

DIPLOMA IN PHARMACY – 2nd YEAR
LESSON PLAN
PHARMACOLOGY – THEORY

Course Code: ER20-21T

75 Hours (3 Hours/week)

Name of Tutor/Teacher: Sh. Shakir Hussain, Guest Faculty in Pharmacy

Schedule of Classes: Theory: Tuesday: 03.00 – 04.00 PM, Thursday: 04.00 – 05.00 PM,
Friday: 12.00 – 01.00 PM, Thursday: 02.00 – 03.00 PM (Tutorial)

Scope: This course provides basic knowledge about different classes of drugs available for the pharmacotherapy of common diseases. The indications for use, dosage regimen, routes of administration, pharmacokinetics, pharmacodynamics, and contraindications of the drugs discussed in this course are vital for successful professional practice.

Course Objectives: This course will discuss the following:

1. General concepts of pharmacology including pharmacokinetics, pharmacodynamics, routes of administration, etc.
2. Pharmacological classification and indications of drugs
3. Dosage regimen, mechanisms of action, contraindications of drugs
4. Common adverse effects of drugs

Course Outcomes: Upon successful completion of this course, the students will be able to

CO2.1T.: Describe the basic concepts of pharmacokinetics and pharmacodynamics

CO2.1T: Enlist the various classes and drugs of choices for any given disease condition

CO2.3T.: Advise the dosage regimen, route of administration and contraindications for a given drug

CO2.4T.: Describe the common adverse drug reactions

Chapter	Topic	Date	Hour	CO	PO	Coverage	Reason for discrepancy	Plans for compensation in backlog	Taught by	Verified by
1 General Pharmacology	Introduction and scope of Pharmacology		1							
	Various routes of drug administration - advantages and disadvantages		2							
	Drug absorption - definition, types, factors affecting drug absorption		3							
	Bioavailability and the factors affecting bioavailability		4							
	Drug distribution - definition, factors affecting drug distribution		5							
	Biotransformation of drugs - Definition, types of biotransformation reactions, factors influencing drug metabolisms-1		6							
	Biotransformation of drugs - Definition, types of biotransformation reactions, factors influencing drug metabolisms-2		7							
	Excretion of drugs - Definition, routes of drug excretion		8							
	General mechanisms of drug action and factors modifying drug action-1		9							
	General mechanisms of drug action and factors modifying drug action-2		10							
2 Drugs Acting on the Peripheral Nervous System	Steps involved in neurohumoral transmission		1							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of: Cholinergic drugs-1		2							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of: Cholinergic drugs-2		3							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of: Anti-Cholinergic drugs		4							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of: Adrenergic drugs-1		5							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of: Adrenergic drugs-2		6							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of: Anti-adrenergic drugs		7							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of: Neuromuscular blocking agents		8							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of: Drugs used in Myasthenia gravis		9							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of: Local anaesthetic agents		10							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of: Non-Steroidal Anti-Inflammatory drugs (NSAIDs)		11							

3 Drugs Acting on the Eye	Definition, classification, pharmacological actions, dose, indications and contraindications of drugs used in: Miotics and Mydriatics	1							
	Definition, classification, pharmacological actions, dose, indications and contraindications of drugs used in Glaucoma	2							
4 Drugs Acting on the Central Nervous System	Definition, classification, pharmacological actions, dose, indications, and contraindications of General anaesthetics	1							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Hypnotics and sedatives	2							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-Convulsant drugs	3							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-anxiety drugs	4							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-depressant drugs	5							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-psychotics	6							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Nootropic agents and Opioid analgesics	7							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Centrally acting muscle relaxants	8							
5 Drugs Acting on the Cardiovascular System	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-hypertensive drugs-1	1							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-hypertensive drugs-2	2							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-anginal drugs	3							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-arrhythmic drugs	4							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Drugs used in atherosclerosis	5							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Congestive heart failure Shock	6							
6 Drugs Acting on Blood and Blood Forming Organs	Definition, classification, pharmacological actions, dose, indications, and contraindications of Hematinic agents	1							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-coagulants	2							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-platelet agents	3							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Thrombolytic drugs	4							

7 Drugs acting on Respiratory System	Definition, classification, pharmacological actions, dose, indications, and contraindications of Bronchodilators & Expectorants	1							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-tussive agents & Mucolytic agents	2							
8 Drugs Acting on the Gastro Intestinal Tract	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-ulcer drugs-1	1							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-ulcer drugs-2	2							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-emetics	3							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Laxatives & Purgatives	4							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-diarrheal drugs	5							
9 Drugs Acting on the Kidney	Definition, classification, pharmacological actions, dose, indications, and contraindications of Diuretics	1							
	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-Diuretics	2							
9 Hormones and Hormone Antagonists	Physiological and pathological role and clinical uses of Thyroid hormones	1							
	Physiological and pathological role and clinical uses of Anti-thyroid drugs	2							
	Physiological and pathological role and clinical uses of Parathormone	3							
	Physiological and pathological role and clinical uses of Calcitonin, Vitamin D, Oxytocin	4							
	Physiological and pathological role and clinical uses of Insulin	5							
	Physiological and pathological role and clinical uses of Oral hypoglycemic agents	6							
	Physiological and pathological role and clinical uses of Estrogen, Progesterone	7							
	Physiological and pathological role and clinical uses of Corticosteroids	8							
10 Autocoids	Physiological role of Histamine, 5-HT and Prostaglandins	1							
	Physiological role of Prostaglandins	2							
	Classification, clinical uses and adverse effects of antihistamines and 5-HT antagonists	3							

11 Chemotherapeutic Agents	Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, Classification, dose, indication and contraindications of drugs belonging to Penicillins	1							
	Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, Classification, dose, indication and contraindications of drugs belonging to Cephalosporins	2							
	Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, Classification, dose, indication and contraindications of drugs belonging to Aminoglycosides	3							
	Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, Classification, dose, indication and contraindications of drugs belonging to Fluoroquinolones & Sulphonamides	4							
	Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, Classification, dose, indication and contraindications of drugs belonging to Macrolides	5							
	Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, Classification, dose, indication and contraindications of drugs belonging to Tetracyclines	6							
	Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, Classification, dose, indication and contraindications of drugs belonging to Anti-tubercular drugs	7							
	Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, Classification, dose, indication and contraindications of drugs belonging to Anti-fungal drugs	8							
	Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, Classification, dose, indication and contraindications of drugs belonging to Anti-viral drugs	9							
	Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, Classification, dose, indication and contraindications of drugs belonging to Anti-amoebic agents & Anthelmintics	10							
	Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, Classification, dose, indication and contraindications of drugs belonging to Anti-malarial agents	11							
	Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, Classification, dose, indication and contraindications of drugs belonging to Anti-neoplastic agents	12							
12 Biologicals	Definition, types and indications of biological agents with examples-1	1							
	Definition, types and indications of biological agents with examples-2	2							

PHARMACOLOGY – PRACTICAL

Course Code: ER20-21P

50 Hours (2 Hours/week/Batch)

Name of Tutor/Teacher: Sh. Shakir Hussain, Guest Faculty in Pharmacy

Schedule of Classes:

Practical: *Batch A*: Tuesday (09.00 – 11.00 AM)

Practical: *Batch B*: Monday (09.00 – 11.00 AM)

Practical: *Batch C*: Wednesday (09.00 – 11.00 AM)

Scope: This course provides the basic understanding about the uses, mechanisms of actions, dose dependent responses of drugs in simulated virtual animal models and experimental conditions.

Course Objectives: This course will demonstrate / provide hands-on experience in the virtual platform using appropriate software on the following

1. Study of pharmacological effects of drugs like local anaesthetics, mydriatic and mitotic on rabbit eye
2. Screening the effects of various drugs acting in the central nervous system
3. Study of drug effects on isolated organs / tissues
4. Study of pyrogen testing on rabbit.

Course Outcomes: Upon successful completion of this course, the students will be able to

CO.2.1P: Study and report the local anaesthetic, mydriatic and mitotic effects of the given drug on the rabbit eye

CO.2.2P: Choose appropriate animal experiment model to study the effects of the given drugs acting on the central nervous system and submit the report

CO.2.3P: Perform the effects of given tissues (simulated) on isolated organs/tissues and interpret the results

CO.2.4P: Interpret the dose dependent responses of drugs in various animal experiment models

Practical

Introduction to the following topics pertaining to the experimental pharmacology have to be discussed and documented in the practical manuals.

1. Introduction to experimental pharmacology
2. Study of laboratory animals: (a) Mice; (b) Rats; (c) Guinea pigs; (d) Rabbits
3. Commonly used instruments in experimental pharmacology
4. Different routes of administration of drugs in animals
5. Types of pre-clinical experiments: In-Vivo, In-Vitro, Ex-Vivo, etc.
6. Techniques of blood collection from animals

Experiments

Note: Animals shall not be used for doing / demonstrating any of the experiments given. The given experiments shall be carried out / demonstrated as the case may be, ONLY with the use of software program(s) such as 'Ex Pharm' or any other suitable software.

Exp. No.	Experiment	Batch	Date	CO	PO	Coverage	Reason for discrepancy	Plans for compensation in backlog	Taught by	Verified by
1	Introduction to experimental pharmacology	A								
		B								
		C								
2	Study of laboratory animals (a) Mice; (b) Rats;	A								
		B								
		C								
3	Study of laboratory animals Guinea pigs; (d) Rabbits	A								
		B								
		C								
4	Commonly used instruments in experimental pharmacology	A								
		B								
		C								
5	Different routes of administration of drugs in animals	A								
		B								
		C								
6	Types of pre-clinical experiments: In-Vivo, In-Vitro, Ex-Vivo, etc	A								
		B								
		C								
7	Techniques of blood collection from animals	A								
		B								
		C								
8	Study of local anaesthetics on rabbit eye	A								
		B								
		C								
9	Study of local anaesthetics on rabbit eye	A								
		B								
		C								
10	Study of Mydriatic effect on rabbit eye	A								
		B								
		C								
11	Study of Mydriatic effect on rabbit eye	A								
		B								
		C								
12	Study of Miotic effect on rabbit eye	A								

		B								
		C								
13	Study of Miotic effect on rabbit eye	A								
		B								
		C								
14	Effect of analgesics using Analgesiometer	A								
		B								
		C								
15	Study of analgesic activity by writhing test	A								
		B								
		C								
16	Screening of anti-convulsant using Electro Convulsiometer	A								
		B								
		C								
17	Screening of Muscle relaxants using Rota-Rod apparatus	A								
		B								
		C								
18	Screening of CNS stimulants and depressants using Actophotometer	A								
		B								
		C								
19	Screening of CNS stimulants and depressants using Actophotometer	A								
		B								
		C								
10	Study of anxiolytic activity using elevated plus maze method	A								
		B								
		C								
21	Study of effect of drugs (any 2) on isolated heart	A								
		B								
		C								
22	Study of effect of drugs (any 2) on isolated heart	A								
		B								
		C								
23	Effect of drugs on ciliary motility on frog's buccal cavity	A								
		B								
		C								
24	Pyrogen testing by rabbit method	A								
		B								
		C								
25	Pyrogen testing by rabbit method	A								
		B								
		C								

Assignments

The students shall be asked to submit written assignments on the following topics (One assignment per student per sessional period. i.e., a minimum of THREE assignments per student)

1. Introduction to Allergy Testing
2. Introduction to Toxicity Studies
3. Drug Facts Labels of US FDA
4. Pre-clinical studies in new drug development
5. Medicines and meals: Before or After food
6. Pre-clinical studies in new drug development
7. Drugs available as paediatric formulations
8. Drug information apps

SUGGESTED READINGS

1. Pharma Satoskar, R.S. and Bhandarkar, S.D. Pharmacology and Pharmacotherapeutics
2. B. Suresh, A Text Book of Pharmacology
3. Derasari and Gandhi's Elements of Pharmacology
4. S.K. Kulkarni, Practical Pharmacology and Clinical Pharmacy
5. H.K. Sharma. Principles of Pharmacology
6. Mary J. Mycek, Lippincott Williams and Wilkins. Lippincott's illustrated Reviews: Pharmacology
7. Tripathi, K.D. Essentials of Medical Pharmacology.
8. Various Drug Information Books like British National Formulary, MIMS, CIMS, Drug Today etc., WHO, NIH Websites
