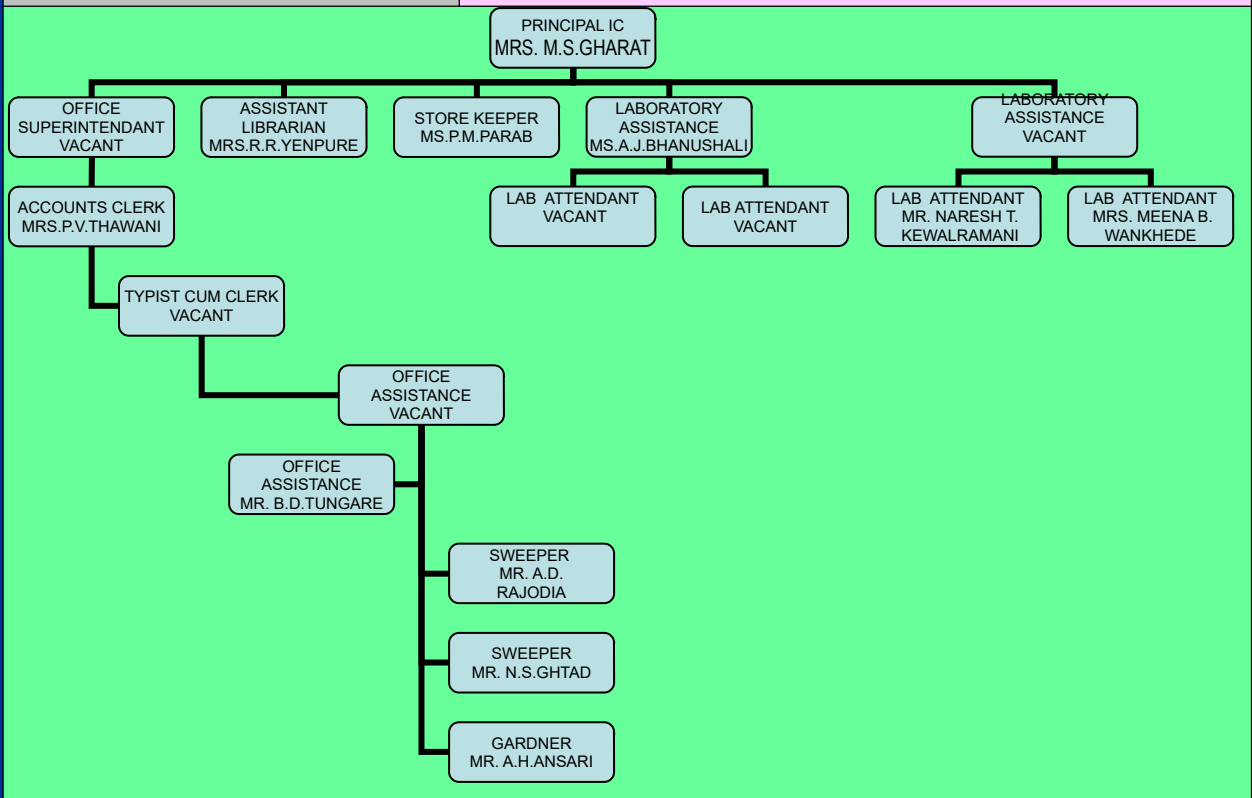


Annexure 10			
Format for Mandatory Disclosure			
Mandatory Disclosure		Updated on 3rd August 2022	
1	Name of the Institution	PRINCIPAL K. M. KUNDNANI PHARMACY POLYTECHNIC, OPP. ULHASNAGAR RAILWAY STATION, CHM CAMPUS, CHM ROAD, ULHASNAGAR-421003, DIST-THANE 0251-2705163, (FAX) 0251-2702625, 9869128246, pkmkpp2003@yahoo.com Web site : www.pkmkpp.org	
2	Name and Address of the Trust/Society/ Company and the Trustees	HYDERABAD (SIND) NATIONAL COLLEGIATE BOARD K.C. COLLEGE, 124, DINSHAW WACHHRA ROAD, CHURCHGATE, MUMBAI-400020. 022-228800845, 9820133693, pres.off@hsncb.com	
3	Name and Address of the Vice Chancellor/Principal/Director	MRS. MANJIRI SANDEEP GHARAT(I/C PRINCIPAL) 201, RL40, MILAP NAGAR, MIDC, DOMBIVLI EAST - 421203 0251-2705163, (FAX) 0251-2702625, 9869128246, symghar@yahoo.com	
4	Name of the affiliating University (Board)	MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION MUMBAI.	
5	Governance		
	Members of the Board and their brief background	Members of the Board and their brief background	
		Name	Qualification
		Mr. Anil Harish	B.A., LL.B., LL.M
		Dr. Niranjani Hiranandani	B.Com., F.C.A., Ph.D
		Mr. Kishu Mansukhani	B.E., M.B.A.
		Mr. Lal Chellaram	B.A. (Economics U.K)
		Mrs. Maya Shahani	-
		Mr. Dinesh Panjwani	M.A, M.Phil.
	Members of Academic Advisory Body		

	Shri Anil Harish	President & Trustee Hyderabad (Sind) National Collegiate Board, Mumbai. Mob: 9820147003	Chairman
	Shri Kishu Mansukhani	Immediate Past President & Trustee, Hyderabad (Sind) National Collegiate Board, Mumbai. Mob: 9370145265	Member
	Mr. Niranjan Hiranandani	Past President & Trustee Hyderabad (Sind) National Collegiate Board, Mumbai. Mob: 9821060438	Member
	Mr. Lal Chellaram	Trustee Hyderabad (Sind) National Collegiate Board, Mumbai.	Member
	Mrs. Maya Shahani	Trustee Hyderabad (Sind) National Collegiate Board, Mumbai.	Member
	Prin. Dinesh Panjwani	Secretary Hyderabad (Sind) National Collegiate Board, Mumbai Mob: 9820133693	Member
	Dr.Mrs Urmila J Joshi	Principal, Prin.K.M.Kundnan i College of Pharmacy,Colaba, Mumbai Mob: 9869612731	Member
	Shri Santosh Ghidinde	Community Pharmacist Dhanwantari Medical & General Stores, Panvel Executive Member, IPA-CPD, Mumbai Mob: 9322267947	Member
	Director, Directorate of Technical Education, (Nominee of the State Government official Member)	Director, Directorate Technical Education, M.S. Mumbai Tel: 22621726.	Member
	Regional Officer Western Block,	Western Regional Office, Industrial	Member

	AICTE (Nominee of the Central Government official Member)	Assurance Building 2 nd floor, Veer Nariman Road, Mumbai-400 020.	
	Shri Ram Banarase Ex-Assistant Commissioner F.D.A.	T-3/204, Saket Tower, Saket Complex, Majiwade, Thane-(W) Tel. 26592363,65 Ext. 2234. Mob: 9892740082	Member
	Dr. (Mrs.) Sampada Patvardhan Consultant	1302/ Pristine tower no. 6 Vasant Lawns next to Jupiter Hospital, Thane (W) Mob:9820662080/ Tel : 21734451	Member
	Mrs Saili Masal, Registrar, Maharashtra State Pharmacy Council	Maharashtra State Pharmacy Council ,ESIS Compound, LBS Marg,Mulund West ,Mumbai-49 .	Member
	Dy. Secretary, M.S.B.T.E.	Dy. Secretary, Board of Technical Education, M.S. Mumbai. Tel: 26473253/54.	Member
	Mrs. Manjiri S. Gharat (I/C Principal)	Prin. K.M.K. Pharmacy Polytechnic, Ulhasnagar Tel 0251-: 2705163. Mob: 9323730078	Member Secretary.
	Mr. Sunil V. Chavan	Selection Grade Lecturer Mob:9323875748	Faculty Member
	Mr.H.G.Chawhan	Senior Lecturer Mob:9702807008	Faculty Member
	Ms. Padma Shah	Board Member	Special Invitee
	Mr. Rajkumar P. Nagpal	Head of A/c's Department	Special Invitee
Frequently of the Board Meeting and Academic Advisory Body	Once in a year , 6 th March 2021		
Organizational Chart	FACULTY		
<pre> graph TD A[MRS. M.S. GHARAT I/C PRINCIPAL] --- B[MR. S.V. CHAVAN SEL.GR. LECTURER] A --- C[MR. H.G. CHAWHAN Sr. LECTURER] A --- D[MRS. SEEMA M. PATTEBAHADUR Sr. LECTURER] A --- E[MS.K.B. BHATIA LECTURER] A --- F[VACANT] </pre>			

ADMINISTRATIVE STAFF & ALLIED STAFF



<p>Nature and Extent of involvement of Faculty and Students in academic affairs/improvements</p>	<p>Faculty are member of internal academic monitoring committee & Student council works with faculty for improvement. Also students are member of Anti ragging committee.</p>
<p>Mechanism/ Norms and Procedure for democratic/ good Governance</p>	<p>All procedure are as per DTE, AICTE, MSBTE norms. Governing body is constituted.</p>
<p>Student feedback mechanism on Institutional Governance/faculty performance</p>	<p>Annually Student feedback is taken about Institute and faculty.</p>

D-14

For AICTE Diploma Courses

wef - 2017-18

Maharashtra State Board of Technical Education

STUDENTS FEED BACK

(Head of the Department shall take the Feed Back at the End of Second Class Test)

Academic Year: _____ Program: _____ Semester: _____ Date: _____

Sr. No	Name of Course (TH/PR)	Name of Faculty	Each Parameter to be Assessed on the Scale of 1 to 5 (1 - Lowest & 5 - Highest)				Effective Use of Teaching Aids	Total (Max 25)
			Punctuality & Discipline	Domain Knowledge	Presentation Skill & Interaction with Students	Ability to Resolve Difficulties		
1								
2								
3								
4								
5								

(Name & Signature of HOD)






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Grievance redressal mechanism for faculty, staff and students	Counseling Cell		
	Name Of The Committee Members	Designation	
	Mrs. Manjiri S Gharat	Chairperson	
	Mr. Sunil V Chavan	Member	
	Mr. H.G.Chawhan	Member	
	Mrs. Seema M Pattebahadur	Member	
Establishment of Anti Ragging Committee	Anti Ragging Committee		
	Name	Designation & Affiliation	Post
	Mrs. Manjiri Gharat	I/C Principal, Prin.K.M.K.Pharmacy Polytechnic 9869128246	Chairperson
	Shri Prakash Kukreja	Ex-Municipal Secretary Ulhasnagar Municipal Corporation 9422073950	Member
	Ex-Officio	Senior Police	Member


			Inspector Central Police Station, Ulhasnagar 0251-2706900	
		Shri Rajesh Harchandani	Editor, Nagarwasi Daily Local Media, 9822280345	Member
		Lion Mohan Balani	President, Lions Club of Ulhasnagar (NGO) 9850223173	Member
		Mr. Lokumal Bhanwani	Parent 9324907560	Member
		Mr. Pandey Navinkumar	General Secretary (Senior Student) 9372032302	Member
		Ms. Rizhwani Khwaish	Student Fresher Representatives 9884461436	Member
		Ms. Preeti Parab	Store Keeper Institution 9930649382	Member
		Shri Naresh Kewalramani	Lab.Attendant Institution, 9323189712	Member
	Establishment of Online Grievance Redressal Mechanism	Displayed on the Website		
	Establishment of Grievance Redressal Committee in the Institution	Name Of The Committee Members	Designation	
		Mrs. Manjiri S Gharat	Chairperson	
		Mr. Sunil V Chavan	Member	
		Mrs. Seema M Pattebahadur	Member	
		Mr. Navinkumar Pandey, Student Representative	Special Invitee	
	Appointment of OMBUDSMAN by the University	Appointed by MSBTE		
	Establishment of Internal Complaint Committee (ICC)	Name Of The Committee Members	Designation	
		Mrs. Manjiri S Gharat	Chairperson	
		Mr. Sunil V Chavan	Member	
		Mrs. Seema M Pattebahadur	Member	
		Ms. Preeti Parab	Member Secretary	
		Mrs. Rupali Yenpure	Member	
		Mr. Ajay N. Gupta Student Representative	Member	
		Ms. Neha Patil, Girls Student Representative	Member	
		Mrs. Sushma Joshi, Parivartan Mahila Sanstha	Member	
	Establishment of Committee for SC/ST	Name & Designation	Post	
		Mrs. Manjiri S Gharat I/C Principal	Chairperson	
		Mr.S.V.Chavan, Sr.Lecturer	Member	
		Mrs. Seema M Pattebahadur	Member	
		Ms. Preeti Parab	Member Secretary	

	Internal Quality Assurance Cell	Name & Designation		Post
		Mrs. Manjiri S Gharat I/C Principal		Chairperson
		Mr.S.V.Chavan, Sr.Lecturer		Member
		Mr. H.G.Chawhan		Member
6	Programmes			
	Name of the Programmes approved by AICTE	Diploma in Pharmacy		
	Name of Programmes Accredited by AICTE	Diploma in Pharmacy		
	Status of Accreditation of the Courses	Total No. of Courses	No. of Courses for which applied for Accreditation	Status of Accreditation
		01	01	Preliminary
	For Each programme the following details are to be given:			
	Name	Diploma in Pharmacy		
	Number of Seats	60		
	Duration	2 Years		
	Cut off marks/rank of admission during the last three years			
		2019-20	2020-21	2021-22
		62.33%	65.33%	83.50%
	Fees	9750.00 – For general Category 3750.00 – For reserve Category		
	Placement Facilities	Placement Officer is appointed, campus interviews are conducted, students are notified above vacancy on placement notice board and via phone calls / messages.		
	Campus placement in last three years with minimum salary, maximum salary and average salary			
		2021-22	2020-21	2019-20
		0 (Due to Covid-19) Minimum salary	0 (Due to Covid-19) Maximum salary	0 (Due to Covid-19) Average salary
		-	-	-
	Name and duration of programme(s) having Twinning and Collaboration with Foreign University(S) and being run in the same Campus along with status of their AICTE approval. If there is Collaboration, give the following details:	N.A.		
7	Faculty			


	Branch wise list Faculty members:			
		Permanent Faculty	Adjunct Faculty	Permanent Faculty : Student Ratio
		6	0	1:20
	Number of Faculty employed and left during the last three years	Nil		
8	Profile of Vice Chancellor/Director/Principal/Faculty			
		Name	 MRS. M.S. GHARAT	
		Date of Birth	06/09/1967	
		Unique id	07DTEMPF7601	
		Gross Salary	2,51,254	
		Education Qualification	M.Pharm.	
		Work Experience	Teaching	25
			Research	-
			Industry	01
			Others	-
		Area of Specialization	Pharmacology	
		Course taught at Diploma level	Social Pharmacy	Theory (F.Y.)
			Pharmacology	Theory (S.Y.)
			Pharmacology	Practical (S.Y.)
		Research Guidance	N.A.	
		Project Carried out	N.A.	
		Patents	N.A.	
		Technology Transfer	N.A.	
		Research Publication	07	
		No. of Books Published with details	02 (Aushadhbhan, Menka Publication,pune)	
		Name	 MR. S.V.CHAVAN	
		Date of Birth	01/06/1971	

		Unique id	07DTESVCM7101	
		Gross Salary	1,44,034	
		Education Qualification	M.Pharm.	
		Work Experience	Teaching	18
			Research	-
			Industry	03
			Others	-
		Area of Specialization	Pharmaceutics	
		Course taught at Diploma level	Social Pharmacy	Practical (F.Y)
			Community Pharmacy & Management	Practical (F.Y)
			Human Anatomy & Physiology	Theory (F.Y)
			Hospital & Clinical Pharmacy	Theory (S.Y)
		Research Guidance	N.A.	
		Project Carried out	N.A.	
		Patents	N.A.	
		Technology Transfer	N.A.	
		Research Publication	N.A.	
		No. of Books Published with details	 MR. H.G. CHAWHAN	
		Name		
		Date of Birth	20/08/1979	
		Unique id	07DTEHGCM7901	
		Gross Salary	1,40,053	
		Education Qualification	M.Pharm.	
		Work Experience	Teaching	17
			Research	-
			Industry	-
			Others	
		Area of Specialization	Pharmaceutics	
		Course taught at Diploma level	Pharmaceutics	Theory (F.Y)
			Pharmacotherapeutics	Theory (S.Y.)

			rapeutics	
			Pharmacotherapeutics	Practical (S.Y.)
			Hospital & Clinical Pharmacy	Practical (S.Y.)
		Research Guidance	N.A.	
		Project Carried out	N.A.	
		Patents	N.A.	
		Technology Transfer	N.A.	
		Research Publication	N.A.	
		No. of Books Published with details	N.A.	
		Name	  MRS. S.M.PATTEBAHADUR	
		Date of Birth	16/05/1976	
		Unique id	07DTE SMPF7601	
		Gross Salary	1,35,929	
		Education Qualification	M.Pharm.	
		Work Experience	Teaching	17
			Research	-
			Industry	-
			Others	-
		Area of Specialization	Pharmacognosy	
		Course taught at Diploma level	Pharmacognosy	Theory (F.Y.)
			Pharmacognosy	Practical (F.Y.)
			Human Anatomy & Physiology	Practical (F.Y.)
			Community Pharmacy & Management	Theory (S.Y.)
		Research Guidance	N.A.	
		Project Carried out	N.A.	
		Patents	N.A.	
		Technology Transfer	N.A.	
		Research Publication	N.A.	


		No. of Books Published with details	N.A.	
		Name	 MS. K.B. BHATIA	
		Date of Birth	13/10/1987	
		Unique id	07DTEKBBF8701	
		Gross Salary	1,10,476	
		Education Qualification	M.Pharm.	
		Work Experience	Teaching	09
			Research	-
			Industry	01
			Others	-
		Area of Specialization	Pharmaceutical Chemistry	
		Course taught at Diploma level	Pharmaceutical Chemistry	Theory (F.Y.)
			Pharmaceutical Chemistry	Practical (F.Y.)
			Hospital & Clinical Pharmacy	Practical (S.Y.)
			Pharmaceutical Jurisprudence	Theory (S.Y.)
		Research Guidance	N.A.	
		Project Carried out	N.A.	
		Patents	N.A.	
		Technology Transfer	N.A.	
		Research Publication	N.A.	
		No. of Books Published with details	N.A.	
9	Fee			
	Details of Fee, as approved by state Fee Committee, for the Institution	Tuition Fees	6000.00	
		Development Fees	3000.00	
		Other Fees	550.00	
		Caution Money Deposits (Refundable)	200.00	
		Total Fees	9750.00	
	Time schedule for payment of fee for the entire programme	As Per DTE Circular		



	No. of Fee waivers granted with amount and name of students	N.A.		
	Number of scholarship offered by the Institution, duration and amount	Name of Scholarship Offered	Duration	Amount
		Social Welfare Scholarship Scheme (SC,OBC,NT)	02	6000.00
		Tribal Scholarship Scheme	02	6000.00
		MSBTE Merit Scholarship	01	6000.00
		Minority Scholarship	02	6000.00
	Criteria for fee waivers/ scholarship	Candidates Belonging to Reserve Category and Minority for Scholarship		
	Estimated cost of Boarding and Lodging in Hostels	N.A.		
10	Admission			
	Number of seats sanctioned with the year of approval	60 (Year of Approval 2022-23)		
	Number of Students admitted under various categories each year in the last three years	Current Year(2022-23)	Last Year (2021-22)	Previous Year (2020-21)
		60	60	60
	Number of applications received during last two years for admission under Management Quota and number admitted	N.A.		
11	Admission Procedure			
	Mention the admission test being followed, name and address of the Test Agency and its URL (website)	N.A.		
	Number of seats allotted to different Test Qualified candidate separately (AIEEE/ CET (State conducted test/ University tests/ CMAT/ GPAT)/ Association conducted test)	N.A.		
	Calendar for admission against Management/vacant seats:	N.A.		
12	Criteria and Weightages for Admission	Passed HSC (Science with Physics, Chemistry & Biology Or Mathematics)		
	Describe each criterion with its respective weightages i.e. Admission Test, marks in qualifying examination etc.	N.A.		
	Mention the minimum level of acceptance, if any	N.A.		
	Mention the cut-off levels of percentage and percentile score of the candidates in the admission test for the last three years	N.A.		

	Display marks scored in Test etc. and in aggregate for all candidates who were admitted	N.A.	
13	List of Applicants		
	List of candidate whose applications have been received along with percentile/percentage score for each of the qualifying examination in separate categories for open seats. List of candidate who have applied along with percentage and percentile score for Management quota seats	N.A.	
14	Results of Admission Under Management seats/Vacant seats	N.A.	
	Composition of selection team for admission under Management Quota with the brief profile of members (This information be made available in the public domain after the admission process is over)	N.A.	
	Score of the individual candidate admitted arranged in order or merit	N.A.	
	List of candidate who have been offered admission	N.A.	
	Waiting list of the candidate in order of merit to be operative from the last date of joining of the first list candidate	N.A.	
	List of the candidate who joined within the date, vacancy position in each category before operation of waiting list	N.A.	
15	Information of Infrastructure and Other Resources Available		
	Number of Class Rooms and size of each	Class Room 1 	66.00Sq.M.
		Class Room 2	67.32 Sq.M.

			
	<p>Number of Tutorial rooms and size of each</p>		<p>38.28 Sq.M.</p>
	<p>Number of Laboratories and size of each</p>	<p>Pharmaceutics Lab</p> 	<p>100 Sq.M.</p>
		<p>Pharmaceutical Chemistry Lab</p> 	<p>100.15 Sq.M.</p>
		<p>Pharmacology Lab</p>	<p>70.58 Sq.M.</p>

			
		<p>Hospital Pharmacy Lab</p> 	<p>51.47 Sq.M.</p>
		<p>Pharmaceutical Technology Lab(Machine Room)</p> 	<p>83.09 Sq.M.</p>
	<p>Number of Drawing Halls with capacity of each</p>	<p>N.A.</p>	
	<p>Number of Computer Centres with capacity of each</p>	<p>01 (20 Computers)</p>	

			
Central Examination Facility, Number of rooms and capacity of each	01 (30.00 Sq.M.)		
Barrier Free Built Environment for disabled and elderly persons	Yes		
Occupancy Certificate	Yes		
Fire and Safety Certificate	Yes		
Hostel Facilities	N.A.		
Library			
Number of Library books/ Titles/ Journals available (program-wise)	No. Of Books	7059 (2022-23)	
	No. Of Titles	1757 (2022-23)	
	No. Of Journals	06	
List of online National/ International Journals subscribed	IPA CPD e-Times (BM) http://www.ipapharma.org		
	Australian Prescriber (Online) www.australianprescriber.com		
	Drug Information Bulletin Ipapharma.org		
E- Library facilities	Yes		
Laboratory and Workshop			
List of Major Equipment/Facilities in each Laboratory/ Workshop	1. Tablet Punching Machine		
	2. Ointment Filling Machine		
	3. Dissolution Rate Test App.		
	4. Disintegration Test App.		
	5. Laminar Air Flow		
	6. Aseptic Cabinet		
	7. Tincture Press		

		8. Homogenizer
	List of Experimental Setup in each Laboratory/ Workshop Computing Facilities	As per PCI Syllabus
	Internet Bandwidth	32 Mbps
	Number and configuration of System	20 - Windows 10
	Total number of system connected by LAN	All
	Total number of system connected by WAN	All
	Major software packages available	Windows Software
	Special purpose facilities available	N.A.
	Innovation Cell	N.A.
	Social Media Cell	N.A.
	Compliance of the National Academic Depository (NAD), applicable to PGCM/ PGDM Institutions and University Departments	N.A.
	List of facilities available	
	Games and Sports Facilities	<p>Play Ground (Out Door)</p>  <p>Indoor Facility</p> 
	Extra-Curricular Activities	Rangoli Competition, Mehendi Competition, Debate Competition etc.
	Soft Skill Development Facilities	Communication Skill, Patient Counseling, Drug Store Management etc.
	Teaching Learning Process	

<p>Curricula and syllabus for each of the programmes as approved by the University</p>	<p>SYLLABUS</p> <p style="text-align: center;">PHARMACEUTICS – THEORY</p> <p>Course Code: ER20-11T 75 Hours (3 Hours/week)</p> <p>Scope: This course is designed to impart basic knowledge and skills on the art and science of formulating and dispensing different pharmaceutical dosage forms.</p> <p>Course Objectives: This course will discuss the following aspects of pharmaceutical dosage forms</p> <ol style="list-style-type: none"> 1. Basic concepts, types and need 2. Advantages and disadvantages, methods of preparation / formulation 3. Packaging and labelling requirements 4. Basic quality control tests, concepts of quality assurance & good manufacturing practices <p>Course Outcomes: Upon successful completion of this course, the students will be able to</p> <ol style="list-style-type: none"> 1. Describe about the different dosage forms and their formulation aspects 2. Explain the advantages, disadvantages and quality control tests of different dosage forms 3. Discuss the importance quality assurance & good manufacturing practices
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Chapter	Topics	Hours
1	<ul style="list-style-type: none"> • History of profession of Pharmacy in India in relation to Pharmacy education, industry, pharmacy practice, and various professional associations. • Pharmacy as a career • Pharmacopoeia: Introduction to IP, BP, USP, NF and extra pharmacopoeia. Salient features of Indian Pharmacopoeia 	7
2	<p>Packaging materials: Types, selection criteria, advantages and disadvantages of glass, plastic, metal, rubber as packaging materials</p>	5
3	<p>Pharmaceutical aids: Organoleptic (Colouring, flavouring, and sweetening) agents</p> <p>Preservatives: Definition, types with examples and uses</p>	3
4	<p>Unit operations: Definition, objectives/applications, principles, construction and workings of;</p>	9
	<p>Size reduction: hammer mill and ball mill</p>	

		5	Size separation: Classification powder according to IP, Cyclone separator, Sieves and standards of sieves	
			Mixing: Double cone blender, Turbine mixer, Triple roller mill and Silverson mixer homogenizer	
			Filtration: Theory of filtration, membrane filter and sintered glass filter	
			Drying: working of fluidized bed dryer and process of freeze drying	
			Extraction: Definition, Classification, method and applications	
		Tablets – coated and uncoated, various modified tablets (sustained release, extended-release, fast dissolving, double layered)	8	
			Capsules - hard and soft gelatine capsules	4

	Liquid oral preparations - solution, syrup, elixir, emulsion, suspension, dry powder for reconstitution	6
	Topical preparations - ointments, creams, pastes, gels, liniments and lotions, suppositories and pessaries	8
	Nasal preparations, Ear preparations	2
	Powders and granules - Insufflations, dusting powders, effervescent powders and effervescent granules	3
	Sterile formulations – Injectables, eye drops and eye ointments	6
	Immunological products: Sera, vaccines, toxoids and their manufacturing methods.	4
	6 Basic structure, layout, sections and activities of pharmaceutical manufacturing plants Quality control and quality assurance: Definition and concepts of quality control &	5

			<p>quality assurance, current good manufacturing practice (cGMP), Introduction to concept of calibration and validation</p>	
		<p>7</p>	<p>Novel drug delivery systems: Introduction, Classification with examples, advantages and challenges</p>	<p>5</p>
<p>PHARMACEUTICS – PRACTICAL</p> <p>Course Code: ER20-11P 75 Hours (3 Hours/week)</p> <p>Scope: This course is designed to train the students in formulating and dispensing common pharmaceutical dosage forms.</p> <p>Course Objectives: This course will discuss and train the following aspects of preparing and dispensing various pharmaceutical dosage forms</p> <ol style="list-style-type: none"> 1. Calculation of working formula from the official master formula 2. Formulation of dosage forms based on working formula 3. Appropriate Packaging and labelling requirements 4. Methods of basic quality control tests <p>Course Outcomes: Upon successful completion of this course, the students will be able to</p>				

1. Calculate the working formula from the given master formula
2. Formulate the dosage form and dispense in appropriate container
3. Design the label with necessary product and patient information
4. Perform the basic quality control tests for the common dosage forms

Practicals

1. Handling and referring the official references: Pharmacopoeias, Formularies, etc. for retrieving formulas, procedures, etc.
2. Formulation of the following dosage forms as per monograph standards and dispensing with appropriate packaging & labelling
 - **Liquid Oral:** Simple syrup, Piperazine citrate elixir, Aqueous Iodine solution, Strong Iodine solution
 - **Emulsion:** Castor oil emulsion, Cod liver oil emulsion, olive oil emulsion
 - **Suspension:** Calamine lotion, Magnesium hydroxide mixture
 - **Ointment:** Simple ointment base, Sulphur ointment
 - **Cream:** Cetrimide cream
 - **Gel: Sodium alginate gel**
 - **Liniment:** Turpentine liniment, White liniment BPC
 - **Dry powder:** Effervescent powder granule, Dusting powder
 - **Sterile Injection:** Normal Saline, Calcium gluconate Injection
 - **Hard Gelatine Capsule:** Indomethacin capsules, Tetracycline capsules
 - **Tablet:** paracetamol tablet granules ready for compression
3. Demonstration on various stages of tablet manufacturing processes (including coating tablets, if possible)
4. Appropriate methods of usage, and storage of special dosage forms including different types of inhalers, spacers, insulin pens
5. Demonstration of quality control tests and evaluation of common dosage forms viz. tablets, capsules, emulsion,

sterile injections as per the monographs

Assignment

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

1. Various systems of measures commonly used in prescribing, compounding and dispensing practices
2. Market preparations (including Fixed Dose Combinations) of each type of dosage forms, generic name, minimum three brand names and label contents of the dosage forms mentioned in theory/practical
3. Overview of various machines / equipments / instruments involved in the formulation and quality control of various dosage forms / pharmaceutical formulations.
4. Overview of extemporaneous preparations at community / hospital pharmacy vs. manufacturing of dosage forms at industrial level
5. Basic pharmaceutical calculations: ratios; conversion to percentage fraction, allegation, proof spirit, isotonicity

Field Visit

The students shall be taken for an industrial visit to pharmaceutical industries to witness and understand the various processes of manufacturing of any of the common dosage forms viz. tablets, capsules, liquid orals, injectables, etc. Individual reports from each student on their learning experience from the field visit shall be submitted.

Recommended Books (Latest Edition)

1. History of Pharmacy in India by Dr. Harikishan Singh
2. Indian Pharmacopoeia, Govt. of India Publication
3. A Text book of Pharmaceuticals Formulation by B.M. Mithal, Vallabh Prakashan.
4. Bentleys' Text book of Pharmaceutics, editor E.A. Rawlins, Elsevier Int.,
5. The Theory and Practice of Industrial Pharmacy. Leon Lachman, Herbert Lieberman and Joseph Kanig, Editors, Lea and Febiger, Philadelphia. Verghese Publishing House
6. Responsible Use of Medicines: A Layman's Handbook, www.ipapharma.org / publications

PHARMACEUTICAL CHEMISTRY – THEORY

Course Code: ER20-12T
Hours (3 Hours/week)

75

Scope: This course is designed to impart basic knowledge on the chemical structure, storage conditions and medicinal uses of organic and inorganic chemical substances used as drugs and pharmaceuticals. Also, this course discusses the impurities, quality control aspects of chemical substances used in pharmaceuticals.

Course Objectives: This course will discuss the following aspects of the chemical substances used as drugs and pharmaceuticals for various disease conditions

1. Chemical classification, chemical name, chemical structure
2. Pharmacological uses, doses, stability and storage conditions
3. Different types of formulations / dosage form available and their brand names
4. Impurity testing and basic quality control tests

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

1. Describe the chemical class, structure and chemical name of the commonly used drugs and pharmaceuticals of both organic and inorganic nature
2. Discuss the pharmacological uses, dosage regimen, stability issues and storage conditions of all such chemical substances commonly used as drugs
3. Describe the quantitative and qualitative analysis, impurity testing of the chemical substances given in the official monographs
4. Identify the dosage form & the brand names of the drugs and pharmaceuticals popular in the marketplace

Chapter	Topic	Hours
1	<p>Introduction to Pharmaceutical chemistry: Scope and objectives</p> <p>Sources and types of errors: Accuracy, precision, significant figures</p> <p>Impurities in Pharmaceuticals: Source and effect of impurities in Pharmacopoeial substances, importance of limit test, Principle and procedures of Limit tests for chlorides, sulphates, iron, heavy metals and arsenic.</p>	8
2	<p>Volumetric analysis: Fundamentals of volumetric analysis, Acid-base titration, non-aqueous titration, precipitation titration, complexometric titration, redox titration</p> <p>Gravimetric analysis: Principle and method.</p>	8
3	<p>Inorganic Pharmaceuticals: Pharmaceutical formulations, market preparations, storage conditions and uses of</p> <ul style="list-style-type: none"> ● Hematinic: Ferrous sulphate, 	7

			<p>Ferrous fumarate, Ferric ammonium citrate, Ferrous ascorbate, Carbonyl iron</p> <ul style="list-style-type: none"> ● Antacids: Aluminium hydroxide gel, Magnesium hydroxide, Magaldrate, Sodium bicarbonate, Calcium Carbonate ● Anti-microbial agents: Silver Nitrate, Ionic Silver, Chlorhexidine Gluconate, Hydrogen peroxide, Boric acid, Bleaching powder, Potassium permanganate ● Dental products: Calcium carbonate, Sodium fluoride, Denture cleaners, Denture adhesives, Mouth washes ● Medicinal gases: Carbon dioxide, nitrous oxide, oxygen 	
		4	Introduction to nomenclature of organic chemical systems with particular reference to heterocyclic compounds containing up to Three rings	2
<p>Study of the following category of medicinal compounds with respect to classification, chemical name, chemical structure (compounds marked with*) uses, stability and storage conditions, different types of formulations and their popular brand names</p>				
		5	Drugs Acting on Central Nervous System	9

			<ul style="list-style-type: none"> ● Anaesthetics: Thiopental Sodium*, Ketamine Hydrochloride*, Propofol ● Sedatives and Hypnotics: Diazepam*, Alprazolam*, Nitrazepam, Phenobarbital* ● Antipsychotics: Chlorpromazine Hydrochloride*, Haloperidol*, Risperidone*, Sulpiride*, Olanzapine, Quetiapine, Lurasidone ● Anticonvulsants: Phenytoin*, Carbamazepine*, Clonazepam, Valproic Acid*, Gabapentin*, Topiramate, Vigabatrin, Lamotrigine ● Anti-Depressants: Amitriptyline Hydrochloride*, Imipramine Hydrochloride*, Fluoxetine*, Venlafaxine, Duloxetine, Sertraline, Citalopram, Escitalopram, Fluvoxamine, Paroxetine 	
		6	<p>Drugs Acting on Autonomic Nervous System</p> <ul style="list-style-type: none"> ● Sympathomimetic Agents: <i>Direct Acting:</i> Nor-Epinephrine*, Epinephrine, Phenylephrine, Dopamine*, Terbutaline, Salbutamol (Albuterol), Naphazoline*, Tetrahydrozoline. <i>Indirect Acting Agents:</i> Hydroxy Amphetamine, Pseudoephedrine. Agents With Mixed Mechanism: Ephedrine, Metaraminol ● Adrenergic Antagonists: Alpha Adrenergic Blockers: Tolazoline, 	9

			<p>Phentolamine</p> <ul style="list-style-type: none"> ● Phenoxybenzamine, Prazosin. Beta Adrenergic Blockers: Propranolol*, Atenolol*, Carvedilol ● Cholinergic Drugs and Related Agents: Direct Acting Agents: Acetylcholine*, Carbachol, And Pilocarpine. Cholinesterase Inhibitors: Neostigmine*, Edrophonium Chloride, Tacrine Hydrochloride, Pralidoxime Chloride, Echothiopate Iodide ● Cholinergic Blocking Agents: Atropine Sulphate*, Ipratropium Bromide <p>Synthetic Cholinergic Blocking Agents: Tropicamide, Cyclopentolate Hydrochloride, Clidinium Bromide, Dicyclomine Hydrochloride*</p>	
		7	<p>Drugs Acting on Cardiovascular System</p> <ul style="list-style-type: none"> ● Anti-Arrhythmic Drugs: Quinidine Sulphate, Procainamide Hydrochloride, Verapamil, Phenytoin Sodium*, Lidocaine Hydrochloride, Lorcaïnide Hydrochloride, Amiodarone and Sotalol ● Anti-Hypertensive Agents: Propranolol*, Captopril*, Ramipril, Methyldopate Hydrochloride, Clonidine Hydrochloride, Hydralazine Hydrochloride, Nifedipine, 	5

		<ul style="list-style-type: none"> ● Antianginal Agents: Isosorbide Dinitrate 	
	8	Diuretics: Acetazolamide, Frusemide*, Bumetanide, Chlorthalidone, Benzthiazide, Metolazone, Xipamide, Spironolactone	2
	9	Hypoglycemic Agents: Insulin and Its Preparations, Metformin*, Glibenclamide*, Pioglitazone, Repaglinide, Gliflozins, Gliptins	3
	10	Analgesic And Anti-Inflammatory Agents: Morphine Analogues, Narcotic Antagonists; Nonsteroidal Anti-Inflammatory Agents (NSAIDs) - Aspirin*, Diclofenac, Ibuprofen*, Piroxicam, Celecoxib, Mefenamic Acid, Paracetamol*, Aceclofenac	3
	11	Anti-Infective Agents <ul style="list-style-type: none"> ● Antifungal Agents: Amphotericin-B, Griseofulvin, Miconazole, Ketoconazole*, Itraconazole, Fluconazole*, Naftifine Hydrochloride ● Urinary Tract Anti-Infective Agents: Norfloxacin, Ciprofloxacin, 	8

			<p>Ofloxacin*, Moxifloxacin, Gatifloxacin</p> <ul style="list-style-type: none"> ● Anti-Tubercular Agents: INH*, Ethambutol, Para Amino Salicylic Acid, Rifampicin, Bedaquiline, Delamanid, Pretomanid* ● Antiviral Agents: Amantadine Hydrochloride, Idoxuridine, Acyclovir*, Foscarnet, Zidovudine, Ribavirin, Remdesivir, Favipiravir ● Antimalarials: Quinine Sulphate, Chloroquine Phosphate*, Primaquine Phosphate, Mefloquine*, Cycloguanil, Pyrimethamine, Artemisinin ● Sulfonamides: Sulfanilamide, Sulfadiazine, Sulfamethoxazole, Sulfacetamide*, Mafenide Acetate, Cotrimoxazole, Dapsone* 	
		12	<p>Antibiotics: Penicillin G, Amoxicillin*, Cloxacillin, Streptomycin, Tetracyclines: Doxycycline, Minocycline, Macrolides: Erythromycin, Azithromycin, Miscellaneous: Chloramphenicol* Clindamycin</p>	8
		13	<p>Anti-Neoplastic Agents: Cyclophosphamide*, Busulfan, Mercaptopurine, Fluorouracil*, Methotrexate, Dactinomycin, Doxorubicin Hydrochloride, Vinblastine Sulphate, Cisplatin*, Dromostanolone Propionate</p>	3
<p>PHARMACEUTICAL CHEMISTRY – PRACTICAL</p> <p>Course Code: ER20-12P 75</p>				

Hours (3 Hours/week)

Scope: This course is designed to impart basic training and hands-on experiences to synthesis chemical substances used as drugs and pharmaceuticals. Also, to perform the quality control tests, impurity testing, test for purity and systematic qualitative analysis of chemical substances used as drugs and pharmaceuticals.

Course Objectives: This course will provide the hands-on experience on the following aspects of chemical substances used as drugs and pharmaceuticals

1. Limit tests and assays of selected chemical substances as per the monograph
2. Volumetric analysis of the chemical substances
3. Basics of preparatory chemistry and their analysis
4. Systematic qualitative analysis for the identification of the chemical drugs

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

1. Perform the limit tests for various inorganic elements and report
2. Prepare standard solutions using the principles of volumetric analysis
3. Test the purity of the selected inorganic and organic compounds against the monograph standards
4. Synthesize the selected chemical substances as per the standard synthetic scheme
5. Perform qualitative tests to systematically identify the unknown chemical substances

Practicals

S. No	Experiment
1	<p>Limit test for</p> <ul style="list-style-type: none"> ● Chlorides; sulphate; Iron; heavy metals
2	<p>Identification tests for Anions and Cations as per Indian Pharmacopoeia</p>
3	<p>Fundamentals of volumetric analysis Preparation of standard solution and standardization of Sodium Hydroxide, Ceric Ammonium Sulfate, Potassium Permanganate</p>
4	<p>Assay of the following compounds</p> <ul style="list-style-type: none"> ● Ferrous sulphate- by redox titration ● Calcium gluconate-by complexometric

	<ul style="list-style-type: none"> ● Sodium chloride-by Modified Volhard's method ● Ascorbic acid by cerimetry ● Metronidazole by Non-Aqueous Titration ● Ibuprofen by alkalimetry
5	Fundamentals of preparative organic chemistry Determination of Melting point and boiling point of organic compounds
6	Preparation of organic compounds <ul style="list-style-type: none"> ● Acetanilide from aniline ● Aspirin from salicylic acid
7	Identification and test for purity of pharmaceuticals Aspirin, Caffeine, Paracetamol, Sulfanilamide
8	Systematic Qualitative analysis experiments (4 substances)

Assignment

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

1. Different monographs and formularies available and their major contents
2. Significance of quality control and quality assurance in pharmaceutical industries
3. Overview on Green Chemistry
4. Various software programs available for computer aided drug discovery
5. Various instrumentations used for characterization & quantification of drug

Recommended Books (Latest Edition)

1. Medicinal & Pharmaceutical chemistry by Harikishan Singh and VK Kapoor
2. Wilson and Gisvold's Text book of Organic Medicinal and pharmaceutical Chemistry
3. Practical Organic Chemistry by Mann and Saunders.
4. Practical Pharmaceutical Chemistry, Volume- I & II by Beckett and J. B. Stanlake
5. Indian Pharmacopoeia
6. Vogel's text book of Practical Organic Chemistry

PHARMACOGNOSY – THEORY

Course Code: ER20-13T
Hours (3 Hours/week)

75

Scope: This course is designed to impart knowledge on the medicinal uses of various drugs of natural origin. Also, the

course emphasizes the fundamental concepts in the evaluation of crude drugs, alternative system of medicine, nutraceuticals and herbal cosmetics.

Course Objectives: This course will discuss the following aspects drug substances derived from natural resources.

1. occurrence, distribution, isolation, identification tests of common phytoconstituents
2. therapeutic activity and pharmaceutical applications of various natural drug substances and phytoconstituents
3. Biological source, chemical constituents of selected crude drugs and their therapeutic efficacy in common diseases and ailments
4. Basic concepts in quality control of crude drugs and various system of medicines
5. Applications of herbs in health foods and cosmetics

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

1. Identify the important/common crude drugs of natural origin
2. describe the uses of herbs in nutraceuticals and cosmeceuticals
3. discuss the principles of alternative system of medicines
4. describe the importance of quality control of drugs of natural origin

Chapter	Topic	Hours
1	Definition, history, present status and scope of Pharmacognosy	02
2	Classification of drugs: <ul style="list-style-type: none"> ● Alphabetical ● Taxonomical ● Morphological ● Pharmacological ● Chemical ● Chemo-taxonomical 	04
3	Quality control of crude drugs:	06

		<ul style="list-style-type: none"> • Different methods of adulteration of crude drugs • Evaluation of crude drugs 	
	4	Brief outline of occurrence, distribution, isolation, identification tests, therapeutic activity and pharmaceutical applications of alkaloids, terpenoids, glycosides, volatile oils, tannins and resins.	06
	5	Biological source, chemical constituents and therapeutic efficacy of the following categories of crude drugs.	34
		Laxatives	Aloe, Castor oil, Ispaghula, Senna
		Cardiotonic	Digitalis, Arjuna
		Carminatives and G.I. regulators	Coriander, Fennel, Cardamom, Ginger, Clove, Black Pepper, Asafoetida, Nutmeg, Cinnamon
		Astringents	Myrobalan, Black

			Catechu
		Drugs acting on nervous system	Hyoscyamus, Belladonna, Ephedra, Opium, Tea leaves, Coffee seeds, Coca
		Anti-hypertensive	Rauwolfia
		Anti-tussive	Vasaka, Tolu Balsam
		Anti-rheumatics	Colchicum seed
		Anti-tumour	Vinca, Podophyllum
		Antidiabetics	Pterocarpus, Gymnema
		Diuretics	Gokhru, Punarnava

		Anti-dysenteric	Ipecacuanha
		Antiseptics and disinfectants	Benzoin, Myrrh, Neem, Turmeric
		Antimalarials	Cinchona, Artemisia
		Oxytocic	Ergot
		Vitamins	Cod liver oil, Shark liver oil
		Enzymes	Papaya, Diastase, Pancreatin, Yeast
		Pharmaceutical Aids	Kaolin, Lanolin, Beeswax, Acacia, Tragacanth, Sodium alginate, Agar, Guar gum, Gelatine

	Miscellaneous	Squill, Galls, Pale catechu, Ashwagandha, Vasaka, Tulsi, Guggul	
6	Plant fibres used as surgical dressings: Cotton, silk, wool and regenerated fibres Sutures – Surgical Catgut and Ligatures		03
7	<ul style="list-style-type: none"> ● Basic principles involved in the traditional systems of medicine like: Ayurveda, Siddha, Unani and Homeopathy ● Method of preparation of Ayurvedic formulations like: Arista, Asava, Gutika, Taila, Churna, Lehya and Bhasma 		08
8	Role of medicinal and aromatic plants in national economy and their export potential		02
9	Herbs as health food: Brief introduction and therapeutic applications of: Nutraceuticals, Antioxidants, Pro-biotics, Pre-biotics, Dietary fibres, Omega-3-fatty acids, Spirulina, Carotenoids, Soya and Garlic		04
10	Herbal cosmetics: Sources, chemical constituents,		04

commercial preparations, therapeutic and cosmetic uses of: Aloe vera gel, Almond oil, Lavender oil, Olive oil, Rosemary oil, Sandal Wood oil

11

Phytochemical investigation of drugs

02

PHARMACOGNOSY – PRACTICAL

Course Code: ER20-13P
Hours (3 Hours/week)

75

Scope: This course is designed train the students in physical identification, morphological characterization, physical and chemical characterization and evaluation of commonly used of herbal drugs.

Course Objectives: This course will provide hands-on experiences to the students in

1. Identification of the crude drugs based on their morphological characteristics
2. Various characteristic anatomical characteristics of the herbal drugs studied through transverse section
3. Physical and chemical tests to evaluate the crude drugs

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

1. Identify the given crude drugs based on the morphological characteristics
2. Take a transverse section of the given crude drugs
3. Describe the anatomical characteristics of the given crude drug under microscopical conditions
4. Carryout the physical and chemical tests to evaluate the given crude drugs

Practicals

1. Morphological Identification of the following drugs:

Ispaghula, Senna, Coriander, Fennel, Cardamom, Ginger, Nutmeg, Black Pepper, Cinnamon, Clove, Ephedra, Rauwolfia, Gokhru, Punarnava, Cinchona, Agar.

2. Gross anatomical studies (Transverse Section) of the following drugs:

Ajwain, Datura, Cinnamon, Cinchona, Coriander, Ashwagandha, Liquorice, Clove, Curcuma, Nuxvomica, Vasaka

3. Physical and chemical tests for evaluation of any FIVE of the following drugs:

Asafoetida, Benzoin, Pale catechu, Black catechu, Castor oil, Acacia, Tragacanth, Agar, Guar gum, Gelatine.

Assignment

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

1. Market preparations of various dosage forms of Ayurvedic, Unani, Siddha, Homeopathic (Classical and Proprietary), indications, and their labelling requirements
2. Market preparations of various herbal cosmetics, indications, and their labelling requirements

Field Visit

The students shall be taken in groups to the medicinal garden to witness and understand the nature of various medicinal plants discussed in theory and practical courses. Additionally, they shall be taken in groups to the pharmacies of traditional system of medicines to understand the availability of various dosage forms and their labelling requirements. Individual reports from each student on their learning experience from the filed visit shall be submitted.

Recommended Books (Latest Editions)

1. Text book of Pharmacognosy by C. K. Kokate, S. B. Gokhale, A.P. Purohith, Nirali Prakashan
2. Text book of Pharmacognosy by C.S. Shah and J. S. Quadry, CBS Publishers & Distributors Pvt. Ltd.

3. Text Book of Pharmacognosy by T. E. Wallis. CBS Publishers & Distributors Pvt. Ltd.
4. Study of crude drugs by M. A. Iyengar, Manipal Press Ltd, Manipal
5. Powder crude drugs by M. A. Iyengar, Manipal Press Ltd, Manipal
6. Anatomy of crude drugs by M. A. Iyengar, Manipal Press Ltd, Manipal
7. Text Book of Homeopathic Pharmacy

HUMAN ANATOMY AND PHYSIOLOGY – THEORY

Course Code: ER20-14T
Hours (3 Hours/week)

75

Scope: This course is designed to impart basic knowledge on the structure and functions of the human body. It helps in understanding both homeostasis mechanism and homeostatic imbalances of various systems of human body.

Course Objectives: This course will discuss the following

1. Structure and functions of the various organ systems and organs of the human body

2. Homeostatic mechanisms and their imbalances in the human body
3. Various vital physiological parameters of the human body and their significances

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

1. Describe the various organ systems of the human body
2. Discuss the anatomical features of the important human organs and tissues
3. Explain the homeostatic mechanisms regulating the normal physiology in the human system
4. Discuss the significance of various vital physiological parameters of the human body

Chapter	Topic	Hours
1	Scope of Anatomy and Physiology	2

		Definition of various terminology	
	2	Structure of Cell: Components and its functions	2
	3	Tissues of the human body: Epithelial, Connective, Muscular and Nervous tissues – their sub-types and characteristics.	4
	4	Osseous system: structure and functions of bones of axial and appendicular skeleton Classification, types and movements of joints, disorders of joints	3 3
	5	Haemopoietic system <ul style="list-style-type: none"> ● Composition and functions of blood ● Process of Hemopoiesis ● Characteristics and functions of RBC's, WBC's and platelets 	8

		<ul style="list-style-type: none"> ● Mechanism of Blood Clotting ● Importance of Blood groups 	
	6	<p>Lymphatic system</p> <ul style="list-style-type: none"> ● Lymph and lymphatic system, composition, function and its formation. ● Structure and functions of spleen and lymph node. 	3
	7	<p>Cardiovascular system</p> <ul style="list-style-type: none"> ● Anatomy and Physiology of heart ● Blood vessels and circulation (Pulmonary, coronary and systemic circulation) ● Cardiac cycle and Heart sounds, Basics of ECG ● Blood pressure and its regulation 	8
	8	<p>Respiratory system</p> <ul style="list-style-type: none"> ● Anatomy of respiratory organs and their functions. 	4

		<ul style="list-style-type: none"> ● Regulation Mechanism of respiration. ● Respiratory volumes and capacities - definitions 	
9	Digestive system	<ul style="list-style-type: none"> ● Anatomy and Physiology of GIT ● Anatomy and functions of accessory glands ● Physiology of digestion and absorption 	8
10	Skeletal muscles	<ul style="list-style-type: none"> ● Histology ● Physiology of muscle contraction ● Disorder of skeletal muscles 	2
11	Nervous system	<ul style="list-style-type: none"> ● Classification of nervous system ● Anatomy and physiology of cerebrum, cerebellum, mid brain ● Function of hypothalamus, medulla 	8

		<ul style="list-style-type: none"> ● oblongata and basal ganglia ● Spinal cord-structure and reflexes ● Names and functions of cranial nerves. ● Anatomy and physiology of sympathetic and parasympathetic nervous system (ANS) 	
	12	Sense organs - Anatomy and physiology of <ul style="list-style-type: none"> ● Eye ● Ear ● Skin ● Tongue ● Nose 	6
	13	Urinary system <ul style="list-style-type: none"> ● Anatomy and physiology of urinary system ● Physiology of urine formation ● Renin - angiotensin system ● Clearance tests and micturition 	4
	14	Endocrine system (Hormones and their functions)	6

			<ul style="list-style-type: none"> ● Pituitary gland ● Adrenal gland ● Thyroid and parathyroid gland ● Pancreas and gonads 	
		<p style="text-align: center;">15</p>	<p style="text-align: center;">Reproductive system</p> <ul style="list-style-type: none"> ● Anatomy of Male and female reproductive system ● Physiology of menstruation ● Spermatogenesis and Oogenesis <p style="text-align: center;">Pregnancy and parturition</p>	<p style="text-align: center;">4</p>
<p>HUMAN ANATOMY AND PHYSIOLOGY – PRACTICAL</p> <p>Course Code: ER20-14P 75</p> <p>Hours (3 Hours/week)</p> <p>Scope: This course is designed to train the students and instil the skills for carrying out basic physiological monitoring of various systems and functions.</p> <p>Course Objectives: This course will provide hands-on experience in the following</p> <ol style="list-style-type: none"> 1. General blood collection techniques and carrying out various haematological assessments and interpreting the results 2. Recording and monitoring the vital physiological parameters in human subjects and the basic interpretations of the results 				

3. Microscopic examinations of the various tissues permanently mounted in glass slides
4. Discuss the anatomical and physiological characteristics of various organ systems of the body using models, charts and other teaching aids

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

1. Perform the haematological tests in human subjects and interpret the results
2. Record, monitor and document the vital physiological parameters of human subjects and interpret the results
3. Describe the anatomical features of the important human tissues under the microscopical conditions
4. Discuss the significance of various anatomical and physiological characteristics of the human body

Practicals

1. Study of compound microscope
2. General techniques for the collection of blood
3. Microscopic examination of Epithelial tissue, Cardiac muscle, Smooth muscle, Skeletal muscle, connective tissue and Nervous tissue of ready / pre-prepared slides.

4. Study of Human Skeleton-Axial skeleton and appendicular skeleton
5. Study of appliances used in Haematological experiments (only identification and listing the appliances)
6. Determination of

- a. Blood group
- b. ESR
- c. Haemoglobin content of blood
- d. Bleeding time and Clotting time

7. Determination of WBC count of blood
8. Determination of RBC count of blood
9. Determination of Differential count of blood
10. Recording of Blood Pressure in various postures, different arms, before and after exertion and interpreting the results
11. Recording of Body temperature (using mercury, digital and IR thermometers at various locations), Pulse rate/ Heart rate (at various locations in the body, before and after exertion), Respiratory Rate
12. Recording Pulse Oxygen (before and after exertion)
13. Recording force of air expelled using Peak Flow Meter
14. Measurement of height, weight, and BMI
15. Study of various systems and organs with the help of chart, models and specimen

- a) Cardiovascular system
- b) Respiratory system
- c) Digestive system
- d) Urinary system
- e) Endocrine system
- f) Reproductive system
- g) Nervous system
- h) Eye
- i) Ear

j) Skin

Recommended Books (Latest Editions)

1. Human Physiology by C. C. Chatterjee
2. Human Anatomy and Physiology by S. Chaudhary and A. Chaudhary
3. Derasari and Gandhi's elements of Human Anatomy, Physiology and Health Education
4. S.R. Kale and R.R. Kale, Textbook of Practical Anatomy and Physiology
5. Ross and Wilson Anatomy and Physiology in Health and illness
6. Human Anatomy and Physiology by Tortora Gerard J
7. Fundamentals of medical Physiology by K. Sambulingam and Prana Sambulingam
8. Ranade V.G. Text book of Practical Physiology
9. Goyal R.K., Natvar M.P. and Shah S.A., Practical Anatomy, Physiology and biochemistry, Experimental Physiology

SOCIAL PHARMACY – THEORY

Course **Code:** **ER20-15T**
75 Hours (3 Hours/week)

Scope: This course is designed to impart basic knowledge on public health, epidemiology, preventive care and other social health related concepts. Also, to emphasize the roles of pharmacists in the public health programs.

Course Objectives: This course will discuss about basic concepts of

1. Public health and national health programs
2. Preventive healthcare

3. Food and nutrition related health issues
4. Health education & promotion
5. General roles and responsibilities of the pharmacists in public health

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

1. Discuss about roles of pharmacists in the national health programs
2. Describe various sources of health hazards and disease preventive measures
3. Discuss the healthcare issues associated with food and nutritional substances
4. Describe the general roles and responsibilities of the pharmacists in public health

Chapter	Topic
1	<p>Introduction to Social Pharmacy</p> <ul style="list-style-type: none"> • Definition and Scope. Social Pharmacy as a discipline in improving the public health. Role of Pharmacists (2) • Concept of Health-WHO Definition, various determinants, and health indicators. (3) • National Health Policy – Indian Perspective (1) • Introduction to Millennium Development Goals (1)
2	<p>Preventive healthcare – Role of Pharmacists in the field</p> <ul style="list-style-type: none"> • Demography and Family Planning. (3) • Mother and child health, importance of breastfeeding, infant milk substitutes and bottle feeding (2) • Overview of Vaccines, types of immunity and immunization (1) • Effect of Environment on Health – Water pollution, safe drinking water, waterborne diseases, air pollution, sewage and solid waste disposal, occupational Environmental pollution due to pharmaceuticals (6) • Psychosocial Pharmacy: Drugs of misuse, psychotropics, narcotics, alcohol, tobacco products, of these habits on social health and product behaviours (2)
3	<p>Nutrition and Health</p> <ul style="list-style-type: none"> • Basics of nutrition – Macronutrients and Micronutrients (1) • Importance of water and fibres in diet (1) • Balanced diet, nutrition deficiency diseases, ill effects, calorific and nutritive values of various foods, fortification (1) • Introduction to food safety, adulteration of foods, effect of ripening, use of pesticides, genetically modified foods (1) • Dietary supplements, nutraceuticals, food safety indications, benefits, Drug-Food Interactions (2)

4	<p>Introduction to Microbiology and common microorganism</p> <p>Epidemiology: Introduction to the terms Epidemiology terms such as epidemic, pandemic, endemic, mode quarantine, isolation, incubation period, contact tracing. (</p> <p>Causative agents, epidemiology and clinical presentation Pharmacist in educating the public in prevention of communicable diseases:</p> <ul style="list-style-type: none"> • Respiratory infections – chickenpox, measles, influenza (including Avian-Flu, H1N1, SARS, ME diphtheria, whooping cough, meningococcal n respiratory infections, tuberculosis, Ebola (10) • Intestinal infections – poliomyelitis, viral hepatitis diarrheal diseases, typhoid, amebiasis, worm i poisoning (8) • Arthropod-borne infections - dengue, malaria chikungunya (4) • Surface infections – trachoma, tetanus, leprosy (• STDs, HIV/AIDS (3)
5	Introduction to health systems and all ongoing National in India, its objectives, functioning, outcome and the role
6	Role of Pharmacists in disaster management.
7	Pharmacoeconomics - basics, Health Insurance, Hea Organizations (HMOs), Health spending, Out-of-pocket e

SOCIAL PHARMACY – PRACTICAL

Course **Code:** **ER20-15P**
75 Hours (3 Hours/week)

Scope: This course is designed to provide simulated experience in various public health & social pharmacy activities.

Course Objectives: This course will train the students on various roles of pharmacists in public health and social pharmacy activities in the following areas

1. National immunization programs
2. Reproductive and child health programs
3. Food and nutrition related health programs
4. Health education & promotion
5. General roles and responsibilities of the pharmacists in public health
6. First Aid for various emergency conditions including basic life support and cardiopulmonary resuscitation

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

1. Describe the roles and responsibilities of pharmacist in

various National health programs

2. Design promotional materials for public health awareness
3. Describe various health hazards including microbial sources
4. Advice on preventive measures for various diseases
5. Provide first aid for various emergency conditions including basic life support and cardiopulmonary resuscitation

Note: Demonstration / Hands-on experience / preparation of charts / models / promotional materials / role plays / enacting / e-brochures / e-flyers / podcasts / video podcasts / any other innovative activities to understand the concept of various elements of social pharmacy listed here. (At least one activity to be carried out for each one of the following)

Practicals

1. National immunization schedule for children, adult vaccine schedule, Vaccines not included in the National Immunization Program.
2. RCH – reproductive and child health – nutritional aspects
3. Family planning devices
4. Microscopical observation of different microbes (readymade slides)
5. Oral Health and Hygiene
6. Personal hygiene and etiquettes – hand washing techniques, Cough and sneeze etiquettes. Various types of masks, PPE gear, wearing/using them, and disposal.
7. Menstrual hygiene, products used
8. Marketed preparations of disinfectants, antiseptics, fumigating agents, antilarval agents, mosquito repellents, etc.
9. Health Communication: Audio / Video podcasts, Images, Power Point Slides, Short Films, etc. in regional language(s) for mass communication / education / awareness on 5 different communicable diseases, their signs and symptoms, and prevention
10. Water purification techniques, use of water testing kit, calculation of content/percentage of KMnO_4 , bleaching powder to be used for wells/tanks
11. Counselling children on junk foods, balanced diets – using Information, Education and Communication (IEC), counselling, etc. (Simulation Experiments)
12. Preparation of various charts on nutrition, sources of various nutrients from locally available foods, calculation of caloric needs of different groups (e.g., child, mother, sedentary lifestyle, etc.). Chart of glycemic index of foods
13. Tobacco cessation, counselling, identifying various tobacco containing products through charts/pictures
14. First Aid – Theory, basics, demonstration, hands on training, audio-visuals, and practices, BSL (Basic Life Support) Systems [SCA - Sudden Cardiac Arrest, FBAO -

Foreign Body Airway Obstruction, CPR, Defibrillation (using AED) (include CPR techniques, First Responder)

Assignment

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

1. An overview on Antibiotics
2. Study labels of various packed foods to understand their nutritional contents
3. Calorie free sweeteners - market examples, and their contents
4. Breastfeeding counselling, guidance – using Information, Education and Communication (IEC)
5. Information about the organizations working on deaddiction services in the region (city / district, etc.)
6. Role of a pharmacist in disaster management – A case study
7. Overview on the National Tuberculosis Elimination Programme (NTEP)
8. Drug disposal systems in the country, at industry level and citizen level
9. Various Prebiotics or Probiotics (dietary and market products)
10. Emergency preparedness: Study local Government structure with respect to Fire, Police departments, health department
11. Prepare poster/presentation for general public on any one of the World Health Days. e.g., TB Day, AIDS Day, Handwashing Day, World Diabetes Day, World Heart Day, etc.
12. List of home medicines, their storage, safe handling and disposal of unused medicines
13. Responsible Use of Medicines: From Purchase to Disposal
14. Collection of newspaper clips (minimum 5) relevant to any one topic and its submission in an organized form with collective summary based on the news items
15. Read a minimum one article relevant to any theory topic, from Pharma /Science/ or other Periodicals and prepare summary of it for submission
16. Mental health and its significances among the various segments of the society
17. Potential roles of pharmacists in rural India

Field Visit

The students shall be taken in groups to visit any THREE of the following facilities to witness and understand the activities of such centres/facilities from the perspectives of the topics discussed in theory and or practical courses. Individual reports from each student on their learning experience from the filed

		<p>visit shall be submitted.</p> <ol style="list-style-type: none"> 1. Garbage Treatment Plant 2. Sewage Treatment Plant 3. Bio-medical Waste Treatment Plant 4. Effluent Treatment Plant 5. Water purification plant 6. Orphanage / Elderly-Care-Home / School and or Hostel/Home for differently abled 7. Primary health care centre <p>Recommended Books (Latest Editions)</p> <ol style="list-style-type: none"> 1. Social Pharmacy – Innovation and development. Geoff Harding, Sarah Nettleton and Kevin Taylor. The Pharmaceutical Press. 2. Text Book of Community Pharmacy Practice. RPSGB Publication 3. Community Pharmacy Handbook- Jonathan Waterfield 4. S Khurana, P Suresh and R Kalsi. Health Education & Community Pharmacy. S Vikas & Co 5. Social Pharmacy: Tayler, Geoffrey. Pharmaceutical Press. London. 6. Websites of Ministry of Health and Family Welfare, National Health Portal 7. Pharmacists at the Frontlines: A Novel Approach at Combating TB www.ipapharma.org Visit Publications 8. Where There Is No Doctor: A Village Health Care Handbook by David Werner ,2015 updated version 9. Various WHO publications www.who.int
		<p style="text-align: center;">PHARMACOLOGY – THEORY</p> <p>Course Code: ER20-21T 75</p> <p>Hours (3 Hours/week)</p> <p>Scope: This course provides basic knowledge about different classes of drugs available for the pharmacotherapy of common diseases. The indications for use, dosage regimen, route of administration, pharmacokinetics, pharmacodynamics, and contraindications of the drugs discussed in this course are vital for the successful professional practice.</p> <p>Course Objectives: This course will discuss the following</p>

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

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

4. Describe the basic concepts of pharmacokinetics and pharmacodynamics
5. Enlist the various classes & drugs of choices for any given disease condition
6. Advise the dosage regimen, route of administration & contraindications for a given drug
7. Describe the common adverse drug reactions

Ch apt er	Topic	H o u r s
1	General Pharmacology	10

			<ul style="list-style-type: none"> • 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 the 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 	
		2	<p>Drugs Acting on Peripheral Nervous System</p> <ul style="list-style-type: none"> •Steps involved in neurohumoral transmission •Definition, classification, pharmacological actions, dose, <p>indications, and contraindications of</p>	1 1

			<p>a) Cholinergic drugs b) Anti-Cholinergic drugs c) Adrenergic drugs d) Anti-adrenergic drugs e) Neuromuscular blocking agents f) Drugs used in Myasthenia gravis g) Local anaesthetic agents</p> <p>h) Non-Steroidal Anti-Inflammatory drugs (NSAIDs)</p>	
		3	<p>Drugs Acting on Eye Definition, classification, pharmacological actions, indications and contraindications of</p> <ul style="list-style-type: none"> • Miotics • Mydriatics • Drugs used in Glaucoma 	2
		4	<p>Drugs Acting on the Central Nervous System Definition, classification, pharmacological actions, dose, indications and contraindications of</p>	8

			<ul style="list-style-type: none"> • General anaesthetics • Hypnotics and sedatives • Anti-Convulsant drugs • Anti-anxiety drugs • Anti-depressant drugs • Anti-psychotics • Nootropic agents • Centrally acting muscle relaxants • Opioid analgesics 	
		5	<p>Drugs Acting on Cardiovascular System Definition, classification, pharmacological actions, indications and contraindications of</p> <ul style="list-style-type: none"> • Anti-hypertensive drugs • Anti-anginal drugs • Anti-arrhythmic drugs • Drugs used in atherosclerosis and • Congestive heart failure 	6
		6	<p>Drugs Acting on Blood and Blood Forming Organs</p> <p>Definition, classification, pharmacological actions,</p>	4

			<p>indications and contraindications of</p> <ul style="list-style-type: none"> • Hematinic agents • Anti-coagulants • Anti-platelet agents • Thrombolytic drugs 	
		7	<p>Definition, classification, pharmacological actions, indications and contraindications of</p> <ul style="list-style-type: none"> • Bronchodilators • Expectorants • Anti-tussive agents • Mucolytic agents 	2
		8	<p>Drugs Acting on Gastro Intestinal Tract</p> <p>Definition, classification, pharmacological actions, indications and contraindications of</p> <ul style="list-style-type: none"> • Anti-ulcer drugs • Anti-emetics • Laxatives and purgatives • Anti-diarrheal drugs 	5

		<p>9</p>	<p>Drugs Acting on Kidney</p> <p>Definition, classification, pharmacological actions, dose, indications, and contraindications of</p> <ul style="list-style-type: none"> • Diuretics • Anti-Diuretics 	<p>2</p>
		<p>10</p>	<p>Hormones and Hormone Antagonists Physiological and pathological role and clinical uses of</p> <ul style="list-style-type: none"> • Thyroid hormones • Anti-thyroid drugs • Parathormone • Calcitonin • Vitamin D • Insulin • Oral hypoglycemic agents • Estrogen • Progesterone • Oxytocin • Corticosteroids 	<p>8</p>
		<p>11</p>	<p>Autocoids</p>	<p>3</p>

			<ul style="list-style-type: none"> • Physiological role of Histamine, 5 HT and Prostaglandins • Classification, clinical uses and adverse effects of antihistamines and 5 HT antagonists 	
		12	<p>Chemotherapeutic Agents: Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, Classification, dose, indication and contraindications of drugs belonging to</p> <ul style="list-style-type: none"> • Penicillins • Cephalosporins • Aminoglycosides • Fluoroquinolones • Macrolides • Tetracyclines • Sulphonamides • Anti-tubercular drugs • Anti-fungal drugs • Anti-viral drugs <ul style="list-style-type: none"> • Anti-amoebic agents • Anthelmintics • Anti-malarial agents • Anti-neoplastic agents 	12
		13	Biologicals	2

Definition, types and indications of biological agents with examples

PHARMACOLOGY – PRACTICAL

Course Code: ER20-21P
Hours (2 Hours/week)

50

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

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

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

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

1. Study and report the local anaesthetic, mydriatic & mitotic effects of the given drug on rabbit eye
2. Choose appropriate animal experiment model to study the effects of the given drugs acting on the central nervous system and submit the report
3. Perform the effects of given tissues on isolated organs / tissues and interpret the results

4. Interpret the dose dependent responses of drugs in various animal experiment models

Practicals

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

1. Introduction to experimental pharmacology
2. Study of laboratory animals

(a) Mice; (b) Rats; (c) Guinea pigs; (d) Rabbits

3. Commonly used instruments in experimental pharmacology
4. Different routes of administration of drugs in animals
5. Types of pre-clinical experiments: In-Vivo, In-Vitro, Ex-Vivo, etc.
6. Techniques of blood collection from animals

Experiments

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

1. Study of local anaesthetics on rabbit eye
2. Study of Mydriatic effect on rabbit eye
3. Study of Miotic effect on rabbit eye
4. Effect of analgesics using Analgesiometer
5. Study of analgesic activity by writhing test
6. Screening of anti-convulsant using Electro Convulsiometer
7. Screening of Muscle relaxants using Rota-Rod apparatus
8. Screening of CNS stimulants and depressants using Actophotometer
9. Study of anxiolytic activity using elevated plus maze method
10. Study of effect of drugs (any 2) on isolated heart
11. Effect of drugs on ciliary motility on frog's buccal cavity

Assignment

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

1. Pyrogen testing by rabbit method
2. Newer techniques in experimental pharmacology
3. Introduction to High Throughput screening
4. Introduction to ELISA test
5. Intro to Allergy Testing
6. Intro to Toxicity Studies
7. Drugs available as paediatric formulations
8. Drug Facts Labels of USFDA
9. Antimicrobial Resistance
10. Introduction to Bioassays
11. Pre-clinical studies in new drug development

Recommended Books (Latest Edition)

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

COMMUNITY PHARMACY AND MANAGEMENT – THEORY

Course Code: ER20-22T
Hours (3 Hours/week)

75

Scope: The course is designed to impart basic knowledge and skills to provide various pharmaceutical care services to patients and general practitioners in the community setup.

Course Objectives: This course will discuss the following

1. Establishing and administering community pharmacy and its legal requirements
2. Professional aspects of handling & filling the prescriptions
3. Patient counselling on diseases, prescription and or non-prescription drugs

4. Scope for performing basic health screening in community pharmacy settings

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

1. Describe the establishment, legal requirements and effective administration of a community pharmacy
2. Professionally handle the prescriptions and dispense medications
3. Counsel the patients about the disease, prescription and or non- prescription drugs
4. Perform basic health screening for patients and interpret the reports in the community pharmacy settings

Chapter	Topic	Hours
1	Community Pharmacy Practice – Definition, history and development of community pharmacy - International and Indian scenarios	2
2	Professional responsibilities of community pharmacist Introduction to concept of Good Pharmacy Practice and SOPs.	3
3	Prescription and prescription handling <ul style="list-style-type: none"> •Definition, parts of prescriptions, legality of prescriptions, prescription handling, labelling of dispensed medications (Main label, ancillary label, pictograms), brief instructions on medication usage •Dispensing process, Good Dispensing Practices, dispensing errors and strategies to minimize them 	7
4	Communication skills <ul style="list-style-type: none"> • Definition, types of communication skills • Interactions with professionals and patients • Verbal communication skills (one-to-one, 	6

	<ul style="list-style-type: none"> over the telephone) • Written communication skills • Body language • Patient interview techniques 	
5	Patient counselling <ul style="list-style-type: none"> • Definition and benefits of patient counselling • Stages of patient counselling - Introduction, counselling content, counselling process and closing the counselling session • Barriers to effective counseling - Types and strategies to overcome the barriers • Patient counselling points for the chronic diseases/disorders - Hypertension, Diabetes, Asthma, Tuberculosis, Chronic obstructive pulmonary disease and AIDS • Patient Package Inserts - Definition, importance and benefits, Scenarios of PPI use in India and other countries • Patient Information leaflets - Definition and uses 	10
6	Medication Adherence Definition, factors influencing non adherence, strategies to overcome non-adherence	2
7	Health Screening Services in Community Pharmacy Introduction, scope and importance of various health screening services - for routine monitoring of patients and early detection & referral of undiagnosed cases	5
9	Over The Counter (OTC) Medications <ul style="list-style-type: none"> • Definition, need and role of Pharmacist in OTC medication dispensing • OTC medications in India, counseling for OTC products • Self-medication and role of pharmacist in promoting the safety of self-medication • Responding to symptoms, minor ailments and advice for the self-care in the conditions such as - Pain management, Cough, Cold, Diarrhea, Constipation, Vomiting, Fever, Sore throat, Skin disorders, Oral health (mouth ulcers, dental pain, gum swelling) 	15
10	Community Pharmacy Management <ul style="list-style-type: none"> • Legal requirements to set up a community pharmacy • Site selection requirements • Pharmacy designs and interiors 	25

- Vendor selection and ordering
- Procurement, inventory control methods, and inventory management
- Financial planning and management
- Accountancy in community pharmacy – Day book, Cash book
- Introduction to pharmacy operation softwares – usefulness and availability
- Customer Relation Management (CRM)
- Audits in Pharmacies
- SOP of Pharmacy Management
- Introduction to Digital Health, mHealth and Online pharmacies

COMMUNITY PHARMACY AND MANAGEMENT – PRACTICAL

Course Code: ER20-22P
Hours (3 Hours/week)

75

Scope: The course is designed to train the students and improve the professional skills to provide various pharmaceutical care services in the simulated community pharmacy.

Course Objectives: This course will train the students in the following

1. Professional handling & filling the prescriptions
2. Patient counselling on diseases and minor ailments
3. Patient counselling on prescription and or non-prescription drugs
4. Preparation of counselling materials such as patient information leaflets
5. Performing basic health screening tests

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

1. Handle & fill the prescriptions in a professional manner
2. Counsel the patients on various diseases and minor ailments

3. Counsel the patients on prescription and or non-prescription drugs
4. Design and prepare the patient information leaflets
5. Perform basic health screening tests

Practicals

Note: The following practicals shall be carried out in the model community pharmacy with appropriate simulated scenarios and materials. Students shall be trained through role plays wherever necessary. The activities of the students shall be assessed / evaluated using a structured objective assessment form.

1. Handling of prescription with professional standards, reviewing prescription, checking for legal compliance and completeness (minimum 5)
2. Identification of drug-drug interaction in the prescription and follow-up actions (minimum 2)
3. Preparation of dispensing labels / auxiliary labels for the prescribed medications (minimum 5)
4. Providing the following health screening services for monitoring patients / detecting new patients (one experiment for each activity)
 - Blood Pressure Recording, Capillary Blood Glucose Monitoring, Lung function assessment using Peak Flow Meter and incentive spirometer, recording capillary oxygen level using Pulse Oximeter
5. Providing counselling to the simulated patients for the following chronic diseases / disorders including education on the use of devices such as insulin pen, inhalers, spacers, nebulizers, etc. where appropriate (one experiment for each disease)
 - Type 2 Diabetes Mellitus, Primary Hypertension, Asthma, Hyperlipidaemia, Rheumatoid Arthritis
6. Providing counselling to the simulated patients for the following minor ailments (any three)
 - Headache, GI disturbances (Nausea, Vomiting, Dyspepsia, diarrhoea, constipation), Worm infestations, Pyrexia, Upper Respiratory Tract infections, Skin infections, Oral and dental disorders.
7. Appropriate handling of dummy dosage forms with correct administration techniques - oral liquids with measuring cup/cap/dropper, Eye Drops, Inhalers, Nasal drops, Insulin pen, nebulizers, different types of tablets, patches

Assignment

The students shall be asked to submit the written assignments on the following topics (One assignment / student / sessional

period. i.e., a minimum of THREE assignments / student)

1. SOPs for various activities in Community Pharmacy (as discussed in Theory and Practical)
2. List out the various abbreviations, short forms used in prescriptions and their interpretation
3. Patient Information Leaflet for a given chronic disease / disorder
4. Patient Information Leaflet for prescription / non-prescription drugs
5. Preparation of window / shelf display materials for the model community pharmacy
6. Software available for the retail pharmacy management including billing, inventory, etc.
7. Dosage / Medication Reminder Aids
8. Overview on the operations and marketing strategies of various online pharmacies
9. Overview on the common fixed dose combinations
10. Overview on the medications require special storage conditions
11. Roles of Community Pharmacists in preventing Antimicrobial Resistance
12. Jan Aushadhi and other Generic Medicine initiatives in India
13. Overview of various professional associations of Pharmacy / Pharmacists in India
14. Community Pharmacy Practice Standards: Global Vs. Indian Scenario

Field Visit

The students shall be taken in groups to visit community pharmacies (both retail and wholesale) to understand and witness the professional activities of the community pharmacists. Individual reports from each student on their learning experience from the field visit shall be submitted.

Recommended Books (Latest Edition)

1. Health Education and Community Pharmacy by N.S. Parmar.
2. WHO consultative group report.
3. Drug store & Business management by Mohammed Ali & Jyoti.
4. Handbook of pharmacy – health care. Edt. Robin J Harman. The Pharmaceutical Press
5. Comprehensive Pharmacy Review – Edt. Leon Shargel. Lippincott Williams & Wilkins.
6. Good Pharmacy Practices Training Manual by

IPA/CDSCO/WHO India

7. Training Module for Community Pharmacists in TB Care and Control/ by MoH/IPA

8. Hand Book of PharmaSoS, Drugs in Special population- Pregnancy and Lactation, Tobacco free future- Choice is yours: KSPC Publications.
9. Responsible Use of Medicines: A Layman's Handbook, www.ipapharma.org/publications
10. Community Pharmacy Practice around the Globe: Part One: www.ipapharma.org/publications

BIOCHEMISTRY & CLINICAL PATHOLOGY – THEORY

Course Code: ER20-23T

75

Hours (3 Hours/week)

Scope: This course is designed to impart basic knowledge on the study of structure and functions of biomolecules and the chemical process associated with living cells in normal and abnormal states. The course also emphasizes on the clinical pathology of blood and urine.

Course Objectives: This course will discuss the following at the fundamental level

1. Structure and Functions of biomolecules
2. Catalytic activity, diagnostic and therapeutic importance of enzymes

3. Metabolic pathways of biomolecules in health and illness (metabolic disorders)

4. Biochemical principles of organ function tests and their clinical significance
5. Qualitative and quantitative determination of biomolecules / metabolites in the biological sample
6. Clinical pathology of blood and urine

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

1. Describe the functions of biomolecules
2. Discuss the various functions of enzymes in the human system
3. Explain the metabolic pathways of biomolecules in both physiological and pathological conditions
4. Describe the principles of organ function tests and their clinical significances
5. Determine the biomolecules / metabolites in the given biological samples, both qualitatively and quantitatively
6. Describe the clinical pathology of blood and urine

Ch apt er	Topic	H o u r s
1	Introduction to biochemistry: Scope of	2

			<p>biochemistry in pharmacy; Cell and its biochemical organization.</p>	
		<p>2</p>	<p>Carbohydrates</p> <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 carbohydrates 	<p>5</p>
		<p>3</p>	<p>Proteins</p> <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 of organization of protein structure) • Qualitative tests and biological role proteins and amino acids • Diseases related to malnutrition of proteins. 	<p>5</p>

		<p>4</p>	<p>Lipids</p> <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 	<p>5</p>
		<p>5</p>	<p>Nucleic acids</p> <ul style="list-style-type: none"> • Definition, purine and pyrimidine bases • Components of nucleosides and nucleotides with examples • Structure of DNA (Watson & Crick model), RNA and their functions 	<p>4</p>
		<p>6</p>	<p>Enzymes</p> <ul style="list-style-type: none"> • Definition, properties and IUB & MB classification • Factors affecting enzyme activity • Mechanism of action of enzymes, 	<p>5</p>

			<p>Enzyme inhibitors</p> <ul style="list-style-type: none"> • Therapeutic and pharmaceutical importance of enzymes 	
		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 	6
		8	<p>Metabolism (Study of cycle/pathways without chemical structures)</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) and its energetic, 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 	20

	<p>abnormal metabolism of amino acids, Disorders of ammonia metabolism, phenylketonuria, alkaptonuria and Jaundice.</p> <ul style="list-style-type: none"> Biological oxidation: Electron transport chain and Oxidative phosphorylation 	
9	<p>Minerals: Functions, Deficiency diseases, recommended dietary requirements of calcium, phosphorus, iron, sodium and chloride</p>	05
10	<p>Water and Electrolytes</p> <ul style="list-style-type: none"> Distribution, functions of water in the body Water turnover & balance Electrolyte composition of the body fluids, Dietary intake of electrolyte and Electrolyte balance Dehydration, causes of dehydration and oral dehydration therapy 	05
11	<p>Introduction to Biotechnology</p>	01
12	<p>Organ function tests</p>	06

			<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 test to assess the functions of liver and their clinical significances • Lipid profile tests and its clinical significances 	
		<p>13</p>	<p>Introduction to Pathology of Blood and Urine</p> <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 	<p>06</p>
<p align="center">BIOCHEMISTRY & CLINICAL PATHOLOGY – PRACTICAL</p> <p>Course Code: ER20-23P 75</p> <p>Hours (3 Hours/week)</p> <p>Scope: This course is designed to train the students in the qualitative testing of various biomolecules and testing of biological samples for determination of normal and abnormal constituents</p> <p>Course Objectives: This course will train and provide hands-on experiences on the following</p> <ol style="list-style-type: none"> 1. Qualitative determination of biomolecules / metabolites in the simulated biological sample 				

2. Determination of normal and abnormal constituents of simulated blood and urine samples

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

1. Qualitatively determine the biomolecules / metabolites in the given biological samples
2. Determine the normal and abnormal constituents in blood and urine samples and interpret the results of such testing

Practicals

1. Qualitative analysis of carbohydrates (4 experiments)
2. Qualitative analysis of Proteins & amino acids (4 experiments)
3. Qualitative analysis of lipids (2 experiments)
4. Qualitative analysis of urine for normal and abnormal constituents

(4 experiments)

5. Determination of constituents of urine (glucose,

creatinine, chlorides)

(2 experiments)

6. Determination of constituents of blood/serum (simulated) (Creatine, glucose, cholesterol, Calcium, Urea, SGOT/SGPT) (5 experiments)

7. Study the hydrolysis of starch from acid and salivary amylase enzyme

(1 experiment)

Assignment

The students shall be asked to submit the written assignments on Various Pathology Lab Reports (One assignment / student / sessional period. i.e., a minimum of THREE assignments / student)

Recommended Books (Latest Edition)

1. Essentials of Biochemistry by U. Satyanarayan, Books and Allied (P) Ltd.
2. A Textbook of Biochemistry by A.V.S.S. Rama Rao, UBS Publishers' Distributors Pvt. Ltd.
3. Practical Biochemistry by R.C. Gupta and S. Bhargavan.
4. Laboratory manual of Biochemistry by Pattabiraman and Sitaram Acharya

PHARMACOTHERAPEUTICS - THEORY

Course **Code:** **ER20-24T**
75 Hours (3 Hours/week)

Scope: This course is designed to impart basic knowledge on etiopathogenesis of common diseases and their management along with quality use of medicines.

Course Objectives: This course will discuss about

1. Etiopathogenesis of selected common diseases and the evidence-based drug therapy
2. Importance of individualized therapeutic plans based on diagnosis
3. Basic methods for assessing the clinical outcomes of drug therapy

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

1. Help assessing the subjective and objective parameters of patients in common disease conditions
2. Assist the other healthcare providers to analyse drug related problems & provide therapeutic interventions
3. Participate in planning the rational drug therapy for common diseases
4. Design and deliver discharge counselling for patients

Chapter	Topic
1	Pharmacotherapeutics – Introduction, scope and objectives of Medicines, Evidence Based Medicine, Essential Standard Treatment Guidelines (STGs)
2	<p>Definition, etiopathogenesis, clinical manifestations and pharmacological management of the diseases as follows:</p> <p>(a) Cardiovascular System</p> <ul style="list-style-type: none"> • Hypertension • Angina and Myocardial infarction • Hyperlipidaemia • Congestive Heart Failure <p>(b) Respiratory System</p> <ul style="list-style-type: none"> • Asthma • COPD <p>(c) Endocrine System</p> <ul style="list-style-type: none"> • Diabetes • Thyroid disorders- Hypo and Hyperthyroidism <p>(d) Central Nervous System</p> <ul style="list-style-type: none"> • Epilepsy • Parkinson's disease • Alzheimer's disease • Stroke • Migraine <p>(e) Gastro Intestinal Disorders</p> <ul style="list-style-type: none"> • Gastro oesophageal reflux disease

- Peptic Ulcer Disease
- Alcoholic liver disease
- Inflammatory Bowel Diseases (Crohn's Disease and Colitis)

(f) Haematological disorders

- Iron deficiency anaemia
- Megaloblastic anaemia

(g) Infectious diseases

- Tuberculosis
- Pneumonia
- Urinary tract infections
- Hepatitis
- Gonorrhoea and Syphilis
- Malaria
- HIV & Opportunistic infections
- Viral Infections (SARS, CoV2)

(h) Musculoskeletal disorders

- Rheumatoid arthritis
- Osteoarthritis

(i) Dermatology

- Psoriasis
- Scabies
- Eczema

(j) Psychiatric Disorders

- Depression
- Anxiety
- Psychosis

(k) Ophthalmology

- Conjunctivitis (bacterial and Viral)
- Glaucoma

(l) Anti-microbial Resistance

(m) Women's Health

- Polycystic Ovary Syndrome
- Dysmenorrhea
- Premenstrual Syndrome

PHARMACOTHERAPEUTICS – PRACTICAL

Course **Code:** **ER20-24P**
25 Hours (1 Hour/week)

Scope: This course is designed to train the students in the basic skills required to support the pharmaceutical care services for selected common disease conditions.

Course Objectives: This course will train the students on

1. How to prepare a SOAP (Subjective, Objective, Assessment and Plan) note for the clinical case of selected common diseases
2. Patient counselling techniques/methods for the common disease conditions

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

1. Write the SOAP (Subjective, Objective, Assessment and Plan) notes for the given clinical cases of selected common diseases
2. Counsel the patients about the disease conditions, uses of drugs, methods of handling & administration of drugs, life-style modifications and monitoring parameters.

Practicals

I. Preparation and discussion of SOAP (Subjective, Objective, Assessment and Plan) notes for at least SIX clinical cases (real / hypothetical) of the following disease conditions which shall be documented.

1. Hypertension
2. Angina Pectoris
3. Myocardial Infarction
4. Hyperlipidaemia
5. Rheumatoid arthritis
6. Asthma
7. COPD
8. Diabetes
9. Epilepsy
10. Stroke
11. Depression
12. Tuberculosis
13. Anaemia (any one type as covered in theory)
14. Viral infection (any one as covered in theory)
15. Dermatological conditions (any one condition as covered in theory)

II. Patient counselling exercises using role plays based on the real / hypothetical clinical case scenarios. The students are expected to provide counselling on disease condition, medications, life-style modifications, monitoring parameters, etc. and the same shall be documented. (Minimum 5 cases)

III. Simulated cases to enable dose calculation of selected drugs in paediatrics, and geriatrics under various pathological conditions. (Minimum 4 cases)

Recommended Books (Latest Editions)

1. Clinical Pharmacy and Therapeutics - Roger and Walker, Churchill Livingstone Publication
2. Clinical Pharmacy and Therapeutics - Eric T. Herfindal, Williams and Wilkins Publication
3. Applied Therapeutics: The clinical Use of Drugs. Lloyd Young and Koda-Kimble MA Lippincott, Williams and Wilkins Publication.
4. Pharmacotherapy: A Pathophysiologic approach - Joseph

T. Dipiro et al. Appleton & Lange Publication.

HOSPITAL AND CLINICAL PHARMACY – THEORY

Course **Code:** **ER20-25T**
75 Hours (3 Hours/week)

Scope: This course is designed to impart fundamental knowledge & professional skills required for facilitating various hospital & clinical pharmacy services.

Course Objectives: This course will discuss and train the students in the following

1. Hospital & Hospital Pharmacy organization and set-ups
2. Basics of hospital pharmacy services including the procurement, supply chain, storage of medicines and medical supplies
3. Basics of clinical pharmacy including introduction to comprehensive pharmaceutical care services
4. Basic interpretations of common laboratory results used in clinical diagnosis towards optimizing the drug therapy

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

1. Explain about the basic concepts of hospital pharmacy administration
2. Manage the supply chain and distribution of medicines within the hospital settings
3. Assist the other healthcare providers in monitoring drug therapy & address drug related problems
4. Interpret the common lab investigation reports for optimizing the drug therapy

S. No.	Topic
1	Hospital Pharmacy <ul style="list-style-type: none">• Definition, scope, national and international scenarios• Organisational structure• Professional responsibilities, Qualification & requirements, job specifications, work load requirements, professional relationships• Good Pharmacy Practice (GPP) in hospital• Hospital Pharmacy Standards (FIP Basel Statement)• Introduction to NABH Accreditation and Role of Pharmacy
2	Different Committees in the Hospital <ul style="list-style-type: none">• Pharmacy and Therapeutics Committee - Objectives and functions• Hospital Formulary - Definition, procedure for development of hospital formulary• Infection Control Committee – Role of Pharmacist in controlling microbial Resistance
4	Supply Chain & Inventory Control <ul style="list-style-type: none">• Preparation of Drug lists - High Risk drugs, Essential medicines, Schedule H1 drugs, NDPS drugs, reserved antibiotics

	<ul style="list-style-type: none"> • Procedures of Drug Purchases – Drug selection, term and tender/e-tender process, quotations, etc. • Inventory control techniques: Economic Order Quantity Level, Inventory Turnover etc. • Inventory Management of Central Drug Store – Stocking Methods of storage, Distribution, Maintaining Cold Storage used for cold storage (Refrigerator, ILR, Walk-in-Cooler) • FEFO, FIFO methods • Expiry drug removal & their disposal methods e.g., M... • Documentation- purchase and inventory
5	Drug distribution <ul style="list-style-type: none"> • Drug distribution (in patients & out patients) – Definition and disadvantages of individual prescription order, Stock Method, Unit Dose Drug Distribution Method, Method. • Distribution of drugs to ICCU/ICU/NICU/Emergency • Automated drug dispensing systems and devices • Distribution of Narcotic and Psychotropic substances and storage
6	Compounding in Hospitals. Bulk compounding, IV admixtures, incompatibilities, Total parenteral nutrition
7	Radio Pharmaceuticals - Storage, dispensing and disposal of radiopharmaceuticals
8	Application of computers in Hospital Pharmacy Practice, Electronic records, Software used in hospital pharmacy
9	Clinical Pharmacy: Definition, scope and development - in different countries Technical definitions, common terminologies used in clinical pharmacy and their significance such as Paediatrics, Geriatric, Anti-natal Care etc. Daily activities of clinical pharmacist: Definition, goal and objectives <ul style="list-style-type: none"> • Ward round participation • Treatment Chart Review • Adverse drug reaction monitoring • Drug information and poisons information • Medication history • Patient counselling • Interprofessional collaboration Pharmaceutical care: Definition, classification of drug therapy, Principles and procedure to provide pharmaceutical care Medication Therapy Management, Home Medication Review
10	Clinical laboratory tests used in the evaluation of drug therapy: Definition, significance and interpretation of test results <ul style="list-style-type: none"> • Haematological, Liver function, Renal function, thyroid function tests • Tests associated with cardiac disorders • Fluid and electrolyte balance • Pulmonary Function Tests
11	Poisoning: Types of poisoning: Clinical manifestations and management

	Drugs and Poison Information Centre and their services Requirements, Information resources with examples, and advantages and disadvantages
12	Pharmacovigilance <ul style="list-style-type: none"> • Definition, aim and scope • Overview of Pharmacovigilance
13	Medication errors: Definition, types, consequences, and strategies to minimize the medication errors, LASA drugs & Tallman letter Drug Interactions: Definition, types, clinical significance of

HOSPITAL AND CLINICAL PHARMACY – PRACTICAL

Course Code: ER20-25P
Hours (1 Hour / Week)

25

Scope: This course is designed to train the students to assist the healthcare providers in the basic services of hospital & clinical pharmacy.

Course Objectives: This course will train the students with hands-on experiences, simulated clinical case studies in the following

1. Methods to systematically approach & respond to the drug information queries
2. How to interpret the common laboratory reports to understand the need for optimizing the dosage regimen
3. How to report the suspected adverse drug reactions to the concerned authorities
4. Uses and methods of handling various medical/surgical aids and devices
5. How to interpret the drug-drug interactions in the treatment of common diseases.

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

1. Professionally handle & answer the drug information queries
2. Interpret the common laboratory reports
3. Report suspected adverse drug reactions using standard procedures
4. Understand the uses and methods of handling various medical/surgical aids and devices
5. Interpret and report the drug-drug interactions in common diseases for optimizing the drug therapy

Note: Few of the experiments of Hospital and Clinical Pharmacy practical course listed here require adequate numbers of desktop computers with internet connectivity, adequate drug information resources including reference books, different types of surgical dressings and other medical devices and accessories. Various charts, models, exhibits pertaining to the experiments shall also be displayed in the laboratory.

Practicals

1. Systematic approach to the drug information queries using primary / secondary / tertiary resources of information (2 cases)
2. Interpretation of laboratory reports to optimize the drug therapy in a given clinical case (2 cases)
3. Filling up IPC's ADR Reporting Form and perform causality assessments using various scales (2 cases)
4. Demonstration / simulated / hands-on experience on the identification, types, use / application / administration of
 - Orthopaedic and Surgical Aids such as knee cap, LS belts, abdominal belt, walker, walking sticks, etc.
 - Different types of bandages such as sterile gauze, cotton, crepe bandages, etc.
 - Needles, syringes, catheters, IV set, urine bag, RYLE's tube, urine pots, colostomy bags, oxygen masks, etc.
5. Case studies on drug-drug interactions (any 2 cases)
6. Wound dressing (simulated cases and role play – any 2 cases)
7. Vaccination and injection techniques (IV, IM , SC) using mannequins (5 activities)

Assignment

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

1. Typical profile of a drug to be included in the hospital formulary
2. Brief layout and various services of the Central Sterile Supplies Department (CSSD)
3. Various types of sterilizers and sterilization techniques used in hospitals
4. Fumigation and pesticide control in the hospitals
5. Genesis and development of Drug / Poison Information centres in India
6. Role of Pharmacist in Transition of Care: Discharge cards, post hospitalization care, medicine reconciliation activities in developed countries
7. Total parenteral nutrition and IV admixtures and their compatibility issues
8. Concept of electronic health records
9. Invasive and Non-invasive diagnostic tests - HRCT, MRI, Sonography, 2DECHO, X-rays, Mammography, ECG, EMG
10. Diagnostic Kits - Pregnancy Test
11. Measures to be taken in hospitals, ICUs to minimize the Anti-microbial Resistance
12. Antimicrobial Stewardship Program

Field Visit

The students shall be taken in groups to visit the Govt / private healthcare facility to understand and witness the various hospital and clinical pharmacy services provided. Individual reports from each student on their learning experience from the field visit shall be submitted.

Recommended Books (Latest Edition)

1. A Textbook of Clinical Pharmacy Practice - Essential concepts and skills - Parthasarathi G, Karin Nyfort-Hansen and Milap Nahata. Orient Longman Pvt. Ltd. Hyderabad.
2. Text Book of Hospital and Clinical Pharmacy by Dr. Pratibha Nand and Dr. Roop K Khar, Birla publications, New Delhi.
3. Gupta B.K and Gupta R.N., GPP in Hospital Pharmacy, Vallabh Prakashan.
4. Basic skills in interpreting laboratory data - Scott LT, American Society of Health System Pharmacists Inc.
5. Australian drug information - Procedure manual. The Society of Hospital Pharmacists of Australia.

PHARMACY LAW AND ETHICS – THEORY

Course Code: **ER20-26T**
75 Hours (3 Hours/week)

Scope: This course is designed to impart basic knowledge on several important legislations related to the profession of pharmacy in India

Course Objectives: This course will discuss the following

1. General perspectives, history, evolution of pharmacy law in India
2. Act and Rules regulating the profession & practice of pharmacy in India
3. Important code of ethical guidelines pertaining to various practice standards
4. Brief introduction to the patent laws and their applications in pharmacy

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

1. Describe the history and evolution of pharmacy law in India
2. Interpret the act and rules regulating the profession & practice of pharmacy in India
3. Discuss the various code of ethics related to practice standards in pharmacy
4. Interpret the fundamentals of patent laws from the perspectives of pharmacy

Chapter	Topics	Hours
1	General Principals of Law, History and various Acts related to Drugs and Pharmacy profession	2
2	<p>Pharmacy Act-1948 & Rules: Objectives, Definitions, Pharmacy Council of India; its constitution and functions, Education Regulations, State and Joint state pharmacy councils, Registration of Pharmacists, Offences and Penalties.</p> <p>Pharmacy Practice Regulations 2015</p>	5
3	<p>Drugs and Cosmetics Act 1940 and Rules 1945 & New Amendments Objectives, Definitions, Legal definitions of schedules to the Act and Rules Import of drugs – Classes of drugs and cosmetics prohibited from import, Import under license or permit. Manufacture of drugs – Prohibition of manufacture and sale of certain drugs, Conditions for grant of license and conditions of license for manufacture of drugs, Manufacture of drugs for test, examination and analysis, manufacture of</p>	23

			<p>new drug, loan license and repacking license.</p> <p>Study of schedule C & C1, G, H, H1, K, P, M, N, X and Y.</p> <p>Sale of Drugs – Wholesale, Retail sale and Restricted license, Records to be kept in a pharmacy</p> <p>Drugs Prohibited for manufacture and sale in India</p> <p>Administration of the Act and Rules – Drugs Technical Advisory Board, Central Drugs Laboratory, Drugs Consultative Committee, Government analysts, licensing authorities, controlling authorities, Drug Inspectors.</p>	
		4	<p>Medicinal and Toilet Preparations Act 1955: Objectives, Definitions, Licensing, Offences and Penalties</p>	2
		5	<p>Narcotic Drugs and psychotropic substance Act 1985 and Rules</p> <p>Objectives, Definitions, Authorities and Officers, Prohibition, Control and Regulation, Offences and Penalties.</p>	2
		6	<p>Drugs and Magic remedies (Objectionable Advertisement) Act 1955</p> <p>Objectives, Definitions, Prohibition of certain advertisements, Classes of Exempted advertisements, Offences and Penalties.</p>	2

	7	Prevention of cruelty to Animals Act-1960: Objectives, Definitions, CPCSEA - brief overview, Institutional Animal Ethics Committee, Breeding and Stocking of Animals, Performance of Experiments, Transfer and Acquisition of animals for experiment, Records, Power to suspend or revoke registration, Offences and Penalties.	2
	8	Poisons Act-1919: Introduction, objective, definition, possession, possession for sales and sale of any poison, import of poisons	2
	9	FSSAI (Food Safety and Standards Authority of India) Act and Rules: brief overview and aspects related to manufacture, storage, and labelling of Food Supplements	2
	10	National Pharmaceutical Pricing Authority: Drugs Price Control Order (DPCO)-2013. Objectives, Definitions, Sale prices of bulk drugs, Retail price of formulations, Retail price and ceiling price of scheduled formulations, pharmaceutical policy 2002, National List of Essential Medicines (NLEM)	5
	11	Code of Pharmaceutical Ethics: Definition, ethical principles, ethical problem solving, registration, code of ethics for Pharmacist in relation to his job, trade, medical profession and his profession, Pharmacist's oath.	5

		12	Medical Termination of Pregnancy Act and Rules – basic understanding/salient features	2
		13	Role of all the government pharma regulator bodies - DCGI, CDSCO, IPC	1
		14	Good Regulatory practices (documentation, licenses, renewals, e-governance) in Community Pharmacy, Hospital pharmacy, Pharma Manufacturing, Wholesale business, inspections, import, export of drugs & medical devices	3
		15	Introduction to BCS system of classification, Basic concepts of Clinical Trials, ANDA, NDA, New Drug development, Schedule Y. Brand v/s Generic, Trade name concept, Introduction to Patent Law and Intellectual Property Rights, Emergency Use Authorization	5
		16	Blood bank – basic requirements and functions	2
		17	Clinical Establishment Act and Rules – Aspects related to Pharmacy	2

18	Biomedical Waste Management Rules 2016 – Basic aspects, and aspects related to pharma manufacture to disposal of pharma / medical waste at homes, hospitals	2
19	Bioethics - Basic concepts, history and principles. Brief overview of ICMR's National Ethical Guidelines for Biomedical and Health Research involving human participants	2
20	Introduction to Consumer Protection Act	2
21	Medical Devices – Categorization, basic aspects related to manufacture and sale	2

Assignment

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

1. Requirements for Ayurvedic, Homeopathic manufacturing, sale and licensing requirements
2. Layout and contents of official websites of various agencies regulating the profession of pharmacy in India: e.g., CDSCO, SUGAM portal, PCI, etc.
3. Licenses required, application processes (online/offline), drug regulatory office website of the respective state
4. Case studies – actions taken on violation of any act / rule related to pharmacy from the literature / media
5. Schedule H1 drugs and its implementation in India
6. Counterfeit / Spurious medicines
7. Drug Testing Labs in India
8. Generic Medicines

Recommended Books (Latest Edition)

1. Forensic Pharmacy by B. Suresh
2. Text book of Forensic Pharmacy by B.M. Mithal
3. Hand book of drug law-by M.L. Mehra
4. A text book of Forensic Pharmacy by N.K. Jain
5. Drugs and Cosmetics Act/Rules by Govt. of India publications.
6. Medicinal and Toilet preparations act 1955 by Govt. of India publications.
7. Narcotic drugs and psychotropic substances act by Govt. of India publications
8. Drugs and Magic Remedies act by Govt. of India publications.
9. CDSCO Website, NPPA Website
10. Books on D and C Act by Nilesh Gandhi and Susheer Deshpande
11. Book by Dr Guruprasad Mohanta

Academic Calendar of the University	Starting of First Term (S.Y.D.Pharm)	17/08/2022
	Starting of First Term (F.Y.D.Pharm.)	01/09/2022*
	Nomination of Students Council Members	2 nd week of Sept. 2022
	Pharmacist Day	25/09/2022
	First Internal Institute Monitoring	3 rd week of Oct. 2022
	Reading Inspiration Day	15/10/2022
	First Sessional Test (Practical)	21/11/2022 TO 26/11/2022
	First Sessional Test (Theory)	14/11/2022 TO 19/11/2022
	Winter Break* (For S.Y.D.Pharm)	20/10/2022 TO 08/11/2022
	M.S.B.T.E. Winter 2022 Practical Examination	01/12/2022 TO 10/12/2022
	M.S.B.T.E. Winter 2022 Theory Examination	14/12/2022 TO 05/01/2023
	Industrial Visit /Hospital Visit	3 rd - 4 th week of Feb 2023
	College Week	2 nd week of Jan 2023
	Seminar/Project Presentation	25/02/2023
	Annual Prize Distribution Programme	01/03/2023
	Second Sessional Test (Practical)	30/01/2023 TO 04/02/2023
	Second Sessional Test (Theory)	06/02/2023 TO 11/02/2023
	Filling Summer-2023 Examination Forms with normal fees	16/02/2023 to 02/03/2023

Second Internal Institute Monitoring	2 nd week of Feb. 2023
External Institute Monitoring	1 st week of March 2023
Third Sessional Test (Practical)	31/03/2023 TO 06/04/2023
Third Sessional Test (Theory)	08/04/2023 TO 15/04/2023
M.S.B.T.E. Summer 2023 Practical Examination	27/04/2023 TO 06/05/2023
M.S.B.T.E. Summer 2023 Theory Examination	11/05/2023 TO 31/05/2023
Result of Summer 2023 Exam.	2 nd week of July 2023

Academic Time Table with the name of the Faculty members handling the Course

PRINCIPAL K. M. KUNDNANI PHARMACY POLYTECHNIC, ULHASNAGAR-3.
Time-Table 2022 -23

Programme: DIPLOMA IN PHARMACY Theory :- 1st Sep 2022
Class :- F.Y.DIPLOMA IN PHARMACY Practical :- 1st Sep 2022

Day/Time	PRACTICAL SESSION		THEORY SESSION			
	9.30 a.m. - 12.30 p.m.		12.30 - 1.00 p.m.	1.00 - 2.00 p.m.	2.00 - 3.00 p.m.	3.00 - 4.00 p.m.
Monday	Pharmaceutics B-I (HC) Pharmaceutical Chemistry B-II (KB) Human Anatomy & Physiology B-II (SRP)		R E C E S S	Pharmaceutics (HC)	Pharmaceutical Chemistry (KB)	Human Anatomy & Physiology (SRP)
Tuesday	Pharmaceutics B-II (HC) Pharmaceutical Chemistry B-III (KB) Pharmacognosy B-I (SP)			Pharmaceutical Chemistry (KB)	Pharmaceutics (HC)	Social Pharmacy (MG)
Wednesday	Social Pharmacy I-III (SC) Pharmaceutical Chemistry B-I (KB) Pharmacognosy B-II (SP)			Human Anatomy & Physiology (SRP)	Pharmacognosy (SP)	Social Pharmacy (MG)
Thursday	Social Pharmacy B-I (SC) Human Anatomy & Physiology B-I (SRP) Library Assignment B-III			Pharmaceutical Chemistry (KB)	Pharmacognosy (SP)	Social Pharmacy (MG)
Friday	Social Pharmacy B-II (SC) Pharmacognosy B-II (SP) Library Assignment B-I			Pharmaceutics (HC)	Pharmacognosy (SP)	Human Anatomy & Physiology (SRP)
Saturday	Pharmaceutics B-III (HC) Human Anatomy & Physiology B-I (SP) Library Assignment B-II			Tutorials & Students Counseling		
				Tutorials & Students Counseling		

Sl.No.	Subject	Theory		Practical	Sl.No.	Name of Teachers	Initial of Teacher Name	Work Load Hrs / week		Total Hrs
		Theory	Practical					F.Y.D.Pharm	S.Y.D.Pharm	
1	Pharmaceutics	02	02	02	1	Mrs. Manjiri S. Gharat	MG	04	04	08
2	Pharmaceutical Chemistry	02	02	02	2	Mr. Sunil V. Chavan	SC	04	04	08
3	Pharmacognosy	02	02	02	3	Mrs. Supriya R. Pawar	SP	04	04	08
4	Social Pharmacy	02	02	02	4	Mr. Anant K. Chavan	HC	04	04	08
5	Human Anatomy & Physiology	02	02	02	5	Mr. Anant K. Chavan	HC	04	04	08
6	All course tutorial	02	02	02	6	Mr. Anant K. Chavan	HC	04	04	08
	Total					Total		20	20	40

F.Y.D.Pharm
Theory :- 20 hours per week
Practical :- 45 hours per week
Total :- 65 hours per week

Library Assignment: Individual Teacher will give assignment that will be completed in Library.

Principal

KMNDI/ES/Sanitary/Time Table/Time-Table-2022-23

PRINCIPAL K. M. KUNDNANI PHARMACY POLYTECHNIC, ULHASNAGAR-3.
Time-Table 2022-23

Programme :- DIPLOMA IN PHARMACY Theory :- 17th Aug, 2022
Class :- S.Y.DIPLOMA IN PHARMACY Practical :- 17th Aug, 2022

DAY/TIME	THEORY SESSION				PRACTICAL SESSION	
	9.30 - 10.30 a.m.	10.30 - 11.30 a.m.	11.30 - 12.30 p.m.	12.30 - 1.00 p.m.	1.00 p.m. - 4.00 p.m.	
Monday	Community Pharmacy Management (SC)	Hosp. & Cl. Pharmacy (SC)	Community Pharmacy Management (SP)	R E C E S S	Pharmacology B-I (MG) Community Pharmacy Management B-II (SC)	
Tuesday	Biochemistry & Clinical Pathology (SRP)	Hosp. & Cl. Pharmacy (SC)	Pharmacology (MG)		Community Pharmacy Management B-I (SC) Biochemistry & Clinical Pathology B-II (SRP)	
Wednesday	Biochemistry & Clinical Pathology (SRP)	Pharmacotherapeutics (HC)	Pharmacology (MG)		Pharmacotherapeutics B-I (HC) Pharmacotherapeutics B-II (HC)	
Thursday	Pharmacy Law & Ethics (KB)	Pharmacotherapeutics (HC)	Community Pharmacy Management (SP)		Hospital & Clinical Pharmacy B-I (HC) Hospital & Clinical Pharmacy B-II (HC)	
Friday	Pharmacotherapeutics (HC)	Pharmacy Law & Ethics (KB)	Biochemistry & Clinical Pathology (SRP)		Biochemistry & Clinical Pathology B-I (KB) Pharmacology B-II (MG)	
Saturday	HOSP. & CL. Pharmacy (SC)	Pharmacy Law & Ethics (KB)	Pharmacology (MG)		Tutorials & Students Counseling	
					Tutorials & Students Counseling	

Sl.No.	Subject	Theory		Practical	Sl.No.	Name of Teachers	Initial of Teacher Name	Work Load Hrs / week		Total Hrs
		Theory	Practical					F.Y.D.Pharm	S.Y.D.Pharm	
1	Pharmacotherapeutics	02	02	02	1	Mr. Manjiri S. Gharat	MG	04	04	08
2	BIOCHEM & CL. PATHOLOGY	02	02	02	2	Mr. Sunil V. Chavan	SC	04	04	08
3	Pharmacology	02	02	02	3	Mr. Anant K. Chavan	HC	04	04	08
4	Comm. Pharm. Managem.	02	02	02	4	Mr. Anant K. Chavan	HC	04	04	08
5	Hosp. & Cl. Pharmacy	02	02	02	5	Mr. Anant K. Chavan	HC	04	04	08
6	Pharmacy Law	02	02	02	6	Mr. Anant K. Chavan	HC	04	04	08
7	All course tutorial	02	02	02	7	Mr. Anant K. Chavan	HC	04	04	08
	Total					Total		20	20	40

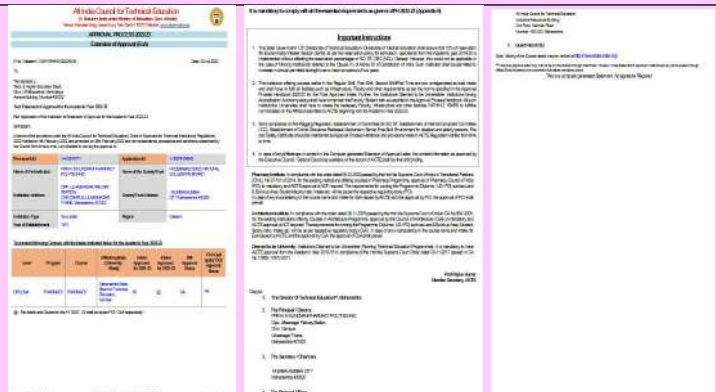
S.Y.D.Pharm
Theory :- 24 hours per week
Practical :- 22 hours per week
Total :- 46 hours per week

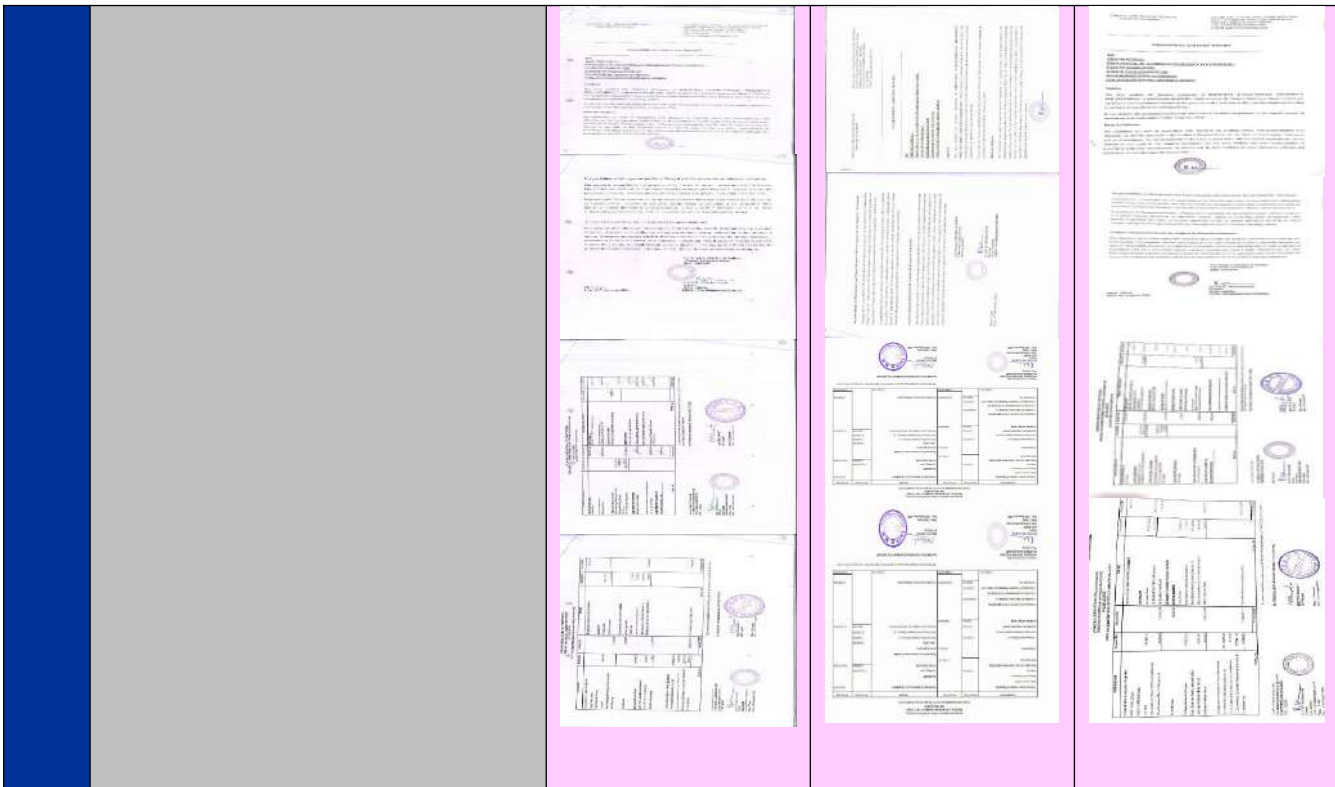
KMNDI/ES/Sanitary/Time Table/Time-Table-2022-23

Principal

Teaching Load of each Faculty

Name of the Teacher	Work load in Hours
Mrs. Manjiri S.Gharat	14 Hours
Mr. Sunil V. Chavan	19 Hours
Mrs. Supriya R. Pawar	17 Hours

		Mr. H.G. Chawhan	21 Hours
		Mrs. Seema M. Pattebahadur	20 Hours
		Ms. Kiran B. Bhatia	20 Hours
	Internal Continuous Evaluation System and place	Day to day assessment	
	Student's assessment of Faculty, System in place	Yes	
	For each Post Graduate Courses give the following:		
	Title of the Course	N.A.	
	Curricula and Syllabi	N.A.	
	Laboratory facilities exclusive to the Post Graduate Course	N.A.	
	Special Purpose		
	Software, all design tools in case	N.A.	
	Academic Calendar and frame work	N.A.	
16	Enrollment of students in the last 3 years	2021-22	2020-21
		60	60
17	List of Research Projects/ Consultancy Works	N.A.	
	Number of Projects carried out, funding agency, Grant received	N.A.	
	Publications (if any) out of research in last three years out of masters projects	N.A.	
	Industry Linkage	N.A.	
	MoUs with Industries (minimum 3)	N.A.	
18	LoA and subsequent EoA till the current Academic Year		
19	Accounted audited statement for the last three years	2019-20	2020-21
			2021-22



20 Best Practices adopted, if any

Model Pharmacy

Prin.K M Kundnani Pharmacy Polytechnic, Ulhasnagar

Report: Beyond the Curriculum Activity

Patent Counseling at Model Pharmacy Role Play Method (Active Learning Technique)

Each year, practicals are conducted for 5 Y D Pharm under Pharmacology, in Model Pharmacy to give idea of Good Pharmacy Practices to the budding pharmacists. Students are introduced to parts of model pharmacy, GPP Training Manual of IFA/WHO/COSCO and to different drug license forms displayed in model pharmacy.

Students are asked to collect prescriptions they are guided to collect the relevant information for patient counseling for their prescription. Students prepare set of patient instructions by referring to Drug information books such as BW, Drug Facts and Compantoon , IFA CPD eTimes, State Pharmacy Council booklets and different websites. Students were also shown excellent examples of Counseling videos from abroad and from India.

Students are asked to follow GPP such as :

Welcoming the patient in pharmacy, receiving the prescription, confirming the identity, counseling about each drug on aspects such as its purpose, dosage, duration, common side effects, any precautions, non-pharmacological advice ,repeat instructions, use of written counseling tools such leaflets, stickers, making the bills, value added services etc. Students are guided how to perform the Role Play and are instructed to decide patient-pharmacist pair. Each pair performs the role play in model pharmacy. All the students watch the role play and then give feedback about it along with the undersigned.



Students performing the Role Play

Though initially shy and hesitant, students find it very interesting and get involved in the process. They realize how its important to educate the patients and how its needed to improve our current community pharmacy practice. Their interest in learning increases with use of such active learning techniques. Students records the practical in Pharmacology Manual.

Mrs Manjil Gharot
Vice-Principal