



SANT DNYANESHWAR SHIKSHAN SANSTHA'S
**ANNASAHEB DANGE COLLEGE OF
D PHARMACY, ASHTA**

ACADEMIC BOOKLET

A.Y. 2022-23



Sant Dnyaneshwar Shikshan Sanstha's
Annasaheb Dange College of D.Pharmacy, Ashta
Tal.-Walwa, Dist.-Sangli, Maharashtra, India 416 301



Institute Vision:

To create Pharmacy professional of finest quality to serve healthcare system of society.

Institute Mission:

1. To serve and sustain an academic environment which is conducive to transform the students into skilled and knowledgeable Pharmacy professionals.
2. To encourage and train the students to meet need of healthcare services.
3. To develop communication and management skill of students to become successful entrepreneur.
4. To help the students to inculcate the knowledge for betterment of society.

Program Educational Objectives

The graduates shall be able to-

PEO I:Gain the knowledge and pursue higher education as per their potential.

PEO II:Based on their acquired knowledge and proven competence, will serve as enterprising professional in any organization

PEO III:Support the healthcare need by initiating startups and working in healthcare related services.

PEO IV:Initiate and Participate in public welfare activities.



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Course List

Class: S.Y. D. Pharm

Sr. No	Name of Subject	Course Abbreviation	Course Code
01	Pharmacology	PGT	20221
02	Pharmacology	PGP	20056
03	Community Pharmacy and Management	CMT	20222
04	Community Pharmacy and Management	CMP	20057
05	Biochemistry & Clinical Pathology	BCT	20223
06	Biochemistry & Clinical Pathology	BCP	20058
07	Pharmacotherapeutics	PTT	20224
08	Pharmacotherapeutics	PTP	20059
09	Hospital and Clinical Pharmacy	HCT	20225
10	Hospital and Clinical Pharmacy	HCP	20060
11	Pharmacy Law and Ethics	PLT	20226

COURSE DETAILS

THEORY

Class	S.Y. D. Pharmacy
Course Code and Course Title	20221 Pharmacology
Prerequisite/s	Basic & preliminary knowledge of HAP is essential
Teaching Scheme: Lecture/Tutorial	03/01
Evaluation Scheme: SES-I, SES-II, SES-III, FE	20/80

THEORY

Course Objectives: The course aims:(What teacher want to do with course while teaching)	
01	General concepts of pharmacology including pharmacokinetics, pharmacodynamics, routes of administration, etc.
02	Pharmacological classification and indications of drugs
03	Dosage regimen, mechanisms of action, contraindications of drugs
04	Common adverse effects of drugs

Course Outcomes (COs):	
Upon successful completion of this course, the student will be able to:	
DP20221.1	Describe basic concepts of Pharmacology including Pharmacokinetics and Pharmacodynamics.
DP20221.2	Explain the various pharmacological classifications of drugs.
DP20221.3	Discuss the pharmacological actions of drugs.
DP20221.4	Summarize physiological role of hormones, autocooids & their antagonists.
DP20221.5	Describe basic principles of chemotherapy
DP20221.6	Apply knowledge of dosage regimen, adverse effects, indications and contraindications of drugs used in treatment of diseases

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

Course Outcomes	Programme Outcomes								
	1	2	3	4	5	6	7	8	9
DP20221.1	3	-	-	3	1	2	3	1	2
DP20221.2	1	-	-	3	-	2	2	2	2
DP20221.3	3	3	-	3	1	3	3	1	2
DP20221.4	2	-	-	3	-	2	3	-	2
DP20221.5	1	-	-	3	2	3	3	-	1
DP20221.6	3	-	-	3	1	3	3	2	2
Total	13	3	-	18	5	15	17	6	11
Avg.	2.17	3.00	-	3.00	1.25	2.50	2.83	1.50	1.83
20221	2.17	3.00	-	3.00	1.25	2.50	2.83	1.50	1.83



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COURSE SKILL ACQUISITION MATRIX:

Course	Programme Outcome								
	1	2	3	4	5	6	7	8	9
20221	2.17	3.00	-	3.00	1.25	2.50	2.83	1.50	1.83

Course 20221	Course Outcomes					
	DP20221.1	DP20221.2	DP20221.3	DP20221.4	DP20221.5	DP20221.6
Target	2.0	2.0	2.0	2.0	2.0	2.0
Target Level	Students scoring above 40% marks					
1	≥ 50%					
2	≥ 55%					
3	≥ 60%					

MODES FOR ASSESSMENT OF COURSE OUTCOMES-THEORY

Mode	CO	Assessment tool
SES-I	DP20221.1, DP20221.2, DP20221.3, DP20221.6	Written test
SES-II	DP20221.2, DP20221.3, DP20221.6	Written test
SES-III	DP20221.2, DP20221.3, DP20221.4, DP20221.5, DP20221.6	Written test
FE	DP20221.1, DP20221.2, DP20221.3, DP20221.4, DP20221.5, DP20221.6	Written test

COURSE DETAILS-THEORY

Unit 1	Introduction and scope of Pharmacology, Various routes of drug administration - advantages and disadvantages, Drug absorption - definition, types, factors affecting drug absorption, Bioavailability and the factors affecting bioavailability, Drug distribution - definition, factors affecting drug distribution, Biotransformation of drugs - Definition, types of biotransformation reactions, factors influencing drug metabolisms, Excretion of drugs - Definition, routes of drug excretion, General mechanisms of drug action and factors modifying drug action	11 hrs
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Unit 2	Steps involved in neurohumoral transmission, Definition, classification, pharmacological actions, dose, indications, and contraindications of Cholinergic drugs, Anti-Cholinergic drugs, Adrenergic drugs, Anti-adrenergic drugs, Neuromuscular blocking agents, Drugs used in Myasthenia gravis, Local anaesthetic agents, Non-Steroidal Anti-Inflammatory drugs (NSAIDs).	12 hrs
Unit 3	Definition, classification, pharmacological actions, dose, indications and contraindications of Miotics, Mydriatics, Drugs used in Glaucoma.	02 hrs
Unit 4	Definition, classification, pharmacological actions, dose, indications, and contraindications of General anaesthetics, Hypnotics and sedatives, Anti-convulsant drugs, Anti-anxiety drugs Anti-depressant drugs, Anti-psychotics, Nootropic agents, Centrally acting muscle relaxants, Opioid analgesics.	09 hrs
Unit 5	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-hypertensive drugs, Anti-anginal drugs, Anti-arrhythmic drugs, Drugs used in atherosclerosis and Congestive heart failure, Drug therapy for shock.	06 hrs
Unit 6	Definition, classification, pharmacological actions, dose, indications, and contraindications of Hematinic agents, Anti-coagulants, Anti-platelet agents, Thrombolytic drugs.	03 hrs
Unit 7	Definition, classification, pharmacological actions, dose, indications, and contraindications of Bronchodilators, Expectorants, Anti-tussive agents, Mucolytic agents.	02 hrs
Unit 8	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-ulcer drugs, Anti-emetics, Laxatives and Purgatives, Anti-diarrheal drugs.	04 hrs
Unit 9	Definition, classification, pharmacological actions, dose, indications, and contraindications of Diuretics, Anti-diuretics.	02 hrs
Unit 10	Physiological and pathological role and clinical uses of Thyroid hormones, Anti-thyroid drugs, Parathormone, Calcitonin, Vitamin D, Insulin, Oral hypoglycemic agents, Estrogen, Progesterone,	07 hrs



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	Oxytocin, Corticosteroids.	
Unit 11	Physiological role of Histamine, 5 HT and Prostaglandins, Classification, clinical uses, and adverse effects of antihistamines and 5 HT antagonists	03 hrs
Unit 12	Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, Classification, dose, indication and contraindications of drugs belonging to following classes: Penicillins, Cephalosporins, Aminoglycosides, Fluoroquinolones, Macrolides, Tetracyclines, Sulphonamides, Anti-tubercular drugs, Anti-fungal drugs, Anti-viral drugs, Anti-amoebic agents, Anthelmintics, Anti-malarial agents, Anti-neoplastic agents	12 hrs
Unit 13	Definition, types, and indications of biological agents with examples	02 hrs

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Pharmacology	Mrs.Shraddha Kale and Rajendra Kale	Nirali Publication (ER20)	1 st Edition	2022
02	Pharmacology	Dr.A.V.Yadav and Mrs.A.S.Dubal	Nirali Publication (ER20)	1 st Edition	2022
03	Pharmacology & Toxicology	Mrs. S.R.Kale	Nirali Publication	24 th	2020
04	Pharmacology & Toxicology	Dr.A.V.Yadav	Nirali Publication	27 th	2016

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Medical Pharmacology	K.D.Tripathi	Jaypee	8 th	2019
02	Pharmacology and Therapeutics	R.S.Satoskar	Elsevier	24 th	2015
03	Essentials of Pharmacotherapeutics	F.S.K.Barar	S.Chand	7 th	2015
04	Illustrated Review Pharmacology	Karen Whalen	Lippincott	South Asian	
05	Pharmacology	Rang & Dell's	Elsevier	7 th	2013

Content Delivery and assessment tools:



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Unit	Lect. No.	Lesson Plan	TM Teaching Method	TA Teaching Aid	AT	Mapping with Outcomes	
		Content Delivery				CO	PO
1	1	Branches of Pharmacology, Sources & nature of drug	LT	CB,PP, VF	QA,CT, SE,FE, CES	DP20221.1	1,4,5,6,7,8,9
	2	Classification of routes of drug administration Oral route, Sublingual route, Local application					
	3	Parenteral route, IV route, IM route, SC route					
	4	Drug Absorption- definition, types and factors affecting it					
	5	Bioavailability of drug and factors affecting it					
	6	Drug Distribution- definition and factors affecting it					
	7	Biotransformation of drug- definition, types and factors affecting it					
	8	Excretion of drug- definition and routes of drug excretion					
	9	General Mechanism of drug action					
	10	Factors modifying drug action					
	11						
2	12	Introduction of Nervous system Steps involved in neurohumoral transmission	LT	CB,PP, VF	QA,CT, SE,FE, CES	DP20221.1 DP20221.2 DP20221.3 DP20221.6	1,2,4,5,6,7,8,9
	13	Cholinergic receptor Definition, classification of parasympathomimetics					
	14	Pharmacological actions, dose, indications and contraindications of parasympathomimetics					
	15	Definition, classification, pharmacological actions, dose, indications and contraindications of parasympatholytics					
	16	Adrenergic receptor Definition, classification of sympathomimetics					
	17	Pharmacological actions, dose, indications and contraindications of sympathomimetics					
	18	SYMPATHOLYTICS Definition, classification, pharmacological actions, dose, indications and contraindications of sympatholytics					

	19	NEUROMUSCULAR BLOCKING AGENTS					
	20	DRUGS USED IN MYESTHENIA GRAVIS – Definition, causes, symptoms & drug therapy					
	21	LOCAL ANAESTHETICS - Definition, classification, pharmacological actions, dose, indications and contraindications of local anaesthetics					
	22	NSAID'S - Introduction of Inflammation, definition, classification of NSAID's					
	23	Pharmacological actions, dose, indications and contraindications of NSAID's					
3	24	DRUGS ACTING ON EYE - Definition, classification- Mydriatics & Miotic	LT	CB,PP	QA,CT, SE,FE, CES	DP20221.2 DP20221.3 DP20221.6	1,2,4,5,6,7,8,9
	25	Drug therapy of glucoma					
4	26	DRUGS ACTING ON CNS- GENERAL ANAESTHETICS Introduction of General anesthesia	LT	CB,PP, VF	QA,CT, SE,FE, CES	DP20221.2 DP20221.3 DP20221.6	1,2,4,5,6,7,8,9
	27	Definition, classification, pharmacological actions, dose, indications and contraindications of general anaesthetics					
	28	HYPNOTICS AND SEDATIVES Sleep & its pattern Definition, classification, pharmacological actions, dose, indications and contraindications of hypnotics and sedatives					
	29	EPILEPSY AND ANTIEPILEPTICS Epilepsy–Definition & types					
	30	Definition, classification, pharmacological actions, dose, indications and contraindications of antiepileptics					
	31	ANTI-ANXIETY DRUGS AND ANTI-DEPRESSANT DRUGS Definition, classification, pharmacological actions, dose, indications and contraindications of drugs					
	32	ANTI-PSYCHOTIC DRUGS AND NOOTROPIC AGENTS Definition, classification, pharmacological actions, dose, indications and contraindications of drugs					
	33	CENTRALLY ACTING MUSCLE RELAXANTS					

		Definition, classification, pharmacological actions, dose, indications and contraindications of drugs					
	34	OPOID ANALGESICS- Definition, classification, pharmacological actions, dose, indications and contraindications of drugs					
5	35	DRUGS ACTING ON CARDIOVASCULAR SYSTEM Definition, classification, pharmacological actions, dose, indications and contraindications of	LT	CB,PP, VF	QA,CT, SE,FE, CES	DP20221.2 DP20221.3 DP20221.6	1,2,4,5,6,7,8,9
	36	Anti-hypertensive Drugs					
	37	Anti-anginal drugs					
	38	Anti-arrhythmic drugs					
	39	Drugs used in CHF and atherosclerosis					
	40	Drug therapy of shock					
6	41	DRUG ACTING ON BLOOD AND BLOOD FORMING AGENTS Definition, classification, pharmacological actions, dose, indications and contraindications of Hematinic agents	LT	CB,PP	QA,CT, SE,FE, CES	DP20221.2 DP20221.3 DP20221.6	1,2,4,5,6,7,8,9
	42	Anti-coagulants					
	43	Anti-platelet agents Thrombolytic drugs					
7	44	Definition, classification, pharmacological actions, dose, indications and contraindications of Bronchodilator and Expectorant	LT	CB,PP, VF	QA,CT, SE,FE, CES	DP20221.2 DP20221.3 DP20221.6	1,2,4,5,6,7,8,9
	45	Antitussive and mucolytic agents					
8	46	DRUGS ACTING ON DIGESTIVE SYSTEM Definition, classification, pharmacological actions, dose, indications and contraindications of Anti-ulcer drugs	LT	CB,PP, VF	QA,CT, SE,FE, CES	DP20221.2 DP20221.3 DP20221.6	1,2,4,5,6,7,8,9
	47	Anti-emetics					
	48	Laxatives and Purgatives					
	49	Anti-diarrheal drugs					

9	50	DRUGS ACTING ON KIDNEY Definition, classification, pharmacological actions, dose, indications and contraindications of Diuretics	LT	CB,PP, VF	QA,CT, SE,FE, CES	DP20221.2 DP20221.3 DP20221.6	1,2,4,5,6,7,8,9
	51	Antidiuretics					
10	52	HARMONE AND HARMONE ANTAGONIST Physiological and Pathological role, clinical uses of Thyroid hormone and anti-thyroid drugs	LT	CB,PP	QA,CT, SE,FE, CES	DP20221.2 DP20221.3 DP20221.4 DP20221.6	1,2,4,5,6,7,8,9
	53	Parathyroid hormone					
	54	Calcitonin and Vitamin D					
	55	Insulin, Oral hypoglycemic agents					
	56						
	57	Estrogen & Progesterone					
	58	Corticosteroids & Oxytocin					
11	59	AUTOCOID Physiological role of Histamine, Serotonin and Prostaglandins	LT	CB,PP	QA,CT, SE,FE, CES	DP20221.2 DP20221.3 DP20221.4 DP20221.6	1,2,4,5,6,7,8,9
	60	Classification, clinical uses and adverse effects of Antihistamines					
	61	Classification, clinical uses and adverse effects of 5HT antagonists					
12	62	CHEMOTHERAPEUTIC AGENTS Introduction, Basic principles of chemotherapy	LT	CB,PP	QA,CT, SE,FE, CES	DP20221.2 DP20221.3 DP20221.5 DP20221.6	1,2,4,5,6,7,8,9
	63	Penicillins, Sulphonamides					
	64	Cephalosporins and Aminoglycosides					
	65	Fluroquinolones and Macrolides					
	66	Tetracyclines					
	67	Anti-tubercular drugs					
	68	Anti-fungal and Anthelmintics					
	69	Anti-viral and Anti-amoebic drugs					
	70	Anti-malarial agents					



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	71						
	72	Anti-neoplastic agents					
	73						
13	74	BIOLOGICAL AGENTS Definition and Types of Biological Agent	LT	CB,PP	QA,CT, SE,FE, CES	DP20221.1 DP20221.2 DP20221.3	1,2,4,5,6,7,8,9
	75	Indication and examples of biological agent					

TM-Teaching Method- Lecture (LT), Demonstration (DM), Chart (C), Model (M)

TA-Teaching Aids -Chalk Board (CB), Power Point Presentation (PP), Video Films (VF)

AT- Assessment Tool - Question Answers (QA), Class Tests (CT), Sessional Examination (SE), Final Examinations (FE), Rubrics (RB) , Course End Survey filled by students,

Plan to Cover Contents beyond Syllabus: THEORY

Planed Date/ Week	Topic Beyond Syllabus	Resource Person with Affiliation	CO	PO
Second week of March	Pathophysiology of Cancer	Mr.G.V.Sutar	DP20221.1	1,9



COURSE DETAILS

Class	S.Y. D. Pharmacy
Course Code and Course Title	20056 Pharmacology
Prerequisite/s	Human Anatomy and Physiology – Practical
Teaching Scheme: Practical	02 Hours
Total contact hours	50
Evaluation Scheme: SE/FE	20/80

Course Objectives: The course aims:(What teacher want to do with course while teaching)	
01	To develop the skill of the pharmacist as a clinical, community and hospital pharmacist.
02	To study pharmacodynamics, pharmacokinetics and toxicology of the drug.
03	To develop the skill of pharmacist to able for counselling the patient, Identify the effect, adverse effect, contraindication of the drug in obstetrics, paediatrics and geriatrics.
04	To develop the skill of pharmacist to identify and decide the dose and route of administration of the drug.

<i>At the end of the course, students should be able to :</i>	
DP20056.1	Explain the basic concept of experimental pharmacology.
DP20056.2	Describe the various instruments used in experimental pharmacology.
DP20056.3	Demonstrate the effect of drug on isolated tissue /organs by using simulated experiments
DP20056.4	Illustrate the action of drug on experimental animal by using simulated experiments.
DP20056.5	Interpret the results through observation and graph.

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

Course Outcomes	Program Outcomes								
	1	2	3	4	5	6	7	8	9
DP20056.1	3	3	-	-	2	3	2	3	-
DP20056.2	3	3	1	3	1	3	-	2	1
DP20056.3	3	3	1	3	3	3	-	3	2
DP20056.4	3	3	1	1	2	3	-	2	3
DP20056.5	3	3	-	-	-	3	-	1	1
Total	15	15	3	7	8	15	2	11	7
Avg. of each PO	3.00	3.00	1.00	2.33	2.00	3.00	2.00	2.20	2.33

COURSE SKILL ACQUISITION MATRIX:

Course	Programme Outcome								
	1	2	3	4	5	6	7	8	9
20056	3.00	3.00	1.00	2.33	2.00	3.00	2.00	2.20	2.33

Course 20056	Course Outcomes				
	DP20056.1	DP20056.2	DP20056.3	DP20056.4	DP20056.5
Target	3	2	2	2	2
2Target Level	Students scoring above 50% marks				
1	>50%				
2	>55%				
3	>60%				

MODES FOR ASSESSMENT OF COURSE OUTCOMES

Mode	CO	Assessment tool
Sessional-I	DP20056.1, DP20056.2, DP20056.3	Written test
Sessional-II	DP20056.1, DP20056.2, DP20056.3	Written test
Sessional-III	DP20056.1, DP20056.2, DP20056.3	Manual and Viva examination
Final	DP20056.1, DP20056.2, DP20056.3, DP20056.4, DP20056.5	Practical exam

Expt No	Title of Experiment	Planned week	CO	PO
1.	Introduction to Experimental pharmacology	1 st	DP20056.1, DP20056.2	1, 2, 3, 4,5,6,7,8,9
2.	To study Laboratory animal 1.Rat, 2.Mice, 3.Ginea Pig, 4.Rabbit	2 nd	DP20056.1, DP20056.2	1, 2, 3, 4,5,6,7,8,9
3.	Different routes of administration of drugs in animals.	3 rd	DP20056.1, DP20056.2	1, 2, 3, 4,5,6,7,8,9
4.	To study the common instruments and equipment's used in experimental Pharmacology	4 th	DP20056.1, DP20056.2	1, 2, 3, 4,5,6,7,8,9
5.	Types of preclinical Experiments In-Vivo, In vitro, Ex-vivo.	5 th	DP20056.1, DP20056.2	1, 2, 3, 4,5,6,7,8,9
6.	Techniques of blood collection from animal experiments	6 th	DP20056.1, DP20056.2	1, 2, 3, 4,5,6,7,8,9

7.	Study of Local anaesthetics on rabbit eye	7 th	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
8.	Study of Mydriatic effect on rabbit eye	8 th	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
9.	Study of Miotic effect on rabbits eye	9 th	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
10	Effect of analgesics using Analgasiometer by Hot plate method	10 th	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
11	Effect of analgesics using Analgasiometer by tail flick method	11 th	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
12	To study the analgesic activity by writhing test	12 th	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
13	Screening of muscle relaxant using Rota-Rod apparatus	13 th	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
14	Screening of Anticonvulsant using electro convulsimeter	14 th	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
15	Screening of CNS Stimulants using Actophotometer	15 th	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
16	Screening of CNS Depressants using Actophotometer	16 th	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
17	Study of anxiolytic activity using elevated plus maze method	17 th	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
18	To study effect of acetylcholine on isolated heart	18 th	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
19	To study effect of Adrenaline on isolated heart	19 th	DP20056.3, DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
20	Effect of Acetylcholine on ciliary motility on frogs buccal cavity	20 th	DP20056.3, DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
21	Effect of Physostigmine on ciliary motility on frogs buccal cavity	21 th	DP20056.3, DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
22	Effect of Atropine on ciliary motility on frogs buccal cavity	22 th	DP20056.3, DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
23	Pyrogen testing by rabbit method.	23 th	DP20056.3, DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
24	Study of effect of Digoxin on isolated frog heart	24 th	DP20056.3, DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
25	Study of Antipsychotic activity by Cooks pole climbing Apparatus	25 th	DP20056.3, DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9



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Assessment Tools: Laboratory Evaluation & assessment Rubric.

Expt. No	Title of Experiment	TM Teaching Method	Mapping with CO	Mapping with PO
1.	Introduction to Experimental pharmacology	LT,DM,	DP20056.1, DP20056.2	1, 2, 3, 4,5,6,7,8,9
2.	To study Laboratory animal 1.Rat, 2.Mice, 3.Ginea Pig, 4.Rabbit	LT,DM	DP20056.1, DP20056.2	1, 2, 3, 4,5,6,7,8,9
3.	Different routes of administration of drugs in animals.	LT,DM,	DP20056.1, DP20056.2	1, 2, 3, 4,5,6,7,8,9
4.	To study the common instruments and equipment's used in experimental Pharmacology	LT,DM,	DP20056.1, DP20056.2	1, 2, 3, 4,5,6,7,8,9
5.	Types of preclinical Experiments In-Vivo, In vitro, Ex-vivo.	LT,DM,	DP20056.1, DP20056.2	1, 2, 3, 4,5,6,7,8,9
6.	Techniques of blood collection from animal experiments	LT	DP20056.1, DP20056.2	1, 2, 3, 4,5,6,7,8,9
7.	Study of Local anaesthetics on rabbit eye	LT,DM,	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
8.	Study of Mydriatic effect on rabbit eye	LT,DM,	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
9.	Study of Miotic effect on rabbits eye	LT,DM,	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
10.	Effect of analgesics using Analgesiometer by Hot plate method	LT,DM,	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
11.	Effect of analgesics using Analgesiometer by tail flick method	LT,DM	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
12.	To study the analgesic activity by writhing test	LT,DM	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
13.	Screening of muscle relaxant using Rota-Rod apparatus	LT,DM	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
14.	Screening of Anticonvulsant using electro convulsimeter	LT,DM	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
15.	Screening of CNS Stimulants using Actophotometer	LT,DM	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
16.	Screening of CNS Depressants using Actophotometer	LT,DM	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
17.	Study of anxiolytic activity using elevated plus maze method	LT,DM,	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
18.	To study effect of acetylcholine on isolated heart	LT,DM	DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
19.	To study effect of Adrenaline on isolated heart	LT,DM	DP20056.3, DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
20.	Effect of Acetylcholine on ciliary motility on frogs buccal cavity	LT,DM	DP20056.3, DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9



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21.	Effect of Physostigmine on ciliary motility on frogs buccal cavity	LT,DM	DP20056.3, DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
22.	Effect of Atropine on ciliary motility on frogs buccal cavity	LT,DM	DP20056.3, DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
23.	Pyrogen testing by rabbit method.	LT,DM	DP20056.3, DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
24.	Study of effect of Digoxin on isolated frog heart	LT,DM	DP20056.3, DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9
25.	Study of Antipsychotic activity by Cooks pole climbing Apparatus	LT,DM	DP20056.3, DP20056.4, DP20056.5	1, 2, 3, 4,5,6,8,9

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Laboratory Manual for Pharmacology	Ms. Kajal Pansare Mr. Ganesh Sonawane. Dr. Vinod Bairagi	Brilliant Publication	1 St	2022
02	Pharmacology and Toxicology with Viva - Voce	U.D.Shivhare	VBD Publication	26 th	2018
03	Pharmacology and Toxicology: Practical Notebook	S.K.Pandey V.D.Sharma	CBS Publishers	1 st	2013
Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Essential of Medical Pharmacology	K.D.Tripathi	Jaypee Publisher	8 th	2018
03	Pharmacology and Therapeutics	R.S.Satoskar	Elsevier India	26th	2020
04	Principles of Pharmacology	H.L.Sharma K.K.Sharma	Paras Publication	2 nd	2012
02	Textbook of Pharmacology	F.S.K.Barar	Chand Publication	4 th	2000
Other Books/E-material:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	MSBTE CD	-	-	-	-



Self-Study Materials and References:

1. Laboratory manuals

Additional Comments:

The E-books as well as some Journal/Conference papers and MSBTE CD are available in the Library.

TM-Teaching Method- Lecture (LT), Demonstration (DM), Chart (C), Model (M)

TA-Teaching Aids -Chalk Board (CB), Power Point Presentation (PP), Video Films (VF)

AT- Assessment Tool - Question Answers (QA), Class Tests (CT), Sessional Examination (SE), Final Examinations (FE), Rubrics (RB) , Course End Survey filled by students,

Plan to Cover Contents beyond Syllabus:

Planned Date/ Week	Topic Beyond Syllabus	Resource Person with Affiliation	CO	PO
26th week (26 th Practical)	*Demonstration on Bioassay using Student organ bath.	Prof. Sutar G. V.	DP20056.3	1,2

COURSE DETAILS

Class	D. Pharmacy 2 nd year
Course Code and Course Title	20222 Community Pharmacy and Management
Prerequisite/s	Basic & preliminary knowledge of Pharmaceutics, Human Anatomy and Physiology
Teaching Scheme: Lecture/Tutorial	03/01
Evaluation Scheme: Theory Paper/SE	80/20

Course Objectives: The course aims: (What teacher want to do with course while teaching)	
01	Establishing and running a community pharmacy and its legal requirements.
02	Professional aspects of handling and filling prescriptions.
03	Patient counselling on diseases, prescription and or non-prescription medicines.
04	Scope of performing basic health screening in community pharmacy settings.

Course Outcomes (COs):	
Upon successful completion of this course, the student will be able to:	
DP20222.1	Recognize the professional responsibilities of community pharmacist and relate the need of community pharmacy practice.
DP20222.2	Describe knowledge regarding basic aspects of prescription with its handling and dispensing of medications.
DP20222.3	Relate the importance of communication skill in professional development.
DP20222.4	Use of community pharmacy knowledge for the counselling of patient.
DP20222.5	Discuss the different health screening techniques and its interpretation.
DP20222.6	Explain the establishment, legal requirements and effective administration of a community pharmacy.

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

Course Outcomes	Programme Outcomes								
	1	2	3	4	5	6	7	8	9
DP20222.1	3	-	2	2	-	3	3	-	1
DP20222.2	3	-	2	3	2	3	2	-	2
DP20222.3	3	-	2	1	1	3	3	-	2
DP20222.4	3	2	2	3	1	3	3	-	3
DP20222.5	3	3	-	2	1	3	2	-	2
DP20222.6	3	3	2	2	2	3	2	-	3
Total	18	8	10	13	7	18	15	-	13
Avg.	3.0	2.66	2.0	2.16	1.4	3.0	2.5	-	2.16
20222	3.0	2.66	2.0	2.16	1.4	3.0	2.5	-	2.16

COURSE SKILL ACQUISITION MATRIX:

Course	Programme Outcome								
	1	2	3	4	5	6	7	8	9
20226	3.0	2.66	2.0	2.16	1.4	3.0	2.5	-	2.16

Course 20226	Course Outcomes				
	DP20226.1	DP20226.2	DP20226.3	DP20226.4	DP20226.5
Target	2	2	2	2	2
Target Level	Students scoring above 40% marks				
1	≥ 50%				
2	≥ 55%				
3	≥ 60%				

MODES FOR ASSESSMENT OF COURSE OUTCOMES

Mode	CO	Assessment tool
SES-I	DP20222.1, DP20222.2	Written test
SES-II	DP20222.3, DP20222.4, DP20222.5	Written test
SES-III	DP20222.4, DP20222.6	Written test
FE	DP20222.1, DP20222.2, DP20222.3, DP20222.4, DP20222.5, DP20222.6	Written test

COURSE DETAILS	
UO20222CH1.1 UO20222CH1.2	Community Pharmacy Practice Definition, History Development of community pharmacy-International and Indian scenario
UO20222CH2.1 UO20222CH2.2 UO20222CH2.3	Professional responsibilities of Community Pharmacist Various responsibilities of Community Pharmacist Introduction to the concept of good pharmacy practice Standard operating procedures (SOPs)
UO20222CH3.1 UO20222CH3.2 UO20222CH3.3 UO20222CH3.4	Prescription and Prescription handling Definition, parts of prescription Legality of prescription, prescription handling. Labeling of dispensed medications (main label, ancillary label, pictogram) Brief instructions on medication usage, Dispensing process, Good dispensing practices Dispensing errors and strategies to minimize them.
UO20222CH4.1	Communication skills Definition, types of communication skills

UO20222CH4.2	Interactions with professionals and patients, Verbal communication skills (one-to-one, over the telephone)
UO20222CH4.3	Written communication skills, Body language
UO20222CH4.4	Patient interview techniques
UO20222CH5.1	Patient Counseling Definition and benefits of patient counseling, Stages of patient counseling- Introduction, Counseling content Counseling process, closing the counseling session
UO20222CH5.2	Barriers to effective counseling-Types and strategies to overcome barriers
UO20222CH5.3	Patient counseling points for chronic diseases/disorders Hypertension, diabetes, Asthma, Tuberculosis ,COPD, AIDS
UO20222CH5.4	Patient package inserts- Definition, importance and benefits
UO20222CH5.5	Scenarios of PPI use in India and other countries
UO20222CH5.6	Patient information leaflets-Definition and uses
UO20222CH6.1	Medication Adherence Definition, factors influencing non-adherence
UO20222CH6.2	Strategies to overcome non-adherence
UO20222CH7.1	Health Screening Services in Community Services Introduction, scope of health screening services Importance of health screening services
UO20222CH7.2	Importance of health screening services for routine monitoring of patients, early detection and referral of undiagnosed cases.
UO20222CH8.1	Over The Counter (OTC) Medications Definition, need and role of pharmacist in OTC medication dispensing OTC medications in India, Counseling for OTC products
UO20222CH8.2	Self-medication, Role of pharmacist in promoting the safe practices during self-medication
UO20222CH8.3	Responding to symptoms, minor ailments and advice for self-care in conditions such as- Pain management, Cough, Cold, Diarrhea, Constipation, Vomiting, Fever, Sore throat, Skin disorders.
UO20222CH8.4	Oral health (mouth ulcers, dental pain, gum swelling)
UO20222CH9.1	Community Pharmacy Management Legal requirements to setup a community pharmacy, Site selection requirements, Pharmacy designs and interiors, Vendor selection and ordering
UO20222CH9.2	Procurement, inventory control methods, Inventory management
UO20222CH9.3	Financial planning and management
UO20222CH9.4	Accountancy in community pharmacy-Day book, Cash book
UO20222CH9.5	Introduction to pharmacy operation software's -usefulness and availability
UO20222CH9.6	Customer relation management (CRM), Audits in Pharmacies, SOP of Pharmacy Management
UO20222CH9.7	Introduction to digital health, mHealth, Online pharmacies

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Modern Concepts in Community Pharmacy and Management	Sahare A.Y., Sonawane S.M., Panpaliya D.V.	S. Vikas and Company	1 st	2022
02	Community Pharmacy and Management	A.V. Yadav	Nirali Prakashan, Pune	1 st	2022
03	Community Pharmacy and Management	Dr. Ashok Hajare	Nirali Prakashan, Pune	1 st	2022
04	A Textbook of Community Pharmacy	Yadav, Mamta	Nikita Publication, Latur	1 st	2022

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Drug Store Management	Dr. Mahesh D. Burande	Nirali Prakashan	3 rd	2015

Content Delivery and assessment tools:

Unit	Lect. No.	Lesson Plan	TM	TA	AT	Mapping with Outcomes	
		Content Delivery				CO	PO
I	1	Introduction to Vision, Mission, PEOs and Course Outcomes Community Pharmacy Practice Definition, History	LT	CB,PP	QA,CT, EX	DP20222.1	1,3,4,6, 7,9
	2	Development of community pharmacy-International and Indian scenarios					
II	3	Professional responsibilities of Community Pharmacist	LT	CB,PP	QA,CT, EX	DP20222.1	1,3,4,6, 7,9
	4	Introduction to the concept of good pharmacy practice					
	5	Standard operating procedures (SOPs)					
III	6	Prescription and Prescription handling Definition, parts of prescription	LT	CB,PP	QA,CT, EX	DP20222.2	1,3,4,5, 6,7,9
	7	Legality of prescription, prescription handling					
	8	Labelling of dispensed medications (main label, ancillary label, pictogram)					
	9	Brief instructions on medication usage.					
	10	Dispensing process					
	11	Good dispensing practices					
IV	12	Dispensing errors and strategies to minimize them	LT	CB,PP	QA,CT EX	DP20222.3	1,3,4,5, 6,7,9
	13	Communication skills Definition, types of communication skills					
	14	Interactions with professionals and patients					
	15	Verbal communication skills (one-to-one, over the telephone)					
	16	Written communication skills					
	17	Body language					
V	18	Patient interview techniques				DP20222.4	1,2,3,4, 5,6,7,9
	19	Patient Counselling Definition and benefits of patient counselling					
	20	Stages of patient counselling- Introduction, counselling content					
	21	Counselling process, closing the counselling session					
	22	Barriers to effective counseling-Types and strategies to overcome barriers					

	23	Patient counselling points for chronic diseases/disorders-Hypertension, diabetes					
	24	Patient counselling points for chronic diseases/disorders- Asthma, Tuberculosis					
	25	Patient counselling points for chronic diseases/disorders- COPD, AIDS					
	26	Patient package inserts- Definition, importance and benefits					
	27	Scenarios of PPI use in India and other countries					
	28	Patient information leaflets-Definition and uses					
VI	29	Medication Adherence Definition, factors influencing non-adherence				DP20222.4	1,2,3,4, 5,6,7,9
	30	Strategies to overcome non-adherence					
VII	31	Health Screening Services in Community Services Introduction, scope of health screening services				DP20222.5	1,2,4,5, 6,7,9
	32	Importance of health screening services for routine monitoring of patients, early detection and referral of undiagnosed cases					
	33	Importance of health screening services					
	34	Importance of health screening services					
	35	Importance of health screening services					
VIII	36	Over The Counter (OTC) Medications Definition, need and role of pharmacist in OTC medication dispensing	LT	CB,PP	QA,CT, EX	DP20222.4	1,2,3,4, 5,6,7,9
	37	OTC medications in India					
	38	Counseling for OTC products					
	39	Self-medication					
	40	Role of pharmacist in promoting the safe practices during self-medication					
	41	Responding to symptoms, minor ailments and advice for self-care in conditions such as- Pain management					
	42	Cough					
	43	Cold					
	44	Diarrhea					
	45	Constipation					

	46	Vomiting					
	47	Fever					
	48	Sore throat					
	49	Skin disorders					
	50	Oral health (mouth ulcers, dental pain, gum swelling)					
IX	51	Community Pharmacy Management Legal requirements to setup a community pharmacy	LT	CB,PP	QA,CT, EX	DP20222.6	1,2,3,4, 5,6,7,9
	52	Legal requirements to setup a community pharmacy					
	53	Site selection requirements					
	54	Site selection requirements					
	55	Pharmacy designs and interiors					
	56	Pharmacy designs and interiors					
	57	Vendor selection and ordering					
	58	Vendor selection and ordering					
	59	Procurement, inventory control methods					
	60	Procurement, inventory control methods					
	61	Inventory management					
	62	Financial planning and management					
	63	Financial planning and management					
	64	Accountancy in community pharmacy-Day book					
	65	Cash book					
	66	Introduction to pharmacy operation softwares-usefulness and availability					
67	Introduction to pharmacy operation softwares-usefulness and availability						
68	Customer relation management (CRM)						
69	Customer relation management (CRM)						
70	Audits in Pharmacies						
71	Audits in Pharmacies						



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	72	SOP of Pharmacy Management					
	73	SOP of Pharmacy Management					
	74	Introduction to digital health, mHealth					
	75	Online pharmacies					

TM-Teaching Method- Lecture (LT).

TA-Teaching Aids -Chalk Board (CB), Power Point Presentation (PP)

AT- Assessment Tool - Class Tests (CT), Question Answers (QA), MSBTE Examinations (EX), Course End Survey filled by students,

COURSE DETAILS

Class	F.Y. D. Pharmacy
Course Code and Course Title	DP20057 Community Pharmacy and Management
Prerequisite/s	Science,Pharmaceutics
Teaching Scheme: Practical	03 Hours
Total contact hours	75 Hours
Evaluation Scheme: SES-I /SES-II/SES-III / MSBTE	10/10/10/80

Course Objectives: The course aims:	
1.	Professional handling and filling prescriptions
2.	Patient counseling on diseases and minor ailments
3.	Patient counseling on prescription and / or non-prescription medicines
4.	Preparation of counseling materials such as patient information leaflets
5.	Performing basic health screening tests

Course Outcomes (COs):	
Upon successful completion of this course, the student will be able to:	
DP20057.1	Handle and fill prescriptions in a professional manner.
DP20057.2	Discuss and counsel patients on various diseases and minor ailments.
DP20057.3	Extend counselling to patients on prescription and non-prescription medicines.
DP20057.4	Prepare list of abbreviation, short form used and construct SOPs for various activities.
DP20057.5	Perform basic health screening tests.
DP20057.6	Design and prepare patient information leaflets.

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

Course Outcomes	Programme Outcomes								
	1	2	3	4	5	6	7	8	9
DP20057.1	3	2	-	2	-	3	3	-	1
DP20057.2	3	-	2	3	-	3	2	-	3
DP20057.3	3	-	3	3	3	3	3	-	3
DP20057.4	3	-	-	-	-	3	-	-	-
DP20057.5	3	3	2	3	-	3	2	-	2
DP20057.6	3	2	-	2	-	3	-	-	1
Total	18	7	7	13	3	18	10	-	10
Avg.	3.0	2.33	2.33	2.6	3.0	3.0	2.5	-	2.0
DP20057	3.0	2.33	2.33	2.6	3.0	3.0	2.5	-	2.0

COURSE SKILL ACQUISITION MATRIX:

Course	Programme Outcome								
	1	2	3	4	5	6	7	8	9
DP20057	3.0	2.33	2.33	2.6	3.0	3.0	2.5	-	2.0

Course DP20051	Course outcome				
	DP20057.1	DP20057.2	DP20057.3	DP20057.4	DP20057.5
Target	2.0	2.0	2.0	2.0	2.0
Target Level	Students scoring above 40% marks				
1	>50%				
2	>55%				
3	>60%				

MODES FOR ASSESSMENT OF COURSE OUTCOMES

Mode	CO	Assessment tool
SES-I	DP20057.1, DP20057.3	Practical sessional exam
SES-II		
SES-III		
MSBTE		

Expt.No.	Title of Experiment	CO	PO
1,2	To study the handling of prescriptions. To study various professional standards of prescription	DP20057.1	PrO20057.1 PrO20057.2 PrO20057.3
3,4	To study the different review techniques for prescription To understand concept of checking prescriptions for legal compliance	DP20057.1	PrO20057.4 PrO20057.5 PrO20057.6 PrO20057.7
5	To study the standards for completeness of prescription	DP20057.1	PrO20057.6 PrO20057.7

6,7	To study types of drug-drug interaction in the prescription with example. To identify drug-drug interaction in the prescription and follow up action with example.	DP20057.1	PrO20057.8 PrO20057.9 PrO20057.10 PrO20057.11 PrO20057.12
8,9	To study technique for preparation of dispensing labels and auxiliary labels for the tablet To study technique for preparation of dispensing labels and auxiliary labels for ointment.	DP20057.6	PrO20057.13 PrO20057.14 PrO20057.15 PrO20057.16
10,11	To study technique for preparation of dispensing labels and auxiliary labels for syrup. To study technique for preparation of dispensing labels and auxiliary labels for Injection.	DP20057.6	PrO20057.17 PrO20057.18 PrO20057.19 PrO20057.20
12	To study technique for preparation of dispensing labels and auxiliary labels for Inhalers.	DP20057.6	PrO20057.21 PrO20057.22
13	To find out blood pressure in various positions. [Before and After exercise]	DP20057.5	PrO20057.23 PrO20057.24 PrO20057.25
14	To find out blood glucose level by using capillary method.	DP20057.5	PrO20057.26 PrO20057.27 PrO20057.28
15	To find out lung function assessment using peak flow meter.	DP20057.5	PrO20057.29 PrO20057.30 PrO20057.31
16	To find out lung function assessment using incentive spirometer.	DP20057.5	PrO20057.32 PrO20057.33 PrO20057.34 PrO20057.35
17	To record capillary oxygen level by using pulse oxymeter.	DP20057.5	PrO20057.36 PrO20057.37
18	To measure and report Body Mass Index of underweight, overweight or obese person.	DP20057.5	PrO20057.38 PrO20057.39 PrO20057.40 PrO20057.41

19	To study, understand process of counselling to stimulated patients for type 2 diabetes mellitus using insulin pen.	DP20057.2 DP20057.3	PrO20057.26 PrO20057.42
20	To study patient counselling technique for the asthma using inhalers.	DP20057.2 DP20057.3	PrO20057.29 PrO20057.43
21	To study patient counselling technique for primary hypertension.	DP20057.2 DP20057.3	PrO20057.44 PrO20057.45 PrO20057.46
22	To study patient counselling technique for Hyperlipidemia	DP20057.2 DP20057.3	PrO20057.47 PrO20057.48
23	To study patient counselling technique for rheumatoid arthritis.	DP20057.2 DP20057.3	PrO20057.49 PrO20057.50
24	To study counselling of patient for GI disturbances [Nausea, vomiting, dyspepsia, diarrhea, constipation]	DP20057.2 DP20057.3	PrO20057.51 PrO20057.52
25	To study counselling of patient for upper respiratory infection.	DP20057.2 DP20057.3	PrO20057.51 PrO20057.52
26	To study counselling of patient for skin infection	DP20057.2 DP20057.3	PrO20057.51 PrO20057.52
27	To study counselling of patient for oral and dental disorders.	DP20057.2 DP20057.3	PrO20057.51 PrO20057.52
28	To study counselling to simulated patients for headache.	DP20057.2 DP20057.3	PrO20057.51 PrO20057.52
29	To study the process of appropriate handling of dummy dosage form with correct administration techniques [Oral liquid, cup/cap/dropper, eye drops, inhalers, nasal drop, insulin pen, nebulizers, different types of tablet, patches, enemas, suppositories]	DP20057.5	PrO20057.53 PrO20057.54 PrO20057.55 PrO20057.56
30	To study the use of different community pharmacy software's and digital health tools.	DP20057.5	PrO20057.57 PrO20057.58 PrO20057.59 PrO20057.60 PrO20057.61

Plan to Cover Contents beyond Syllabus:

Planned Date/ Week	Topic Beyond Syllabus	Resource Person with Affiliation	CO	PO

Assessment Tools: Laboratory Evaluation & assessment Rubric.

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	A Laboratory Manual for Community pharmacy and management	Dr. Vijay D. Tambe, Ms. Supriya S. Shinde, Mr. Yogesh R. Thombare, Ms. Akshada S. Kale, Ms. Shalu N. Anap	Brilliant Publication	1 st	2022
02	A Practical Manual of Community Pharmacy and Management	Akanksha L. Patil, Dr. Md. Rageeb Md. Usman, Monali D. Sonawane, Rahul P. Umbarkar	Pee Vee	-	2022

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Drug Store Management	Dr. Mahesh D. Burande	Nirali Prakashan	3 rd	2015
02	Dispensing Pharmacy	R.M. Mehta	Vallabh Prakashan	6 th	2003



COURSE DETAILS

THEORY

Class	S.Y. D. Pharmacy
Course Code and Course Title	Biochemistry and Clinical pathology(20058)
Prerequisite/s	Basic & preliminary knowledge of Chemistry and human anatomy and physiology is essential
Teaching Scheme: Lecture/Tutorial	03
Evaluation Scheme: SES-I, SES-II,SES-III, FE	20/80

THEORY

Course Objectives: The course aims:(What teacher want to do with course while teaching)	
01	Structure and functions of biomolecules
02	Catalytic activity, diagnostic and therapeutic importance of enzymes
03	Metabolic pathways of biomolecules in health and illness(metabolic disorders)
04	Biochemical principles of organ function tests and their clinical significance
05	Qualitative and quantitative determination of biomolecules/metabolites in the biological sample
06	Clinical pathology of blood and urine



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MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

Course Outcomes	Programme Outcomes								
	1	2	3	4	5	6	7	8	9
DP20223.1	3	-	-	3	1	1	2	1	1
DP20223.2	3	-	-	2	3	1	2	3	-
DP20223.3	3	-	-	3	3	1	3	3	2
DP20223.4	3	-	-	3	3	1	3	3	3
DP20223.5	3	1	-	3	3	1	3	3	3
DP20223.6	3	-	1	3	3	1	3	3	3
Total	18	1	1	17	16	6	16	16	12
Avg.	3.00	1.00	1.00	2.83	2.66	1.00	2.66	2.66	2.40
DP20223	3.00	1.00	1.00	2.83	2.66	1.00	2.66	2.66	2.40

COURSE SKILL ACQUISITION MATRIX:

Course	Programme Outcome								
	1	2	3	4	5	6	7	8	9
DP20223	3.00	1.00	1.00	2.83	2.66	1.00	2.66	2.66	2.40



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Course 2023	Course Outcomes					
	DP20223.1	DP20223.2	DP20223.3	DP20223.4	DP20223.5	DP20223.6
Target	3.0	2.0	2.0	2.0	2.0	2.0
Target Level	Students scoring above 40% marks					
1	≥ 50%					
2	≥ 55%					
3	≥ 60%					

MODES FOR ASSESSMENT OF COURSE OUTCOMES-THEORY

Mode	CO	Assessment tool
SES-I	DP20223.1	Written test
SES-II	DP20223.2, DP20223.3, DP20223.6	Written test
SES-III	DP20223.4, DP20223.5, DP20223.6	MCQ, Assignment, Open book test, Seminar
FE	DP20223.1, DP20223.2, DP20223.3, DP20223.4, DP20223.5, DP20223.6	Written test

COURSE DETAILS-THEORY		
Unit 1	Introduction to biochemistry: Scope of biochemistry in pharmacy; Cell and its biochemical organization.	02 hours
Unit 2	Carbohydrates <ul style="list-style-type: none"> • Definition, classification with examples, chemical properties • Monosaccharides- Structure of glucose, fructose, and galactose • Disaccharides-structure of maltose, lactose, and sucrose • Polysaccharides-chemical nature of starch and glycogen • Qualitative tests and biological role of carbohydrates 	05 hours
Unit 3	Proteins <ul style="list-style-type: none"> • Definition, classification of proteins based on composition and solubility with examples • Definition, classification of amino acids based on chemical nature and nutritional requirements with examples • Structure of proteins (four level so for organization of protein structure) • Qualitative tests and biological role of proteins and amino acids • Diseases related to malnutrition of proteins. 	05 hours
Unit 4	Lipids <ul style="list-style-type: none"> • Definition, classification with examples • Structure and properties of triglycerides (oils and fats) • Fatty acid classification- Based on chemical and nutritional requirements with examples • Structure and functions of cholesterol in the body • Lipoproteins- types, composition and functions in the body Qualitative tests and functions of lipids 	05 hours
Unit 5	Nucleic acids <ul style="list-style-type: none"> • Definition, purine and pyrimidine bases 	04 hours

	<ul style="list-style-type: none"> • Components of nucleosides and nucleotides with examples • Structure of DNA(Watson and Crick model),RNA and their functions 	
Unit 6	<p>Enzymes</p> <ul style="list-style-type: none"> • Definition, properties and IUB and MB classification • Factors affecting enzyme activity • Mechanism of action of enzymes, Enzyme inhibitors • Therapeutic and pharmaceutical importance of enzymes 	05 hours
Unit 7	<p>Vitamins</p> <ul style="list-style-type: none"> • Definition and classification with examples. • Sources, chemical nature, functions, coenzyme form, recommended dietary requirements, deficiency diseases of fat- and water-soluble vitamins 	06 hours
Unit 8	<p>Metabolism(Studyofcycle/pathwayswithoutchemicalstructures)</p> <ul style="list-style-type: none"> • Metabolism of Carbohydrates: Glycolysis, TCA cycle and glycogen metabolism, regulation of blood glucose level. Diseases related to abnormal metabolism of Carbohydrates • Metabolism of lipids: Lipolysis, β-oxidation of Fatty acid(Palmitic acid) ketogenesis and ketolysis. Diseases related to abnormal metabolism of lipids such as Ketoacidosis, Fatty liver ,Hypercholesterolemia • Metabolism of Amino acids (Proteins) :General reactions of amino acids and its significance–Transamination, deamination, Urea cycle and decarboxylation .Diseases related to abnormal metabolism of amino acids, Disorder of ammonia metabolism, phenyl ketonuria, alkaptonuria and Jaundice. • Biological oxidation: Electron transport chain and Oxidative phosphorylation 	20 hours
Unit 9	<p>Minerals: Types, Functions, Deficiency diseases, recommended dietary requirements</p>	05 hours
Unit 10	<p>WaterandElectrolytes</p> <ul style="list-style-type: none"> • Distribution, functions of water in the body • Water turn over and balance 	05 hours



	<ul style="list-style-type: none">• Electrolyte composition of the body fluids, Dietary intake of electrolyte and Electrolyte balance• Dehydration, causes of dehydration and oral rehydration therapy	
Unit 11	Introduction to Biotechnology	01 hours
Unit 12	Organ function tests <ul style="list-style-type: none">• Functions of kidney and routinely performed tests to assess the functions of kidney and their clinical significances• Functions of liver and routinely performed tests to assess the functions of liver and their clinical significances• Lipid profile tests and its clinical significances	06 hours
Unit 13	Introduction to Pathology of Blood and Urine <ul style="list-style-type: none">• Lymphocytes and Platelets, their role in health and disease• Erythrocytes-Abnormal cells and their significance• Normal and Abnormal constituents of Urine and their significance	06 hours

Content Delivery and assessment tools:

Unit	Lect. No.	Lesson Plan	TM Teaching Method	TA Teaching Aid	AT	Mapping with Outcomes	
						CO	PO
		Content Delivery					
I	1	Introduction to vision ,mission and course outcome Introduction to biochemistry Scope of Biochemistry in pharmacy	LT	CB,PP	QA,CT,SE, FE,CES	DP20223.1	1,2,4,6,9
	2	Cell and its biochemical organization					
II	3	Carbohydrates Definition, classification with examples, chemical properties	LT	CB,PP	QA,CT,SE, FE,CES	DP20223.1	1,4,6,7,9
	4	Monosaccharide's-Structure of glucose, fructose and galactose					
	5	Disaccharides-Structure of maltose,lactose,andsucrose					
	6	Polysaccharides-Chemical nature of starch and glycogen					
	7	Qualitative tests and biological role of carbohydrates					
III	8	Proteins Definition, classification of proteins based on composition and solubility with examples	LT	CB,PP	QA,CT,SE, FE,CES	DP20223.1	1,4,6,7,9
	9	Definition, classification of amino acids based on chemical nature and nutritional requirements with examples					
	10	Structure of proteins(four levels of organization of protein structure)					
	11	Qualitative tests and biological role of proteins and amino acids					

	12	Diseases related to malnutrition of proteins.					
IV	13	Lipids Definition, Classification with examples, Structure and properties of triglycerides(oils and fats)					
	14	Fatty acid classification–Based on Chemical on and nutritional requirements with examples					
	15	Structure and functions of cholesterol in the body					
	16	Lipoproteins-types, composition and functions in the body					
	17	Qualitative tests and functions of lipids					
	V	18	Nucleic acids Definition, purine and pyrimidine bases				
19		Components of nucleosides and nucleotides with examples					
20		Structure of DNA(Watson and Crick model)					
21		Structure of RNA and their functions					
VI	22	Enzymes Definition, properties and IUB and MB classification	LT,M	CB,PP	QA,CT,SE, FE,CES	DP20223.2	1,4,6,7,9
	23	Factors affecting enzyme activity					
	24	Mechanism of action of enzymes					
	25	Enzyme inhibitors					
	26	Therapeutic and pharmaceutical importance of enzymes					
VII	27	Vitamins Definition and classification with examples	LT	CB,PP	QA,CT,SE, FE,CES	DP20223.2	1,4,6,7,9
	28	Sources, chemical nature, Functions, coenzyme form, recommended dietary requirements, deficiency diseases of Vitamin A and D					
	29	Vitamin E and K				DP20223.3	1,4,6,7,9
	30	Vitamin B1, B2 and B3					

	31	Vitamin B5, B9 and B12					
	32	Vitamin Choline, Biotin and Vit. C					
VIII	33	Metabolism Metabolism of Carbohydrates: Glycolysis	LT,C	CB,PP,VF	QA,CT,SE, FE,CES	DP20223.3 DP20223.6	1,4,6,7,9
	34	TCAcycle					
	35	Glycogen metabolism					
	36	Regulation of blood glucose level					
	37	Diseases related to abnormal metabolism of Carbohydrates					
	38	Metabolism of lipids: Lipolysis					
	39	β -oxidation of Fatty acid(Palmiticacid) Ketogenesis					
	40	Ketolysis					
	41	Diseases related to abnormal metabolism of lipids such as Ketoacidosis					
	42	Fatty liver					
	43	Hypercholesterolemia					
	44	Metabolism of Amino acids(Proteins): General reactions of amino acids and its significance– Transamination					
	45	deamination					
	46	Urea cycle					
	47	decarboxylation					
	48	Diseases related to abnormal metabolism of amino acids					
	49	Disorders of ammonia metabolism					
	50	Phenylketonuria ,alkaptonuria and Jaundice.					
	51	Biological oxidation: Electron transport chain					
52	Oxidative phosphorylation						

IX	53	Minerals: Introduction, Definition, Classification		CB,PP	QA,CT,SE, FE,CES	DP20223.3 DP20223.6	1,4,6,7,9
	54	Functions, Deficiency diseases, Recommended dietary requirements of Macro elements Calcium, Phosphorus					
	55	Magnesium, Sodium, Chlorine					
	56	Microelements Iron, Copper					
	57	Iodine, Zinc, Fluorine					
X	58	Water and Electrolytes Distribution and functions of water in the body	LT	CB,PP,VF	QA,CT,SE, FE,CES	DP20223.3	1,4,6,7,9
	59	Water turn over and balance					
	60	Electrolyte composition of the body fluids					
	61	Dietary Intake of electrolyte and Electrolyte balance					
	62	Dehydration, causes of dehydration and oral Rehydrationtherapy					
XI	63	IntroductiontoBiotechnology	LT	CB	QA,CT,SE, FE,CES	DP20223.1	1,4,6,7,8
XII	64	Organ functiontests Introduction and Functions of kidney	LT	CB,PP	QA,CT,SE, FE,CES	DP20223.4 DP20223.6	1,4,6,7,9
	65	Kidney Function Test and their clinical significances					
	66	Liver:- Introduction and types of Liver diseases					
	67	Functions of Liver					
	68	Liver Function Test					
	69	Lipid profile tests and its clinical significances					
XIII	70	Introduction to Pathologyof Blood and Urine Introduction	LT	CB,PP	QA,CT,SE, FE,CES	DP20223.5 DP20223.6	1,4,6,7,9
	71	Lymphocytes,their role in health and disease					
	72	Platelets, their role in health and disease					
	73	Erythrocytes-Abnormal cells and their significance					



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	74	Normal constituents of Urine and their significance					
	75	Abnormal constituents of Urine and their significance					
	76*	Guest lecture on Biotechnology				DP20223.1	1,4,6,7,8

THEORY

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Biochemistry and Clinical Pathology	Dr.Kunal Das	Nirali Publication	1 st	2022
02	Biochemistry and Clinical Pathology	Dr.R.A.Ahirrao	Pee Vee Publication	1 st	2022
03	Biochemistry and Clinical Pathology	Dr.Abhishek Tiwari	Nirali Publication	1 st	2022
04	Biochemistry and Clinical Pathology	Amol J. Giri	Pee Vee Publication	1 st	2022
05	Biochemistry and Clinical Pathology	N.Murgesh	Satya Publishers	3 rd	2004

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Biochemistry	Dr. Satyanarayan	Elsevier	4 th	2013



Plan to Cover Contents beyond Syllabus: THEORY

Planned Date/ Week	Topic Beyond Syllabus	Resource Person with Affiliation	CO	PO
Third week in December	Biotechnology	Awaiting	DP20223.1	1,2,5,6,7,8,9

TM-Teaching Method- Lecture (LT), Demonstration (DM), Chart (C), Model (M)

TA-Teaching Aids -Chalk Board (CB), Power Point Presentation (PP), Video Films (VF)

AT- Assessment Tool - Question Answers (QA), Class Tests (CT), Sessional Examination (SE), Final Examinations (FE), Rubrics (RB) ,
Course End Survey filled by students,



COURSE DETAILS

PRACTICAL

Class	S.Y. D. Pharmacy
Course Code and Course Title	20223 Biochemistry and Clinical pathology
Prerequisite/s	Basic & preliminary knowledge of Chemistry is essential
Teaching Scheme: Practical	02
Total contact hours	06
Evaluation Scheme: SES-I, SES-II,SES-III, AS,FE	10/10/10/80

Course Objectives: The course aims:(What teacher want to do with course while teaching)	
01	Qualitatively determine the biomolecules/metabolites in the given biological sample.
02	Qualitatively analysis of urine for normal and abnormal constituents of urine sample.
03	Determine the normal and abnormal constituents in blood /Serum.
04	Determine the normal and abnormal constituents in urine.
05	Study the hydrolysis of starch from acid and salivary amylase enzyme.

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
DP20058.1	Explain basic concept of biomolecules as well as normal and abnormal constituent of blood and urine.
DP20058.2	Perform qualitative analysis of biomolecules and urine sample.
DP20058.3	Estimate various constituents of blood and urine sample.
DP20058.4	Determine hydrolysis of starch from acid and salivary amylase enzyme.
DP20058.5	Analyze clinical pathology of blood and urine.



MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

Course Outcomes	Programme Outcomes								
	1	2	3	4	5	6	7	8	9
DP20058.1	3	2	-	3	3	1	3	3	3
DP20058.2	3	3	-	3	3	3	3	2	3
DP20058.3	3	3	1	3	3	1	3	3	3
DP20058.4	3	2	-	3	3	1	2	-	3
DP20058.5	3	3	-	3	3	2	3	3	3
Total	15	13	1	15	15	08	14	11	15
Avg.	3.00	2.60	1.00	3.00	3.00	1.60	2.80	2.75	3.00
DP20058	3.00	2.60	1.00	3.00	3.00	1.60	2.80	2.75	3.00

COURSE SKILL ACQUISITION MATRIX:

Course	Programme Outcome								
	1	2	3	4	5	6	7	8	9
DP20058	3.00	2.60	1.00	3.00	3.00	1.60	2.80	2.75	3.00

Course 20058	Course Outcomes				
	DP20058.1	DP20058.2	DP20058.3	DP20058.4	DP20058.5
Target	3.0	2.0	2.0	2.0	2.0
Target Level	Students scoring above 40% marks				
1	≥ 50%				
2	≥ 55%				
3	≥ 60%				



MODES FOR ASSESSMENT OF COURSE OUTCOMES-PRACTICAL

Mode	CO	Assessment tool
SES-I	DP20058.1, DP20058.2	Written Test, Performance
SES-II	DP20058.1, DP20058.2, DP20058.3, DP20058.5	Written Test, Performance
SES-III	DP20058.1, DP20058.3, DP20058.4, DP20058.5	Written Test, Performance
PM	DP20058.1, DP20058.2, DP20058.3, DP20058.4, DP20058.5	Day to Day assessment
FE	DP20058.1, DP20058.2, DP20058.3, DP20058.4, DP20058.5	Practical exam



COURSE DETAILS-PRACTICAL

Expt. No	Title of Experiment
1)	Introduction to Biochemistry and Clinical pathology Laboratory
2)	Carbohydrates To identify given sample of carbohydrate by qualitative tests.(Sucrose)
3)	To identify given sample of carbohydrate by qualitative tests. (Maltose)
4)	To identify given sample of carbohydrate by qualitative tests. (Lactose)
5)	To identify given sample of carbohydrate by qualitative tests. (Fructose)
6)	Amino Acids To identify given sample of amino acid by qualitative tests. (Cystein)
7)	To identify given sample of amino acid by qualitative tests. (Tryptophane)
8)	Proteins To identify given sample of Protein by qualitative tests(Albumine)
9)	To identify given sample of Protein by qualitative tests(Gelatin)
10)	Lipids To study physical and chemical properties of fats and oils.
11)	To conduct test on cholesterol to verify physical properties and chemical test

12)	Urine To detect normal constituents in given sample of urine by qualitative test
13)	To detect normal constituents in given sample of urine by qualitative test
14)	To detect abnormal constituents in given sample of urine by qualitative test
15)	To detect abnormal constituents in given sample of urine by qualitative test
16)	To estimate quantity of glucose in given sample of urine
17)	To estimate quantity of creatinine in given sample of urine
18)	Blood To estimate quantity of total cholesterol in given sample of blood plasma
19)	To estimate quantity of glucose in given sample of blood plasma
20)	To estimate quantity of Calcium in given sample of serum / blood
21)	To estimate quantity of Creatinine in given sample of serum / blood
22)	To estimate quantity of Urea in given sample of serum
23)	Study the hydrolysis of Starch from acid and salivary amylase enzyme.
24)	To identify given sample of carbohydrate by qualitative tests.
25)	To identify given sample of Protein by qualitative tests.

Content Delivery and assessment tools:

PRACTICAL

Practical No.	Lesson Plan	TM Teaching Method	TA Teaching Aid	AT	Mapping with Outcomes	
	Content Delivery				CO	PO
1	Introduction to Biochemistry and Clinical pathology Laboratory	LT,DM	CB	QA,SE,AS,FE,RB	DP20058.1	1,2,3,4,7,9
2	Carbohydrates To identify given sample of carbohydrate by qualitative tests	LT,C	CB	QA,SE,AS,FE,RB	DP20058.1 DP20058.2	1,2,3,4,7,9
3	To identify given sample of carbohydrate by qualitative tests					
4	To identify given sample of carbohydrate by qualitative tests					
5	To identify given sample of carbohydrate by qualitative tests					
6	Amino Acids To identify given sample of amino acid by qualitative tests.	LT,C	CB	QA,SE,AS,FE,RB	DP20058.1 DP20058.2	1,2,3,4,7,9
7	To identify given sample of amino acid by qualitative tests.					
8	Proteins To identify given sample of Protein by qualitative tests.	LT,C	CB	QA,SE,AS,FE,RB	DP20058.1 DP20058.2	1,2,3,4,7,9
9	To identify given sample of Protein by qualitative tests.					
10	Lipids To study physical and chemical properties of fats and oils.	LT,C	CB	QA,SE,AS,FE,RB	DP20058.1 DP20058.2	1,2,3,4,7,9
11	To conduct test on cholesterol to					

	verify physical properties and chemical test					
12	Urine To detect normal constituents in given sample of urine by qualitative test	LT,C	CB	QA,SE,AS,FE,RB	DP20058.1 DP20058.2DP20058.3DP20058.5	1,2,3,4,7,9
13	To detect normal constituents in given sample of urine by qualitative test					
14	To detect abnormal constituents in given sample of urine by qualitative test					
15	To detect abnormal constituents in given sample of urine by qualitative test					
16	To estimate quantity of glucose in given sample of urine					
17	To estimate quantity of creatinine in given sample of urine					
18	Blood To estimate quantity of total cholesterol in given sample of blood plasma	LC,DM	CB	QA,SE,AS,FE,RB	DP20058.1 DP20058.3DP20058.5	1,2,3,4,7,9
19	To estimate quantity of glucose in given sample of blood plasma					
20	To estimate quantity of Calcium in given sample of serum / blood					
21	To estimate quantity of Creatinine in given sample of serum / blood					
22	To estimate quantity of Urea in given sample of serum					



23	Study the hydrolysis of Starch from acid and salivary amylase enzyme	LC	CB	QA,SE,AS,FE,RB	DP20058.4	1,2,3,4,7,9
24	To identify given sample of carbohydrate by qualitative tests.	LC,C	CB	QA,SE,AS,FE,RB	DP20058.1 DP20058.2	1,2,3,4,7,9
25	To identify given sample of Protein by qualitative tests.					
26	Visit to pathology lab	DM	-			1,2,3,4,7,9

DETAILS-PRACTICAL

Expt. No	Title of Experiment	TM Teaching Method	Mapping with CO	Mapping with PO
1.	Introduction to Biochemistry and Clinical pathology Laboratory	CB,DM	DP20058.1 DP20058.2	1,2,3,4,6,9
2.	Carbohydrates To identify given sample of carbohydrate by qualitative tests. (Sucrose)	CB,C	DP20058.1 DP20058.2	1,2,3,4,6,9
3.	To identify given sample of carbohydrate by qualitative tests. (Maltose)	CB,C		
4.	To identify given sample of carbohydrate by qualitative tests. (Lactose)	CB,C		
5.	To identify given sample of carbohydrate by qualitative tests. (Fructose)	CB,C		
6.	Amino Acids To identify given sample of amino acid by qualitative tests. (Cystein)	CB,C	DP20058.1 DP20058.2	1,2,3,4,6,9
7.	To identify given sample of amino acid by qualitative tests. (Tryptophane)	CB,C		
8.	Proteins	CB,C		1,2,3,4,6,9



	To identify given sample of Protein by qualitative tests(Albumine)		DP20058.1 DP20058.2	
9.	To identify given sample of Protein by qualitative tests(Gelatin)	CB,C		
10.	Lipids To study physical and chemical properties of fats and oils.	CB,C		
11.	To conduct test on cholesterol to verify physical properties and chemical test	CB,C	DP20058.1 DP20058.2	1,2,3,4,6,9
12.	Urine To detect normal constituents in given sample of urine by qualitative test	CB,C		
13.	To detect normal constituents in given sample of urine by qualitative test	CB,C	DP20058.1 DP20058.2 DP20058.5	1,2,3,4,6,9
14.	To detect abnormal constituents in given sample of urine by qualitative test	CB,C		
15.	To detect abnormal constituents in given sample of urine by qualitative test	CB,C		
16.	To estimate quantity of glucose in given sample of urine	CB	DP20058.1 DP20058.3 DP20058.5	1,2,3,4,6,9
17.	To estimate quantity of creatinine in given sample of urine	CB		
18.	Blood To estimate quantity of total cholesterol in given sample of blood plasma	CB	DP20058.1 DP20058.3 DP20058.5	1,2,3,4,6,9
19.	To estimate quantity of glucose in given sample of blood plasma	CB		
20.	To estimate quantity of Calcium in given sample of serum / blood	CB		



21.	To estimate quantity of Creatinine in given sample of serum / blood	CB		
22.	To estimate quantity of Urea in given sample of serum	CB		
23.	Study the hydrolysis of Starch from acid and salivary amylase enzyme.	CB	DP20058.4	1,2,3,4,6,9
24.	To identify given sample of carbohydrate by qualitative tests.	CB,C	DP20058.1	1,2,3,4,6,9
25.	To identify given sample of Protein by qualitative tests.	CB,C	DP20058.2	
26.	Visit to pathology lab	DM	DP20058.1 DP20058.2 DP20058.5	1,2,3,4,6,9

TM-Teaching Method- Lecture (LT), Demonstration (DM), Chart (C), Model (M)

TA-Teaching Aids -Chalk Board (CB), Power Point Presentation (PP), Video Films (VF)

AT- Assessment Tool - Question Answers (QA), Class Tests (CT), Sessional Examination (SE), Final Examinations (FE), Rubrics (RB) , Course End Survey filled by students,



PRACTICAL

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Biochemistry & Clinical Pathology	Mrs.Namita S. Girhepunje Dr.Nitin G. Dumore	BrilliantPublication	1 st	2022
02	Biochemistry and Clinical Pathology	Mrs.Shradha R. Kale	Nirali Publication	1 st	2020
03	Biochemistry and Clinical Pathology	Dr.G.D.Gupta	S.Chand	1 st	2013

Plan to Cover Contents beyond Syllabus: PRACTICAL

Planned Date/ Week	Topic Beyond Syllabus	Resource Person with Affiliation	CO	PO
First week in January	Visit to pathology lab	Awaiting	DP20058.1 DP20058.2 DP20058.3 DP20058.5	1,2,3,4,5,6,7,9

COURSE DETAILS

Class	S.Y. D. Pharmacy
Course Code and Course Title	20224. Pharmacotherapeutics
Prerequisite/s	Science/HAP
Teaching Scheme: Lecture/Tutorial	03/01
Evaluation Scheme: SES-I/SES-II /SES-III/ MSBTE	20/20/20/80

Course Objectives: This course will discuss the following aspects of drug Substances derived from natural resources	
01	Etiopathogenesis of selected common diseases and evidence.
02	Importance of individualized therapeutic plans based on diagnosis.
03	Basic methods for assessing the clinical outcomes of drug therapy.

Course Outcomes (COs):	
Upon successful completion of this course, the student will be able to:	
DP20224.1	Describe the scope and objectives of pharmacotherapeutics.
DP20224.2	Discuss rational used evidence based, essential medicine list with standard treatment guidelines.
DP20224.3	Define disease; discuss the etiopathogenesis of selected disease states.
DP20224.4	Explain the clinical manifestations of selected disease states.
DP20224.5	Summarize the various methods involved in the diagnosis of selected disease state.
DP20224.6	Develop the individualized pharmacological and non-pharmacological plans based on diagnosis

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

Course Outcomes	Programme Outcomes								
	1	2	3	4	5	6	7	8	9
DP20224.1	3	-	-	3	1	1	3	-	3
DP20224.2	3	-	3	3	2	1	2	-	3
DP20224.3	3	-	-	3	1	3	-	-	2
DP20224.4	3	-	-	3	1	2	-	-	3
DP20224.5	3	3	-	3	2	1	2	-	3
DP20224.6	3	1	-	3	1	1	2	1	3
Total	18	4	3	18	8	9	9	1	17
Avg. of each PO	3.00	2.00	3.00	3.00	1.33	1.5	2.25	1.00	2.83

COURSE SKILL ACQUISITION MATRIX:

Course	Programme Outcome								
	1	2	3	4	5	6	7	8	9
DP20224	3.00	2.00	3.00	3.00	1.33	1.5	2.25	1.00	2.83

Course DP20113	Course Outcomes					
	DP20224.1	DP20224.2	DP20224.3	DP20224.4	DP20224.5	DP20224.6
Target	2	2	2	2	2	2
Target Level	Students scoring above 40% marks					
1	>50%					
2	>55%					
3	>60%					

MODES FOR ASSESSMENT OF COURSE OUTCOMES

Mode	CO	Assessment tool
SES-I	DP20224.1, DP20224.2, DP20224.3, DP20224.4, DP20224.5, DP20224.6	Written test, Assignment,
SES-II	DP20224.3, DP20224.4, DP20224.5, DP20224.6	Written test, Assignment,
SES-III	DP20224.3, DP20224.4, DP20224.5, DP20224.6	Written test, Assignment,
FE	DP20224.1, DP20224.2, DP20224.3, DP20224.4, DP20224.5, DP20224.6	Written test

COURSE DETAILS		
1	Pharmacotherapeutics: Introduction and scope of Pharmacotherapeutics Rational use of Medicines, Evidence Based Medicine, Essential Medicines List, Standard Treatment Guidelines (STGs)	08Hours
2A	Definition, etiopathogenesis, clinical manifestations, non-pharmacological and pharmacological management of the diseases associated with Cardiovascular System:Hypertension, Angina pectoris, Myocardial infarction., Hyperlipidaemia, Congestive Heart Failure,	08 Hours
2B	Definition, etiopathogenesis, clinical manifestations, non-pharmacological and pharmacological management of the diseases associated with Respiratory System: Asthma, COPD,	04 Hours
2C	Definition, etiopathogenesis, clinical manifestations, non-pharmacological and pharmacological management of the diseases associated with Endocrine System: Diabetes, Hypothyroidism&Hypothyroidism	05 Hours
2D	Definition, etiopathogenesis, clinical manifestations, non-pharmacological and pharmacological management of the diseases associated with Central Nervous System:Epilepsy, Parkinson's disease.Alzheimer's disease.Stroke, Migraine	8 Hours
2E	Definition, etiopathogenesis, and clinical manifestations, non-pharmacological and pharmacological management of the diseases associated with Gastro Intestinal Disorders:Gastro oesophageal reflux disease, peptic Ulcer Disease, Alcoholic liver disease.Inflammatory Bowel Diseases (Crohn's Disease and Ulcerative Colitis)	8 Hours
2F	Definition, etiopathogenesis, and clinical manifestations, non-pharmacological and pharmacological management of the diseases associated with Hematological disorders:Iron deficiency anaemia, Megaloblastic anaemia.	4 Hours
2G	Definition, etiopathogenesis, and clinical manifestations, non-pharmacological and pharmacological management of the diseases associated with Infectious disorders:Tuberculosis, Pneumonia, Urinary tract infections, Hepatitis, Gonorrhoea and Syphilis.Malaria, HIV and Opportunistic infections.(SARS, CoV2)	12 Hours
2H	Definition, etiopathogenesis, and clinical manifestations, non-pharmacological and pharmacological management of the diseases associated with Musculoskeletal disorders: Rheumatoid arthritis.Osteoarthritis,	3 Hours
2I	Definition, etiopathogenesis, and clinical manifestations, non-pharmacological and pharmacological management of the diseases associated with Dermatology: Psoriasis, Scabies,Eczema	3 Hours
2J	Definition, etiopathogenesis, and clinical manifestations, non-pharmacological and pharmacological management of the diseases associated with Psychiatric Disorders:Depression,, Anxiety, Psychosis	4 Hours



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2K	Definition, etiopathogenesis, and clinical manifestations, non-pharmacological and pharmacological management of the diseases associated with Ophthalmology: Conjunctivitis, Glaucoma,	2 Hours
2L	Definition, etiopathogenesis, and clinical manifestations, non-pharmacological and pharmacological management of the diseases associated with antimicrobial resistance. antibiotic resistance	2 Hours
2M	Definition, etiopathogenesis, and clinical manifestations, non-pharmacological and pharmacological management of the diseases associated with Women's Health: Polycystic Ovary Syndrome, Dysmenorrhea, Premenstrual Syndrome	4 Hours

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Pharmacotherapeutics	Shaju P	CBS Publisher	1 st edition	2022
02	Pharmacotherapeutics	Arun K. Mishra	Nirali Prakashan	1 st edition	2021

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Pharmacotherapeutics	R.S. Satoskar	Popular Prakashan	19 th editions	2017

Content Delivery and assessment tools:



ANNASAHEB DANGE COLLEGE OF D. PHARMACY, ASHTA

Chapter	Lect. No.	Lesson Plan	TM	TA	AT	Mapping with Outcomes	
		Content Delivery				CO	PO
1	1	Introduction, scope & objective of Pharmacotherapeutics.	LT	CB, PP	QA, CT	DP20224.1 DP20224.2	1,8,9
	2	To study the Rational use of Medicines.					
	3	To study Definition, Components, Objectives and Factors influencing EBM.					
	4	To study steps involved in applying EBM process to Pharmacotherapeutics decision making and merits of EBM					
	5	To know the definition, concept and history of essential medicines.					
	6	To know the national list, process of essential medicine of India.					
	7	To learn the definition, and different policy makers.					
	8	To learn the different steps involved in the STG manual.					
2A	9	2. Definition, etiopathogenesis, clinical manifestations, non-pharmacological and pharmacological management of the diseases associated Cardiovascular System: Definition, etiopathogenesis, clinical manifestations of Hypertension.	LT	CB, PP	QA, CT	DP20224.3 DP20224.4 DP20224.5 DP20224.6	1,2,4,5,6,7,9
	10	Non pharmacological and pharmacological management of the Hypertension					
	11	Definition, etiopathogenesis, clinical manifestations, non-pharmacological and pharmacological management of Angina.					
	12	definition, etiopathogenesis, clinical manifestations, non-pharmacological and pharmacological management of Myocardial infarction.					

	14	Non pharmacological and pharmacological management of the Hyperlipidaemia.					
	15	Definition, etiopathogenesis, clinical manifestations of Congestive Heart Failure					
	16	Non pharmacological and pharmacological management of the Congestive Heart Failure					
2B	17	Respiratory System Definition, etiopathogenesis, clinical manifestations of Asthma					
	18	Non pharmacological and pharmacological management of the Asthma.					
	19	Definition, etiopathogenesis, clinical manifestations of COPD.	LT	CB, PP	QA, CT	DP20224.3 DP20224.4 DP20224.5 DP20224.6	1,2,4,5,6,7,9
	20	Non pharmacological and pharmacological management of the COPD					
2C	21	Introduction to Endocrine System	LT	CB, PP	QA, CT	DP20224.3	1,2,4,5,6,7,9
	22	Definition, etiopathogenesis, clinical manifestations of Diabetes.					
	23	Non pharmacological and pharmacological management of the Diabetes				DP20224.4	
	24	Definition, etiopathogenesis, clinical manifestations of Hypothyroidism and Hypothyroidism				DP20224.5	
	25	Non pharmacological and pharmacological management of the Hypothyroidism and Hypothyroidism				DP20224.6	
2D	26	Central Nervous System Definition, etiopathogenesis, clinical manifestations, Nonpharmacological and pharmacological management of the of Epilepsy.	LT	CB, PP	QA, CT	DP20224.3 DP20224.4	1,2,4,5,6,7,9
	27	Definition, etiopathogenesis, clinical manifestations, Nonpharmacological and pharmacological management of the Parkinson's disease.				DP20224.5	
	28	Definition, etiopathogenesis, clinical manifestations of the Alzheimer's disease.				DP20224.6	



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	29	Non pharmacological and pharmacological management of the Alzheimer's disease.					
	30	Definition, etiopathogenesis, clinical manifestations of the Stroke.	LT	CB, PP, VF	QA, CT	DP20111.4	
	31	Non pharmacological and pharmacological management of the Stroke					
	32	Definition, etiopathogenesis, clinical manifestations of the Migraine.					
	33	Non pharmacological and pharmacological management of the Migraine.					
2E	34	Gastro Intestinal Disorders: Definition, etiopathogenesis, clinical manifestations of the Gastro oesophageal reflux disease.	LT	CB, PP	QA, CT	DP20224.3 DP20224.4 DP20224.5 DP20224.6	1,2,4,5,6,7,9
	35	Non pharmacological and pharmacological management of the Gastro oesophageal reflux disease.					
	36	Definition, etiopathogenesis, clinical manifestations of the Peptic Ulcer Disease.					
	37	Non pharmacological and pharmacological management of the Peptic Ulcer Disease					
	38	Definition, etiopathogenesis, clinical manifestations of the Alcoholic liver disease.					
	39	Non pharmacological and pharmacological management of the Alcoholic liver disease.					
	40	Definition, etiopathogenesis, clinical manifestations of the Inflammatory Bowel Diseases (Crohn's Disease and Ulcerative Colitis)					
	41	Non pharmacological and pharmacological management of the Inflammatory Bowel Diseases (Crohn's Disease and Ulcerative Colitis)					
2F	42	Haematological disorders: Definition, etiopathogenesis, clinical manifestations of the Iron deficiency anaemia	LT	CB, PP	QA, CT	DP20224.3 DP20224.4	1,2,4,5,6,7,9
	43	Non pharmacological and pharmacological management of the Iron deficiency anaemia					

	44	Definition, etiopathogenesis, clinical manifestations of the Megaloblastic anaemia.				DP20224.5	
	45	Non pharmacological and pharmacological management of the Megaloblastic anaemia.				DP20224.6	
2G	46	Infectious diseases	LT	CB, PP	QA, CT	DP20224.3 DP20224.4 DP20224.5 DP20224.6	1,2,4,5,6,7,9
		Definition, etiopathogenesis, clinical manifestations of the Tuberculosis.					
	47	Non pharmacological and pharmacological management of the Tuberculosis.					
	48	Definition, etiopathogenesis, clinical manifestations of the Pneumonia.					
	49	Non pharmacological and pharmacological management of the Pneumonia					
	50	Definition, etiopathogenesis, clinical manifestations of the Urinary tract infections					
	51	Non pharmacological and pharmacological management of the Urinary tract infections.					
	52	Definition, etiopathogenesis, clinical manifestations of the Hepatitis.					
	53	Non pharmacological and pharmacological management of the Hepatitis					
	54	Definition, etiopathogenesis, clinical manifestations, Nonpharmacological and pharmacological management of the Gonorrhoea and Syphilis.					
	55	Definition, etiopathogenesis, clinical manifestations, Nonpharmacological and pharmacological management of the Malaria.					
2H	56	Definition, etiopathogenesis, clinical manifestations, Nonpharmacological and pharmacological management of the HIV and Opportunistic infections.	LT	CB, PP	QA, CT	DP20224.3 DP20224.4	1,2,4,5,6,7,9
	57	Definition, etiopathogenesis, clinical manifestations, Nonpharmacological and pharmacological management of the Viral Infections (SARS, CoV2)					
	58	Musculoskeletal disorders: Definition, etiopathogenesis, clinical manifestations of the Rheumatoid					

		arthritis.				DP20224.5 DP20224.6	
	59	Non pharmacological and pharmacological management of the Rheumatoid arthritis.					
	60	Definition, etiopathogenesis, clinical manifestations, Non pharmacological and pharmacological management of the Osteoarthritis.					
	61	Dermatology: Definition, etiopathogenesis, clinical manifestations, Non pharmacological and pharmacological management of the Psoriasis.	LT	CB, PP	QA, CT	DP20224.3 DP20224.4 DP20224.5 DP20224.6,	1,2,4,5,6,7,9
	62	Definition, etiopathogenesis, clinical manifestations, Non pharmacological and pharmacological management of the Scabies.					
	63	Definition, etiopathogenesis, clinical manifestations, Non pharmacological and pharmacological management of the Eczema					
2J	64	Psychiatric Disorders: Definition, etiopathogenesis, clinical manifestations of Depression	LT	CB, PP	QA, CT	DP20224.3 DP20224.4 DP20224.5 DP20224.6	1,2,4,5,6,7,9
	65	Non pharmacological and pharmacological management of the Depression.					
	66	Definition, etiopathogenesis, clinical manifestations Non pharmacological and pharmacological management of the Anxiety.					
	67	Definition, etiopathogenesis, clinical manifestations, Non pharmacological and pharmacological management of the Psychosis.					
2K	68	Ophthalmology: Definition, etiopathogenesis, clinical manifestations, Non pharmacological and pharmacological management of the Conjunctivitis(bacterial and viral).				DP20224.3 DP20224.4 DP20224.5 DP20224.6	1,2,4,5,6,7,9
	69	Definition, etiopathogenesis, clinical manifestations, Non pharmacological and pharmacological management of the Glaucoma.					
2L	70	Anti-microbial Resistance: Causes, mechanism, prevention of antimicrobial resistance.	LT	CB, PP	QA, CT	DP20224.3 DP20224.4 DP20224.5 DP20224.6	1,2,4,5,6,7,9
	71	Impact of resistance in human medicine & environment, spread of antibiotic resistance.					



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2M	72	Women's Health: Definition, etiopathogenesis, clinical manifestations of, Non pharmacological and pharmacological management of the Polycystic Ovary Syndrome	LT	CB, PP, VF	QA, CT	DP20224.3 DP20224.4 DP20224.5 DP20224.6	1,9
	73	Definition, etiopathogenesis, clinical manifestations of, Non pharmacological and pharmacological management of the Dysmenorrhea.					
	74	Definition, etiopathogenesis, clinical manifestations of Premenstrual Syndrome.					
	75	Non pharmacological and pharmacological management of the Premenstrual Syndrome.					

TM-Teaching Method- Lecture (LT).

TA-Teaching Aids -Chalk Board (CB), Power Point Presentation (PP), Video Films (VF)

AT- Assessment Tool - Class Tests (CT), Question Answers (QA), MSBT Examinations (EX), Rubrics (RB) , Course End Survey filled by students,

COURSE DETAILS

Class	S.Y. D. Pharmacy
Course Code and Course Title	20059 Pharmacotherapeutics
Prerequisite/s	Science/HAP
Teaching Scheme: Practical	01 Hours
Total contact hours	25 Hours
Evaluation Scheme: SES-I/SES-II /SES-III/ MSBTE	10/10/10/80

Course Objectives: This course will discuss the following aspects of drug Substances derived from natural resources	
01	How to prepare a SOAP (Subjective, Objective, Assessment and Plan) note for clinical cases of selected common diseases
02	Patient counselling techniques/methods for common disease conditions

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
DP20059.1	Explain the SOAP (Subjective, Objective, Assessment and Plan) notes for the given clinical cases of selected common diseases.
DP20059.2	Counsel the patients about the disease conditions, uses of drugs, methods of handling and administration of drugs, life-style modifications and monitoring Parameters.
DP20059.3	Prepare individualized therapeutic plans based on diagnosis of disease.
DP20059.4	Discuss the therapeutic approach to management of selected diseases.
DP20059.5	Conduct planned experiments and prepares laboratory report in a standard format.

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

Course Outcomes	Programme Outcomes								
	1	2	3	4	5	6	7	8	9
DP20059.1	3	3	3	3	3	2	2	1	3
DP20059.2	3	-	3	3	2	3	3	2	3
DP20059.3	3	3	-	3	3	2	2	3	3
DP20059.4	3	1	1	3	2	1	2	1	3
DP20059.5	3	-	3	3	2	1	3	-	3
Total	15	7.0	10	15	12	9.0	12	7	15
Avg. of each PO	3.00	2.33	2.50	3.00	2.40	1.80	2.40	1.75	3.00

COURSE SKILL ACQUISITION MATRIX:

Course	Programme Outcome								
	1	2	3	4	5	6	7	8	9
DP20224	3.00	2.33	2.50	3.00	2.40	1.80	2.40	1.75	3.00

Course DP20059	Course Outcomes				
	DP20059.1	DP20059.2	DP20059.3	DP20059.4	DP20059.5
Target	2	2	2	2	2
Target Level	Students scoring above 40% marks				
1	>50%				
2	>55%				
3	>60%				

MODES FOR ASSESSMENT OF COURSE OUTCOMES

Mode	CO	Assessment tool
SES-I	DP20059.1, DP20059.3, DP20059.4	Written test, , Manual
SES-II	DP20059.1, DP20059.2, DP20059.3, DP20059.4, DP20059.5	Written test, Manual
SES-III	DP20059.2, DP20059.3, DP20059.4, DP20059.5	Written test, Manual
MSBTE	DP20059.1, DP20059.2, DP20059.3, DP20059.4, DP20059.5	Written test, Manual

COURSE DETAILS- PRACTICAL	
Expt. No	Title of Experiment
1	Introduction to preparation and discussion of SOAP (Subjective, Assessment and Plan)
2	To study and understand SOAP of Hypertension.
3	To study and understand SOAP of Angina Pectoris.
4	To study and understand SOAP of Myocardial Infarction.
5	To study and understand SOAP of Hyperlipidemia.
6	To study and understand SOAP of Rheumatoid Arthritis.
7	To study and understand SOAP of Asthma.
8	To study and understand SOAP of COPD.
9	To study and understand SOAP of Diabetes Mellitus.
10	To study and understand SOAP of Epilepsy disorders.
11	To study and understand SOAP of Cerebrovascular Accident.(stroke)
12	To study and understand SOAP of Depression.
13	To study and understand SOAP of Tuberculosis.
14	To study and understand SOAP of Anaemia.
15	To study and understand SOAP of viral infection.

16	To study and understand SOAP of Dermatological condition
17	Case Study 01 Acute Sinusitis To study and understand clinical case scenarios and disease condition, medications, life-style modification, monitoring parameters etc.
18	Case Study 02 Cancer To study and understand clinical case scenarios and disease condition, medications, life-style modification, monitoring parameters etc.
19	Case Study 03 Migraine To study and understand clinical case scenarios and disease condition, medications, life-style modification, monitoring parameters etc.
20	Case Study 04 Acute Kidney Failure To study and understand clinical case scenarios and disease condition, medications, life-style modification, monitoring parameters etc.
21	Case Study 05 Parkinson's Disease To study and understand clinical case scenarios and disease condition, medications, life-style modification, monitoring parameters etc.
22	Case Study No. 01 To study and understand dose calculation of selected drugs in paediatrics, and geriatrics under various pathological conditions.
23	Case Study No. 02 To study and understand dose calculation of selected drugs in paediatrics, and geriatrics under various pathological conditions.
24	Case Study No. 03 To study and understand dose calculation of selected drugs in paediatrics, and geriatrics under various pathological conditions.
25	Case Study No. 04 To study and understand dose calculation of selected drugs in paediatrics, and geriatrics under various pathological conditions.

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Practical Manual of PHARMACOTHERAPEUTICS	Dr. Abhishek Sharma Dr. Hashim Khan	Nirali Prakashan	1 st edition	2022
02	Practical Manual of PHARMACOTHERAPEUTICS	Dr. G.D. Gupta Dr. Shailesh Sharma	Nirali Prakashan	1 st edition	2022

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Pharmacotherapeutics for Advanced Practice	Virginia Poole Arcangelo, Andrew M. Peterson,	LWW	2021 editions	2021

Content Delivery and assessment tools:



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Expt. No	Title of Experiment	Planned week	Mapping with CO	Mapping with PO
1.	Introduction to preparation and discussion of SOAP (Subjective, Assessment and Plan)	1 st	DP20059.1	1,2,3,4,5,6,7,8,9
2.	To study and understand SOAP of Hypertension.	2 nd	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
3.	To study and understand SOAP of Angina Pectoris.	3 rd	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
4.	To study and understand SOAP of Myocardial Infarction.	4 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
5.	To study and understand SOAP of Hyperlipidemia.	5 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
6.	To study and understand SOAP of Rheumatoid Arthritis.	6 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
7.	To study and understand SOAP of Asthma.	7 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
8.	To study and understand SOAP of COPD.	8 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9



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9.	To study and understand SOAP of Diabetes Mellitus.	9 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
10.	To study and understand SOAP of Epilepsy disorders.	10 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
11.	To study and understand SOAP of Cerebrovascular Accident.(stroke)	11 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
12.	To study and understand SOAP of Depression.	12 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
13.	To study and understand SOAP of Tuberculosis.	13 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
14.	To study and understand SOAP of Anaemia.	14 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
15.	To study and understand SOAP of viral infection.	15 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
16.	To study and understand SOAP of Dermatological condition	16 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9



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17.	Case Study 01 Acute Sinusitis To study and understand clinical case scenarios and disease condition, medications, life-style modification, monitoring parameters etc.	17 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
18.	Case Study 02 Cancer To study and understand clinical case scenarios and disease condition, medications, life-style modification, monitoring parameters etc.	18 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
19.	Case Study 03 Migraine To study and understand clinical case scenarios and disease condition, medications, life-style modification, monitoring parameters etc.	19 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
20.	Case Study 04 Acute Kidney Failure To study and understand clinical case scenarios and disease condition, medications, life-style modification, monitoring parameters etc.	20 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
21.	Case Study 05 Parkinson's Disease To study and understand clinical case scenarios and disease condition, medications, life-style modification, monitoring parameters etc.	21 st	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
22.	Case Study No. 01 To study and understand dose calculation of selected drugs in paediatrics, and geriatrics under various pathological conditions.	22 nd	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
23.	Case Study No. 02 To study and understand dose calculation of selected drugs in paediatrics, and geriatrics under various pathological conditions.	23 rd	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
24.	Case Study No. 03 To study and understand dose calculation of selected drugs in paediatrics, and geriatrics under various pathological conditions.	24 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9



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25.	Case Study No. 04 To study and understand dose calculation of selected drugs in paediatrics, and geriatrics under various pathological conditions.	25 th	DP20059.2 DP20059.3 DP20059.4 DP20059.5	1,2,3,4,5,6,7,8,9
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TM-Teaching Method- Lecture (LT).

TA-Teaching Aids -Chalk Board (CB), Power Point Presentation (PP), Video Films (VF)**AT- Assessment Tool** - Class Tests (CT), Question Answers (QA), MSBT Examinations (EX), Rubrics (RB) , Course End Survey filled by students



COURSE DETAILS

THEORY

Class	S.Y. D. Pharmacy
Course Code and Course Title	20225 Hospital and Clinical Pharmacy
Prerequisite/s	Basic & preliminary knowledge of Pharmaceutics, HAP, Pharmacology is essential
Teaching Scheme: Lecture/Tutorial	03/01
Evaluation Scheme: SES-I, SES-II, SES-III, FE	20/80

THEORY

Course Objectives: The course aims:(What teacher want to do with course while teaching)	
01	Explain basic concepts of hospital, hospital pharmacy& its administration.
02	Explain management of supply chain, inventory control & drug distribution and compounding of drugs in hospital
03	Describe application of Computer in hospital
04	Elaborate concept of clinical pharmacy and its importance in health care services.

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
DP20225.1	Explain basic concepts of hospital, hospital pharmacy& its administration.
DP20225.2	Explain management of supply chain, inventory control & drug distribution and compounding of drugs in hospital
DP20225.3	Describe application of Computer in hospital
DP20225.4	Elaborate concept of clinical pharmacy and its importance in health care services.
DP20225.5	Interpret common laboratory reports for management of drug therapy.
DP20225.6	Identify, monitor & report drug related problems

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

Course Outcomes	Program Outcomes								
	1	2	3	4	5	6	7	8	9
DP20225.1	3	1	-	3	1	1	3	-	3
DP20225.2	3	3	-	3	3	-	3	2	3
DP20225.3	3	3	-	-	1	1	-	-	3
DP20225.4	3	3	3	3	3	2	3	2	3
DP20225.5	3	3	-	3	2	1	3	-	3
DP20225.6	3	2	-	3	2	1	3	-	3
Total	18	15	3	15	12	6	15	4	18
Avg. of each PO	3	2.5	3	3	2	1.2	3	2	3

COURSE SKILL ACQUISITION MATRIX:

Course	Programme Outcome								
	1	2	3	4	5	6	7	8	9
DP20225	3	2.5	3	3	2	1.2	3	2	3

Course DP20225	Course Outcomes					
	DP20225.1	DP20225.2	DP20225.3	DP20225.4	DP20225.5	DP20225.6
Target	2	2	2	2	2	2
Target Level	Students scoring above 40% marks					
1	≥ 50%					
2	≥ 55%					
3	≥ 60%					

MODES FOR ASSESSMENT OF COURSE OUTCOMES-THEORY

Mode	CO	Assessment tool
SES-I	DP20225.1, DP20225.2	Written test
SES-II	DP20225.2, DP20225.3, DP20225.4	Written test
SES-III	DP20225.5, DP20225.6	Written test
FE	DP20225.1, DP20225.2, DP20225.3, DP20225.4 DP20225.5, DP20225.6	Written test

COURSE DETAILS-THEORY		
UNIT	Topic	Hours
UNIT I	<p>HOSPITALS: Definition, scope, national and international scenario, Organizational structure Professional responsibilities, Qualification and experience requirements, job specifications, work load requirements and inter professional relationships Good Pharmacy Practice (GPP) in hospital, Hospital Pharmacy Standards (FIP Basel Statements, AHSP) Introduction to NAQS guidelines and NABH Accreditation and Role of Pharmacists.</p>	(06Hrs)
UNIT II	<p>DIFFERENT COMMITTEES IN THE HOSPITAL Pharmacy and Therapeutics Committee -Objectives, Composition, and functions Hospital Formulary - Definition, procedure for development and use of hospital formulary Infection Control Committee – Role of Pharmacist in preventing Antimicrobial Resistance</p>	(04Hrs)
UNIT III	<p>SUPPLY CHAIN AND INVENTORY CONTROL Preparation of Drug lists - High Risk drugs, Emergency drugs Schedule H1 drugs, NDPS drugs, reserved Antibiotics Procedures of Drug Purchases – Drug selection, short term, long term Tender/e-tender process, quotations Inventory control techniques: Economic Order Quantity Reorder Quantity Level, Inventory Turnover etc. Inventory Management of Central Drug Store – Storage conditions, Methods of storage Distribution, Maintaining Cold Chain, Devices used for cold storage (Refrigerator, ILR, Walk-in-Cold rooms) FEFO, FIFO methods, Expiry drug removal and handling, and disposal. Disposal of Narcotics, cytotoxic drugs, Documentation - purchase and inventory</p>	(14Hrs)
UNIT IV	<p>.DRUG DISTRIBUTION Manufacturing of liquid orals and external bulk concentrate Drug distribution (in- patients and out - patients) – Definition, advantages and disadvantages of individual prescription order method, Floor Stock Method, Unit Dose Drug Distribution Method, Drug Basket Method. Distribution of drugs to ICCU/ICU/NICU/Emergency wards Automated drug dispensing systems and devices Distribution of Narcotic and Psychotropic substances and their storage</p>	(07hrs)
UNIT V	<p>COMPOUNDING IN HOSPITALS Bulk compounding IV admixture services and incompatibilities Total parenteral nutrition</p>	(04Hrs)
UNIT VI	<p>RADIO PHARMACEUTICALS Storage, dispensing and disposal of radiopharmaceuticals</p>	(02Hrs)
UNIT VII	<p>Application of computers in Hospital Pharmacy Practice, Electronic health records, Software used in hospital pharmacy.</p>	(02Hrs)
UNIT VIII	<p>CLINICAL PHARMACY: Definition, scope, and development - in India and other countries Technical definitions, common terminologies used in clinical settings and their significance such as Pediatrics, Geriatric, Anti-natal Care, Post-natal Care, etc. Daily activities of clinical pharmacists: Definition, goal, and procedure of</p>	(12Hrs)



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	Ward round participation, Treatment Chart Review, Adverse drug reaction monitoring. Drug information and poisons information, Medication history Patient counseling, Inter-professional collaboration PHARMACEUTICAL CARE: Definition, classification of drug related problems. Principles and procedure to provide pharmaceutical care Medication Therapy Management, Home Medication Review	
UNIT IX	Clinical laboratory tests used in the evaluation of disease states - significance and interpretation of test results Hematological, Liver function, Renal function, Thyroid function tests Tests associated with cardiac disorders, Fluid and electrolyte balance Pulmonary Function Tests	(10Hrs)
UNIT X	POISONING: Types of poisoning: Poison Clinical manifestations and Antidotes Drugs and Poison Information Centre and their services – Definition, Requirements, Information resources with examples, Information resources advantages and disadvantages	(06Hrs)
UNIT XI	PHARMACOVIGILANCE Definition, aim and scope , Overview of Pharmacovigilance	(02 Hrs)
UNIT XII	MEDICATION ERRORS: Definition, types, consequences, and strategies to minimize medication errors,LASA drugs and Tallman lettering as per ISMP Drug Interactions: Definition, types, Clinical significance of drug interactions	(06Hrs)



Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Hospital and Clinical Pharmacy	Dr. A. V. Yadav Dr.B.V. Yadav	Nirali Publication	1 st	2022
02	Hospital and Clinical Pharmacy	Mr. D. S. Londhi Mr. P. Golani Dr. Md. Rageeb Md. Usman Dr. A. Mahajan	Pee Vee Publication	1 st	2022
03	Dispensing Pharmacy	R M Mehta	Vallabh Prakashan	6 th	2017
04	Practical Hospital and clinical Pharmacy	Dr. A R Paradkar S.B. Gokhale	Nirali Publication	6 th	2016
05	Hospital and Clinical Pharmacy	Dr.A.R.Paradkar	Nirali Publication	19 th	2015
06	Professional Pharmacy	N.K Jain S N Sharma	Vallabh Prakashan	7 th	2014

Content Delivery and assessment tools:



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Unit	Lect. No.	Lesson Plan	TM Teaching Method	TA Teaching Aid	AT	Mapping with Outcomes	
		Content Delivery				CO	PO
	1	Discussion regarding Vision, mission & PEOs of Institute HOSPITALS: Definition, scope, national and international scenario	LT	CB,PP,	QA, SE, FE	DP20225.1 DP20225.2	1, 2, 4,5,6,7 8,9
	2	Organizational structure					
	3	Professional responsibilities, Qualification and experience requirements, job specifications, work load requirements and inter professional relationships					
	4	Good Pharmacy Practice (GPP) in hospital					
	5	Hospital Pharmacy Standards (FIP Basel Statements, AHSP)					
	6	Introduction to NAQS guidelines and NABH Accreditation and Role of Pharmacists					
	7	DIFFERENT COMMITTEES IN THE HOSPITAL Pharmacy and Therapeutics Committee -Objectives, Composition, and functions	LT	CB,PP,	QA, SE,FE	DP20225.1 DP20225.2	1, 2, 4,5,6,7 8,9
	8	Hospital Formulary - Definition, procedure for development					
	9	Use of hospital formulary					
	10	Infection Control Committee – Role of Pharmacist in preventing Antimicrobial Resistance					
	11	SUPPLY CHAIN AND INVENTORY CONTROL Preparation of Drug lists - High Risk drugs, Emergency drugs	LT	CB,PP,	QA, SE, FE	DP20225.1 DP20225.2	1, 2, 4,5,6,7 8,9
	12	Schedule H1 drugs, NDPS drugs,					
	13	Reserved Antibiotics					



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14	Procedures of Drug Purchases – Drug selection, short term, long term					
15	Tender/e-tender process, quotations					
16	Inventory control techniques: Economic Order Quantity					
17	Reorder Quantity Level, Inventory Turnover etc.					
18	Inventory Management of Central Drug Store – Storage conditions, Methods of storage					
19	Distribution, Maintaining Cold Chain,					
20	Devices used for cold storage (Refrigerator, ILR, Walk-in-Cold rooms)					
21	FEFO, FIFO methods					
22	Expiry drug removal and handling, and disposal.					
23	Disposal of Narcotics, cytotoxic drugs					
24	Documentation - purchase and inventory					
25	DRUG DISTRIBUTION Manufacturing of liquid orals and external bulk concentrate Drug distribution (in- patients and out - patients) – Definition, advantages and disadvantages of individual prescription order method,	LT	CB,PP,	QA, SE,FE	DP20225.1 DP20225.2	1, 2, 4,5,6,7 8,9
26	Floor Stock Method, Unit Dose Drug Distribution Method, Drug Basket Method					
27	Distribution of drugs to ICCU/ICU					
28	Distribution of drugs to NICU/Emergency wards					
29	Automated drug dispensing systems and devices					
30	Distribution of Narcotic and Psychotropic substances					
31	Storage of Narcotic and Psychotropic substances					



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32	COMPOUNDING IN HOSPITALS Bulk compounding	LT	CB,PP,	QA, SE, FE	DP20225.1 DP20225.2	1, 2, 4,5,6,7 8,9
33	IV admixture services					
34	Incompatibilities					
35	Total parenteral nutrition					
36	RADIO PHARMACEUTICALS Storage, dispensing	LT	CB,PP,	QA, SE, FE	DP20225.1 DP20225.2	1, 2, 4,5,6,7 8,9
37	Disposal of radiopharmaceuticals					
38	Application of computers in Hospital Pharmacy Practice,	LT	CB,PP,	QA, SE, FE	DP20225.3	1, 2, 5,6,9
39	Electronic health records, Software used in hospital pharmacy.					
40	CLINICAL PHARMACY: Definition, scope, and development - in India and other countries	LT	CB,PP,	QA, SE, FE	DP20225.4	1, 2, 3,4,5,6 7,8,9
41	Technical definitions, common terminologies used in clinical settings and their significance such as Pediatrics, Geriatric, Anti-natal Care, Post-natal Care, etc.					
42	Technical definitions, common terminologies used in clinical settings and their significance Anti-natal Care, Post-natal Care, etc.					
43	Daily activities of clinical pharmacists: Definition, goal, and procedure of Ward round participation					
44	Treatment Chart Review					



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45	Adverse drug reaction monitoring. Drug information and poisons information					
46	Medication history & Patient counseling					
47	Inter-professional collaboration					
48	PHARMACEUTICAL CARE: Definition, classification of drug related problems					
49	Principles and procedure to provide pharmaceutical care					
50	Medication Therapy Management					
51	Home Medication Review					
52	Clinical laboratory tests used in the evaluation of disease states - significance and interpretation of test results Hematological,	LT	CB,PP,	QA, SE,FE	DP20225.5	1, 2, 4,5,6 7,9
53	Liver function,					
54	Renal function,					
55	Thyroid function tests					
56	Tests associated with cardiac disorders					
57	Tests associated with cardiac disorders					
58	Fluid and electrolyte balance					
59	Fluid and electrolyte balance					
60	Pulmonary Function Tests					



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61	Pulmonary Function Tests					
62	POISONING: Types of poisoning:	LT	CB,PP,	QA, SE, FE,	DP20225.6	1, 2, 4,5,6 7,9
63	Poison Clinical manifestations and Antidotes					
64	Drugs and Poison Information Centre– Definition, Requirements					
65	Drugs and Poison Information Centre services					
66	Information resources with examples,					
67	Information resources advantages and disadvantages					
68	PHARMACOVIGILANCE Definition, aim and scope	LT	CB,PP,	QA, SE,FE,	DP20225.6	1, 2, 4,5,6 7,9
69	Overview of Pharmacovigilance					
70	MEDICATION ERRORS: Definition, types,	LT	CB,PP,	QA, SE, FE	DP20225.6	1, 2, 4,5,6 7,9
71	consequences to minimize medication errors,					
72	strategies to minimize medication errors					
73	LASA drugs and Tallman lettering as per ISMP					
74	Drug Interactions: Definition, types					
75	Clinical significance of drug interactions					

TA-Teaching Aids -Chalk Board (CB), Power Point Presentation (PP), Video Films (VF)

AT- Assessment Tool - Question Answers (QA), Class Tests (CT), Sessional Examination (SE), Final Examinations (FE), Rubrics (RB) , Course End Survey filled by students,



PRACTICAL

Class	S.Y. D. Pharmacy
Course Code and Course Title	20060 Hospital and Clinical Pharmacy
Prerequisite/s	Basic & preliminary knowledge of Pharmaceutics, HAP, Pharmacology is essential
Teaching Scheme:	Practical
Total contact hours	03
Evaluation Scheme: SES-I, SES-II, SES-III, PM, FE	20/80

PRACTICAL

Course Objectives: The course aims:	
01	Hospital and Hospital Pharmacy organization and set-ups
02	Basics of hospital pharmacy services including the procurement, supply chain, storage of medicines and medical supplies
03	Basics of clinical pharmacy including introduction to comprehensive pharmaceutical care services
04	Basic interpretations of common laboratory results used in clinical diagnosis towards optimizing the drug therapy

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
DP20060.1	Explain the drug information services
DP20060.2	Illustrate the handling of drug information queries
DP20060.3	Interpret the common laboratory reports
DP20060.4	Report suspected adverse drug reactions using standard procedures
DP20060.5	Demonstrate the handling of various medical/surgical aids and devices
DP20060.6	Interpret and report the drug-drug interactions in common diseases for optimizing the drug therapy

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

Course Outcomes	Programme Outcomes								
	1	2	3	4	5	6	7	8	9
DP20060.1	3	3	3	3	3	3	3	-	3
DP20060.2	3	3	3	3	3	3	3	-	3
DP20060.3	3	3	3	3	3	2	3	1	3
DP20060.4	3	3	3	3	2	3	3	-	3
DP20060.5	3	3	3	3	1	2	3	2	3
DP20060.6	3	3	3	3	1	3	3	-	3
Total	18	18	18	18	13	16	18	-	18
Avg.	3.00	3.00	3.00	3.00	2.16	2.66	3.00	1.5	3.00
DP20060	3.00	3.00	3.00	3.00	2.16	2.66	3.00	1.5	3.00

COURSE SKILL ACQUISITION MATRIX:

Course	Programme Outcome								
	1	2	3	4	5	6	7	8	9
DP20060	3.00	3.00	3.00	3.00	2.16	2.66	3.00	1.5	3.00

Course DP20060	Course Outcomes					
	DP20060.1	DP20060.2	DP20060.3	DP20060.4	DP20060.5	DP20060.6
Target	2	2	2	2	2	2
Target Level	Students scoring above 40% marks					
1	≥ 50%					
2	≥ 55%					
3	≥ 60%					

MODES FOR ASSESSMENT OF COURSE OUTCOMES-PRACTICAL

Mode	CO	Assessment tool
SES-I	DP20060.1,DP20060.2, DP20060.3,DP20060.4, DP20060.5	Practical exam
SES-II	DP20060.1,DP20060.2, DP20060.3,DP20060.4, DP20060.5	Practical exam
SES-III	DP20060.1,DP20060.2, DP20060.3,DP20060.4, DP20060.5, DP20060.6	Practical exam
PM	DP20060.1,DP20060.2, DP20060.3,DP20060.4, DP20060.5, DP20060.6	Day to Day assessment
FE	DP20060.1,DP20060.2, DP20060.3,DP20060.4, DP20060.5, DP20060.6	Practical exam



COURSE DETAILS-PRACTICAL

Expt. No	Title of Experiment
1)	To study and understand Systematic approach to drug information queries using primary / secondary / tertiary resources of information Case Study: 01
2)	To study and understand Systematic approach to drug information queries using primary / secondary / tertiary resources of information Case Study: 02
3)	To study and understand Interpretation of laboratory reports to optimize the drug therapy in a given clinical case. Case Study: 01
4)	To study and understand Interpretation of laboratory reports to optimize the drug therapy in a given clinical case. Case Study: 02
5)	To study and understand Filling up IPC's ADR Reporting Form and perform causality assessments using various scales Case Study: 01
6)	To study and understand Filling up IPC's ADR Reporting Form and perform causality assessments using various scales Case Study: 02.
7)	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application /administration of Orthopedic Aids such as knee cap, cervical collar.
8)	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application /administration of Orthopedic Aids Such as, LS belts, abdominal belt
9)	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application /administration of Orthopedic Aids Such as walker, walking sticks
10)	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application /administration of Different types of bandages such as sterile gauze, cotton, crepe bandages, etc
11)	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application /administration of Needles, syringes
12)	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application of IV set
13)	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application of RYLE's tube.
14)	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application of catheters, urine bag, urine pots.
15)	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application of colostomy bags.
16)	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application of oxygen masks.
17)	To study and understand Case studies on drug-drug interactions Case Study: 01
18)	To study and understand Case studies on drug-drug interactions Case Study: 02
19)	To study and understand Wound dressing (simulated cases and role play
20)	To study and understand Wound dressing (simulated cases and role play
21)	To study and understand Intradermal Injection simulator technique using mannequins
22)	To study and understand Subcutaneous Injection technique using mannequins
23)	To study and understand Intravenous and Intramuscular Injection technique using mannequins



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24)	To study and understand vaccination technique using mannequins
25)	To study and understand Use of Hospital Pharmacy Software and various digital health tools

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	A laboratory Manual For Hospital & Clinical Pharmacy	Mrs.Deepali B. Jagatap Dr.Rajeshri S. Chavan	Brilliant Publication	1 st	2022
02	Dispensing Pharmacy	R M Mehta	Vallabh Prakashan	6 th	2017
03	Practical Hospital and clinical Pharmacy	Dr. A R Paradkar S.B. Gokhale	Nirali Publication	6 th	2016
04	Hospital and Clinical Pharmacy	Dr. A. V. Yadav B.V. Yadav	Nirali Publication	29 th	2016
05	Hospital and Clinical Pharmacy	Dr.A.R.Paradkar	Nirali Publication	19 th	2015
06	Professional Pharmacy	N.K Jain S N Sharma	Vallabh Prakashan	7 th	2014

Content Delivery and assessment tools:



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[D.Pharm Course]

COURSE DETAILS-PRACTICAL

Expt. No	Title of Experiment	TM Teaching Method	Mapping with CO	Mapping with PO
1.	To study and understand Systematic approach to drug information queries using primary / secondary / tertiary resources of information Case Study: 01	LT, DM	DP20060.1 DP20060.2	1,2,3,4,5,6,7,9
2.	To study and understand Systematic approach to drug information queries using primary / secondary / tertiary resources of information Case Study: 02	LT, DM	DP20060.1 DP20060.2	1,2,3,4,5,6,7,9
3.	To study and understand Interpretation of laboratory reports to optimize the drug therapy in a given clinical case. Case Study: 01	LT, DM	DP20060.3	1,2,3,4,5,6,7,8,9
4.	To study and understand Interpretation of laboratory reports to optimize the drug therapy in a given clinical case. Case Study: 02	LT, DM	DP20060.3	1,2,3,4,5,6,7,8,9
5.	To study and understand Filling up IPC's ADR Reporting Form and perform causality assessments using various scales Case Study: 01	LT, DM	DP20060.4	1,2,3,4,5,6,7,9
6.	To study and understand Filling up IPC's ADR Reporting Form and perform causality assessments using various scales Case Study: 02.	LT, DM	DP20060.4	1,2,3,4,5,6,7,9
7.	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application /administration of Orthopedic Aids such as knee cap, cervical collar.	LT, DM	DP20060.5	1,2,3,4,5,6,7,8,9
8.	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application /administration of Orthopedic Aids Such as, LS belts, abdominal belt	LT, DM	DP20060.5	1,2,3,4,5,6,7,8,9
9.	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application /administration of Orthopedic Aids Such as walker, walking sticks	LT, DM	DP20060.5	1,2,3,4,5,6,7,8,9
10.	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application /administration of Different types of bandages such as sterile gauze, cotton, crepe bandages, etc	LT, DM	DP20060.5	1,2,3,4,5,6,7,8,9



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11.	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application /administration of Needles, syringes	LT, DM	DP20060.5	1,2,3,4,5,6,7,8,9
12.	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application of IV set	LT, DM	DP20060.5	1,2,3,4,5,6,7,8,9
13.	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application of RYLE's tube.	LT, DM	DP20060.5	1,2,3,4,5,6,7,8,9
14.	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application of catheters, urine bag, urine pots.	LT, DM	DP20060.5	1,2,3,4,5,6,7,8,9
15.	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application of colostomy bags.	LT, DM	DP20060.5	1,2,3,4,5,6,7,8,9
16.	To study and understand demonstration / simulated / hands-on experience on the identification, types, use / application of oxygen masks.	LT, DM	DP20060.5	1,2,3,4,5,6,7,8,9
17.	To study and understand Case studies on drug-drug interactions Case Study: 01	LT, DM	DP20060.6	1,2,3,4,5,6,7,9
18.	To study and understand Case studies on drug-drug interactions Case Study: 02	LT, DM	DP20060.6	1,2,3,4,5,6,7,9
19.	To study and understand Wound dressing (simulated cases and role play	LT, DM	DP20060.5	1,2,3,4,5,6,7,8,9
20.	To study and understand Wound dressing (simulated cases and role play	LT, DM	DP20060.5	1,2,3,4,5,6,7,8,9
21.	To study and understand Intradermal Injection simulator technique using mannequins	LT, DM	DP20060.5	1,2,3,4,5,6,7,8,9
22.	To study and understand Subcutaneous Injection technique using mannequins	LT, DM	DP20060.5	1,2,3,4,5,6,7,8,9
23.	To study and understand Intravenous and Intramuscular Injection technique using mannequins	LT, DM	DP20060.5	1,2,3,4,5,6,7,8,9
24.	To study and understand vaccination technique using mannequins	LT, DM	DP20060.5	1,2,3,4,5,6,7,8,9



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25.	To study and understand Use of Hospital Pharmacy Software and various digital health tools	LT, DM	DP20060.5	1,2,3,4,5,6,7,8,9
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TM-Teaching Method- Lecture (LT), Demonstration (DM), Chart (C), Model (M)

TA-Teaching Aids -Chalk Board (CB), Power Point Presentation (PP), Video Films (VF)

AT- Assessment Tool - Question Answers (QA), Class Tests (CT), Sessional Examination (SE), Final Examinations (FE), Rubrics (RB) ,
Course End Survey filled by students,

COURSE DETAILS

Class	D. Pharmacy 2 nd year
Course Code and Course Title	20226 Pharmacy Law and Ethics
Prerequisite/s	Basic & preliminary knowledge of Pharmacy is essential
Teaching Scheme: Lecture/Tutorial	03/01
Evaluation Scheme: Theory Paper/SE	80/20

Course Objectives: The course aims: (What teacher want to do with course while teaching)	
01	To introduce pharmaceutical jurisprudence, different pharmaceutical acts with their objectives.
02	To focus on codes of pharmaceutical ethics during the pharmaceutical practice.
03	To emphasise on authoritative bodies, their constitution and functions.
04	To familiarise with various schedules, definitions, offences penalties as per the laws.

Course Outcomes (COs):	
Upon successful completion of this course, the student will be able to:	
DP20226.1	Summarize historical development of pharmaceutical laws in India.
DP20226.2	Describe the acts, rules, and ethical guidelines regulating the pharmacy profession in India.
DP20226.3	Explain regulatory authorities and agencies governing practice of Pharmacy Profession.
DP20226.4	Interpret various pharmacy allied legislation and fundamentals of patent laws in perspective of pharmacy.
DP20226.5	Apply the knowledge of pharmaceutical Laws in the pharmacy Profession.

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

Course Outcomes	Programme Outcomes								
	1	2	3	4	5	6	7	8	9
DP20226.1	3	-	-	2	-	1	-	-	1
DP20226.2	3	-	-	2	3	1	3	-	1
DP20226.3	3	-	-	-	3	1	3	-	1
DP20226.4	3	-	2	-	-	1	3	2	1
DP20226.5	3	-	-	-	2	1	2	-	2
Total	15	-	2	4	8	5	11	2	6
Avg.	3	-	2	2	2.66	1	2.75	2	1.2
20226	3	-	2	2	2.66	1	2.75	2	1.2

COURSE SKILL ACQUISITION MATRIX:

Course	Programme Outcome								
	1	2	3	4	5	6	7	8	9
20226	3	-	2	2	2.66	1	2.75	2	1.2

Course 20226	Course Outcomes				
	DP20226.1	DP20226.2	DP20226.3	DP20226.4	DP20226.5
Target	2	2	2	2	2
Target Level	Students scoring above 40% marks				
1	≥ 50%				
2	≥ 55%				
3	≥ 60%				

MODES FOR ASSESSMENT OF COURSE OUTCOMES

Mode	CO	Assessment tool
SES-I	DP20226.1, DP20226.2, DP20226.5	Written test, Assignment
SES-II	DP20226.2, DP20226.3, DP20226.5	Written test, Assignment
SES-III	DP20226.4, DP20226.5	Written test, Assignment
FE	DP20226.1, DP20226.2, DP20226.3, DP20226.4	Written test

COURSE DETAILS

COURSE DETAILS		
Chapter 1	Pharmaceutical legislation in India	02Hours
UO20226CH1.1	General Principles of Laws, History	
UO20226CH1.2	Scope and objectives, Acts related to Drugs and Pharmacy Profession	
Chapter 2	Pharmacy act- 1948	05Hours
UO20226CH2.1	Give objectives and definitions related to the act	
UO20226CH2.2	Explain E.R., approval of institution, withdrawal of approval,	
UO20226CH2.3	Qualification granted outside territorial, Central register of pharmacy, Registration of pharmacist, preparation of 1st and subsequent reg. Application for registration, fees, Removal of name, restoration of names, offences and penalties.	
UO20226CH2.4	Pharmacy Practice Regulations 2015	
Chapter 3	Drugs and Cosmetics Act 1940 and Rules 1945	
UO20226CH3.1	Recall objectives, definition and schedules of the act.	

UO20226CH3.2	Explain composition and functions of DTAB, DCC and CDL.	
UO20226CH3.3	Enlist qualification, powers and duties of government analysts and drug Inspectors	
UO20226CH3.4	Describe provisions relating to drugs, sale of drugs, wholesale retail licenses, labeling and packing of drugs other than homeopathic medicines, sale of ayurvedic, unani and homeopathic drugs, provisions relating to cosmetics, Sale of cosmetics, labeling of cosmetics and packaging.	23Hours
UO20226CH3.5	Describe provisions relating to manufacture of drugs, Manufacture of drugs for test, examination and analysis, provisions relating to import of drugs.	
UO20226CH3.6	Discuss Schedule – schedule C and C1, G, H, H1, K, P, X, M,N	
Chapter 4	Narcotic substances and psychotropic substances act and rules- 1985	02Hours
UO20226CH4.1	Recall objectives, definition of the act, authorities of officers	
UO20226CH4.2	Explain power of central and state government, Offences & penalties.	
Chapter 5	Drug and magic remedies Act 1954	02Hours
UO20226CH5.1	Recall objectives, definition of the act,	
UO20226CH5.2	Discuss classes of Prohibited and exempted advertisements, Relate offences and penalties	
Chapter 6	Prevention of Cruelty to Animals Act-1960	02Hours
UO20226CH6.1	Objectives, Definitions, CPCSEA - brief overview, Institutional Animal Ethics Committee, Breeding and Stocking of Animals	
UO20226CH6.2	Performance of Experiments, Transfer and Acquisition of animals for experiment, Records, Power to suspend or revoke registration, Offences and Penalties.	
Chapter 7	Poisons act- 1919	02Hours
UO20226CH7.1	Recall objectives, definition of the act,	
UO20226CH7.2	Explain provision for possession, possession for sale, sale of poison, Import, penalties.	
Chapter 8	FSSAI (Food Safety and Standards Authority of India) Act 2006 and Rules	02Hours
UO20226CH8.1	Discuss in brief overview and aspects related to Manufacture	
UO20226CH8.2	Explain in brief overview and aspects related to storage, sale, and labeling of Food Supplements	
Chapter 9	National Pharmaceutical Pricing Authority: Drugs Price Control Order (DPCO) – 2013	05Hours
UO20226CH9.1	Objectives, Definitions, Sale prices of bulk drugs, Retail price of formulations	

UO20226CH9.2	Retail price and ceiling price of scheduled formulations	
UO20226CH9.3	Pharmaceutical Policy 2002: Introduction & objectives	
UO20226CH9.4	Features of Pharmaceutical Policy 2002, National List of Essential Medicines (NLEM)	
Chapter 10	Pharmaceutical ethics	
UO20226CH10.1	Define Ethics and Laws. Explain the steps involved in ethical problem solving.	05Hours
UO20226CH10.2	Explain Pharmaceutical code of ethics, pharmacist's relation to his job, and Pharmacist's relation to his medical profession.	
UO20226CH10.3	Reproduce Pharmacist's oath	
Chapter 11	Medical termination of pregnancy act 1971 and rules 1975	
UO20226CH11.1	Recall objectives, definition of the act.	02Hours
UO20226CH11.2	Relate circumstances under which pregnancy can be terminated	
UO20226CH11.3	Describe experience/ training, place approved, Maintenance of admission register, offences and penalties. Amendments: Medical Termination of Pregnancy Act 2021 & its features	
Chapter 12	Role of all the government pharma regulator bodies	
UO20226CH12.1	Discuss the functions of various pharma regulator bodies like Central Drugs Standards Control Organization (CDSCO), Indian Pharmacopoeia Commission (IPC)	01Hours
Chapter 13	Good Regulatory practices	
UO20226CH13.1	In community pharmacy: Retail sale and wholesale sale	03Hours
UO20226CH13.2	Good Regulatory practices: In Hospital pharmacy, Pharma Manufacturing	
UO20226CH13.3	Good Regulatory practices in import, export of drugs and medical devices	
Chapter 14	Introduction to BCS system of classification, ANDA	
UO20226CH14.1	BCS system of classification, ANDA NDA, New Drug development	07Hours
UO20226CH14.2	Basic concepts of Clinical Trials	
UO20226CH14.3	New Drugs and Clinical Trials Rules, 2019	
UO20226CH14.4	Brand v/s Generic, Trade name concept	
UO20226CH14.5	Introduction to Patent Law and Intellectual Property Rights Emergency Use Authorization	
Chapter 15	Blood bank	02Hours

UO20226CH15.1	Basic requirements, Blood bank functions	
Chapter 16	Clinical Establishment Act 2010 and Rules	02Hours
UO20226CH16.1	Introduction , Aspects related to Pharmacy	
Chapter 17	Biomedical Waste Management Rules 2016	02Hours
UO20226CH17.1	Aspects related to pharma manufacture to disposal of pharma / medical waste at homes, pharmacies, and hospitals	
Chapter 18	Bioethics	02Hours
UO20226CH18.1	Basic concepts, history and principles, Brief overview of ICMR 's	
UO20226CH18.2	National Ethical Guidelines for Biomedical and Health Research involving human participants	
Chapter 19	Introduction to the Consumer Protection Act 1986	01Hours
UO20226CH19.1	Objective, definitions, consumer Protection Council	
Chapter 20	Introduction to the Disaster Management Act 2005	01Hours
UO20226CH20.1	Disaster, Disaster management, various agencies, offences and penalties.	
Chapter 21	Medical Devices	02Hours
UO20226CH21.1	Categorization, basic aspects related to manufacture and sale	

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Pharmacy Laws and Ethics	Dr. B.S. Kuchekar	Nirali prakashan	1 st	2022
02	Pharmacy Laws and Ethics	Shalini Sharma	PV publication	1 st	2022
03	Forensic Pharmacy	Dr. B.S. Kuchekar	Nirali prakashan	23 th	2019
04	Textbook of Forensic Pharmacy	Guru Prasad Mohanta	CBS publication	2 nd	2018
05	Pharmaceutical Jurisprudence	Dr. B.S. Kuchekar	Nirali prakashan	19 th	2009
06	A text book of Forensic Pharmacy	N.K. Jain	Vallabh prakashan	6 th	2003



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Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Forensic Pharmacy	C. K. Kokate and S. B. Gokhale	Pharma Book Syndicate, Hyderabad	1 st	2006

Content Delivery and assessment tools:

Unit	Lect. No.	Lesson Plan	TM	TA	AT	Mapping with Outcomes	
		Content Delivery				CO	PO
I	1	Pharmaceutical legislation in India General Principles of Laws, History	LT	CB,PP	QA,CT, EX	DP20226.1	1,4,6,9
	2	Scope and objectives, Acts related to Drugs and Pharmacy Profession					
II	3	Pharmacy act- 1948 Introduction, objectives, definitions,	LT	CB,PP	QA,CT, EX	DP20226.2	1,4,5,6, 7, 9
	4	PCI (members, functions, power)					
	5	Education Regulations, State and Joint state pharmacy councils					
	6	Registration of Pharmacists, Offences and Penalties					
	7	Pharmacy Practice Regulations 2015					
III	8	Drugs and Cosmetics Act 1940 and Rules 1945 and New Amendments: Introduction, Objectives	LT	CB,PP	QA,CT EX	DP20226.2	1,4,5,6, 7, 9
	9	Definitions under Drugs and Cosmetics Act 1940					
	10	Legal definitions of schedules to the Act and Rules					
	11	Administrative bodies, DTAB, DCC					
	12	Central Drug Laboratory					
	13	government analysts					
	14	Inspectors, powers, duties of inspectors,					
	15	licensing authorities , Provisions relating to sale of drugs					
	16	Condition of licenses to be satisfy for issuing license					
	17	General conditions of a license for sale of drugs					
	18	Cancellation and suspension of a license					
	19	Offences and penalties					
	20	Sale of Ayurvedic, Unani, Homoeopathic medicines					
	21	Drugs prohibited for manufacture and sale in India					
	22	Provision related to Manufacture of drugs for sale					
23	Conditions for grant of license license in from 25and 25-F and Conditions						

		of liscence of the same					
	24	Conditions of license for manufacture of drugs C,C1 but not X and medical devices					
	25	loan license					
	26	repacking liscence					
	27	Manufacture of drugs for test, examination and analysis and Classes of drugs and cosmetics prohibited from import					
	28	condition of to be satisfied before a liscence in form no 10 and 10 A, condition of liscences of the same					
	29	schedule C and C1, G, H, H1,K					
	30	schedule P,M, N, X					
IV	31	Narcotic substances and psychotropic substances act and rules-1985: objectives, definitions, Authorities and officers	LT	CB,PP	QA,CT, EX	DP20226.2	1,4,5,6, 7, 9
	32	Power of central govt. Powers of state govt. Offences & penalties					
V	33	Drug and magic remedies Act- Objectives, definition, Prohibited advertisement	LT	CB,PP	QA,CT, EX	DP20226.2	1,4,5,6, 7, 9
	34	Classes of exempted advertisements, Offences and penalties					
VI	35	Prevention of Cruelty to Animals Act-1960 Objectives, Definitions, CPCSEA - brief overview, Institutional Animal Ethics Committee, Breeding and Stocking of Animals	LT	CB,PP	QA,CT, EX	DP20226.3	1,5,7,9
	36	Performance of Experiments, Transfer and Acquisition of animals for experiment, Records, Power to suspend or revoke registration, Offences and Penalties.					
VII	37	Poisons act- 1919 Introduction, object, possession, Possession for sale	LT	CB,PP	QA,CT, EX	DP20226.2	1,4,5,6, 7, 9
	38	sale of poison, offences & penalties, list of poison					
VIII	39	FSSAI (Food Safety and Standards Authority of India) Act and Rules: brief overview and aspects related to Manufacture	LT	CB,PP	QA,CT, EX	DP20226.3	1,5,7,9
	40	Brief overview and aspects related to storage, sale, and labeling of Food Supplements					

IX	41	National Pharmaceutical Pricing Authority: Drugs Price Control Order (DPCO) – 2013: Objectives, Definitions	LT	CB,PP,	QA,CT, EX	DP20226.3	1,5,7,9
	42	Sale prices of bulk drugs, Retail price of formulations					
	43	Retail price and ceiling price of scheduled formulations					
	44	Pharmaceutical Policy 2002: Introduction & objectives					
	45	Features of Pharmaceutical Policy 2002, National List of Essential Medicines (NLEM)					
X	46	Code of Pharmaceutical ethics Definition, ethical principles	LT	CB,PP	QA,CT, EX	DP20226.2	1,4,5,6, 7, 9
	47	Ethical problem solving					
	48	Professional conduct relation to his job & trade					
	49	Pharmacist's relation to medical profession					
	50	Pharmacist's relation to his profession & Pharmacist's oath					
XI	51	Medical Termination of Pregnancy Act and Rules 1971 Objectives, definitions, circumstances under which pregnancy can be terminated, Experience/ training, place approved, offences and penalties	LT	CB,PP	QA,CT, EX	DP20226.2	1,4,5,6, 7, 9
	52	Amendments: Medical Termination of Pregnancy Act 2021 & its features					
XII	53	Role of all the government pharma regulator bodies – Central Drugs Standards Control Organization (CDSCO), Indian Pharmacopoeia Commission (IPC)	LT	CB,PP	QA,CT, EX	DP20226.3	1,5,7,9
XIII	54	Good Regulatory practices: In community pharmacy: Retail sale and wholesale sale	LT	CB,PP	QA,CT, EX	DP20226.3	1,5,7,9
	55	Good Regulatory practices: In Hospital pharmacy, Pharma Manufacturing					
	56	Good Regulatory practices in import, export of drugs and medical devices					
XIV	57	Introduction to BCS system of classification, ANDA	LT	CB,PP	QA,CT, EX	DP20226.4	1,3,6,7, 8,9
	58	NDA, New Drug development.					
	59	Basic concepts of Clinical Trials					
	60	New Drugs and Clinical Trials Rules, 2019					
	61	Brand v/s Generic, Trade name concept					

	62	Introduction to Patent Law and Intellectual Property Rights					
	63	Emergency Use Authorization					
XV	64	Blood bank – basic requirements	LT	CB,PP	QA,CT, EX	DP20226.4	1,3,6,7, 8,9
	65	Blood bank functions					
XVI	66	Clinical Establishment Act and Rules – Introduction	LT	CB,PP	QA,CT, EX	DP20226.4	1,3,6,7, 8,9
	67	Aspects related to Pharmacy					
XVII	68	Biomedical Waste Management Rules 2016: Basic aspects	LT	CB,PP	QA,CT, EX	DP20226.4	1,3,6,7, 8,9
	69	aspects related to pharma manufacture to disposal of pharma/ medical waste at homes, pharmacies, and hospitals					
XVIII	70	Bioethics - Basic concepts, history and principles, Brief overview of ICMR's	LT	CB,PP	QA,CT, EX	DP20226.4	1,3,6,7, 8,9
	71	National Ethical Guidelines for Biomedical and Health Research involving human participants					
XIX	72	Introduction to the Consumer Protection Act	LT	CB,PP	QA,CT, EX	DP20226.4	1,3,6,7, 8,9
XX	73	Introduction to the Disaster Management Act	LT	CB,PP	QA,CT, EX	DP20226.4	1,3,6,7, 8,9
XXI	74	Medical Devices – Categorization	LT	CB,PP	QA,CT, EX	DP20226.4	1,3,6,7, 8,9
	75	basic aspects related to manufacture and sale					

TM-Teaching Method- Lecture (LT).

TA-Teaching Aids -Chalk Board (CB), Power Point Presentation (PP)

AT- Assessment Tool - Class Tests (CT), Question Answers (QA), MSBTE Examinations (EX), Course End Survey filled by students,



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Plan to Cover Contents beyond Syllabus:

Planed Date/ Week	Topic Beyond Syllabus	Resource Person with Affiliation	CO	PO
2 nd Week of January	Drug Inspector	Awaiting	DP20226.2	1,4,5,6,7,9