduction, classification, ion exchange resins, properties, mechanism of the ion exchange process, factors affecting ion exchange, methodology, and applications

Gel chromatography- Introduction, theory, instrumentation and applications

Affinity chromatography- Introduction, theory, instrumentation and applications

References

- Introduction To Spectroscopy, by Pavia Lampman.
- Text book of Pharmaceutical Analysis by Kenneth A. Connors
- Vogel's Text book of Quantitative Chemical Analysis by A.I. Vogel
- Spectrophotometric identification of Organic Compounds by Silverstein

M. PHARM IN PHARMACOGNOSY

Syllabus (M. Pharm Entrance Exam)

1. **Introduction to Pharmacognosy:** Plants in medicine: the origins of Pharmacognosy, the scope and practice of pharmacognosy, and classification of crude drugs.
2. **Principles Related to the Commercial Production of Natural Products:** Production of crude drugs, cultivation and collection of herbal drugs, plant growth hormones, plant tissue culture; biochemical conversions; and clonal propagation.
3. **Quality Control and Standardization of Herbal Drugs:** Drug adulteration, qualitative and quantitative microscopy, quality control methods for crude drugs and herbal formulations.
4. **Phytochemistry:** General methods associated with the phytochemical investigation of herbal products. Chemistry of natural compounds. Classical and modern methods of extraction. Role of chromatography in isolation, purification, and quantification of natural compounds. The basic metabolic pathways and the origin of secondary metabolites (biogenesis of secondary plant metabolites). Role of spectroscopy in the characterization of natural compounds.
5. **Pharmacopoeial and Related Drugs of Biological Origin:** Introduction to secondary plant metabolites, carbohydrates, phenols and phenolic glycosides, volatile oils, alkaloids, glycosides, resins, tannins, pharmaceutical aids, animal products, toxic drugs, and enzymes.
6. **Complementary Alternative Medicine and Phytotherapy:** Unani system of medicine, Chinese traditional medicine, Ayurvedic system of medicine, Homeopathic system of medicine, Aromatherapy. The search for naturally derived anticancer agents, antiprotozoal agents, antimalarial drugs, antihepatotoxic drugs, oral hypoglycaemic drugs, antibacterials, antiviral drugs, etc.
7. **Modern Application of Pharmacognosy:** Phytopharmaceuticals, herbal formulations, herbal cosmetics, natural pesticides and insecticides, plant nutraceuticals, natural coloring and flavoring agents, hallucinogenic, allergens, and worldwide trade of crude drugs and volatile oils.

Reference Books:

1. Evans, W. C. (2009). *Trease and Evans' Pharmacognosy*. Elsevier Health Sciences.
2. Ali, M. (2018). *Pharmacognosy- Pharmacognosy and Phytochemistry*, (Vol. 1 & 2), CBS Publishers & Distributors
3. Ahmad, J., & Ahamad, J. (Eds.). (2020). *Bioactive Phytochemicals: Drug Discovery to Product Development*. Bentham Science Publishers.

Pharmacology Syllabus

Unit I: Introduction, definitions and scope of Pharmacology, Principles of Drug Therapy, drug dosage forms Routes of administrations, Pharmacokinetics and Pharmacodynamics.

Unit II: Drugs Affecting the Autonomic Nervous System

Unit III: Drugs Acting on Blood and Blood-forming Organs (Anticoagulant and antiplatelet drugs)

Unit IV: Drugs Affecting the Cardiovascular System

Unit V: Drugs Affecting the Central Nervous System (Sedatives and Hypnotic drugs, Antiepileptics, Antiparkinsons, Anti-Alzheimer, Antipsychotics, Antidepressants.

Unit VI: Chemotherapeutic Drugs

Unit VII: Drugs Acting on Kidneys.

Unit VIII: Petic ulcer Drugs, Insulin, Insulin analogues and oral hypoglycemic agents, Thyroid and Antithyroid drugs, steroids, Antibiotics.

References

- Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology, Churchill Livingstone Elsevier.
- Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata McGraw-Hill
- Mycek M.J, Gelnet S.B and Perper M.M. Lippincott's Illustrated Reviews-Pharmacology
- Goodman and Gilman's, The Pharmacological Basis of Therapeutics
- K. D. Tripathi. Essentials of Medical Pharmacology, JAYPEE Brothers Medical Publishers (P) Ltd, New Delhi.
- Modern Pharmacology with Clinical Applications, by Charles R. Craig & Robert