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SYD Pharmacy PO, CO, CO-PO Mapping, Justification and Teaching / Practical Plan of course subjects.

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Subject Name: Pharmacology

Subject Code ER20-21T

Theory/Practical: Theory

Program Outcomes:

Sr. No.	Program Outcome (PO)
1	Pharmacy Knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy.
2	Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
3	Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
4	Professional Identity: Understand, analyze and communicate the value of them professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
5	Pharmaceutical Ethics: Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
6	Communication: Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
7	The Pharmacist and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
8	Environment and sustainability: Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
9	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self-assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

Course Outcome:

CO Code	Course Outcomes (CO)	Blooms Level
ER20-21T.1	Describe the basic principles of pharmacology and pharmacological actions of drugs acting on the peripheral nervous system.	L2- Understand
ER20-21T.2	Apply pharmacological principles to determine the uses, dosage, and contraindications of drugs acting on the eye and central nervous system.	L3 – Apply
ER20-21T.3	Analyze the pharmacological actions, therapeutic uses, dosage, and contraindications of drugs acting on the central nervous and cardiovascular systems.	L4 – Analyze
ER20-21T.4	Evaluate the appropriate use of drugs acting on the blood, respiratory, gastrointestinal, and renal systems based on their therapeutic uses and contraindications.	L5 – Evaluate
ER20-21T.5	Analyze hormonal and autacoid drugs based on their pharmacological actions, therapeutic uses, and adverse effects.	L4 – Analyze
ER20-21T.6	Apply pharmacological knowledge of chemotherapeutic agents and biologicals for their appropriate therapeutic use and precautions.	L3 – Apply

CO-PO Mapping:

CO Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
ER20-21T.1	3	1	–	2	1	1	2	–	2
ER20-21T.2	3	1	–	2	2	1	3	–	2
ER20-21T.3	3	1	–	2	2	1	3	–	3
ER20-21T.4	3	1	–	2	2	1	3	–	3
ER20-21T.5	3	1	–	2	2	1	2	–	3
ER20-21T.6	3	1	–	2	2	1	3	–	3

3 = High Correlation

2 = Moderate Correlation

1 = Low Correlation

– = No Correlation

Justification of CO–PO Mapping:

Course Outcome	Program Outcome	Level	Justification
CO1	PO1	3	Develops fundamental pharmacological knowledge of drug actions required for pharmacy practice.
	PO2	1	Supports the use of drug-information and digital resources for learning pharmacology.
	PO3	-	-
	PO4	2	Builds knowledge required to understand the pharmacist's professional role in medication use.
	PO5	1	Basic understanding of drug actions supports responsible medication-related decisions.
	PO6	1	Provides a knowledge base for communicating basic medicine-related information.
	PO7	2	Understanding drug actions contributes to safe and responsible healthcare practice.
	PO8	-	-
	PO9	2	Establishes foundational knowledge that can be continuously updated throughout professional practice.
CO2	PO1	3	Applies pharmacological knowledge to understand drug uses, dosage, and contraindications.
	PO2	1	Supports use of drug-information resources for interpreting pharmacological information.
	PO4	2	Strengthens professional responsibility for appropriate and safe medication use.
	PO3	-	-
	PO5	2	Consideration of dosage and contraindications supports responsible and ethical medication decisions.
	PO6	1	Supports communication of relevant medicine-related information.
	PO7	3	Appropriate dosage and recognition of contraindications directly contribute to patient safety.
	PO8	-	-

	PO9	2	Encourages updating pharmacological knowledge as drug information changes.
CO3	PO1	3	Develops analytical knowledge of pharmacological actions, therapeutic uses, dosage, and contraindications.
	PO2	1	Current drug-information resources can support analysis of pharmacological information.
	PO3	-	-
	PO4	2	Strengthens professional understanding of appropriate medication use.
	PO5	2	Analysis of dosage and contraindications supports responsible and ethical decisions.
	PO6	1	Supports accurate communication of drug-related information.
	PO7	3	Analysis of CNS and cardiovascular medicines contributes directly to safe healthcare practice.
	PO8	-	-
	PO9	3	Changing medicines and therapeutic information require continuous updating of pharmacological knowledge.
CO4	PO1	3	Requires comprehensive pharmacological knowledge to evaluate appropriate drug use.
	PO2	1	Current drug-information resources can support evaluation of therapeutic information.
	PO3	-	-
	PO4	2	Supports the pharmacist's professional responsibility for appropriate medication use.
	PO5	2	Evaluation of contraindications supports safe and ethical medication decisions.
	PO6	1	Provides knowledge needed to communicate relevant medicine-related information.
	PO7	3	Evaluation of appropriate drug use directly contributes to health and patient safety.
	PO8	-	-
	PO9	3	Evaluation of therapy requires awareness of current and evolving pharmacological information.
CO5	PO1	3	Develops analytical knowledge of hormonal and autacoid drugs and their therapeutic properties.

	PO2	1	Drug-information resources can support analysis of medicines and safety information.
	PO3	-	-
	PO4	2	Contributes to professional understanding of medicines used in healthcare.
	PO5	2	Awareness of adverse effects supports responsible and ethical medication practice.
	PO6	1	Supports communication of relevant drug and adverse-effect information.
	PO7	2	Understanding adverse effects contributes to safe and responsible medicine use.
	PO8	-	-
	PO9	3	New medicines and updated safety information require continuous learning.
CO6	PO1	3	Requires application of specialized pharmacological knowledge of chemotherapeutic agents and biologicals.
	PO2	1	Modern drug-information resources can support safe use of evolving therapeutic agents.
	PO3	-	-
	PO4	2	Supports professional responsibility in appropriate medicine use.
	PO5	2	Attention to precautions supports ethical and responsible professional practice.
	PO6	1	Supports communication of precautions and relevant medicine information.
	PO7	3	Appropriate therapeutic use and precautions directly contribute to patient health and safety.
	PO8	-	-
	PO9	3	Chemotherapeutic agents and biologicals are evolving areas requiring continuous professional learning.

Gap Analysis:

PO	Mapping %	GAP %	Action plan to fill the GAP
PO1	100%	0%	-
PO2	33.33	66.67	-
PO3	0%	100%	Team-based pharmacology activities requiring students to take participatory and coordinating roles.
PO4	66.67	33.33	
PO5	61.11	38.89	-
PO6	33.33	66.67	-
PO7	88.89	11.11	-
PO8	0%	100%	Incorporate environmental aspects of medicines, pharmaceutical waste, and safe disposal practices into Pharmacology teaching.
PO9	94.44	5.56	-

Teaching plan:

Lecture No.	Teaching Plan	Hours	Course Outcome	Teaching Methodology (Like PPT, Notes etc.)
1	Introduction and scope of Pharmacology	1	ER20-21T.1	Powerpoint Presentation, Question and Answer, Lecturing
2	Various routes of drug administration - advantages and disadvantages	1	ER20-21T.1	Powerpoint Presentation, Question and Answer, Lecturing
3	Drug absorption - definition, types, factors affecting drug absorption	1	ER20-21T.1	Powerpoint Presentation, Question and Answer, Lecturing
4	Tutorial 1 - Revision of Various Routes of drug administration	1	-	Discussion, Test.
5	Bioavailability and the factors affecting bioavailability	1	ER20-21T.1	Powerpoint Presentation, Question and Answer, Lecturing
6	Drug distribution - definition, factors affecting drug distribution	1	ER20-21T.1	Powerpoint Presentation, Question and Answer, Lecturing
7	Biotransformation of drugs - Definition, types of biotransformation reactions,	1	ER20-21T.1	Powerpoint Presentation, Question and Answer, Lecturing
8	Tutorial 2 - Revision on Drug distribution	1	-	Discussion, Test.
9	Factors influencing drug metabolisms	1	ER20-21T.1	Powerpoint Presentation, Question and Answer, Lecturing

10	Excretion of drugs - Definition, routes of drug excretion	1	ER20-21T.1	Powerpoint Presentation, Question and Answer, Lecturing
11	General mechanisms of drug action	1	ER20-21T.1	Powerpoint Presentation, Question and Answer, Lecturing
12	Tutorial 3 - Test	1	-	Discussion, Test.
13	factors modifying drug action	1	ER20-21T.1	Powerpoint Presentation, Question and Answer, Lecturing
14	Steps involved in neurohumoral transmission	1	ER20-21T.2	Powerpoint Presentation, Question and Answer, Lecturing
15	Definition, classification	1	ER20-21T.2	Powerpoint Presentation, Question and Answer, Lecturing
16	Tutorial 4- Revision on Steps in neurohumoral transmission	1	-	Discussion, Test.
17	Pharmacological actions, dose, indications, and contraindications.	1	ER20-21T.2	Powerpoint Presentation, Question and Answer, Lecturing
18	a) Cholinergic drugs	1	ER20-21T.2	Powerpoint Presentation, Question and Answer, Lecturing
19	b) Anti-Cholinergic drugs	1	ER20-21T.2	Powerpoint Presentation, Question and Answer, Lecturing

20	Tutorial 5 - Revision on cholinergic drugs	1	-	Discussion, Test.
21	c) Adrenergic drugs	1	ER20-21T.2	Powerpoint Presentation, Question and Answer, Lecturing
22	d) Anti-adrenergic drugs	1	ER20-21T.2	Powerpoint Presentation, Question and Answer, Lecturing
23	e) Neuromuscular blocking agents	1	ER20-21T.2	Powerpoint Presentation, Question and Answer, Lecturing
24	Tutorial 6 - Revision on antiadrenergic drugs	1	-	Discussion, Test.
25	f) Drugs used in Myasthenia gravis	1	ER20-21T.2	Powerpoint Presentation, Question and Answer, Lecturing
26	g) Local anesthetic agents	1	ER20-21T.2	Powerpoint Presentation, Question and Answer, Lecturing
27	h) Non-Steroidal Anti-Inflammatory drugs	1	ER20-21T.2	Powerpoint Presentation, Question and Answer, Lecturing
28	Tutorial 7- Revision on Local anesthetic agent	1	-	Discussion, Test.
29	Definition, classification, pharmacological actions, dose, Miotics	1	ER20-21T.2	Powerpoint Presentation, Question and Answer, Lecturing
30	Mydriatics, Drugs used in Glaucoma	1	ER20-21T.2	Powerpoint Presentation, Question and Answer,

				Lecturing
31	Definition, classification, pharmacological actions, dose, indications, and contraindications of General anesthetics	1	ER20-21T.2	Powerpoint Presentation, Question and Answer, Lecturing
32	Tutorial 8 - Revision on General anesthetics	1	-	Discussion, Test.
33	Hypnotics and sedatives	1	ER20-21T.3	Powerpoint Presentation, Question and Answer, Lecturing
34	Anti-Convulsant drugs	1	ER20-21T.3	Powerpoint Presentation, Question and Answer, Lecturing
35	Anti-anxiety drugs	1	ER20-21T.3	Powerpoint Presentation, Question and Answer, Lecturing
36	Tutorial 9 - Revision on hypnotics & sedatives	1	-	Discussion, Test.
37	Anti-depressant drugs	1	ER20-21T.3	PowerPoint Presentation, Question and Answer, Lecturing
38	Anti-psychotics	1	ER20-21T.3	PowerPoint Presentation, Question and Answer, Lecturing
39	Nootropic agents	1	ER20-21T.3	PowerPoint Presentation, Question and Answer, Lecturing
40	Tutorial 10 - Revision on Antidepressant	1	-	Discussion, Test.
41	Centrally acting muscle relaxants, opioid analgesics	1	ER20-21T.3	PowerPoint Presentation, Question

				and Answer, Lecturing
42	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-hypertensive drugs	1	ER20-21T.3	Powerpoint Presentation, Question and Answer, Lecturing
43	Anti-anginal drugs	1	ER20-21T.4	Powerpoint Presentation, Question and Answer, Lecturing
44	Tutorial 11 - Revision on antianginal drugs	1	-	Discussion, Test.
45	Anti-arrhythmic drugs	1	ER20-21T.4	Powerpoint Presentation, Question and Answer, Lecturing
46	Drugs used in atherosclerosis	1	ER20-21T.4	Powerpoint Presentation, Question and Answer, Lecturing
47	Congestive heart failure	1	ER20-21T.4	Powerpoint Presentation, Question and Answer, Lecturing
48	Tutorial 12 - Revision on CHF	1	-	Discussion, Test.
49	Drug therapy for shock	1	ER20-21T.4	Powerpoint Presentation, Question and Answer, Lecturing
50	Definition, classification, pharmacological actions, dose, indications, and contraindications of Hematinic agents.	1	ER20-21T.4	Powerpoint Presentation, Question and Answer, Lecturing
51	Anti-coagulants	1	ER20-21T.4	Powerpoint Presentation, Question and Answer, Lecturing

52	Tutorial 13 - Revision Anticoagulants	1	-	Discussion, Test.
53	Anti-platelet agents	1	ER20-21T.4	Powerpoint Presentation, Question and Answer, Lecturing
54	Thrombolytic drugs	1	ER20-21T.4	Powerpoint Presentation, Question and Answer, Lecturing
55	Definition, classification, pharmacological actions, dose, indications, and contraindications of Bronchodilators, Expectorants	1	ER20-21T.4	Powerpoint Presentation, Question and Answer, Lecturing
56	Tutorial 14 - Revision on Thrombolytic drugs	1	-	Discussion, Test.
57	Anti-tussive agents, Mucolytic agents	1	ER20-21T.4	Powerpoint Presentation, Question and Answer, Lecturing
58	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-ulcer drugs	1	ER20-21T.4	Powerpoint Presentation, Question and Answer, Lecturing
59	Anti-emetics	1	ER20-21T.4	Powerpoint Presentation, Question and Answer, Lecturing
60	Tutorial - 15- Test	1	-	Discussion, Test.
61	Laxatives	1	ER20-21T.4	Powerpoint Presentation, Question and Answer, Lecturing
62	purgatives	1	ER20-21T.4	Powerpoint Presentation, Lecturing

63	Anti-diarrheal drugs	1	ER20-21T.4	Powerpoint Presentation, Question and Answer, Lecturing
64	Tutorial 16 - Revision on Laxatives	1	-	Discussion, Test.
65	Definition, classification, pharmacological actions, dose, indications, and contraindications of Diuretics	1	ER20-21T.4	Powerpoint Presentation, Question and Answer, Lecturing
66	Anti-Diuretics	1	ER20-21T.4	Powerpoint Presentation, Question and Answer, Lecturing
67	Physiological and pathological role and clinical uses of Thyroid hormones	1	ER20-21T.5	Powerpoint Presentation, Question and Answer, Lecturing
68	Tutorial 17 - Physiological and pathological role and clinical uses of Thyroid hormones	1	-	Discussion, Test.
69	Anti-thyroid drugs	1	ER20-21T.5	Powerpoint Presentation, Question and Answer, Lecturing
70	Parathormone, Calcitonin	1	ER20-21T.5	Powerpoint Presentation, Question and Answer, Lecturing
71	Vitamin D, Insulin	1	ER20-21T.5	Powerpoint Presentation, Question and Answer, Lecturing
72	Tutorial 18 - Vitamin D, Insulin	1	-	Discussion, Test.
73	Oral hypoglycemic agents	1	ER20-21T.5	Powerpoint Presentation, Lecturing

74	Estrogen, Progesterone	1	ER20-21T.5	Powerpoint Presentation, Question and Answer, Lecturing
75	Oxytocin	1	ER20-21T.5	Powerpoint Presentation, Question and Answer, Lecturing
76	Tutorial 19 - Revision on Oxytocin	1	-	Discussion, Test.
77	Corticosteroids	1	ER20-21T.5	Powerpoint Presentation, Question and Answer, Lecturing
78	Physiological role of Histamine, 5 HT and Prostaglandins	1	ER20-21T.5	Powerpoint Presentation, Question and Answer, Lecturing
79	Classification	1	ER20-21T.5	Powerpoint Presentation, Question and Answer, Lecturing
80	Tutorial 20 - Revision on Histamines and 5 HT	1	-	Discussion, Test.
81	clinical uses, and adverse effects of antihistamines and 5 HT antagonists	1	ER20-21T.5	Powerpoint Presentation, Question and Answer, Lecturing
82	Introduction, basic principles, Classification, dose, indication and contraindications of drugs of following classes: Penicillins	1	ER20-21T.5	Powerpoint Presentation, Question and Answer, Lecturing
83	Cephalosporins, Aminoglycosides	1	ER20-21T.5	Powerpoint Presentation, Question and Answer, Lecturing
84	Tutorial 21 - Revision on Cephalosporins	1	-	Discussion, Test.

85	Fluoroquinolones, Macrolides	1	ER20-21T.6	Powerpoint Presentation, Question and Answer, Lecturing
86	Tetracyclines	1	ER20-21T.6	Powerpoint Presentation, Question and Answer, Lecturing
87	Sulphonamides	1	ER20-21T.6	Powerpoint Presentation, Question and Answer, Lecturing
88	Tutorial 22- Revision on Sulphonamides	1	-	Discussion, Test.
89	Anti-tubercular drugs	1	ER20-21T.6	Powerpoint Presentation, Question and Answer, Lecturing
90	Anti-fungal drugs	1	ER20-21T.6	Powerpoint Presentation, Question and Answer, Lecturing
91	Anti-viral drugs	1	ER20-21T.6	Powerpoint Presentation, Question and Answer, Lecturing
92	Tutorial 23 - Revision on Anti-viral drugs	1	-	Discussion, Test.
93	Anti-amoebic agents	1	ER20-21T.6	Powerpoint Presentation, Question and Answer, Lecturing
94	Anthelmintics	1	ER20-21T.6	Powerpoint Presentation, Question and Answer, Lecturing
95	Anti-malarial agents	1	ER20-21T.6	Powerpoint Presentation, Question

				and Answer, Lecturing
96	Tutorial 24 - Revision on Anti-malarial agents	1	-	Discussion, Test.
97	Anti-neoplastic agents	1	ER20-21T.6	Powerpoint Presentation, Question and Answer, Lecturing
98	Definition, types	1	ER20-21T.6	Powerpoint Presentation, Question and Answer, Lecturing
99	Indications of biological agents with examples	1	ER20-21T.6	Powerpoint Presentation, Question and Answer, Lecturing
100	Tutorial 25 - Revision on Indications of biological agents with examples	1	-	Discussion, Test.

Subject Name: Pharmacology

Subject Code: ER20-21P

Theory / Practical: Practical

Program Outcomes:

Sr. No.	Program Outcome (PO)
1	Pharmacy Knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy.
2	Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
3	Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
4	Professional Identity: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
5	Pharmaceutical Ethics: Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
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7	The Pharmacist and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
8	Environment and sustainability: Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
9	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self-assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

Course Outcome:

CO Code	Course Outcome (CO)	Blooms Level
ER20-21P.1	Explain experimental pharmacology principles, laboratory animals, instruments, and routes of drug administration.	L2 – Understand
ER20-21P.2	Demonstrate appropriate experimental techniques to study drug effects using rabbit models.	L3 – Apply
ER20-21P.3	Use appropriate experimental methods to study mydriatic, miotic, pyrogenic, and analgesic drug effects using suitable models and techniques.	L3 – Apply
ER20-21P.4	Interpret analgesic, anticonvulsant, muscle relaxant, and CNS stimulant responses using appropriate experimental models and instruments.	L4 – Analyze
ER20-21P.5	Examine CNS depressant, anxiolytic, sympathomimetic and Para sympathomimetic drug responses using appropriate experimental models.	L4 – Analyze
ER20-21P.6	Assess experimental drug responses using appropriate observations, pharmacological principles, and experimental techniques.	L5 – Evaluate

CO-PO Mapping:

CO Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
ER20-21P.1	3	2	–	2	2	1	2	–	2
ER20-21P.2	3	3	1	2	2	1	2	–	2
ER20-21P.3	3	3	1	2	2	1	2	–	3
ER20-21P.4	3	3	1	2	2	1	2	–	3
ER20-21P.5	3	3	1	2	2	1	3	1	3
ER20-21P.6	3	3	1	2	2	1	3	1	3

3 = High Correlation

2 = Moderate Correlation

1 = Low Correlation

– = No Correlation

Justification of CO–PO Mapping:

Course Outcome	Program Outcome	Level	Justification
CO1	PO1	3	Builds foundational knowledge of experimental pharmacology, laboratory animals, instruments, and drug administration.
	PO2	2	Introduces commonly used pharmacological instruments and laboratory resources.
	PO3	-	-
	PO4	2	Establishes basic professional understanding of pharmacology laboratory practices.
	PO5	2	Introduces responsible and ethical considerations associated with laboratory animals and experimental work.
	PO6	1	Students develop basic ability to communicate experimental information and observations.
	PO7	2	Introduces safe and responsible practices relevant to pharmacological experimentation.
	PO8	-	-
	PO9	2	Provides foundational knowledge for further learning of experimental pharmacology.
CO2	PO1	3	Applies pharmacological knowledge to understand demonstrated drug effects using rabbit models.
	PO2	3	Involves understanding and applying information related to experimental techniques and instruments.
	PO3	1	Group-based demonstrations can provide limited opportunities for coordination and participation.
	PO4	2	Develops practical understanding relevant to professional pharmacy practice.
	PO5	2	Reinforces responsible and ethical considerations in animal-based experimental demonstrations.
	PO6	1	Requires students to record and communicate observed experimental findings.
	PO7	2	Promotes awareness of safe and responsible experimental practices.
	PO8	-	-
	PO9	2	Encourages students to develop practical knowledge through continued learning.

CO3	PO1	3	Develops pharmacological knowledge through observation of mydriatic, miotic, pyrogenic, and analgesic drug effects.
	PO2	3	Requires appropriate use or interpretation of experimental methods, models, and supporting software/resources.
	PO3	1	Collaborative practical activities provide limited opportunities for coordination and participation.
	PO4	2	Develops practical knowledge applicable to professional pharmacy activities.
	PO5	2	Reinforces responsible conduct and ethical considerations during experimental demonstrations.
	PO6	1	Requires communication and documentation of experimental observations.
	PO7	2	Supports awareness of safe and responsible pharmacological practices.
	PO8	-	-
	PO9	3	Exposure to different experimental methods supports continued development of pharmacological knowledge.
CO4	PO1	3	Develops knowledge of analgesic, anticonvulsant, muscle relaxant, and CNS stimulant drug responses.
	PO2	3	Requires interpretation of experimental models and instruments used for pharmacological screening.
	PO3	1	Group activities can provide limited opportunities for coordination and shared responsibility.
	PO4	2	Strengthens practical understanding relevant to professional pharmacy practice.
	PO5	2	Promotes responsible and ethical consideration of experimental procedures.
	PO6	1	Requires recording, interpretation, and communication of experimental observations.
	PO7	2	Supports safe and responsible understanding of pharmacological screening procedures.
	PO8	-	-
	PO9	3	Interpretation of different screening methods promotes continued learning and development of pharmacological knowledge.
CO5	PO1	3	Develops knowledge of CNS and cardiovascular drug responses through pharmacological models.

	PO2	3	Requires interpretation of experimental models, instruments, and demonstrated techniques.
	PO3	1	Group-based practical activities provide limited opportunities for coordination and participation.
	PO4	2	Strengthens professional understanding of pharmacological drug responses.
	PO5	2	Reinforces responsible and ethical considerations in experimental pharmacology.
	PO6	1	Requires communication and documentation of observed responses.
	PO7	3	Relates pharmacological drug effects to safe and responsible healthcare practice.
	PO8	1	Can address responsible use and disposal of laboratory materials through sustainability-related practical discussion.
	PO9	3	Examination of different drug responses supports continuous development of pharmacological knowledge.
CO6	PO1	3	Integrates pharmacological knowledge to assess drug responses in isolated preparations.
	PO2	3	Requires interpretation and appropriate use of experimental techniques, observations, and supporting tools.
	PO3	1	Group discussion and interpretation activities provide limited opportunities for coordination and responsibility.
	PO4	2	Develops professional competence in evaluating pharmacological observations.
	PO5	2	Reinforces responsible and ethical laboratory practices.
	PO6	1	Requires clear documentation and communication of experimental findings.
	PO7	3	Evaluation of drug responses supports safe and responsible pharmacological practice.
	PO8	1	Can incorporate appropriate laboratory-waste management and resource conservation during practical activities.
	PO9	3	Evaluation of experimental observations encourages continuous learning and application of pharmacological knowledge.

Gap Analysis:

PO	Mapping %	GAP %	Action plan to fill the GAP
PO1	100%	0%	-
PO2	100%	0%	-
PO3	83.33%	16.67%	Group practical demonstration
PO4	100%	0%	-
PO5	100%	0%	-
PO6	100%	0%	-
PO7	100%	0%	-
PO8	33.33%	66.67%	Waste-management activity: Students identify laboratory waste and prepare a short chart/poster showing its appropriate disposal method.
PO9	100%	0%	-

Practical plan:

Practical No.	Practical Plan	Hours	Course Outcome	Teaching Methodology (Like PPT, Notes etc.)
1	Introduction to experimental pharmacology	2	ER20-21P.1	Software, Lecturing
2	Study of laboratory animal	2	ER20-21P.1	Software, Lecturing
3	Commonly used instruments in experimental pharmacology	2	ER20-21P.1	Software, Lecturing
4	Different route of drug administration of drug in animals- I	2	ER20-21P.1	Software, Lecturing
5	Different route of drug administration of drug in animals- II	2	ER20-21P.2	Software, Lecturing
6	Type of preclinical experiments	2	ER20-21P.2	Software, Lecturing
7	Technique of blood collection from animals	2	ER20-21P.2	Software, Lecturing
8	Study of local anesthetics on rabbit eye	2	ER20-21P.2	Software, Lecturing
9	Study of mydriatics effect on rabbit eye	2	ER20-21P.2	Software, Lecturing
10	Study of miotic effect on rabbit eye	2	ER20-21P.3	Software, Lecturing
11	Pyrogen testing by rabbit method	2	ER20-21P.3	Software, Lecturing
12	Study of analgesic activity by hot plate method	2	ER20-21P.3	Software, Lecturing
13	Study of anxiolytic activity by elevated plus maze method	2	ER20-21P.3	Software, Lecturing

14	Screening of CNS depressants by actophotometer	2	ER20-21P.4	Software, Lecturing
15	Screening of CNS stimulants by actophotometer	2	ER20-21P.4	Software, Lecturing
16	Screening of muscle relaxants by rota rod apparatus	2	ER20-21P.4	Software, Lecturing
17	Screening of anti-convulsant by electro convulsimeter	2	ER20-21P.4	Software, Lecturing
18	Study of analgesic activity by writhing test	2	ER20-21P.5	Software, Lecturing
19	Effect of analgesic activity by tail flick method	2	ER20-21P.5	Software, Lecturing
20	Study of effect of acetylcholine on isolated frog heart	2	ER20-21P.5	Software, Lecturing
21	Effect of atropine on ciliary motility of frog esophagus	2	ER20-21P.5	Software, Lecturing
22	Effect of acetylcholine on ciliary motility of frog esophagus	2	ER20-21P.6	Software, Lecturing
23	Study of effect of digoxin on isolated frog heart	2	ER20-21P.6	Software, Lecturing
24	Study of effect of calcium and potassium ion on isolated frog heart	2	ER20-21P.6	Software, Lecturing
25	Study of effect of adrenaline on isolated frog heart	2	ER20-21P.6	Software, Lecturing

Subject Name: Community Pharmacy & Management

Subject Code: ER20-22T

Theory / Practical: Theory

Program Outcomes:

Sr. No.	Program Outcome (PO)
1	Pharmacy Knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy.
2	Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
3	Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
4	Professional Identity: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
5	Pharmaceutical Ethics: Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
6	Communication: Communicate effectively with the pharmacy community and with society, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
7	The Pharmacist and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
8	Environment and sustainability: understand the impact of the professional pharmacy solutions in societal and environmental contexts, demonstrate the knowledge of, and need for sustainable development.
9	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Outcome:

CO Code	Course Outcome (CO)	Blooms Level
ER20-22T.1	Describe the principles of community pharmacy practice, professional responsibilities, GPP, SOP's, and prescription handling.	L1 – Remember
ER20-22T.2	Explain communication skills and patient counselling techniques for providing effective pharmaceutical care.	L2 – Understand
ER20-22T.3	Apply medication adherence strategies, health screening services, and appropriate counselling for selected OTC medications.	L3 – Apply
ER20-22T.4	Analyze self-medication practices, minor ailments, and the rational use of OTC medications in community pharmacy.	L4 – Analyze
ER20-22T.5	Evaluate the legal, operational, financial, inventory aspects of community pharmacy.	L5 – Evaluate
ER20-22T.6	Develop pharmacy management practices by utilizing SOPs, software, digital health, and online pharmacy services and CRM aspects of community pharmacy	L6 – Create

CO-PO Mapping:

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
ER20-22T.1	3	—	3	2	2	2	2	—	2
ER20-22T.2	3	1	3	2	2	3	2	—	2
ER20-22T.3	3	2	2	2	2	2	3	—	2
ER20-22T.4	3	2	2	2	3	2	3	-	2
ER20-22T.5	3	3	3	2	2	2	2	—	2
ER20-22T.6	3	3	3	2	1	1	2	-	3

3 = High Correlation
 2 = Moderate Correlation
 1 = Low Correlation
 — = No Correlation

Justification of CO–PO Mapping:

Course Outcome	Program Outcome	Level	Justification
CO1	PO1	3	Provides fundamental knowledge of community pharmacy practice, GPP, SOPs, and prescription handling.
	PO2	-	
	PO3	3	Develops responsibility and teamwork while following professional pharmacy procedures.
	PO4	2	Strengthens the professional identity of a pharmacist by understanding roles and responsibilities.
	PO5	2	Promotes ethical and legal practices during prescription handling and pharmacy services.
	PO6	2	Recognizes the importance of effective communication during prescription processing.
	PO7	2	Creates awareness of the pharmacist's role in promoting safe and rational medicine use.
	PO8	-	.-
	PO9	2	Encourages continuous learning of professional standards and pharmacy regulations
CO2	PO1	3	Explains the principles of patient counselling and pharmaceutical care.
	PO2	1	Identifies appropriate counselling aids and digital resources used during patient education.
	PO3	3	Develops leadership and interpersonal skills while counselling patients.
	PO4	2	Reinforces the pharmacist's professional role as a healthcare educator.

	PO5	2	Demonstrates ethical behavior, empathy, and patient confidentiality during counselling.
	PO6	3	Communicates effectively with patients to improve medicine use and health outcomes.
	PO7	2	Promotes public health through patient education and rational medicine use.
	PO8	-	
	PO9	2	Encourages continuous improvement in communication and counselling skills.
CO3	PO1	3	Applies pharmaceutical knowledge to improve medication adherence and OTC medicine use.
	PO2	2	Uses health screening tools and pharmacy resources appropriately.
	PO3	2	Demonstrates responsibility while providing patient-centered pharmacy services.
	PO4	2	Performs professional responsibilities during health screening and OTC counselling.
	PO5	2	Ensures ethical practice while recommending OTC medicines.
	PO6	2	Provides clear counselling to improve adherence and safe medicine use.
	PO7	3	Supports community health through rational OTC use and health screening services.
	PO8	-	-
	PO9	2	Updates knowledge on medication adherence strategies and patient care practices.
CO4	PO1	3	Applies pharmaceutical knowledge to evaluate self-medication practices and OTC medicine use.

	PO2	2	Uses appropriate information resources to support rational OTC recommendations.
	PO3	2	Demonstrates responsible decision-making while managing minor ailments.
	PO4	2	Strengthens the pharmacist's professional role in promoting rational self-medication.
	PO5	3	Applies ethical principles while advising patients on OTC medicines.
	PO6	2	Communicates appropriate advice for the safe use of OTC medicines.
	PO7	3	Promotes public health by encouraging the rational use of medicines.
	PO8	-	-
	PO9	2	Recognizes the need to update knowledge on OTC guidelines and self-medication practices.
CO5	PO1	3	Applies pharmaceutical and management knowledge to evaluate community pharmacy operations.
	PO2	3	Uses pharmacy management software and inventory systems effectively.
	PO3	3	Demonstrates leadership and decision-making in pharmacy management activities.
	PO4	2	Strengthens professional competence in pharmacy administration and management.
	PO5	2	Applies legal and ethical principles in pharmacy management and patient services.
	PO6	2	Recognizes the importance of communication in customer relationship management.
	PO7	2	Supports quality pharmacy services for the benefit of society.
	PO8	-	-

	PO9	2	Encourages continuous learning of pharmacy management practices and regulations.
CO6	PO1	3	Integrates pharmacy knowledge to develop effective pharmacy management practices.
	PO2	3	Utilizes pharmacy software, digital health technologies, and modern pharmacy tools effectively.
	PO3	3	Demonstrates leadership, planning, and decision-making while managing pharmacy services.
	PO4	2	Performs professional responsibilities using digital technologies in pharmacy practice.
	PO5	1	Follows ethical principles while using digital health and online pharmacy services.
	PO6	1	Recognizes the importance of effective communication in digital pharmacy practice.
	PO7	2	Supports efficient healthcare delivery through technology-enabled pharmacy services.
	PO8	-	-
	PO9	3	Demonstrates self-directed learning by adopting emerging technologies and continuously updating professional knowledge.

Gap Analysis:

PO	Mapping %	GAP %	Action plan to fill the GAP
PO1	100%	0%	-
PO2	83.33%	16.67%	-
PO3	100%	0%	-
PO4	100%	0%	-
PO5	100%	0%	-
PO6	100%	0%	-
PO7	100%	0%	-
PO8	00	100	Conduct guest lecture on Green Pharmacy, pharmaceutical waste management, safe disposal of medicines, and sustainable pharmacy practices.
PO9	100	0	-

Teaching plan:

Lecture No.	Teaching Plan	Hour	Course Outcome	Teaching Methodology (Like PPT, Notes etc.)
1	Definition and History	1	ER20-22T.1	PPT, Notes, Lecturing
2	International and Indian scenarios	1	ER20-22T.1	PPT, Notes, Lecturing
3	Introduction and responsibilities of community pharmacy	1	ER20-22T.1	PPT, Notes, Lecturing
4	Tutorial 1: Revision on Definition and History, International and Indian scenarios Introduction and responsibilities of community pharmacy	1	-	Discussion, Test
5	Concept of good pharmacy practices	1	ER20-22T.1	PPT, Notes, Lecturing
6	Concept of SOP	1	ER20-22T.1	PPT, Notes, Lecturing
7	Introduction of prescription	1	ER20-22T.1	PPT, Notes, Lecturing
8	Tutorial 2: Group discussion on Introduction of prescription, Concept of SOP	1	-	Discussion, Test
9	Legality of prescription	1	ER20-22T.1	PPT, Notes, Lecturing
10	Prescription handling	1	ER20-22T.1	PPT, Notes, Lecturing
11	Labeling and process of dispensing	1	ER20-22T.1	PPT, Notes, Lecturing
12	Tutorial 3: Class Test-01	1		Discussion, Test
13	Brief instruction on medication uses	1	ER20-22T.1	PPT, Notes, Lecturing
14	GDP and dispensing errors	1	ER20-22T.1	PPT, Notes, Lecturing
15	Minimizing dispensing errors	1	ER20-22T.1	PPT, Notes, Lecturing
16	Tutorial 4: Revision on Brief instruction on medication uses, GDP and dispensing errors, Minimizing dispensing errors	1		Discussion, Test
17	Definition and types of communication skill	1	ER20-22T.2	PPT, Notes, Lecturing
18	Interaction with professionals	1	ER20-22T.2	PPT, Notes, Lecturing
19	Verbal communication skills	1	ER20-22T.2	PPT, Notes, Lecturing

20	Tutorial 5: Verbal communication skills, Definitions and types of communication skills.	1		Discussion, Test
21	Written communication Skills	1	ER20-22T.2	PPT, Notes, Lecturing
22	Body language	1	ER20-22T.2	PPT, Notes, Lecturing
23 24	Patient interview techniques	1	ER20-22T.2	PPT, Notes, Lecturing
25	Tutorial 6: Group Discussion on written communication skills, Body Language	1		Discussion, Test
26	Introduction and pharmacy as patient counselling	1	ER20-22T.2	PPT, Notes, Lecturing
27	Steps involved in counselling	1	ER20-22T.2	PPT, Notes, Lecturing
28	Barriers to effective counselling	1	ER20-22T.2	PPT, Notes, Lecturing
29	Tutorial 7: Revision n Introduction and pharmacy as patient counseling, Steps involved in counseling	1		Discussion, Test
30	Strategies to overcome barriers	1	ER20-22T.2	PPT, Notes, Lecturing
31	Counselling points for hypertension	1	ER20-22T.2	PPT, Notes, Lecturing
32	Counselling points for Diabetes	1	ER20-22T.2	PPT, Notes, Lecturing
33	Tutorial 8: Revision on Counselling points for Diabetes, Hypertension	1		Discussion, Test
34	Counselling points for asthma	1	ER20-22T.2	PPT, Notes, Lecturing
35	Counselling points for tuberculosis	1	ER20-22T.2	PPT, Notes, Lecturing
36	Counselling points for COPD	1	ER20-22T.2	PPT, Notes, Lecturing
37	Tutorial 9: Group discussion on Counselling points for COPD, Asthma	1		Discussion, Test
38	Counselling points for AIDS	1	ER20-22T.2	PPT, Notes, Lecturing
39	Definition, factors influencing non adherence	1	ER20-22T.3	PPT, Notes, Lecturing
40	Strategies to overcome non adherence	1	ER20-22T.3	PPT, Notes, Lecturing
41	Tutorial 10: Class Test no-02	1		Discussion, Test
42	Intro and importance of screening	1	ER20-22T.3	PPT, Notes, Lecturing
43	Measurement of blood pressure	1	ER20-22T.3	PPT, Notes, Lecturing

44	Measurement of capillary blood glucose	1	ER20-22T.3	PPT, Notes, Lecturing
45	Tutorial 11: Measurement of capillary blood glucose	1		Discussion, Test
46	Assessment of lung function	1	ER20-22T.3	PPT, Notes, Lecturing
47	Body mass index	1	ER20-22T.3	PPT, Notes, Lecturing
48	Introduction	1	ER20-22T.3	PPT, Notes, Lecturing
49	Tutorial 12: Group Discussion on Introduction of OTC	1		Discussion, Test
50	Need of OTC	1	ER20-22T.3	PPT, Notes, Lecturing
51	Benefits of OTC	1	ER20-22T.3	PPT, Notes, Lecturing
52	Role of pharmacist in promoting the safe practice	1	ER20-22T.3	PPT, Notes, Lecturing
53	Tutorial 13: Group Discussion Role of pharmacist in promoting the safe practice, Benefits of OTC	1		Discussion, Test
54	Medication dispensing	1	ER20-22T.3	PPT, Notes, Lecturing
55	OTC medication in India	1	ER20-22T.4	PPT, Notes, Lecturing
56	Legal provision about OTC	1	ER20-22T.4	PPT, Notes, Lecturing
57	Tutorial 14: Legal provision about OTC, OTC medication in India	1		Discussion, Test
58	Medication in developed countries	1	ER20-22T.4	PPT, Notes, Lecturing
59	Counseling for OTC Product	1	ER20-22T.4	PPT, Notes, Lecturing
60	OTC Products	1	ER20-22T.4	PPT, Notes, Lecturing
61	Tutorial 15: Revision on OTC Products, Counseling for OTC Product	1		Discussion, Test
62	Self-medication	1	ER20-22T.4	PPT, Notes, Lecturing
63	Role of pharmacist in safe practices during self-medication	1	ER20-22T.4	PPT, Notes, Lecturing
64	Role of pharmacist in safe practices during self-medications	1	ER20-22T.4	PPT, Notes, Lecturing
65	Tutorial 16: Revision of Role of pharmacist in safe practices during self-medications, Self medication	1		Discussion, Test

66	Responding to symptoms, minor ailments and advice	1	ER20-22T.4	PPT, Notes, Lecturing
67	Responding to symptoms, minor ailments and advice for selfcare	1	ER20-22T.4	PPT, Notes, Lecturing
68	Intro and types of community pharmacy	1	ER20-22T.5	PPT, Notes, Lecturing
69	Tutorial 17: Revision on Responding to symptoms, minor ailments and advice for selfcare	1		Discussion, Test
70	Legal requirements to setup community pharmacy	1	ER20-22T.5	PPT, Notes, Lecturing
71	Organization of retail pharmacy	1	ER20-22T.5	PPT, Notes, Lecturing
72	Organization of wholesale pharmacy	1	ER20-22T.5	PPT, Notes, Lecturing
73	Tutorial 18: Organization of wholesale pharmacy, Organization of retail pharmacy	1		Discussion, Test
74	Pharmacy Designs	1	ER20-22T.5	PPT, Notes, Lecturing
75	Pharmacy designs & interiors	1	ER20-22T.5	PPT, Notes, Lecturing
76	Material management	1	ER20-22T.5	PPT, Notes, Lecturing
77	Tutorial 19: Class Test No-03	1		Discussion, Test
78	Vendor selection	1	ER20-22T.5	PPT, Notes, Lecturing
79	Vendor audit	1	ER20-22T.5	PPT, Notes, Lecturing
80	Placement of order	1	ER20-22T.5	PPT, Notes, Lecturing
81	Tutorial 20: Group Discussion on Placement of order, Vendor audit, Vendor Selection	1		Discussion, Test
82	Procurement, inventory control Management	1	ER20-22T.5	PPT, Notes, Lecturing
83	Financial Planning and Management	1	ER20-22T.5	PPT, Notes, Lecturing
84	Accountancy in community pharmacy (day and cash book)	1	ER20-22T.6	PPT, Notes, Lecturing
85	Tutorial 21: Group Discussion on Accountancy in community pharmacy day and cash book	1		Discussion, Test
86	Accountancy in community pharmacy (day and cash book)	1	ER20-22T.6	PPT, Notes, Lecturing
87	Need of pharmacy operation software	1	ER20-22T.6	PPT, Notes, Lecturing

88	Advantages of POS (Pharmacy Operation Software)	1	ER20-22T.6	PPT, Notes, Lecturing
89	Tutorial 22: Revision on Advantages of POS (Pharmacy Operation Software)	1		Discussion, Test
90	Categories of pharmacy operation software	1	ER20-22T.6	PPT, Notes, Lecturing
91	Modules of pharmacy Operation software	1	ER20-22T.6	PPT, Notes, Lecturing
92	Customer relation management	1	ER20-22T.6	PPT, Notes, Lecturing
93	Tutorial 23: Customer relation management, Categories of pharmacy operation software	1		Discussion, Test
94	Audits in pharmacies	1	ER20-22T.6	PPT, Notes, Lecturing
95	SOP of pharmacy management	1	ER20-22T.6	PPT, Notes, Lecturing
96	Importance of digital health	1	ER20-22T.6	PPT, Notes, Lecturing
97	Tutorial 24: Revision on Importance of digital health	1		Discussion, Test
98	Benefits of digital health	1	ER20-22T.6	PPT, Notes, Lecturing
99	m Health	1	ER20-22T.6	PPT, Notes, Lecturing
100	Tutorial 25: Lecture Online pharmacies	1	ER20-22T.6	Discussion, Test, Lecturing

Subject Name: Community Pharmacy & Management

Subject Code: ER20-22P

Theory / Practical: Practical

Program Outcomes:

Sr. No.	Program Outcome (PO)
1	Pharmacy Knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy.
2	Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
3	Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
4	Professional Identity: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
5	Pharmaceutical Ethics: Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
6	Communication: Communicate effectively with the pharmacy community and with society, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
7	The Pharmacist and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
8	Environment and sustainability: understand the impact of the professional pharmacy solutions in societal and environmental contexts, demonstrate the knowledge of, and need for sustainable development.
9	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Outcome (CO):

CO Code	Course Outcome (CO)	Bloom's Level
ER20-22 P.1	Describe the components of a prescription and identify prescription errors, omissions, legal requirements, and overdose to ensure safe dispensing.	L1- Remember
ER20-22 P.2	Explain the principles of prescription review by identifying drug–drug interactions and preparing dispensing and auxiliary labels for solid dosage forms.	L2 – Understand
ER20-22 P.3	Prepare dispensing and auxiliary labels for liquid, semisolid, and suppository dosage forms.	L3 – Apply
ER20-22 P.4	Analyze patient health parameters by performing basic clinical screening tests and interpreting the results.	L4 – Analyze
ER20-22 P.5	Evaluate patient counselling strategies for the management of common chronic diseases to promote the safe and effective use of medicines.	L5 – Evaluate
ER20-22 P.6	Develop patient counselling plans, demonstrate dosage form administration techniques, and utilize software and digital health tools in pharmacy practice.	L6 – Create

CO-PO Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
ER20-22 P.1	3	-	1	2	1	2	3	–	1
ER20-22 P.2	3	1	1	2	1	2	3	–	2
ER20-22 P.3	3	-	2	2	1	2	2	–	2
ER20-22 P.4	3	2	1	2	2	3	3	–	2
ER20-22 P.5	3	2	3	2	1	3	3	–	3
ER20-22 P.6	3	3	3	3	2	3	3	-	3

3 = High Correlation
 2 = Moderate Correlation
 1 = Low Correlation
 – = No Correlation

Justification of CO–PO Mapping:

Course Outcome	Program Outcome	Level	Justification
CO1	PO1	3	Provides the pharmacy knowledge required for accurate prescription review and safe dispensing.
	PO2	-	-
	PO3	1	Develops responsibility and decision-making while reviewing prescriptions.
	PO4	2	Strengthens understanding of professional responsibilities in ensuring accurate prescription handling.
	PO5	1	Promotes compliance with legal and ethical requirements during prescription screening and dispensing.
	PO6	2	Students communicate prescription-related information clearly to patients and healthcare professionals.
	PO7	3	Promotes patient safety by identifying prescription errors and ensuring rational medicine use.
	PO8	-	-
	PO9	1	Encourages continuous learning of prescription standards and regulations.
CO2	PO1	3	Applies pharmaceutical knowledge to identify drug interactions and prepare dispensing labels.
	PO2	1	Uses dispensing methods, pharmacy references, and labeling techniques effectively.

	PO3	1	Students develop responsibility and teamwork while performing dispensing activities.
	PO4	2	Reinforces professional dispensing practices according to pharmacy standards.
	PO5	1	Ensures ethical and safe dispensing by identifying potential drug interactions.
	PO6	2	Improves communication through clear dispensing and auxiliary labels.
	PO7	3	Supports safe medication use in community pharmacy practice.
	PO8	-	-
	PO9	2	Encourages continuous improvement of dispensing skills through practical learning.
CO3	PO1	3	Applies pharmacy knowledge while dispensing different dosage forms accurately.
	PO2	-	-
	PO3	2	Develops responsibility and organizational skills during dispensing activities.
	PO4	2	Students demonstrate professionalism while handling different pharmaceutical dosage forms.
	PO5	1	Follows ethical and legal requirements while dispensing medicines.
	PO6	2	Provides clear dispensing instructions to ensure correct medicine use.
	PO7	2	Supports safe and effective dispensing services in the community.
	PO8	-	-

	PO9	2	Strengthens practical competency through repeated dispensing practice.
CO4	PO1	3	Applies pharmacy knowledge to assess and interpret patient health parameters.
	PO2	2	Uses modern healthcare devices such as BP apparatus, glucometer, pulse oximeter, and peak flow meter.
	PO3	1	Develops confidence and responsibility while performing patient health assessment.
	PO4	2	Strengthens the pharmacist's professional role in primary healthcare services.
	PO5	2	Ensures ethical practice while maintaining patient confidentiality during health screening.
	PO6	3	Students communicate health assessment findings and patient care advice effectively.
	PO7	3	Contributes to community healthcare through early health screening services.
	PO8	-	-
	PO9	2	Promotes continuous learning of clinical assessment skills.
CO5	PO1	3	Applies pharmacy knowledge to provide appropriate patient counselling for chronic diseases.
	PO2	2	Uses patient education materials and counselling aids effectively.
	PO3	3	Develops leadership and decision-making skills while counselling patients.
	PO4	2	Strengthens the professional role of the pharmacist as a healthcare educator.

	PO5	1	Promotes ethical principles and patient-centred pharmaceutical care.
	PO6	3	Students communicate effectively to improve medication adherence and patient outcomes.
	PO7	3	Promotes rational medicine use and improves public health through patient counselling.
	PO8	-	-
	PO9	3	Encourages continuous learning of disease management and counselling practices.
CO6	PO1	3	Integrates pharmacy knowledge while planning and delivering pharmaceutical care.
	PO2	3	Uses community pharmacy software, digital health tools, and dosage administration techniques effectively.
	PO3	3	Students develop leadership, planning, and decision-making skills while providing patient care.
	PO4	3	Demonstrates professional competence in community pharmacy practice.
	PO5	2	Follows ethical principles while providing pharmaceutical care and maintaining patient confidentiality.
	PO6	3	Enhances communication through patient counselling and dosage form administration.
	PO7	3	Improves community health by promoting the safe and effective use of medicines.
	PO8	-	-
	PO9	3	Encourages lifelong learning through digital health technologies and community pharmacy practices.

Gap Analysis:

PO	Mapping %	GAP %	Action plan to fill the GAP
PO1	100	0	-
PO2	66.66	33.33	-
PO3	100	00	-
PO4	100	0	-
PO5	100	00	-
PO6	100	0	-
PO7	100	0	-
PO8	00	100	Conduct a simulated pharmacy waste segregation and disposal activity in which students identify different types of pharmacy waste and demonstrate appropriate segregation, storage and disposal practices.
PO9	100	00	-

Practical plan:

Practical No.	Practical Plan	Course Outcome	Hours	Teaching Methodology (Like PPT, Notes etc.)
1	To Review, Handle and identify the parts of the prescription.	ER20-22P.1	3	Laboratory Manual
2	To check the Legal compliance and completeness of prescription	ER20-22P.1	3	Laboratory Manual
3	To Identify the errors in prescription	ER20-22P.1	3	Laboratory Manual
4	To Identify the Omission Errors in the given prescription and make necessary corrections for ensuring the completeness of the prescription.	ER20-22P.1	3	Laboratory Manual
5	To identify the overdose in the given prescription	ER20-22P.2	3	Laboratory Manual
6	To Identify and Resolve the Pharmacokinetic drug-drug interactions in the prescription.	ER20-22P.2	3	Laboratory Manual
7	To identify and Resolve the Pharmacodynamic drug-drug interactions in the prescription	ER20-22P.2	3	Laboratory Manual
8	To prepare dispensing and auxiliary labels for the prescribed solid dosage form.	ER20-22P.2	3	Laboratory Manual
9	To prepare dispensing and auxiliary labels for the prescribed Monophasic Liquid dosage form.	ER20-22P.3	3	Laboratory Manual
10	To prepare dispensing and auxiliary labels for the prescribed biphasic liquid dosage form.	ER20-22P.3	3	Laboratory Manual
11	To prepare dispensing and auxiliary labels for the prescribed semisolid dosage form.	ER20-22P.3	3	Laboratory Manual

12	To prepare dispensing and auxiliary labels for the prescribed suppositories.	ER20-22P.3	3	Laboratory Manual
13	To determine blood pressure by using sphygmomanometer	ER20-22P.4	3	Laboratory Manual
14	To determine the capillary blood glucose level by using a Glucometer.	ER20-22P.4	3	Laboratory Manual
15	To measure the peak expiratory flow rate using peak flow meter and maximum value of air inhaled using Incentive Spirometer.	ER20-22P.4	3	Laboratory Manual
16	To measure the capillary oxygen level using Pulse Oximeter.	ER20-22P.4	3	Laboratory Manual
17	To determine the body mass index (BMI) of the subject and interpret the body weight status.	ER20-22P.5	3	Laboratory Manual
18	To counsel the simulated patient for the management of Diabetes Mellitus (Type 2).	ER20-22P.5	3	Laboratory Manual
19	To counsel the simulated patient for the management of Primary Hypertension.	ER20-22P.5	3	Laboratory Manual
20	To counsel the simulated patient for the management of Asthma	ER20-22P.5	3	Laboratory Manual
21	To counsel the simulated patient for the management of Hyperlipidemia	ER20-22P.6	3	Laboratory Manual
22	To counsel the simulated patient for the management of Rheumatoid Arthritis.	ER20-22P.6	3	Laboratory Manual
23	To counsel the simulated patient for the management of minor ailments.	ER20-22P.6	3	Laboratory Manual
24	To demonstrate the handling and administration techniques for various dosage forms	ER20-22P.6	3	Laboratory Manual
25	To introduce with community Pharmacy software and Digital Health tools.	ER20-22P.6	3	Laboratory Manual

Subject Name: Biochemistry and Clinical Pathology

Subject Code: ER20-23T

Theory / Practical: Theory

Program Outcomes:

Sr. No.	Program Outcome (PO)
1	Pharmacy Knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy.
2	Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
3	Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
4	Professional Identity: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
5	Pharmaceutical Ethics: Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
6	Communication: Communicate effectively with the pharmacy community and with society, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
7	The Pharmacist and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
8	Environment and sustainability: understand the impact of the professional pharmacy solutions in societal and environmental contexts, demonstrate the knowledge of, and need for sustainable development.
9	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Outcome:

CO Code	Course Outcome (CO)	Blooms Level
ER20-23T.1	Know about introduction to biochemistry and Carbohydrates.	L1 – Remember
ER20-23T.2	Classify various qualitative tests for proteins and lipids with their role.	L2 – Understand
ER20-23T.3	Determine the nucleic acid, enzymes, vitamins and their functions.	L3 – Apply
ER20-23T.4	Describe metabolism and its related diseases.	L4 – Analyze
ER20-23T.5	Elaborate minerals, water and electrolytes with their functions.	L5 – Evaluate
ER20-23T.6	Explain the organ function tests and introduction to pathology.	L6 – Create

CO-PO Mapping:

CO Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
ER20-23T.1	3	2	-	2	1	-	-	1	3
ER20-23T.2	3	-	-	2	-	2	-	2	3
ER20-23T.3	3	2	-	2	-	-	-	-	3
ER20-23T.4	3	1	-	2	-	2	2	2	3
ER20-23T.5	3	-	-	2	-	1	-	-	3
ER20-23T.6	3	3	-	2	2	2	1	3	3

3 = High Correlation

2 = Moderate Correlation

1 = Low Correlation

– = No Correlation

Justification of CO–PO Mapping:

Course Outcome	Program Outcome	Level	Justification
CO1	PO1	3	Students acquire fundamental knowledge of biochemistry and carbohydrates, strongly supporting core pharmaceutical knowledge.
	PO2	2	Students understand biochemical concepts useful for analyzing pharmaceutical problems.
	PO3	-	-
	PO4	2	Basic biochemical principles support analytical understanding of biological systems.
	PO5	1	Limited use of scientific tools and laboratory resources during introductory learning.
	PO6	-	-
	PO7	-	-
	PO8	1	Encourages ethical learning and professional conduct in basic sciences.
	PO9	3	Promotes effective communication of fundamental biochemical concepts.
CO2	PO1	3	Qualitative analysis of proteins and lipids strengthens pharmaceutical knowledge and laboratory skills.
	PO2	-	-
	PO3	-	-
	PO4	2	Interpretation of qualitative test results develops analytical ability.
	PO5	-	-
	PO6	2	Laboratory practices promote safe handling of biological samples.
	PO7	-	-

	PO8	2	Encourages ethical laboratory practices and accurate reporting.
	PO9	3	Students communicate laboratory observations and results effectively.
CO3	PO1	3	Understanding nucleic acids, enzymes and vitamins strengthens pharmaceutical fundamentals.
	PO2	2	Students apply biochemical principles to solve biological problems.
	PO3	-	-
	PO4	2	Functional analysis of biomolecules develops analytical thinking.
	PO5	-	-
	PO6	-	-
	PO7	-	-
	PO8	-	-
	PO9	3	Improves scientific communication and conceptual understanding.
CO4	PO1	3	Knowledge of metabolism and metabolic disorders strengthens pharmaceutical science competency.
	PO2	1	Students identify disease mechanisms through basic analytical skills.
	PO3	-	-
	PO4	2	Analysis of metabolic pathways enhances problem-solving ability.
	PO5	-	

	PO6	2	Understanding metabolic disorders supports healthcare awareness.
	PO7	2	Promotes awareness of health and environmental factors affecting metabolism.
	PO8	2	Encourages ethical responsibility toward patient care.
	PO9	3	Enhances communication regarding disease mechanisms and treatment.
CO5	PO1	3	Knowledge of minerals, water and electrolytes supports pharmaceutical sciences.
	PO2	-	-
	PO3	-	-
	PO4	2	Understanding electrolyte balance supports clinical interpretation.
	PO5	-	-
	PO6	1	Provides awareness of electrolyte disorders and patient care.
	PO7	-	-
	PO8	-	-
	PO9	3	Improves communication regarding physiological functions.
CO6	PO1	3	Organ function tests and pathology provide strong pharmaceutical and clinical knowledge.
	PO2	3	Students interpret diagnostic reports and analyze pathological conditions.

	PO3	-	-
	PO4	2	Clinical data interpretation enhances analytical competence.
	PO5	2	Students utilize laboratory instruments and diagnostic techniques
	PO6	2	Develops professional responsibility in healthcare and diagnostics.
	PO7	1	Promotes awareness of safe biomedical waste handling.
	PO8	3	Encourages professional ethics while handling patient-related information.
	PO9	3	Strengthens communication and teamwork in clinical laboratory practice.

Gap Analysis:

PO	Mapping %	GAP %	Action plan to fill the GAP
PO1	100	00	-
PO2	44.4	55.6	-
PO3	00	100	Conduct group activity, Seminar and NSS Activity.
PO4	66.7	33.3	-
PO5	16.7	83.3	Introduce more problem-solving exercises, case studies, tutorials, and clinical discussions.
PO6	38.9	61.1	-
PO7	16.7	83.3	-
PO8	44.4	55.6	-
PO9	100	00	-

Teaching plan:

Lecture No.	Teaching Plan	Hours	Course Outcome	Teaching Methodology (Like PPT, Notes etc.)
1	Scope of biochemistry in pharmacy.	1	ER20-23T.1	PPT, Notes
2	Cell and its biological organization.	1	ER20-23T.1	PPT, Notes
3	Definition and classification of carbohydrates with examples.	1	ER20-23T.1	PPT, Notes
4	Tutorial -1	1		Discussion, Test
5	Monosaccharides – Structure of glucose, fructose and galactose.	1	ER20-23T.1	PPT, Notes
6	Disaccharides – Structure of maltose, lactose and sucrose.	1	ER20-23T.1	PPT, Notes
7	Polysaccharides – Chemical nature of starch and glycogen.	1	ER20-23T.1	PPT, Notes
8	Tutorial-2	1		Discussion, Test
9	Qualitative tests and biological role of carbohydrates.	1	ER20-23T.1	PPT, Notes
10	Definition and classification of proteins based on composition and solubility with examples.	1	ER20-23T.1	PPT, Notes
11	Definition and classification of amino acids based on chemical nature and nutritional requirements with examples.	1	ER20-23T.1	PPT, Notes
12	Tutorial-3	1		Discussion, Test
13	Structure of proteins: Primary, secondary, tertiary and quaternary.	1	ER20-23T.1	PPT, Notes
14	Qualitative tests, biological role of proteins and amino acids.	1	ER20-23T.1	PPT, Notes
15	Diseases related to malnutrition of proteins.	1	ER20-23T.1	PPT, Notes
16	Tutorial - 4	1		Discussion, Test
17	Definition and classification of lipids with examples	1	ER20-23T.2	PPT, Notes
18	Structure and properties of triglycerides (oils and fats), classification of fatty acids based on chemical and nutritional requirements with examples.	1	ER20-23T.2	PPT, Notes
19	Structure and functions of cholesterol in the body.	1	ER20-23T.2	PPT, Notes
20	Tutorial -5	1		Discussion, Test

21	Lipoproteins – Types, composition and functions in the body.	1	ER20-23T.2	PPT, Notes
22	Qualitative tests and functions of lipids.	1	ER20-23T.2	PPT, Notes
23	Definition of nucleic acids; purine and pyrimidine bases.	1	ER20-23T.2	PPT, Notes
24	Tutorial - 6	1		Discussion, Test
25	Components of nucleosides and nucleotides with examples.	1	ER20-23T.2	PPT, Notes
26	Structure of DNA (Watson and Crick model) and its functions.	1	ER20-23T.2	PPT, Notes
27	Structure and functions of RNA.	1	ER20-23T.2	PPT, Notes
28	Tutorial-7	1		PPT, Notes
29	Definition, properties of enzymes; IUB and MB classification.	1	ER20-23T.2	Discussion, Test
30	Factors affecting enzyme activity.	1	ER20-23T.2	PPT, Notes
31	Enzyme inhibitors.	1	ER20-23T.2	PPT, Notes
32	Tutorial - 8	1		Discussion, Test
33	Therapeutic importance of enzymes.	1	ER20-23T.2	PPT, Notes
34	Pharmaceutical importance of enzymes.	1	ER20-23T.2	PPT, Notes
35	Definition and classification of vitamins with examples.	1	ER20-23T.2	PPT, Notes
36	Tutorial-9	1		Discussion, Test
37	Sources, chemical nature, functions, coenzyme form, recommended dietary requirements and deficiency diseases of vitamin A, E.	1	ER20-23T.3	PPT, Notes
38	Sources, chemical nature, functions, coenzyme form, recommended dietary requirements and deficiency diseases of vitamin D, K.	1	ER20-23T.3	PPT, Notes
39	Sources, chemical nature, functions, coenzyme form, recommended dietary requirements and deficiency diseases of B complex group.	1	ER20-23T.3	PPT, Notes
40	Tutorial -10	1		Discussion, Test
41	Biochemical importance of B complex group.	1	ER20-23T.3	PPT, Notes

42	Sources, chemical nature, functions, coenzyme form, recommended dietary requirements and deficiency diseases of vitamin C.	1	ER20-23T.3	PPT, Notes
43	Carbohydrate metabolism: Glycolysis.	1	ER20-23T.3	PPT, Notes
44	Tutorial -11	1		Discussion, Test
45	Tricarboxylic acid (TCA) cycle	1	ER20-23T.3	PPT, Notes
46	Glycogen metabolism.	1	ER20-23T.3	PPT, Notes
47	Regulation of blood glucose level	1	ER20-23T.3	PPT, Notes
48	Tutorial -12	1		Discussion, Test
49	Diseases related to abnormal metabolism of carbohydrates.	1	ER20-23T.3	PPT, Notes
50	Diabetes mellitus.	1	ER20-23T.3	PPT, Notes
51	Biological oxidation.	1	ER20-23T.3	PPT, Notes
52	Tutorial -13	1		Discussion, Test
53	Electron Transport Chain (ETC).	1	ER20-23T.3	PPT, Notes
54	Oxidative phosphorylation.	1	ER20-23T.3	PPT, Notes
55	Metabolism of lipids: Lipolysis.	1	ER20-23T.4	PPT, Notes
56	Tutorial -14	1		Discussion, Test
57	β -oxidation of fatty acids (palmitic acid) and its energetics.	1	ER20-23T.4	PPT, Notes
58	Ketogenesis and ketolysis	1	ER20-23T.4	PPT, Notes
59	Diseases related to abnormal metabolism of lipids: Ketoacidosis.	1	ER20-23T.4	PPT, Notes
60	Tutorial -15	1		Discussion, Test
61	Fatty liver and hypercholesterolemia.	1	ER20-23T.4	PPT, Notes
62	Metabolism of amino acids (proteins).	1	ER20-23T.4	PPT, Notes
63	General reactions of amino acids and its significance: Transamination and deamination.	1	ER20-23T.4	PPT, Notes
64	Tutorial - 16	1		Discussion, Test

65	Urea cycle and decarboxylation.	1	ER20-23T.4	PPT, Notes
66	Disorders related to abnormal metabolism of amino acids.	1	ER20-23T.4	PPT, Notes
67	Disorders of tyrosine metabolism.	1	ER20-23T.4	PPT, Notes
68	Tutorial - 17	1		Discussion, Test
69	Functions, deficiency diseases, recommended daily requirements of calcium and phosphorus.	1	ER20-23T.5	PPT, Notes
70	Functions, deficiency diseases, recommended daily requirements of iron.	1	ER20-23T.5	PPT, Notes
71	Functions, deficiency diseases, recommended daily requirements of sodium.	1	ER20-23T.5	PPT, Notes
72	Tutorial - 18	1		Discussion, Test
73	Functions, deficiency diseases, recommended daily requirements of potassium.	1	ER20-23T.5	PPT, Notes
74	Functions, deficiency diseases, recommended daily requirements of chloride.	1	ER20-23T.5	PPT, Notes
75	Distribution, functions of water in the body.	1	ER20-23T.5	PPT, Notes
76	Tutorial- 19	1		Discussion, Test
77	Water turnover and balance.	1	ER20-23T.5	PPT, Notes
78	Electrolyte composition of body fluids.	1	ER20-23T.5	PPT, Notes
79	Dietary intake of electrolytes and electrolyte balance.	1	ER20-23T.5	PPT, Notes
80	Tutorial 20	1		Discussion, Test
81	Dehydration, causes of dehydration and oral rehydration therapy.	1	ER20-23T.5	PPT, Notes
82	Introduction to biotechnology.	1	ER20-23T.5	PPT, Notes
83	Functions of kidney: routinely performed tests to assess kidney function.	1	ER20-23T.5	PPT, Notes
84	Tutorial -21	1		Discussion, Test
85	Clinical significance of kidney function tests.	1	ER20-23T.6	PPT, Notes

86	Functions of liver and routinely performed tests to assess liver function.	1	ER20-23T.6	PPT, Notes
87	Clinical significance of liver function tests.	1	ER20-23T.6	PPT, Notes
88	Tutorial -22	1		Discussion, Test
89	Lipid profile tests.	1	ER20-23T.6	PPT, Notes
90	Clinical significance of lipid profile tests.	1	ER20-23T.6	PPT, Notes
91	Lymphocytes and platelets.	1	ER20-23T.6	PPT, Notes
92	Tutorial -23	1		Discussion, Test
93	Clinical significance of alteration in lymphocytes and platelets.	1	ER20-23T.6	PPT, Notes
94	Erythrocytes.	1	ER20-23T.6	PPT, Notes
95	Clinical significance of abnormal erythrocytes.	1	ER20-23T.6	PPT, Notes
96	Tutorial - 24	1		Discussion, Test
97	Normal constituents of urine.	1	ER20-23T.6	PPT, Notes
98	Clinical significance of abnormal constituents of urine.	1	ER20-23T.6	PPT, Notes
99	abnormal constituents of urine.	1	ER20-23T.6	PPT, Notes
100	Tutorial -25	1		Discussion, Test

Subject Name: Biochemistry and Clinical Pathology

Subject Code: ER20-23P

Theory / Practical: Practical

Program Outcomes:

PO. No.	Program Outcome (PO)
1	Pharmacy Knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy.
2	Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
3	Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
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6	Communication: Communicate effectively with the pharmacy community and with society, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
7	The Pharmacist and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
8	Environment and sustainability: understand the impact of the professional pharmacy solutions in societal and environmental contexts, demonstrate the knowledge of, and need for sustainable development.
9	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Outcome:

CO Code	Course Outcome (CO)	Blooms Level
ER2023P.1	Recall the names, principles, and uses of different laboratory instruments and qualitative tests for carbohydrates.	L1- Remember
ER2023P.2	Explain the principles and procedures of qualitative tests for proteins and carbohydrates.	L2- Understand
ER2023P.3	Perform qualitative tests to identify proteins, amino acids, lipids, and cholesterol in biological samples.	L3- Apply
ER2023P.4	Analyze normal and abnormal constituents of urine based on standard laboratory test results.	L4- Analyze
ER2023P.5	Evaluate the results of urine constituent analysis and starch hydrolysis experiments to draw appropriate conclusions.	L5- Evaluate
ER2023P.6	Design and demonstrate a systematic laboratory procedure for determining various constituents of human blood following good laboratory practices.	L6- Create

CO-PO Mapping:

CO Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
ER20-23P.1	3	2	—	—	-	—	—	1	1
ER20-23P.2	3	2	—	1	-	2	—	2	1
ER20-23P.3	3	3	1	1	-	2	1	2	1
ER20-23P.4	3	2	1	2	-	2	2	2	1
ER20-23P.5	3	2	2	2	-	2	2	1	2
ER20-23P.6	3	3	2	2	1	2	2	2	2

3 = High Correlation

2 = Moderate Correlation

1 = Low Correlation

— = No Correlation

Justification of CO–PO Mapping:

Course Outcome	Program Outcome	Level	Justification
CO1	PO1	3	Develops fundamental knowledge of laboratory instruments and qualitative analytical techniques.
	PO2	2	Introduces the appropriate use of laboratory instruments and procedures.
	PO3	-	-
	PO4	-	-
	PO5	-	Promotes safe and ethical handling of laboratory equipment and chemicals.
	PO6	-	-
	PO7	-	-
	PO8	1	Provides limited exposure to responsible laboratory practices, including appropriate handling of laboratory materials and minimizing unnecessary waste.
	PO9	1	Encourages continuous learning of laboratory techniques.
CO2	PO1	3	Strengthens theoretical understanding of biochemical testing principles.
	PO2	2	Enhances knowledge of laboratory methods and procedures.
	PO3	-	-
	PO4	1	Builds professional competence in laboratory practice.
	PO5	-	-

	PO6	2	Develops the ability to explain laboratory procedures and report findings.
	PO7	-	-
	PO8	2	Laboratory testing procedures promote proper use of reagents and resources, p connection to sustainable laboratory practices.
	PO9	1	Promotes self-learning and continuous professional improvement.
CO3	PO1	3	Applies pharmaceutical knowledge in practical laboratory investigations.
	PO2	3	Demonstrates proficient use of laboratory instruments and techniques.
	PO3	1	Promotes teamwork and responsible participation during practical sessions.
	PO4	1	Develops confidence in professional laboratory practice.
	PO5	-	-
	PO6	2	Improves documentation and communication of experimental results.
	PO7	1	Highlights the role of laboratory diagnosis in healthcare services.
	PO8	2	Practical laboratory investigations encourage responsible use of instruments, chemicals, and laboratory resources, supporting sustainable laboratory practice
	PO9	1	Encourages continuous learning of laboratory techniques.
CO4	PO1	3	Applies biochemical knowledge to interpret clinical laboratory findings.
	PO2	2	Uses standard laboratory methods for urine analysis.

	PO3	1	Promotes teamwork and responsible participation during practical sessions.
	PO4	2	Develops competence in clinical laboratory investigations.
	PO5	-	-
	PO6	2	Improves interpretation and reporting of laboratory observations.
	PO7	2	Relates laboratory findings to patient care and community health.
	PO8	2	Clinical laboratory investigations involve appropriate handling and disposal of providing a limited connection to environmental safety.
	PO9	1	Encourages continuous learning of laboratory techniques.
CO5	PO1	3	Integrates biochemical concepts for evaluation of laboratory results.
	PO2	2	Applies laboratory procedures for interpretation of results.
	PO3	2	Supports collaborative decision-making during laboratory work.
	PO4	2	Enhances professional judgment based on experimental findings.
	PO5	-	-
	PO6	2	Develops scientific reporting and presentation skills.
	PO7	2	Connects laboratory evaluation with healthcare responsibilities.
	PO8	1	Encourages proper laboratory waste disposal and environmental awareness.
	PO9	2	Promotes self-learning and continuous professional improvement.
CO6	PO1	3	Demonstrates comprehensive practical knowledge of blood analysis.
	PO2	3	Effectively utilizes laboratory instruments and analytical methods.

	PO3	2	Develops leadership and teamwork in laboratory activities.
	PO4	2	Strengthens professional competence in diagnostic laboratory practice.
	PO5	1	Emphasizes ethical handling of biological samples and patient data.
	PO6	2	Improves laboratory documentation and communication of findings.
	PO7	2	Demonstrates the pharmacist's role in disease diagnosis and public health.
	PO8	2	Promotes safe biomedical waste management and sustainable laboratory practices.
	PO9	2	Encourages continuous updating of laboratory skills and knowledge.

Gap Analysis:

PO	Mapping %	GAP %	Action plan to fill the GAP
PO1	100	0	-
PO2	100	0	-
PO3	67	33	-
PO4	83.33	16.67	-
PO5	16.67	83.33	Conduct an ethical laboratory practice activity in which students demonstrate proper handling, labelling, confidentiality and responsible management of biological samples and laboratory records.
PO6	83.33	16.67	-
PO7	66.66	33.33	-
PO8	100	00	-
PO9	100	00	-

Practical plan:

Practical No.	Practical Plan	Hours	Course Outcome	Teaching Methodology (Like PPT, Notes etc.)
1	Introduction to Biochemistry and Clinical Pathology Laboratory	2	ER20-23P.1	Laboratory Manual
2	Qualitative analysis of a sample containing carbohydrate	2	ER20-23P.1	Laboratory Manual
3	Qualitative analysis of a sample containing carbohydrate	2	ER20-23P.1	Laboratory Manual
4	Qualitative analysis of a sample containing carbohydrate	2	ER20-23P.1	Laboratory Manual
5	Qualitative analysis of a sample containing carbohydrate	2	ER20-23P.2	Laboratory Manual
6	Qualitative analysis of a sample containing carbohydrate	2	ER20-23P.2	Laboratory Manual
7	Qualitative analysis of a sample containing protein	2	ER20-23P.2	Laboratory Manual
8	Qualitative analysis of a sample containing protein	2	ER20-23P.2	Laboratory Manual
9	Qualitative analysis of a sample containing amino acid	2	ER20-23P.3	Laboratory Manual
10	Qualitative analysis of a sample containing amino acid	2	ER20-23P.3	Laboratory Manual
11	Qualitative analysis of Lipid	2	ER20-23P.3	Laboratory Manual
12	Qualitative analysis of Cholesterol	2	ER20-23P.3	Laboratory Manual
13	Qualitative analysis of urine sample for normal constitutes	2	ER20-23P.4	Laboratory Manual
14	Qualitative analysis of urine sample for normal constitutes	2	ER20-23P.4	Laboratory Manual

15	Qualitative analysis of urine sample for Abnormal constituents	2	ER20-23P.4	Laboratory Manual
16	Qualitative analysis of urine sample for Abnormal constituents	2	ER20-23P.4	Laboratory Manual
17	Qualitative analysis of urine sample for Abnormal constituents	2	ER20-23P.4	Laboratory Manual
18	Estimation of Glucose in Urine	2	ER20-23P.5	Laboratory Manual
19	Estimation of Creatinine in Urine	2	ER20-23P.5	Laboratory Manual
20	Estimation of Creatinine in Human Blood	2	ER20-23P.5	Laboratory Manual
21	Estimation of Glucose in Blood	2	ER20-23P.5	Laboratory Manual
22	Estimation of Cholesterol in Human Blood	2	ER20-23P.6	Laboratory Manual
23	Estimation of Calcium in Human Blood	2	ER20-23P.6	Laboratory Manual
24	Estimation of Urea Human Blood	2	ER20-23P.6	Laboratory Manual
25	Hydrolysis of Starch	2	ER20-23P.6	Laboratory Manual

Subject Name: Hospital and Clinical Pharmacy

Subject Code: ER20-25T

Theory / Practical: Theory

Program Outcomes:

PO. No.	Program Outcome (PO)
1	Pharmacy Knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy.
2	Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
3	Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
4	Professional Identity: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
5	Pharmaceutical Ethics: Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
6	Communication: Communicate effectively with the pharmacy community and with society, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
7	The Pharmacist and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
8	Environment and sustainability: understand the impact of the professional pharmacy solutions in societal and environmental contexts, demonstrate the knowledge of, and need for sustainable development.
9	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Outcome:

CO Code	Course Outcome (CO)	Blooms Level
ER20-25T.1	Explain the organization, functions, standards, committees, and professional responsibilities of hospital pharmacy services.	L2 – Understand
ER20-25T.2	Demonstrate the application of principles of procurement, inventory control, storage, documentation, and disposal of medicines in hospital pharmacy practice.	L3 – Apply
ER20-25T.3	Use appropriate principles of drug distribution, hospital compounding, radiopharmaceutical handling, and computerized pharmacy services.	L3 – Apply
ER20-25T.4	Analyze clinical pharmacy activities, pharmaceutical care, medication therapy management, and drug-related problems to support rational drug therapy.	L4 – Analyze
ER20-25T.5	Interpret laboratory investigations and poisoning-related clinical information to support appropriate and safe drug therapy.	L4 – Analyze
ER20-25T.6	Evaluate pharmacovigilance, medication-error prevention, and drug-interaction information for safe and rational medication use.	L5 – Evaluate

CO-PO Mapping:

CO Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
ER20-25T.1	3	-	-	3	2	2	2	—	1
ER20-25T.2	3	-	-	2	2	3	3	3	1
ER20-25T.3	3	3	-	2	2	2	2	2	1
ER20-25T.4	3	2	-	3	2	3	2	-	3
ER20-25T.5	3	1	-	2	3	3	2	-	3
ER20-25T.6	3	2	-	3	3	3	3	-	3

3 = High Correlation

2 = Moderate Correlation

1 = Low Correlation

— = No Correlation

Justification of CO–PO Mapping:

Course Outcome	Program Outcome	Level	Justification
CO1	PO1	3	Develops fundamental knowledge of hospital pharmacy organization, functions and services.
	PO2	-	-
	PO3	-	-
	PO4	3	Directly develops understanding of the pharmacist's professional role in hospitals.
	PO5	2	Professional standards and responsibilities promote ethical practice.
	PO6	2	Committee functioning and professional interactions require effective communication.
	PO7	2	Hospital pharmacy services contribute to safe and effective patient care.
	PO8	-	-
	PO9	1	Exposure to professional standards encourages continued learning.
CO2	PO1	3	Develops knowledge of procurement, inventory control, storage and disposal of medicines.
	PO2	-	-
	PO3	-	-
	PO4	2	Builds professional competence in hospital medicine management.
	PO5	2	Responsible procurement, handling and disposal of medicines require ethical practice.

	PO6	3	Documentation and coordination provide limited communication development.
	PO7	3	Proper storage and inventory control directly support medication and patient safety.
	PO8	3	Expired medicines and pharmaceutical waste management provide a sustainability connection.
	PO9	1	Changing inventory systems and practices require continuous updating of knowledge.
CO3	PO1	3	Develops knowledge of drug distribution, compounding, radiopharmaceuticals and computer applications.
	PO2	3	Computer applications and electronic systems directly support modern tool usage.
	PO3	-	-
	PO4	2	Develops professional competence in hospital pharmacy services.
	PO5	2	Safe handling and distribution of medicines require ethical responsibility.
	PO6	2	Pharmacy service coordination requires clear professional communication.
	PO7	2	Safe drug distribution and handling directly support patient safety.
	PO8	2	Radiopharmaceutical and pharmaceutical waste management provide environmental relevance.
	PO9	1	Changing technologies and pharmacy systems require continuous learning.
CO4	PO1	3	Integrates clinical pharmacy, pharmaceutical care and medication therapy knowledge.
	PO2	2	Clinical pharmacy uses drug-information and electronic health resources.

	PO3	-	-
	PO4	3	Strengthens the pharmacist's professional identity as a healthcare team member.
	PO5	2	Patient-centered pharmaceutical care requires ethical and responsible decisions.
	PO6	3	Patient counselling and interprofessional collaboration require effective communication.
	PO7	2	Identification of drug-related problems supports safe and rational medication use.
	PO8	-	-
	PO9	3	Clinical pharmacy requires continuous updating of therapeutic knowledge.
CO5	PO1	3	Develops knowledge of laboratory investigations and poisoning management.
	PO2	1	Interpretation requires clinical information and appropriate reference resources.
	PO3	-	-
	PO4	2	Supports the pharmacist's role in monitoring and optimizing drug therapy.
	PO5	3	Safe interpretation and poisoning management require responsible decisions.
	PO6	3	Clinical findings and recommendations must be communicated clearly.
	PO7	2	Supports prevention of drug-related harm and safe medication use.
	PO8	-	-

	PO9	3	Laboratory medicine and toxicology require continuous updating of knowledge.
CO6	PO1	3	Integrates knowledge of pharmacovigilance, medication errors and drug interactions.
	PO2	2	Safety reporting and drug-interaction assessment use information resources and systems.
	PO3	-	-
	PO4	3	Directly supports professional responsibility for medication safety.
	PO5	3	ADR reporting, error prevention and interaction management strongly involve ethical responsibility.
	PO6	3	Medication-related risks and safety information require effective communication.
	PO7	3	Prevention of medication errors and adverse events directly supports patient safety.
	PO8	-	-
	PO9	3	Pharmacovigilance and drug-interaction knowledge require lifelong learning.

Gap Analysis

PO	Mapping %	GAP %	Action plan to fill the GAP
PO1	100	0	-
PO2	83.33	16.67	-
PO3	0	100	Conduct Group Seminars with related topics
PO4	100	0	-
PO5	100	0	-
PO6	100	0	-
PO7	100	0	-
PO8	66.67	33.33	-
PO9	100	0	-

Teaching plan:

Lecture No.	Teaching Plan	Hours	Course Outcome	Teaching Methodology (Like PPT, Notes etc.)
1	National, Scope and International Scenario of Hospital Pharmacy.	1	ER20-25. T1	PPT, Notes, Lecturing
2	Organization Structure of Hospital Pharmacy	1	ER20-25. T1	PPT, Notes, Lecturing
3	Professional Responsibilities of Hospitals.	1	ER20-25. T1	PPT, Notes, Lecturing
4	Tutorial 1: Revision of National, Scope and International Scenario of Hospital Pharmacy,	1		Discussion, Test
5	Qualification And Experience Requirements of Hospitals	1	ER20-25. T1	PPT, Notes, Lecturing
6	Work Load Requirements of Hospital	1	ER20-25. T1	PPT, Notes, Lecturing
7	Good Pharmacy Practice in Hospital	1	ER20-25. T1	PPT, Notes, Lecturing
8	Tutorial 2: Group discussion	1		Discussion, Test
9	STANDARDS Of Hospital Pharmacy	1	ER20-25. T1	PPT, Notes, Lecturing
10	Introduction to NABH Accreditation and Role of Hospital Pharmacy	1	ER20-25. T1	PPT, Notes, Lecturing
11	Different Committees in Hospital.	1	ER20-25. T1	PPT, Notes, Lecturing
12	Tutorial 3: STANDARDS Of Hospital Pharmacy,	1		Discussion, Test
13	Pharmacy And Therapeutic Committee	1	ER20-25. T1	PPT, Notes, Lecturing
14	Procedure for Development and use of Hospital Formulary	1	ER20-25. T2	PPT, Notes, Lecturing
15	Role of Pharmacist in Preventing Antimicrobial Resistance	1	ER20-25. T2	PPT, Notes, Lecturing
16	Tutorial 4: group discussion	1		Discussion, Test
17	Supply Chain and Inventory Control.	1	ER20-25. T2	PPT, Notes, Lecturing

18	Preparation Of Drug Lists in Hospital.	1	ER20-25. T2	PPT, Notes, Lecturing
19	Procedure Of Drug Purchases in Hospital	1	ER20-25. T2	PPT, Notes, Lecturing
20	Tutorial 5: Revision on Supply Chain and Inventory Control, Preparation of Drug Lists in Hospital, Procedure of Drug Purchases in Hospital	1		Discussion, Test Lecturing
21	Drug Selection for Short Term, Long term and Quotations	1	ER20-25. T2	PPT, Notes, Lecturing
22	Inventory control techniques in Hospital.	1	ER20-25. T2	PPT, Notes, Lecturing
23	Economic Order Quantity in Hospital	1	ER20-25. T2	PPT, Notes, Lecturing
24	Tutorial 6: revision Drug Selection for Short Term, Long term and Quotations, Inventory control techniques in Hospital, Economic Order Quantity in Hospital.	1		Discussion, Test
25	Reorder Quantity Level in Hospital.	1	ER20-25. T2	PPT, Notes, Lecturing
26	Inventory Management of Central Drug Store	1	ER20-25. T2	PPT, Notes, Lecturing
27	Storage Conditions in Hospital	1	ER20-25. T2	PPT, Notes, Lecturing
28	Tutorial 7: Interaction with students	1		Discussion, Test
29	Maintaining Cold Chain in Hospital.	1	ER20-25. T2	PPT, Notes, Lecturing
30	Device Used for Cold Storage in Hospital	1	ER20-25. T2	PPT, Notes, Lecturing
31	FEFO, FIFO Methods in Hospital.	1	ER20-25. T2	PPT, Notes, Lecturing
32	Tutorial 8: Maintaining Cold Chain in Hospital, Device Used for Cold Storage in Hospital, FEFO, FIFO Methods in Hospital.	1		Discussion, Test
33	Expiry Drug Removal and their Disposal Methods in Hospital	1	ER20-25. T3	PPT, Notes, Lecturing
34	Documentation of Purchase and Inventory	1	ER20-25. T3	PPT, Notes, Lecturing
35	Drug Distribution in Hospital	1	ER20-25. T3	PPT, Notes, Lecturing
36	Tutorial 9: Group discussion on Expiry Drug	1		Discussion, Test

	Removal and their Disposal Methods in Hospital, Documentation of Purchase and Inventory, Drug Distribution in Hospital			
37	Disadvantages of Individual Prescription Order Method	1	ER20-25. T3	PPT, Notes, Lecturing
38	Floor Stock Method	1	ER20-25. T3	PPT, Notes, Lecturing
39	Unit Dose Drug Distribution Method.	1	ER20-25. T3	PPT, Notes, Lecturing
40	Tutorial 10: group discussion on Disadvantages of Individual Prescription Order Method, Floor Stock Method, Unit Dose Drug Distribution Method.	1		Discussion, Test
41	Distribution of Drug to ICCU/ICU/NICU/ Emergency Wards	1	ER20-25. T3	PPT, Notes, Lecturing
42	Automated Drug Dispensing System and Device	1	ER20-25. T3	PPT, Notes, Lecturing
43	Distributions of Narcotic and Psychotropic Substance and their Storage.	1	ER20-25. T3	PPT, Notes, Lecturing
44	Tutorial 11: Discussion on Distribution of Drugs to ICCU/ICU/NICU/ Emergency Wards,	1		Discussion, Test
45	Compounding In Hospitals	1	ER20-25. T3	PPT, Notes, Lecturing
46	Bulk Compounding in Hospital	1	ER20-25. T3	PPT, Notes, Lecturing
47	Service and Incompatibilities in Hospital.	1	ER20-25. T3	PPT, Notes, Lecturing
48	Tutorial 12: Compounding In Hospitals, Bulk Compounding in Hospital, Service and Incompatibilities in Hospital.	1		Discussion, Test
49	Radio Pharmaceuticals	1	ER20-25. T3	PPT, Notes, Lecturing
50	Storage in Radio Pharmaceuticals	1	ER20-25. T3	PPT, Notes, Lecturing
51	Dispensing and Disposal of Radiopharmaceuticals	1	ER20-25. T3	PPT, Notes, Lecturing
52	Tutorial 13: Radio Pharmaceuticals, Storage in Radio Pharmaceuticals, Dispensing and Disposal of Radiopharmaceuticals	1		Discussion, Test

53	Application Of Computers in Hospital Pharmacy	1	ER20-25. T4	PPT, Notes, Lecturing
54	Software's used in Hospital Pharmacy	1	ER20-25. T4	PPT, Notes, Lecturing
55	Clinical Pharmacy in Hospital.	1	ER20-25. T4	PPT, Notes, Lecturing
56	Tutorial 14: Application Of Computers in Hospital Pharmacy, Software's used in Hospital Pharmacy, Clinical Pharmacy in Hospital.	1		Discussion, Test
57	Scope and Development of Clinical Pharmacy	1	ER20-25. T4	PPT, Notes, Lecturing
58	Common Technology of Clinical Pharmacy	1	ER20-25. T4	PPT, Notes, Lecturing
59	Daily Activities of Clinical Pharmacists	1	ER20-25. T4	PPT, Notes, Lecturing
60	Tutorial 15: Scope and Development of Clinical Pharmacy, Common Technology of Clinical Pharmacy, Daily Activities of Clinical Pharmacists.	1		Discussion, Test
61	Ward round participation	1	ER20-25. T4	PPT, Notes, Lecturing
62	Treatment chart review.	1	ER20-25. T4	PPT, Notes, Lecturing
63	Adverse drug reaction monitoring	1	ER20-25. T4	PPT, Notes, Lecturing
64	Tutorial 16: Ward round participation, Treatment chart review, Adverse drug reaction monitoring.	1		Discussion, Test
65	Drug information and poisons information	1	ER20-25. T4	PPT, Notes, Lecturing
66	Medication history	1	ER20-25. T5	PPT, Notes, Lecturing
67	Interprofessional collaboration	1	ER20-25. T5	PPT, Notes, Lecturing
68	Tutorial 17: Drug information and poisons information, Medication history, Interprofessional collaboration	1		Discussion, Test
69	Introduction of Pharmaceutical care	1	ER20-25. T5	PPT, Notes, Lecturing
70	Classification of drug related problems	1	ER20-25. T5	PPT, Notes, Lecturing
71	Principles and procedure to provide	1	ER20-25. T5	PPT, Notes, Lecturing

	Pharmaceutical car.			
72	Tutorial 18: Revision on Introduction of Pharmaceutical care, Classification of drug related problems	1		Discussion, Test
73	Medication therapy management	1	ER20-25. T5	PPT, Notes, Lecturing
74	Home medication review	1	ER20-25. T5	PPT, Notes, Lecturing
75	Introduction clinical laboratory Test	1	ER20-25. T5	PPT, Notes, Lecturing
76	Tutorial 19: Group discussion on Medication therapy management, home medication review, Introduction clinical laboratory Test.	1		Discussion, Test
77	Clinical laboratory test used in the evaluation of disease state.	1	ER20-25. T5	PPT, Notes, Lecturing
78	Significance and interpretation of the test Result.	1	ER20-25. T5	PPT, Notes, Lecturing
79	Hematological, Liver function test	1	ER20-25. T5	PPT, Notes, Lecturing
80	Tutorial 20: Clinical laboratory test used in the evaluation of disease state	1		Discussion, Test
81	Renal function, Thyroid function test.	1	ER20-25. T5	PPT, Notes, Lecturing
82	Test associated with cardiac failure	1	ER20-25. T6	PPT, Notes, Lecturing
83	Fluid and electrolyte balance	1	ER20-25. T6	PPT, Notes, Lecturing
84	Tutorial 21: Revision on Renal function, Thyroid function test, Test associated with cardiac failure, Fluid and electrolyte balance.	1		Discussion, Test
85	Pulmonary and function test	1	ER20-25. T6	PPT, Notes, Lecturing
86	Introduction and types of poisoning.	1	ER20-25.T6	PPT, Notes, Lecturing
87	Clinical manifestation and antidotes	1	ER20-25. T6	PPT, Notes, Lecturing
88	Tutorial 22: Pulmonary and function test, Introduction and types of poisoning, Clinical manifestation and antidotes.	1		Discussion, Test

89	Drug and poison information Centre and their services.	1	ER20-25. T6	PPT, Notes, Lecturing
90	Requirement information resources with example.	1	ER20-25. T6	PPT, Notes, Lecturing
91	Definition, Aim and scope of pharmacovigilance	1	ER20-25. T6	PPT, Notes, Lecturing
92	Tutorial 23: group discussion on Drug and poison information Centre and their services	1		Discussion, Test
93	Overview of Pharmacovigilance	1	ER20-25. T6	PPT, Notes, Lecturing
94	Medication errors: Definition, types, consequences, and strategies to minimize medication errors	1	ER20-25. T6	PPT, Notes, Lecturing
95	LASA drugs and Tallman lettering as per ISMP	1	ER20-25. T5	PPT, Notes, Lecturing
96	Tutorial 24: group discussion on LASA drugs and Tallman lettering as per ISMP, Overview of Pharmacovigilance	1		Discussion, Test
97	Drug Interactions	1	ER20-25. T5	PPT, Notes, Lecturing
98	Definition, types of drug interaction	1	ER20-25. T5	PPT, Notes, Lecturing
99	Clinical significance of drug interactions.	1	ER20-25. T5	PPT, Notes, Lecturing
100	Tutorial 25: discussion on Drug Interactions: Definition, types, clinical significance of drug interactions.	1		Discussion, Test Lecturing

Subject Name: Hospital and Clinical Pharmacy

Subject Code: ER20-25P

Theory / Practical: Practical

Program Outcomes

PO. No.	Program Outcome (PO)
1	Pharmacy Knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy.
2	Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
3	Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
4	Professional Identity: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
5	Pharmaceutical Ethics: Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
6	Communication: Communicate effectively with the pharmacy community and with society, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
7	The Pharmacist and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
8	Environment and sustainability: understand the impact of the professional pharmacy solutions in societal and environmental contexts, demonstrate the knowledge of, and need for sustainable development.
9	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Outcome:

CO Code	Course Outcome (CO)	Blooms Level
ER20-25P.1	Describe systematic drug-information approaches and the identification and uses of orthopedic, walking, and bandage aids in patient care.	L2 – Understand
ER20-25P.2	Demonstrate appropriate identification and use of needles, syringes, urinary catheters, urine bags, urine pots, colostomy bags, and Ryle's tube.	L3 – Apply
ER20-25P.3	Interpret the appropriate use of oxygen masks, IV sets, and laboratory reports for supporting safe and optimized drug therapy.	L4 – Analyze
ER20-25P.4	Examine drug-drug interaction cases and wound-dressing procedures to support safe patient care.	L4 – Analyze
ER20-25P.5	Demonstrate appropriate ADR reporting, casualty assessment, wound dressing, and intravenous infusion techniques using simulated cases and mannequins.	L3 – Apply
ER20-25P.6	Evaluate appropriate injection techniques and the use of hospital pharmacy software and digital health tools in pharmacy practice.	L5 – Evaluate

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
ER20-25P.1	3	3	—	2	-	3	1	—	3
ER20-25P.2	3	2	—	2	1	2	2	2	2
ER20-25P.3	3	2	—	2	-	3	2	—	3
ER20-25P.4	3	2	1	2	1	3	3	-	3
ER20-25P.5	3	2	3	2	-	3	3	2	2
ER20-25P.6	3	3	2	3	-	2	3	-	3

3 = High Correlation

2 = Moderate Correlation

1 = Low Correlation

— = No Correlation

Justification of CO–PO Mapping

Course Outcome	Program Outcome	Level	Justification
CO1	PO1	3	Applies pharmacy knowledge through drug-information queries and patient-care aids.
	PO2	3	Uses primary, secondary and tertiary drug- information resources.
	PO3	-	-
	PO4	2	Supports the pharmacist's professional role in providing drug information and patient-care support.
	PO5	-	-
	PO6	3	Drug-information queries require effective communication of reliable information.
	PO7	1	Appropriate drug information and patient-care aids support safe patient care.
	PO8	-	-
	PO9	3	Drug information requires regular updating with new medicines and evidence.
CO2	PO1	3	Develops knowledge of common medical devices and their appropriate use.
	PO2	2	Requires selection and appropriate handling of medical devices.
	PO3	-	-
	PO4	2	Supports professional competence in patient-care activities.
	PO5	1	Safe handling of invasive devices requires professional responsibility.

	PO6	2	Appropriate device use requires clear instructions and communication.
	PO7	2	Correct device identification and use contribute to patient safety.
	PO8	2	Needles, syringes and other devices require appropriate clinical-waste handling.
	PO9	2	Medical devices and techniques require continuing professional learning.
CO3	PO1	3	Develops knowledge of oxygen devices, IV sets and laboratory investigations.
	PO2	2	Uses appropriate clinical devices and information resources.
	PO3	-	-
	PO4	2	Supports the pharmacist's role in patient-care and drug-therapy optimization.
	PO5	-	-
	PO6	3	Laboratory findings and clinical information require effective communication.
	PO7	2	Supports safe and optimized drug therapy.
	PO8	-	-
	PO9	3	Clinical information and laboratory interpretation require continuous updating.
CO4	PO1	3	Develops knowledge of drug interactions and wound-care procedures.
	PO2	2	Requires appropriate clinical information and practical resources.
	PO3	1	Case-based activities provide limited opportunity for coordination and teamwork.

	PO4	2	Supports professional responsibility for medication safety and patient care.
	PO5	1	Safe identification of interactions and wound care require responsible practice.
	PO6	3	Clinical findings and interaction information require effective communication.
	PO7	3	Helps prevent medication-related problems and supports patient safety.
	PO8	-	-
	PO9	3	Drug-interaction knowledge requires continuous updating.
CO5	PO1	3	Develops practical knowledge of ADR reporting, casualty assessment, wound care and infusion.
	PO2	2	Uses reporting forms, assessment scales and mannequins as practical resources.
	PO3	3	Simulated clinical activities support teamwork, coordination and role allocation.
	PO4	2	Develops professional competence in patient-care activities.
	PO5	-	-
	PO6	3	Patient-care procedures and case activities require effective communication.
	PO7	3	ADR reporting and safe procedures directly support patient safety.
	PO8	2	Clinical materials require appropriate handling and disposal.
	PO9	2	Clinical procedures require continuing development of practical skills.

CO6	PO1	3	Develops knowledge of injection techniques and digital pharmacy applications.
	PO2	3	Directly uses hospital pharmacy software and digital health tools.
	PO3	2	Practical administration and digital activities involve coordination and responsible roles.
	PO4	3	Supports professional competence in medication administration and digital pharmacy practice.
	PO5	-	-
	PO6	2	Injection procedures and digital documentation require clear communication.
	PO7	3	Safe medication administration directly supports patient safety.
	PO8	-	-
	PO9	3	Digital health technologies require continuous updating of knowledge and skills.

Gap Analysis

PO	Mapping %	GAP %	Action plan to fill the GAP
PO1	100	0	-
PO2	100	0	-
PO3	50.00	50.00	Small-group practical activities where students are assigned roles such as drug-information provider, device demonstrator, patient-care assistant and observer, followed by a short team-based case discussion.
PO4	100	0	-
PO5	33.33	66.66	-
PO6	100	0	-
PO7	100	0	-
PO8	33.33	66.66	-
PO9	100	0	-

Teaching plan:

Lecture No.	Teaching Plan	Hours	Course Outcome	Teaching Methodology (Like PPT, Notes etc.)
1.	Systematic approach in handling drug information queries: Case 1	2	ER20-25. P1	Experimental Work
2.	Systematic approach in handling drug information queries: Case 2	2	ER20-25. P1	Experimental Work
3.	To demonstrate the identification, Types and use of orthopedic aids; knee cap, Lumbo sacral and abdominal belt	2	ER20-25. P1	Experimental Work
4.	To demonstrate the identification, Types and use of Walking aids	2	ER20-25. P1	Experimental Work
5.	To demonstrate the identification, Types and use of Bandages	2	ER20-25. P1	Experimental Work
6.	To demonstrate the identification, Types and use of Needle and syringes.	2	ER20-25. P2	Experimental Work
7.	To demonstrate the identification, Types and use of urinary catheter, urine bags, urine pots.	2	ER20-25. P2	Experimental Work
8.	To demonstrate the identification, Types and use of Colostomy bags	2	ER20-25. P2	Experimental Work
9.	To demonstrate the identification, Types and use of Ryle's tube	2	ER20-25. P2	Experimental Work
10.	To demonstrate the identification types and use of oxygen mask	2	ER20-25. P3	Experimental Work
11.	To demonstrate the use of Intravenous (IV) sets.	2	ER20-25. P3	Experimental Work
12.	To interpret the given laboratory reports for optimization of drug therapy: Case-1	2	ER20-25. P3	Experimental Work
13.	To interpret the given laboratory reports for optimization of drug	2	ER20-25. P3	Experimental Work

	therapy: Case-2			
14.	To identify the type of drug-drug interactions in the given Case-1	2	ER20-25. P3	Experimental Work
15.	To identify the type of drug-drug interactions in the given Case-2	2	ER20-25. P4	Experimental Work
16.	To perform wound dressing to knee injury Case-1	2	ER20-25. P4	Experimental Work
17.	To perform wound dressing to diabetic foot ulcer Case-1	2	ER20-25. P4	Experimental Work
18.	To fill correctly IPC's ADR reporting form and perform casualty assessment using various scales in the given Case-1	2	ER20-25. P4	Experimental Work
19.	To fill correctly IPC's ADR reporting form and perform casualty assessment using various scales in the given Case-2	2	ER20-25. P5	Experimental Work
20.	To study the administration of intravenous infusion in the mannequin.	2	ER20-25. P5	Experimental Work
21.	To study the administration of intramuscular infusion in the mannequin.	2	ER20-25. P5	Experimental Work
22.	To study the administration of subcutaneous injection in the mannequin.	2	ER20-25. P5	Experimental Work
23.	To study the administration of intradermal injection in the mannequin.	2	ER20-25. P6	Experimental Work
24.	To study the administration of injectable vaccines in the mannequin.	2	ER20-25. P6	Experimental Work
25.	To study the use of Hospital pharmacy software and various digital health tools.	2	ER20-25. P6	Experimental Work

Subject Name: Pharmacotherapeutics

Subject Code: ER20-24T

Theory/ Practical: Theory

Program Outcomes:

PO. No.	Program Outcome (PO)
1	Pharmacy Knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy.
2	Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
3	Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
4	Professional Identity: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
5	Pharmaceutical Ethics: Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
6	Communication: Communicate effectively with the pharmacy community and with society, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
7	The Pharmacist and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
8	Environment and sustainability: understand the impact of the professional pharmacy solutions in societal and environmental contexts, demonstrate the knowledge of, and need for sustainable development.
9	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Outcome:

Course Code	Course Outcomes	Blooms Level
ER20-24T.1	State the principles of pharmacotherapeutics and the management of cardiovascular disorders.	L1 – Remember
ER20-24T.2	Explain the pharmacotherapeutic management of respiratory and endocrine disorders.	L2 – Understand
ER20-24T.3	Apply pharmacotherapeutic principles in the management of central nervous system and hematological disorders.	L3 – Apply
ER20-24T.4	Analyze the pharmacotherapeutic management of infectious diseases.	L4 – Analyze
ER20-24T.5	Evaluate the pharmacotherapeutic management of gastrointestinal, musculoskeletal, and dermatological disorders.	L5 – Evaluate
ER20-24T.6	Develop patient-specific therapeutic and counselling plans for psychiatric, ophthalmic, women's health disorders, and antimicrobial resistance.	L6 – Create

CO-PO Mapping:

CO Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
ER20-24T.1	3	—	—	1	1	1	2	—	3
ER20-24T.2	3	-	—	1	1	1	2	-	2
ER20-24T.3	3	1	—	1	1	1	2	—	2
ER20-24T.4	3	-	—	1	1	1	3	-	3
ER20-24T.5	3	1	—	1	2	1	3	-	3
ER20-24T.6	3	2	2	1	3	3	3	-	3

3 = High Correlation

2 = Moderate Correlation

1 = Low Correlation

— = No Correlation

CO-PO Justification:			
Course Outcome	Program Outcome	Level	Justification
CO1	PO1	3	Provides strong knowledge of pharmacotherapeutics and management of cardiovascular disorders. Helps students understand principles required for safe and rational drug therapy.
	PO2	-	-
	PO3	—	-
	PO4	1	Develops basic understanding of therapeutic approaches for cardiovascular disorders. Students use fundamental information to understand appropriate treatment.
	PO5	1	Introduces pharmaceutical knowledge related to cardiovascular drug therapy. Students become familiar with commonly used therapeutic approaches.
	PO6	1	Creates awareness of professional responsibilities in cardiovascular disease management. Students understand the importance of appropriate and responsible drug use.
	PO7	2	Develops awareness of safe and rational pharmacotherapy for cardiovascular disorders. Students recognize the importance of responsible medication use.
	PO8	—	-
	PO9	3	Provides basic knowledge supporting professional communication in pharmacotherapeutic practice. Students understand the importance of communicating treatment-related information appropriately.
CO2	PO1	3	Provides strong knowledge of pharmacotherapeutic management of respiratory and endocrine disorders. Students develop a sound foundation for understanding drug therapy in these conditions.
	PO2	-	-
	PO3	—	-
	PO4	1	Develops basic understanding of therapeutic problems associated with respiratory and endocrine disorders. Students interpret fundamental information related to their pharmacotherapy.
	PO5	1	Introduces the application of pharmaceutical knowledge to respiratory and endocrine drug therapy. Students become familiar with appropriate medicines and treatment approaches.

	PO6	1	Develops awareness of professional responsibilities in managing respiratory and endocrine disorders. Students understand the importance of appropriate medication use.
	PO7	2	Promotes awareness of safe and rational pharmacotherapy for respiratory and endocrine disorders. Students recognize the importance of responsible medicine use.
	PO8	—	-
	PO9	2	Develops basic communication related to pharmacotherapeutic information. Students learn to understand and communicate treatment-related information appropriately.
CO3	PO1	3	Provides strong pharmaceutical knowledge related to CNS and hematological disorders. Students apply pharmacotherapeutic principles to understand appropriate treatment.
	PO2	1	Students use basic patient and disease information while applying pharmacotherapeutic principles. This supports selection and understanding of suitable treatment approaches.
	PO3	-	-
	PO4	1	Develops the ability to interpret therapeutic problems in CNS and hematological disorders. Students apply relevant information to understand patient management.
	PO5	1	Introduces the use of pharmaceutical knowledge in applying drug therapy. Students become familiar with therapeutic options for CNS and hematological conditions.
	PO6	1	Creates awareness of professional responsibilities during pharmacotherapeutic decision-making. Students understand the need for safe and appropriate drug use.
	PO7	2	Promotes responsible use of medicines in CNS and hematological disorders. Students recognize the importance of safe and rational pharmacotherapy.
	PO8	—	-
	PO9	2	Develops basic communication skills related to patient treatment. Students understand the need to communicate therapeutic information clearly.
CO4	PO1	3	Provides strong knowledge of pharmacotherapeutic management of infectious diseases. Students analyze antimicrobial therapy and related treatment principles.

	PO2	-	-
	PO3	-	-
	PO4	1	Develops basic ability to analyze therapeutic problems associated with infectious diseases. Students interpret relevant information for appropriate pharmacotherapy.
	PO5	1	Helps students analyze the use of antimicrobial medicines in infectious diseases. Students understand appropriate selection and use of therapeutic agents.
	PO6	1	Develops awareness of professional responsibilities in antimicrobial therapy. Students understand the importance of responsible antimicrobial use.
	PO7	3	Strongly emphasizes rational and responsible use of antimicrobial medicines. Students understand the importance of preventing inappropriate antimicrobial use and resistance.
	PO8	—	-
	PO9	3	Develops communication related to infectious disease treatment and antimicrobial use. Students can explain important treatment information clearly.
CO5	PO1	3	Provides strong knowledge of pharmacotherapeutic management of GI, musculoskeletal and dermatological disorders. Students evaluate treatment options using pharmaceutical and therapeutic knowledge.
	PO2	1	Students use patient and disease information to evaluate therapeutic approaches. This supports understanding of suitable treatment options for different disorders.
	PO3	-	-
	PO4	1	Develops the ability to evaluate therapeutic problems and treatment options. Students assess relevant information to support appropriate pharmacotherapy.
	PO5	2	Students evaluate medicines and therapeutic approaches used in different disorders. This strengthens their ability to use pharmaceutical knowledge in patient care.
	PO6	1	Develops awareness of professional responsibilities while evaluating treatment options. Students recognize the importance of safe and appropriate therapy.

	PO7	3	Strongly promotes safe and rational use of medicines in common disorders. Students evaluate therapy while considering responsible medication use.
	PO8	—	-
	PO9	3	Develops communication skills required for explaining treatment and medication-related information. Students can communicate therapeutic advice clearly.
CO6	PO1	3	Provides strong knowledge required to develop patient-specific therapeutic and counselling plans. Students integrate pharmacotherapeutic knowledge to address diverse health conditions.
	PO2	2	Students analyze patient-specific information while developing individualized therapeutic plans. They use clinical information to identify suitable treatment and counselling approaches.
	PO3	2	Encourages students to develop appropriate patient-specific therapeutic and counselling plans. They apply professional knowledge to formulate practical solutions for patient care.
	PO4	1	Strongly develops the ability to analyze patient-specific therapeutic needs. Students evaluate clinical information before preparing individualized management plans.
	PO5	3	Strongly integrates pharmaceutical knowledge in developing therapeutic plans. Students select appropriate therapeutic approaches and counselling strategies for patients.
	PO6	3	Strongly develops professional responsibility through patient-specific therapy and counselling. Students consider patient needs, safety and ethical aspects while planning care.
	PO7	3	Promotes responsible and rational use of medicines, including antimicrobial resistance management. Students develop plans that support safe medication use and better health outcomes.
	PO8	—	-
	PO9	3	Strongly develops communication and counselling skills for patient care. Students formulate and communicate individualized therapeutic advice clearly and effectively.

GAP Analysis:

PO	Mapping %	GAP %	Action plan to fill the GAP
PO1	100.00	0.00	-
PO2	50	50	-
PO3	16.67	83.33	Increase opportunities for students to develop leadership and teamwork skills through community pharmacy camps, group Activities, PPT Presentations.
PO4	100.00	0.00	-
PO5	100	00	-
PO6	100.00	0.00	-
PO7	100.00	0.00	-
PO8	0.00	100.00	Conduct guest lecture on green chemistry and biochemical waste management.
PO9	100.00	0.00	-

Teaching plan:

Lecture No.	Teaching Plan	Hours	Course Outcome	Teaching Methodology (Like PPT, Notes etc.)
1	Introduction of Pharmacotherapeutics	1	ER20-24T.1	PPT Notes, Lecturing, Smart Board
2	Scope of Pharmacotherapeutics	1	ER20-24T.1	PPT Notes, Lecturing, Smart Board
3	Objective of Pharmacotherapeutics	1	ER20-24T.1	PPT Notes, Lecturing, Smart Board
4	Tutorial NO 1 : Revision, Class Test	1		Discussion, Test
5	Rational use of Medicines	1	ER20-24T.1	PPT Notes, Lecturing, Smart Board
6	Evidence Based Medicine	1	ER20-24T.1	PPT Notes, Lecturing, Smart Board
7	Essential Medicines List	1	ER20-24T.1	PPT Notes, Lecturing, Smart Board
8	Tutorial No 2: Revision, Class Test	1		Discussion, Test
9	Standard Treatment Guidelines (STGs)-1	1	ER20-24T.1	PPT Notes, Lecturing, Smart Board
10	Standard Treatment Guidelines (STGs)-2	1	ER20-24T.1	PPT Notes, Lecturing, Smart Board
11	(a) Cardiovascular System Definition, etiopathogenesis of Hypertension	1	ER20-24T.1	PPT Notes, Lecturing, Smart Board
12	Tutorial No 3: Revision, Class Test	1		Discussion, Test
13	Clinical manifestations, non-pharmacological and pharmacological management of Hypertension	1	ER20-24T.1	PPT Notes, Lecturing, Smart Board

14	Definition, etiopathogenesis of Angina and Myocardial infarction	1	ER20-24T.1	PPT Notes, Lecturing, Smart Board
15	Clinical manifestations, non-pharmacological and pharmacological management of Angina and Myocardial infarction	1	ER20-24T.1	PPT Notes, Lecturing, Smart Board
16	Tutorial No 4: Revision, Class Test	1		Discussion, Test
17	Definition, causes of Hyperlipidemia	1	ER20-24T.1	PPT Notes, Lecturing, Smart Board
18	Clinical manifestations, non-pharmacological and pharmacological management Hyperlipidemia	1	ER20-24T.1	PPT Notes, Lecturing, Smart Board
19	Definition, etiopathogenesis of Congestive Heart Failure	1	ER20-24T.1	PPT Notes, Lecturing, Smart Board
20	Tutorial No 5: Revision, Class Test	1		Discussion, Test
21	Clinical manifestations, non-pharmacological and pharmacological management Congestive Heart Failure	1	ER20-24T.1	PPT Notes, Lecturing, Smart Board
22	(b) Respiratory System Definition, causes of Asthma	1	ER20-24T.2	PPT Notes, Lecturing, Smart Board
23	Clinical manifestations, non-pharmacological and pharmacological management of Asthma	1	ER20-24T.2	PPT Notes, Lecturing, Smart Board
24	Tutorial No 6: Revision, Class Test	1		Discussion, Test
25	Definition, causes of COPD	1	ER20-24T.2	PPT Notes, Lecturing, Smart Board
26	Clinical manifestations, non-pharmacological and pharmacological management COPD	1	ER20-24T.2	PPT Notes, Lecturing, Smart Board
27	(c) Endocrine System-Definition and causes of Diabetes	1	ER20-24T.2	PPT Notes, Lecturing, Smart Board
28	Tutorial No 7: Revision, Class Test	1		Discussion, Test

29	Clinical manifestations, non-pharmacological and pharmacological management Diabetes	1	ER20-24T.2	PPT Notes, Lecturing, Smart Board
30	Thyroid disorders	1	ER20-24T.2	PPT Notes, Lecturing, Smart Board
31	Definition, Etiopathogenesis of Hypothyroidism	1	ER20-24T.2	PPT Notes, Lecturing, Smart Board
32	Tutorial No 8: Revision, Class Test	1		Discussion, Test
33	Clinical manifestations, non-pharmacological and pharmacological management of Hyperthyroidism	1	ER20-24T.2	PPT Notes, Lecturing, Smart Board
34	(d) Central Nervous System - Definition, Etiopathogenesis of Epilepsy	1	ER20-24T.3	PPT Notes, Lecturing, Smart Board
35	Clinical manifestations, non-pharmacological and pharmacological management of Epilepsy	1	ER20-24T.3	PPT Notes, Lecturing, Smart Board
36	Tutorial NO 9: Revision, Class Test	1		Discussion, Test
37	Definition, Etiopathogenesis of Epilepsy Parkinson's disease	1	ER20-24T.3	PPT Notes, Lecturing, Smart Board
38	Clinical manifestations, non-pharmacological and pharmacological management of Parkinson's disease	1	ER20-24T.3	PPT Notes, Lecturing, Smart Board
39	Definition, Etiopathogenesis of Alzheimer's disease	1	ER20-24T.3	PPT Notes, Lecturing, Smart Board
40	Tutorial No 10: Revision, Class Test	1		Discussion, Test
41	Clinical manifestations, non-pharmacological and pharmacological management of Alzheimer's disease	1	ER20-24T.3	PPT Notes, Lecturing, Smart Board
42	CNS- Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Stroke	1	ER20-24T.3	PPT Notes, Lecturing, Smart Board

43	CNS- Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Migraine	1	ER20-24T.3	PPT Notes, Lecturing, Smart Board
44	Tutorial NO 11: Revision, Class Test	1		Discussion, Test
45	(e) Gastro Intestinal Disorders Definition, Etiopathogenesis of Gastro esophageal reflux disease	1	ER20-24T.5	PPT Notes, Lecturing, Smart Board
46	Clinical manifestations, non-pharmacological and pharmacological management of Gastro esophageal reflux disease	1	ER20-24T.5	PPT Notes, Lecturing, Smart Board
47	Definition, Etiopathogenesis of Peptic Ulcer Disease	1	ER20-24T.5	PPT Notes, Lecturing, Smart Board
48	Tutorial No 12: Revision, Class Test	1		Discussion, Test
49	Clinical manifestations, non-pharmacological and pharmacological management of Peptic Ulcer Disease	1	ER20-24T.5	PPT Notes, Lecturing, Smart Board
50	Definition, Etiopathogenesis of Alcoholic liver disease	1	ER20-24T.5	PPT Notes, Lecturing, Smart Board
51	Clinical manifestations, non-pharmacological and pharmacological management of Alcoholic liver disease	1	ER20-24T.5	PPT Notes, Lecturing, Smart Board
52	Tutorial No 13: Revision, Class Test	1		Discussion, Test
53	Inflammatory Bowel Diseases- Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Crohn's Disease	1	ER20-24T.5	PPT Notes, Lecturing, Smart Board
54	Inflammatory Bowel Diseases- Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Ulcerative Colitis	1	ER20-24T.5	PPT Notes, Lecturing, Smart Board
55	Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Iron deficiency anemia	1	ER20-24T.5	PPT Notes, Lecturing, Smart Board

56	Tutorial No 14: Revision, Class Test	1		Discussion, Test
57	Definition, Etiopathogenesis of Megaloblastic anemia	1	ER20-24T.5	PPT Notes, Lecturing, Smart Board
58	Clinical manifestations, non-pharmacological and pharmacological management of Megaloblastic anemia	1	ER20-24T.5	PPT Notes, Lecturing, Smart Board
59	(g) Infectious diseases Definition, Etiopathogenesis of Tuberculosis	1	ER20-24T.4	PPT Notes, Lecturing, Smart Board
60	Tutorial No 15: Revision, Class Test	1		Discussion, Test
61	Clinical manifestations, non-pharmacological and pharmacological management of Tuberculosis	1	ER20-24T.4	PPT Notes, Lecturing, Smart Board
62	Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Pneumonia	1	ER20-24T.4	PPT Notes, Lecturing, Smart Board
63	Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Urinary tract infections	1	ER20-24T.4	PPT Notes, Lecturing, Smart Board
64	Tutorial No 16: Revision, Class Test	1		Discussion, Test
65	Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Hepatitis	1	ER20-24T.4	PPT Notes, Lecturing, Smart Board
66	pharmacological management of Malaria	1	ER20-24T.4	PPT Notes, Lecturing, Smart Board
67	Gonorrhea	1	ER20-24T.4	PPT Notes, Lecturing, Smart Board
68	Tutorial No 17: Revision, Class Test	1		Discussion, Test
69	Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of HIV	1	ER20-24T.4	PPT Notes, Lecturing, Smart Board

70	Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Opportunistic infections	1	ER20-24T.4	PPT Notes, Lecturing, Smart Board
71	Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Viral Infections SARS	1	ER20-24T.4	PPT Notes, Lecturing, Smart Board
72	Tutorial No 18: Revision, Class Test	1		Discussion, Test
73	Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Viral Infections CoV2	1	ER20-24T.4	PPT Notes, Lecturing, Smart Board
74	Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Syphilis	1	ER20-24T.4	PPT Notes, Lecturing, Smart Board
75	h) Musculoskeletal disorders Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Rheumatoid arthritis	1	ER20-24T.5	PPT Notes, Lecturing, Smart Board
76	Tutorial No 19: Revision, Class Test	1		Discussion, Test
77	Definition, Etiopathogenesis of Osteoarthritis	1	ER20-24T.5	PPT Notes, Lecturing, Smart Board
78	Clinical manifestations, non-pharmacological and pharmacological management of Osteoarthritis	1	ER20-24T.5	PPT Notes, Lecturing, Smart Board
79	Dermatology- Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Scabies	1	ER20-24T.5	4PPT Notes, Lecturing, Smart Board
80	Tutorial No 20: Revision, Class Test	1		Discussion, Test
81	Dermatology- Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Eczema	1	ER20-24T.5	PPT Notes, Lecturing, Smart Board
82	J) Psychiatric Disorders- Definition, Etiopathogenesis, Clinical manifestations, non-	1	ER20-24T.6	PPT Notes, Lecturing, Smart Board

	pharmacological and pharmacological management of Depression			
83	Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Anxiety	1	ER20-24T.6	PPT Notes, Lecturing, Smart Board
84	Tutorial No 21: Revision, Class Test	1		Discussion, Test
85	Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Psychosis	1	ER20-24T.6	PPT Notes, Lecturing, Smart Board
86	K) Ophthalmology- Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Conjunctivitis	1	ER20-24T.6	PPT Notes, Lecturing, Smart Board
87	Definition, Etiopathogenesis, of Glaucoma	1	ER20-24T.6	PPT Notes, Lecturing, Smart Board
88	Tutorial No 22: Revision, Class Test	1		Discussion, Test
89	Clinical manifestations, non-pharmacological and pharmacological management of Glaucoma	1	ER20-24T.6	PPT Notes, Lecturing, Smart Board
90	Definition, Causes Anti-Microbial Resistance	1	ER20-24T.6	PPT Notes, Lecturing, Smart Board
91	Clinical manifestations, non-pharmacological and pharmacological management Antimicrobial Resistance	1	ER20-24T.6	PPT Notes, Lecturing, Smart Board
92	Tutorial No 23: Revision, Class Test	1		Discussion, Test
93	M) Women's Health-	1	ER20-24T.6	PPT Notes, Lecturing, Smart Board
94	Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and pharmacological management of Polycystic Ovary Syndrome	1	ER20-24T.6	PPT Notes, Lecturing, Smart Board
95	Definition, Etiopathogenesis, Clinical manifestations, non-pharmacological and	1	ER20-24T.6	PPT Notes, Lecturing, Smart Board

	pharmacological management of Dysmenorrhea			
96	Tutorial No 24: Revision, Class Test	1		Discussion, Test
97	Definition, Etiopathogenesis of Depression	1	ER20-24T.6	PPT Notes, Lecturing, Smart Board
98	Clinical manifestations, non-pharmacological and pharmacological management of Depression	1	ER20-24T.6	PPT Notes, Lecturing, Smart Board
99	Final Paper Discussion	1	ER20-24T.6	PPT Notes, Lecturing, Smart Board
100	Tutorial No 25: Revision, Class Test	1		Discussion, Test

Subject name: Pharmacotherapeutics

Subject Code: ER20-24P

Theory / Practical: Practical

Program Outcomes:

PO. No.	Program Outcome (PO)
1	Pharmacy Knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy.
2	Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
3	Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
4	Professional Identity: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
5	Pharmaceutical Ethics: Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
6	Communication: Communicate effectively with the pharmacy community and with society, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
7	The Pharmacist and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
8	Environment and sustainability: understand the impact of the professional pharmacy solutions in societal and environmental contexts, demonstrate the knowledge of, and need for sustainable development.
9	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Outcome:

CO Code	Course Outcome (CO)	Blooms Level
ER20-24P.1	Explain the pharmacotherapy of cardiovascular disorders using SOAP notes.	L2-Understand
ER20-24P.2	Apply the principles of pharmacotherapy to prepare and interpret SOAP notes for endocrine, respiratory, and musculoskeletal disorders.	L3-Apply
ER20-24P.3	Analyze patient cases by preparing and discussing SOAP notes for neurological and hematological disorders.	L4-Analyze
ER20-24P.4	Evaluate appropriate pharmacotherapeutic interventions for infectious and dermatological disorders using SOAP-based case discussions.	L5-Evaluate
ER20-24P.5	Develop effective patient counselling plans to improve medication adherence, therapeutic outcomes, and patient safety.	L6-Create
ER20-24P.6	Calculate and justify appropriate drug doses for special patient populations, including pediatric, geriatric, renal failure, and hepatic dysfunction cases.	L3-Apply

CO-PO Mapping:

COs \ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
ER20-24 P.1	3	-	-	2	-	1	1	-	2
ER20-24 P.2	3	-	1	2	-	2	2	-	3
ER20-24 P.3	3	-	-	2	1	2	2	-	3
ER20-24 P.4	3	1	-	3	2	2	3	-	3
ER20-24 P.5	2	1	2	3	3	3	3	-	3
ER20-24 P.6	3	2	-	2	1	2	3	-	2

3 = High Correlation

2 = Moderate Correlation

1 = Low Correlation

– = No Correlation

Justification of CO–PO Mapping:

Course Outcome	Program Outcome	Level	Justification
CO1	PO1	3	Develops knowledge of cardiovascular diseases and their pharmacotherapeutic management through SOAP case studies.
	PO2	-	-
	PO3	-	-
	PO4	2	Recognizes the professional role of the pharmacist in documenting and monitoring patient therapy.
	PO5	-	-
	PO6	1	Improves written communication through preparation and discussion of SOAP notes.
	PO7	1	Promotes rational drug therapy to improve patient health and safety.
	PO8	-	-
	PO9	2	Encourages self-learning while studying disease conditions and treatment guidelines.
CO2	PO1	3	Applies pharmacy knowledge to manage common chronic disorders through patient cases.
	PO2	-	-
	PO3	1	Participates in case discussions and collaborative learning activities.
	PO4	2	Demonstrates the pharmacist's role in providing appropriate patient care.
	PO5	-	-
	PO6	2	Communicates clinical findings effectively through SOAP presentations.
	PO7	2	Supports safe and rational use of medicines for chronic diseases.

	PO8	-	-
	PO9	3	Develops independent learning through case-based exercises.
CO3	PO1	3	Analyzes disease conditions and selects appropriate pharmacotherapy.
	PO2	-	-
	PO3	-	-
	PO4	2	Strengthens professional responsibility in clinical case evaluation.
	PO5	1	Considers ethical aspects while handling patient information.
	PO6	2	Presents and discusses patient cases clearly and accurately.
	PO7	2	Promotes patient safety through evidence-based therapeutic decisions.
	PO8	-	-
	PO9	3	Improves critical thinking and lifelong learning through case analysis.
CO4	PO1	3	Evaluates suitable pharmacotherapy based on disease condition and patient needs.
	PO2	1	Uses therapeutic guidelines to evaluate treatment options.
	PO3	-	-
	PO4	3	Demonstrates professional judgment while evaluating patient therapy.
	PO5	2	Applies ethical principles during patient care and medication selection.
	PO6	2	Communicates treatment plans effectively during case discussions.
	PO7	3	Promotes rational antimicrobial use and patient safety.

	PO8	-	-
	PO9	3	Updates knowledge using current treatment recommendations.
CO5	PO1	2	Uses pharmacotherapy knowledge while counselling patients.
	PO2	1	Uses counselling aids and patient information resources effectively.
	PO3	2	Demonstrates leadership and teamwork during patient counselling activities.
	PO4	3	Performs the professional role of a pharmacist in patient education.
	PO5	3	Follows ethical principles, confidentiality and respect during counselling.
	PO6	3	Develops effective verbal and interpersonal communication skills.
	PO7	3	Encourages safe medicine use and improves community health outcomes.
	PO8	-	-
	PO9	3	Builds confidence through continuous learning and patient interaction.
CO6	PO1	3	Applies pharmacotherapy knowledge to calculate appropriate drug doses.
	PO2	2	Uses calculation methods and clinical data to determine correct doses.
	PO3	-	-
	PO4	2	Demonstrates professional competence in individualized dose selection.
	PO5	1	Ensures ethical responsibility by minimizing medication errors.
	PO6	2	Documents and explains dose calculations clearly.
	PO7	3	Supports patient safety through accurate dose adjustment in special populations.

	PO8	-	
	PO9	2	Encourages continuous improvement in calculation and clinical decision-making skills.

Gap Analysis:

PO	Mapping %	GAP %	Action plan to fill the GAP
PO1	100	0	-
PO2	50	50	-
PO3	33.33	66.67	-
PO4	100	0	-
PO5	66.67	33.33	-
PO6	100	0	-
PO7	100	0	-
PO8	0	100	Conduct a practical activity on pharmaceutical waste segregation and safe disposal in which students classify unused/expired medicines and demonstrate appropriate disposal procedures using simulated materials.
PO9	100	0	-

Practical plan:

Practical No.	Practical Plan	Hours	Course Outcome	Teaching Methodology (Like PPT, Notes etc.)
1	Write Subjective, Objective, Assessment and Plan (SOAP) notes for Hypertension	1	ER20-24T.1	Smart Board, Test/Viva
2	Write SOAP notes for Angina Pectoris	1	ER20-24T.1	Smart Board, Test/Viva
3	Write SOAP notes for Myocardial Infarction	1	ER20-24T.1	Smart Board, Test/Viva
4	Write SOAP notes for Hyperlipidemia	1	ER20-24T.1	Smart Board, Test/Viva
5	Write SOAP notes for Diabetes.	1	ER20-24T.2	Smart Board, Test/Viva
6	Write SOAP notes for Asthma	1	ER20-24T.2	Smart Board, Test/Viva
7	Write SOAP notes for COPD	1	ER20-24T.2	Smart Board, Test/Viva
8	Write SOAP notes for Rheumatoid arthritis	1	ER20-24T.2	Smart Board, Test/Viva
9	Write SOAP notes for Epilepsy	1	ER20-24T.3	Smart Board, Test/Viva
10	Write SOAP notes for Stroke	1	ER20-24T.3	Smart Board, Test/Viva
11	Write SOAP notes for Depression	1	ER20-24T.3	Smart Board, Test/Viva
12	Write SOAP notes for Anemia	1	ER20-24T.3	Smart Board, Test/Viva
13	Write SOAP notes for Tuberculosis	1	ER20-24T.4	Smart Board, Test/Viva
14	Write SOAP notes for AIDS	1	ER20-24T.4	Smart Board, Test/Viva
15	Write SOAP notes for Scabies	1	ER20-24T.4	Smart Board, Test/Viva
16	Patient Counselling for Hypertension (Case 1)	1	ER20-24T.5	Smart Board, Test/Viva
17	Patient Counselling for Epilepsy (Case 2)	1	ER20-24T.5	Smart Board, Test/Viva
18	Patient Counselling for COPD (Case 3)	1	ER20-24T.5	Smart Board, Test/Viva

19	Expt. No. 19 Patient Counselling for Depression (Case 4)	1	ER20-24T.5	Smart Board, Test/Viva
20	Expt. No. 20 Patient Counselling for Tuberculosis (Case 5)	1	ER20-24T.5	Smart Board, Test/Viva
21	Expt. No. 21 Dose Calculation of Selected Drug in Pediatric Patients	1	ER20-24T.6	Smart Board, Test/Viva
22	Expt. No. 22 Dose Calculation of Selected Drug in Pediatric Patient	1	ER20-24T.6	Smart Board, Test/Viva
23	Expt. No. 23 Dose Calculation of Selected Drug in Geriatric Patients	1	ER20-24T.6	Smart Board, Test/Viva
24	Expt. No. 24 Dose Calculation in Patients with Impaired Renal Function	1	ER20-24T.6	Smart Board, Test/Viva
25	Expt. No. 25 Dose Calculation in Patients with Hepatic Dysfunction	1	ER20-24T.6	Smart Board, Test/Viva

Subject Name: Pharmacy Law and Ethics

Subject Code: ER20-26T

Theory/ Practical: Theory

Program Outcomes:

PO. No.	Program Outcome (PO)
1	Pharmacy Knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy.
2	Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
3	Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
4	Professional Identity: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
5	Pharmaceutical Ethics: Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
6	Communication: Communicate effectively with the pharmacy community and with society, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
7	The Pharmacist and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
8	Environment and sustainability: understand the impact of the professional pharmacy solutions in societal and environmental contexts, demonstrate the knowledge of, and need for sustainable development.
9	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Outcome:

CO Code	Course Outcome (CO)	Blooms Level
ER20-26T.1	Identify the basic concepts of pharmacy law and the provisions of the Drugs and Cosmetics Act related to schedules, import, and manufacture of drugs.	L1 – Remember
ER20-26T.2	Explain the legal requirements for the sale of drugs, maintenance of records, prohibited drugs, and administration of the Drugs and Cosmetics Act.	L2 – Understand
ER20-26T.3	Apply the provisions of the Pharmacy Act, NDPS Act, Drugs and Magic Remedies Act, Prevention of Cruelty to Animals Act, and Poisons Act in pharmacy practice.	L3 – Apply
ER20-26T.4	Analyze the legal and ethical requirements of FSSAI, DPCO, and the Code of Pharmaceutical Ethics.	L4 – Analyze
ER20-26T.5	Evaluate the roles of regulatory bodies, good regulatory practices, clinical trials, and patent laws in pharmacy.	L5 – Evaluate
ER20-26T.6	Develop ethical and legally compliant pharmacy practices for healthcare and patient safety.	L6 – Create

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
ER20-26T.1	3	—	—	2	3	1	2	1	2
ER20-26T.2	3	-	—	2	3	2	3	2	2
ER20-26T.3	3	—	1	2	3	1	3	—	2
ER20-26T.4	2	—	1	3	3	2	3	2	2
ER20-26T.5	3	-	2	3	3	2	3	-	3
ER20-26T.6	2	2	3	3	3	3	3	2	3

Justification of CO–PO Mapping:

CO	PO	Level	Justification
CO1	PO1	3	Provides basic knowledge of pharmacy laws and important drug regulations. It helps students understand the legal provisions related to drugs.
	PO2	-	-
	PO3	-	-
	PO4	2	Helps students understand the legal duties and responsibilities of a pharmacist. It develops awareness of professional responsibilities.
	PO5	3	Creates awareness about following legal and ethical practices in pharmacy. It helps students understand the importance of responsible professional conduct.
	PO6	1	Clear communication supports proper implementation of legal provisions.
	PO7	2	Helps students understand the importance of drug laws for public health and safety. It creates awareness of the pharmacist's responsibility towards society.
	PO8	1	Helps students to understand schedules of environment and sustainability.
	PO9	2	Encourages students to keep learning about changes in pharmacy laws. It develops awareness of the need to remain updated with regulations.
CO2	PO1	3	Provides knowledge about the legal requirements for selling medicines and maintaining records. It helps students understand the rules governing the supply of medicines.
	PO2	-	-
	PO3	-	-
	PO4	2	Helps students understand the pharmacist's responsibility in the sale of medicines. It promotes responsible professional practice.
	PO5	3	Promotes proper and ethical practices while selling and supplying medicines. It helps students follow legal requirements during pharmacy practice.
	PO6	2	Develops skills in maintaining records and communicating required information clearly. Proper documentation is important for effective pharmacy practice.
	PO7	3	Helps students understand the pharmacist's responsibility for safe and legal supply of medicines. It connects pharmacy practice with public health and patient safety.
	PO8	2	Helps students to understand schedules of environment and sustainability.
	PO9	2	Encourages students to stay updated with changes in drug laws and rules. This supports continuous professional learning.
CO3	PO1	3	Helps students apply important pharmacy laws in professional practice. It develops the ability to use legal provisions in practical situations.
	PO2	-	-

	PO3	1	Develops responsible behaviour while following different pharmacy laws. It supports responsible participation in professional activities.
	PO4	2	Helps students understand their professional duties under different Acts. It strengthens their understanding of the pharmacist's role.
	PO5	3	Promotes ethical and legal handling of drugs, poisons and related activities. It helps students make responsible decisions in pharmacy practice.
	PO6	1	Helps students communicate important legal requirements in pharmacy practice. Clear communication supports proper implementation of legal provisions.
	PO7	3	Develops awareness of legal responsibilities related to health, safety and society. It helps students understand the pharmacist's responsibility towards the public.
	PO8	-	-
	PO9	2	Encourages students to remain aware of changes in pharmacy legislation. It supports continuous updating of professional knowledge.
CO4	PO1	2	Provides knowledge of FSSAI, DPCO and pharmaceutical ethics. It helps students understand important regulatory requirements in pharmacy.
	PO2	-	-
	PO3	1	Develops responsible decision-making in professional situations. It helps students deal responsibly with regulatory and ethical issues.
	PO4	3	Helps students understand the professional role and responsibilities of pharmacists. It develops awareness of proper professional conduct.
	PO5	3	Develops understanding of ethical principles and their use in pharmacy practice. It helps students make responsible and ethical professional decisions.
	PO6	2	Helps students communicate professional and ethical responsibilities clearly. Good communication supports responsible pharmacy practice.
	PO7	3	Connects pharmacy regulations and ethics with public health and society. It helps students understand their responsibility towards patients and society.
	PO8	2	Creates awareness about responsible pharmacy practices and their effect on society and environment. It encourages consideration of environmental responsibilities in professional practice.
	PO9	2	Encourages students to learn about new changes in regulations and professional ethics. It develops the habit of continuous learning.
CO5	PO1	3	Provides knowledge about regulatory bodies, clinical trials, regulatory practices and patent laws. It develops understanding of important legal and regulatory aspects of pharmacy.
	PO2	-	-
	PO3	2	Develops responsible decision-making and leadership in regulatory situations. It helps students participate effectively in professional activities.
	PO4	3	Helps students understand the pharmacist's professional and legal responsibilities. It strengthens their professional identity and role.

	PO5	3	Develops ethical understanding in clinical trials, regulations and patent-related matters. It helps students follow ethical principles in professional decisions.
	PO6	2	Develops communication and documentation skills needed in regulatory activities. Accurate communication is important for regulatory and professional work.
	PO7	3	Helps students understand how regulations protect patients, public health and society. It develops awareness of the pharmacist's social and legal responsibilities.
	PO8	-	-
	PO9	3	Encourages continuous learning because pharmacy regulations and laws change regularly. Students need to update their knowledge throughout their professional career.
CO6	PO1	2	Helps students use pharmacy law knowledge to follow proper pharmacy practices. It supports safe and legally compliant professional work.
	PO2	2	Encourages the use of appropriate professional resources for legal and safe practice. It helps students use available tools to support compliance.
	PO3	3	Develops leadership and responsible decision-making for safe pharmacy practice. It prepares students to take responsibility in professional situations.
	PO4	3	Strengthens the professional role and responsibilities of a pharmacist. It helps students develop a responsible professional identity.
	PO5	3	Develops ethical and legally correct behavior in pharmacy practice. It helps students apply ethical principles while making professional decisions.
	PO6	3	Develops clear communication needed for patient safety and healthcare. Effective communication helps prevent errors and supports proper patient care.
	PO7	3	Helps students understand their responsibility towards patients, healthcare and society. It promotes safe and responsible pharmacy practice.
	PO8	2	Encourages responsible pharmacy practices that consider environmental and social effects. It develops awareness of sustainable professional practices.
	PO9	3	Encourages continuous learning and improvement for safe and legally compliant practice. It prepares students to keep updating their professional knowledge

Gap Analysis:

PO	Mapping %	GAP %	Action plan to fill the GAP
PO1	100	0	-
PO2	16.67	83.33	Encourage student's seminar about different software used in Pharmacy law & Ethics.
PO3	66.67	33.33	-
PO4	100	0	-
PO5	100	0	-
PO6	100	0	-
PO7	100	0	-
PO8	66.67	33.33	-
PO9	100	0	-

Teaching plan:

Lecture No.	Teaching Plan	Hours	Course Outcome	Teaching Methodology (Like PPT, Notes etc.)
1	General principles of law	1	ER20-26T.1	PPT, Notes, Smart Board
2	History and various acts related to drug and pharmacy profession	1	ER20-26T.1	PPT, Notes, Smart Board
3	Introduction, education regulation	1	ER20-26T.	PPT, Notes, Smart Board
4	Tutorial 1: Class Test on topic general principles of ethics.	1		Discussion, Test
5	New ER-2020	1	ER20-26T.	PPT, Notes, Smart Board
6	Education regulation 1991, State pharmacy council,	1	ER20-26T.	PPT, Notes, Smart Board
7	registration of pharmacist	1	ER20-26T.	PPT, Notes, Smart Board
8	Tutorial 2: Class Test on topic State pharmacy council	1		Discussion, Test
9	Pharmacy practice regulation ,2015	1	ER20-26T.	PPT, Notes, Smart Board
10	Manufacture of drugs for test, examination and analysis.	1	ER20-26T.1	PPT, Notes, Smart Board
11	Manufacture of new drug, loan license and repacking license	1	ER20-26T.1	PPT, Notes, Smart Board
12	Tutorial 3: Class Test	1		Discussion, Test
13	Study of schedule A to M	1	ER20-26T.1	PPT, Notes, Smart Board
14	Study of schedule N to X	1	ER20-26T.1	PPT, Notes, Smart Board
15	In detail schedule G, H, X	1	ER20-26T.1	PPT, Notes, Smart Board
16	Tutorial 4: Group Discussion	1		Discussion, Test
17	Sale of drugs	1	ER20-26T.1	PPT, Notes, Smart Board
18	wholesale, retail and restricted license	1	ER20-26T.1	PPT, Notes, Smart Board

19	Records in pharmacy drugs prohibited for mfg. and sale	1	ER20-26T.1	PPT, Notes, Smart Board
20	Tutorial 5: Revision	1		Discussion, Test
21	Records in pharmacy drugs prohibited for manufacturer and sale	1	ER20-26T.1	PPT, Notes, Smart Board
22	Administration of the act and rules: Drugs Technical Advisory Board	1	ER20-26T.2	PPT, Notes, Smart Board
23	Drugs Consultative Committee	1	ER20-26T.2	PPT, Notes, Smart Board
24	Tutorial 6: Class Test	1		Discussion, Test
25	Government analyst	1	ER20-26T.2	PPT, Notes, Smart Board
26	Licensing authority, controlling authority	1	ER20-26T.2	PPT, Notes, Smart Board
27	Drug inspector	1	ER20-26T.2	PPT, Notes, Smart Board
28	Tutorial 7: Group Discussion	1		Discussion, Test
29	Introduction, objectives, definitions	1	ER20-26T.2	PPT, Notes, Smart Board
30	Legal definitions of schedules to the act and rules import of drugs	1	ER20-26T.2	PPT, Notes, Smart Board
31	Legal definitions of schedules to the act and rules import drugs	1	ER20-26T.2	PPT, Notes, Smart Board
32	Tutorial 8: Class Test and Discussion	1		Discussion, Test
33	Classes of drugs and cosmetics prohibited from import	1	ER20-26T.2	PPT, Notes, Smart Board
34	Import under license or permit	1	ER20-26T.2	PPT, Notes, Smart Board
35	Manufacture of drugs	1	ER20-26T.2	PPT, Notes, Smart Board
36	Tutorial 9: Paper presentation skills	1		Discussion, Test

37	Prohibition of manufacture and sale of certain drugs	1	ER20-26T.2	PPT, Notes, Smart Board
38	Conditions for grant of license	1	ER20-26T.2	PPT, Notes, Smart Board
39	Conditions of license for manufacture of drugs	1	ER20-26T.2	PPT, Notes, Smart Board
40	Tutorial 10: Class test and group discussion	1		Discussion, Test
41	Medicinal and Toilet Preparations Act 1955: Objectives, Definitions	1	ER20-26T.3	PPT, Notes, Smart Board
42	Licensing, Offences and Penalties	1	ER20-26T.3	PPT, Notes, Smart Board
43	Objectives, Definitions, Authorities and Officers, Prohibition,	1	ER20-26T.3	PPT, Notes, Smart Board
44	Tutorial 11: Unit Test	1		Discussion, Test
45	Control and Regulation, Offences and Penalties.	1	ER20-26T.3	PPT, Notes, Smart Board
46	Introduction Objectives, Definitions, Prohibition of certain advertisements	1	ER20-26T.3	PPT, Notes, Smart Board
47	Classes of Exempted advertisements, Offences and Penalties	1	ER20-26T.3	PPT, Notes, Smart Board
48	Tutorial 12: unit test	1		Discussion, Test
49	Objectives, Definitions, CPCSEA - brief overview, Institutional Animal Ethics Committee, Breeding and Stocking of Animals, Performance of Experiments, Transfer and Acquisition of animals for experiment	1	ER20-26T.3	PPT, Notes, Smart Board
50	Records, Power to suspend or revoke registration, Offences and Penalties.	1	ER20-26T.3	PPT, Notes, Smart Board
51	Introduction, objective, definition, possession	1	ER20-26T.3	PPT, Notes, Smart Board

52	Tutorial 13: Group Study and test	1		Discussion, Test
53	possession for sales and sale of any poison, import of poisons	1	ER20-26T.3	PPT, Notes, Smart Board
54	brief overview and aspects related to manufacture, storage	1	ER20-26T.4	PPT, Notes, Smart Board
55	sale and labelling of Food Supplements	1	ER20-26T.4	PPT, Notes, Smart Board
56	Tutorial 14: Group study	1		Discussion, Test
57	Drugs Price Control Order (DPCO) - 2013.	1	ER20-26T.4	PPT, Notes, Smart Board
58	Objectives, Definitions, Sale prices of bulk drugs of DPCO	1	ER20-26T.4	PPT, Notes, Smart Board
59	Retail price of formulations, Retail price and ceiling price of scheduled formulations	1	ER20-26T.4	PPT, Notes, Smart Board
60	Tutorial: 15 Revision and class test	1		Discussion, Test
61	pharmaceutical policy 2002	1	ER20-26T.4	PPT, Notes, Smart Board
62	Definition, ethical principles of pharmaceutical policy 2002	1	ER20-26T.4	PPT, Notes, Smart Board
63	ethical problem solving, registration	1	ER20-26T.4	PPT, Notes, Smart Board
64	Tutorial 16: Group Discussion	1		Discussion, Test
65	code of ethics for Pharmacist in relation to his job, trade	1	ER20-26T.4	PPT, Notes, Smart Board
66	medical profession and his profession	1	ER20-26T.4	PPT, Notes, Smart Board
67	Pharmacist's oath.	1	ER20-26T.4	PPT, Notes, Smart Board
68	Tutorial 17: On units	1		Discussion, Test

69	Medical Termination of Pregnancy Act and Rules – basic understanding	1	ER20-26T.5	PPT, Notes, Smart Board
70	Medical Termination of Pregnancy Act and Rules –salient features	1	ER20-26T.5	PPT, Notes, Smart Board
71	Role of all the government pharma regulator bodies – Central Drugs Standards Control Organization (CDSCO), Indian Pharmacopoeia Commission (IPC)	1	ER20-26T.5	PPT, Notes, Smart Board
72	Tutorial 18: class tests	1		Discussion, Test
73	Good Regulatory practices (documentation, licenses, renewals, e-governance) in Community Pharmacy,	1	ER20-26T.5	PPT, Notes, Smart Board
74	Hospital, pharmacy, Pharma Manufacturing, Wholesale business.	1	ER20-26T.5	PPT, Notes, Smart Board
75	inspections, import, export of drugs and medical devices	1	ER20-26T.5	PPT, Notes, Smart Board
76	Tutorial 19: Class test	1		Discussion, Test
77	Introduction to BCS system of classification, Basic concepts of Clinical Trials	1	ER20-26T.5	PPT, Notes, Smart Board
78	ANDA, NDA, New Drug development,	1	ER20-26T.5	PPT, Notes, Smart Board
79	Schedule Y. Brand v/s Generic	1	ER20-26T.5	PPT, Notes, Smart Board
80	Tutorial 20: Test	1		Discussion, Test

81	Trade name concept, Introduction to Patent Law and Intellectual Property Rights	1	ER20-26T.5	PPT, Notes, Smart Board
82	Emergency Use Authorization	1	ER20-26T.5	PPT, Notes, Smart Board
83	basic requirements IPR	1	ER20-26T.5	PPT, Notes, Smart Board
84	Tutorial 21: CLASS TEST	1		Discussion, Test
85	functions of IPR	1	ER20-26T.5	PPT, Notes, Smart Board
86	Aspects related to Pharmacy	1	ER20-26T.6	PPT, Notes, Smart Board
87	Clinical Establishment Act and Rules – Aspects related to Pharmacy	1	ER20-26T.6	PPT, Notes, Smart Board
88	Tutorial 22: Revision	1		Discussion, Test
89	Basic aspects, and aspects related to pharma manufacture to disposal of pharma / medical waste at homes,	1	ER20-26T.6	PPT, Notes, Smart Board
90	Pharmacies, and hospitals	1	ER20-26T.6	PPT, Notes, Smart Board
91	Basic concepts, history and principles. Brief overview of ICMR's National Ethical Guidelines for Biomedical	1	ER20-26T.6	PPT, Notes, Smart Board
92	Tutorial 23: tests	1		Discussion, Test
93	Health Research involving human participants	1	ER20-26T.6	PPT, Notes, Smart Board
94	consumers the power to seek redress for faulty products, misleading information, or deceptive conduct	1	ER20-26T.6	PPT, Notes, Smart Board
95	Categorization	1	ER20-26T.6	PPT, Notes, Smart Board
96	Tutorial 24: Revision	1		Discussion, Test
97	Basic aspects related to manufacture and sale	1	ER20-26T.6	PPT, Notes, Smart Board
98	Revision	1	ER20-26T.6	PPT, Notes, Smart Board
99	Class Test Discussion	1	ER20-26T.6	PPT, Notes, Smart Board
100	Tutorial 25: Revision and Test	1		Discussion, Test