

Course	Diploma in Pharmacy (D.Pharm.)	Year - 1
Type of Course	Core Courses	
Prerequisite		
Course Objective	Upon successful completion of this course, the students will be able to 1. Calculate the working formula from the given master formula 2. Formulate the dosage form and dispense in an appropriate container 3. Design the label with the necessary product and patient information 4. Perform the basic quality control tests for the common dosage forms	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
0	0	3	3	-	-	80	20	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Reference Books	
1.	Dispensing Pharmacy By Sanmathi B S BSP Books

List of Practical	
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 and labelling
3.	Prepare and submit Liquid Oral: Simple syrup, Piperazine citrate elixir, Aqueous Iodine solution
4.	Prepare and submit Emulsion: Castor oil emulsion, Cod liver oil emulsion
5.	prepare and submit Suspension: Calamine lotion, Magnesium hydroxide mixture
6.	Prepare and submit Ointment: Simple ointment base, Sulphur ointment





7.	prepare and submit Cream: Cetrimide cream
8.	Prepare and submit Gel: Sodium alginate gel
9.	prepare and submit Liniment: Turpentine liniment, White liniment BPC



10.	Prepare and submit Dry powder: Effervescent powder granules, Dusting powder
11.	prepare and submit Sterile Injection: Normal Saline, Calcium gluconate Injection
12.	prepare and submit Hard Gelatine Capsule: Tetracycline capsules
13.	prepare and submit Tablet: Paracetamol tablets
14.	Formulation of at least five commonly used cosmetic preparations – e.g. cold cream, shampoo, lotion, toothpaste etc
15.	Demonstration on various stages of tablet manufacturing processes
17.	Appropriate methods of usage and storage of all dosage forms including special dosage such as different types of inhalers, spacers, insulin pens
18.	Demonstration of quality control tests and evaluation of common dosage forms viz. tablets, capsules, emulsion, sterile injections as per the monographs



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Type of Course	Core Courses	
Prerequisite		
Course Objective	Upon successful completion of this course, the students will be able to 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 of quality assurance and good manufacturing practices	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
3	1	0	4	80	20	-	-	100

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Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
1	History of the profession of Pharmacy in India in relation to Pharmacy education, industry, pharmacy practice, and various professional associations. <ul style="list-style-type: none"> History of the 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	10
2	Packaging materials: Types, selection criteria, advantages and disadvantages of glass, plastic, metal, rubber as packaging materials.	5	10
3	Pharmaceutical aids: Organoleptic (Colouring, flavouring, and sweetening) agents Preservatives: Definition, types with examples and uses.	3	6
4	Unit operations: Definition, objectives/applications, principles, construction, and workings of: Unit operations: Definition, objectives/applications, principles, construction, and workings of: <ul style="list-style-type: none"> Size reduction: hammer mill and ball mill. Size separation: Classification of powders 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.	9	24



5	Tablets – coated and uncoated, various modified tablets (sustained release, extended-release, fast dissolving, multilayered, etc.)	41	32
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Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
	Tablets – coated and uncoated, various modified tablets (sustained release, extended-release, fast dissolving, multilayered, etc.) Capsules - hard and soft gelatin capsules Liquid oral preparations - solution, syrup, elixir, emulsion, suspension, dry powder for reconstitution Topical preparations - ointments, creams, pastes, gels, liniments and lotions, suppositories, and pessaries Nasal preparations, Ear preparations Powders and granules - Insufflations, dusting powders, effervescent powders, and effervescent granules Sterile formulations – Injectable, eye drops and eye ointments Immunological products: Sera, vaccines, toxoids, and their manufacturing methods.		
6	Basic structure, layout, sections, and activities of pharmaceutical manufacturing plants Quality control and quality assurance: Definition and concepts of quality control and quality assurance, current good manufacturing practice (cGMP), Introduction to the concept of calibration and validation.	5	10
7	Novel drug delivery systems: Introduction, Classification with examples, advantages, and challenges.	5	8
Total		75	100

Course Outcomes	
At the end of this course, students will be able to:	
CO1	Explain different dosage forms and their formulation.
CO2	Explain various process and equipments used for manufacturing of pharmaceutical products.
CO3	Explain the importance of quality control, quality assurance and good manufacturing practices.

Reference Books	
1.	Modern Pharmaceutics By Gilbert S. Banker & C.T. Rhodes 3rd Edition
2.	Indian pharmacopoeia By Indian Pharmacopoeia Committee Delhi : Manager of Publications
3.	Bentley's Text Book of Pharmaceutics, By E.A. Rawlins, English Language Book Society, Elsevier Health Sciences, USA



Course	Diploma in Pharmacy (D.Pharm.)	Year - 1
Type of Course	Core Courses	
Prerequisite		
Course Objective	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	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
0	0	3	3	-	-	80	20	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Reference Books	
1.	Practical Pharmaceutical Chemistry Vol I & II, By A.H. Beckett & J. B. Stenlake's, Stahlone Press of University of London
2.	Advanced Practical organic chemistry (TextBook) By N. K. Vishnoi Vikas Publishing House,



List of Practical

1.	To study various apparatus used in the laboratory.
2.	To perform the limit test for chloride.
3.	To Perform the limit test for sulphate.
4.	To perform the limit test for iron.
5.	To perform the limit test for heavy metals.
6.	To perform identification tests for Anions and Cations as per Indian Pharmacopoeia.
7.	To prepare and standardize 0.1M Sodium hydroxide solution.
8.	To prepare and standardize 0.5M Potassium Permanganate solution.
9.	To perform assay of ferrous sulphate by redox titration.
10.	To perform assay of Calcium gluconate by complexometric titration.
11.	To perform assay of Ibuprofen by alkalimetry.
12.	To perform assay of Sodium chloride by Modified Volhard's method.
13.	To perform assay of Ascorbic acid by iodometry.
14.	To determine of Melting point and boiling point of given organic compound.
15.	To Prepare and submit of Benzoic acid from Benzamide.
16.	To Prepare and submit of Picric acid from Phenol.
17.	To perform identification test and test for purity of Caffeine.
18.	To perform identification test and test for purity of Paracetamol.
19.	To perform identification test and test for purity of Aspirin.
20.	To perform identification test and test for purity of Sulfanilamide.
21.	To Perform qualitative analysis of given organic compound (Benzoic acid).
22.	To Perform qualitative analysis of given organic compound (Naphthol).
23.	To Perform qualitative analysis of given organic compound (Aniline).
24.	To Perform qualitative analysis of given organic compound (Benzamide).



Course	Diploma in Pharmacy (D.Pharm.)	Year - 1
Type of Course	Core Courses	
Prerequisite		
Course Objective	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	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
3	1	0	4	80	20	-	-	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
1	Introduction to Pharmaceutical chemistry: <ul style="list-style-type: none"> Scope and objectives Sources and types of errors: Accuracy, precision, significant figures 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. 	8	10
2	Volumetric analysis: <ul style="list-style-type: none"> Fundamentals of volumetric analysis, Acid-base titration, non-aqueous titration, precipitation titration, complexometric titration, redox titration. Gravimetric analysis: Principle and method. 	8	10
3	Inorganic Pharmaceuticals: Pharmaceutical formulations, market preparations, storage conditions and uses of <ul style="list-style-type: none"> Haematinics: Ferrous sulphate, Ferrous fumarate, Ferric ammonium citrate, Ferrous ascorbate, Carbonyl iron Gastro-intestinal Agents: Antacids :Aluminium hydroxide gel, Magnesium hydroxide, Magaldrate, Sodium bicarbonate, Calcium Carbonate, Acidifying agents, Adsorbents, Protectives, Cathartics Topical 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 	7	9
4	Introduction to nomenclature of organic chemical systems with particular reference to heterocyclic compounds containing up to Three rings	2	3
5	Drugs Acting on Central Nervous System	9	13



- **Anesthetics:** 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



Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
6	Drugs Acting on Autonomic Nervous System <ul style="list-style-type: none"> • Sympathomimetic Agents: Direct Acting: Nor-Epinephrine*, Epinephrine, Phenylephrine, Dopamine*, Terbutaline, Salbutamol (Albuterol), Naphazoline*, Tetrahydrozoline. • Indirect Acting Agents: Hydroxy Amphetamine, Pseudoephedrine. Agents With Mixed Mechanism: Ephedrine, Metaraminol • Adrenergic Antagonists: Alpha Adrenergic Blockers: Tolazoline, Phentolamine, 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 Synthetic Cholinergic Blocking Agents: Tropicamide, Cyclopentolate Hydrochloride, Clidinium Bromide, Dicyclomine Hydrochloride* 	9	13
7	Drugs Acting on Cardiovascular System <ul style="list-style-type: none"> • Anti-Arrhythmic Drugs: Quinidine Sulphate, Procainamide Hydrochloride, Verapamil, Phenytoin Sodium*, Lidocaine Hydrochloride, Lorcainide Hydrochloride, Amiodarone and Sotalol • Anti-Hypertensive Agents: Propranolol*, Captopril*, Ramipril, Methyldopate Hydrochloride, Clonidine Hydrochloride, Hydralazine Hydrochloride, Nifedipine • Antianginal Agents: Isosorbide Dinitrate 	5	7
8	Diuretics: Acetazolamide, Frusemide*, Bumetanide, Chlorthalidone, Benzthiazide, Metolazone, Xipamide, Spironolactone	2	3
9	Hypoglycemic Agents: Insulin and Its Preparations, Metformin*, Glibenclamide*, Glimepiride, Pioglitazone, Repaglinide, Gliflozins, Gliptins	3	4
10	Analgesic And Anti-Inflammatory Agents: <ul style="list-style-type: none"> • Analgesic And Anti-Inflammatory Agents: Morphine Analogues, Narcotic Antagonists • Nonsteroidal Anti-Inflammatory Agents (NSAIDs) - Aspirin*, Diclofenac, Ibuprofen*, Piroxicam, Celecoxib, Mefenamic Acid, Paracetamol*, Aceclofenac 	3	4
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, Ofloxacin*, Moxifloxacin, • Anti-Tubercular Agents: INH*, Ethambutol, Para Amino Salicylic Acid, Pyrazinamide, 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 	8	10
12	Antibiotics:	8	10



	Antibiotics: Penicillin G, Amoxicillin*, Cloxacillin, Streptomycin, Tetracyclines: Doxycycline, Minocycline, Macrolides: Erythromycin, Azithromycin, Miscellaneous: Chloramphenicol* Clindamycin		
13	Anti-Neoplastic Agents:	3	4



Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
	Cyclophosphamide*, Busulfan, Mercaptopurine, Fluorouracil*, Methotrexate, Dactinomycin, Doxorubicin Hydrochloride, Vinblastine Sulphate, Cisplatin*, Dromostanolone Propionate		
Total		75	100

Course Outcomes	
At the end of this course, students will be able to:	
CO1	Understand basic concepts involved in errors and to know the sources of impurities and methods to determine the impurities. Knowledge of sources of impurities and methods to determine the impurities in pharmaceuticals.
CO2	Understand concept of various volumetric analysis. Clarify need and basic principles of Acid Base titration, non aqueous titration, complexometric titration, precipitation titrations, gravimetric analysis etc.
CO3	knowledge of different category of inorganic pharmaceutical used as Gastro-intestinal agents, haematinics, topical agents, dental products and medicinal gases also study about pharmaceutical formulation, market preparations, storage condition and uses of them.
CO4	Knowledge of the classification, nomenclature and structure of the organic compound.
CO5	Study of classification, chemical name, chemical structure, pharmacological uses, stability and storage conditions of drugs of different categories.

Reference Books	
1.	Inorganic Pharmaceutical Chemistry (TextBook) By M.L Schroff, National Book Centre, Calcutta 1968
2.	Text book of Pharmaceutical Analysis By Kenneth A. Connors Wiley India Pvt. Limited, 2007
3.	Wilson and Giswold's Organic medicinal and Pharmaceutical Chemistry By John M Beale, John Block Lippincott Williams and Wilkin
4.	Heterocyclic Chemistry (TextBook) By Raj K. Bansal New Age International Publisher



Course	Diploma in Pharmacy (D.Pharm.)	Year - 1
Type of Course	Core Courses	
Prerequisite		
Course Objective	This course will discuss the following aspects of drug substances derived from natural resources. <ol style="list-style-type: none"> 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 	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
0	0	3	3	-	-	80	20	100

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Reference Books	
1.	Practical Handbook of Pharmacognosy (TextBook) By K.R. Khandelwal

List of Practical	
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, Nux vomica, 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



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Prerequisite		
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Teaching Scheme (Contact Hours)				Examination Scheme				
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Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
1	Definition, history, present status and scope of Pharmacognosy	2	4
2	Classification of drugs <ul style="list-style-type: none"> • Alphabetical • Taxonomical • Morphological • Pharmacological • Chemical • Chemo-taxonomical 	4	6
3	Quality control of crude drugs <ul style="list-style-type: none"> • Different methods of adulteration of crude drugs • Evaluation of crude drugs 	6	7
4	Brief outline of occurrence, distribution, isolation, identification tests, therapeutic activity and pharmaceutical applications of alkaloids, terpenoids, glycosides, volatile oils, tannins and resins.	6	8
5	Biological source, chemical constituents and therapeutic efficacy of the following categories of crude drugs	30	40



	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, Pale 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, Ashwagandha, Tulsi, Guggul		
6	Plant fibres used as surgical dressings	3	5
	Cotton, silk, wool and regenerated fibres Sutures – Surgical Catgut and Ligatures		
7	Basic principles involved in the traditional systems of medicine	8	11



Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
	<ul style="list-style-type: none"> Ayurveda, Siddha, Unani and Homeopathy Method of preparation of Ayurvedic formulations like: Arista, Asava, Gutika, Taila, Churna, Lehya and Bhasma 		
8	Role of medicinal and aromatic plants in national economy and their export potential	2	3
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	4	6
10	Introduction to herbal formulations	4	3
11	Herbal cosmetics Sources, chemical constituents, commercial preparations, therapeutic and cosmetic uses of: Aloe vera gel, Almond oil, Lavender oil, Olive oil, Rosemary oil, Sandal Wood oil	4	4
12	Phytochemical investigation of drugs	2	3
Total		75	100

Reference Books	
1.	Essentials of Pharmacognosy By Dr.SH.Ansari
2.	"Trease and Evans' Pharmacognosy" By Trease, G.E. and Evans, W.C. WB Saunders Co.
3.	Pharmacognosy By Tyler, V.E., Brady, L.R. and Robbers, J.E.
4.	Pharmacognosy and Phytochemistry By Mohammad Ali
5.	Rangari, V.D., Text book of Pharmacognosy and Phytochemistry By Vol. I, Carrier Pub., 200
6.	Pharmacognosy Kokate, (TextBook) By Purohit and Gokhale



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Type of Course	Core Courses	
Prerequisite	19990115-P - HUMAN ANATOMY & PHYSIOLOGY - PRACTICAL	
Course Objective	1. Students would have studied about the gross morphology, structure and functions of cell, skeletal, muscular, cardiovascular system of the human body. 2. They would have understood the various homeostatic mechanisms and their imbalances. 3. Students would be able to identify the different types of bones in human body. 4. Students would be able to identify the various tissues of different systems of human body. 5. Students would learn about the various experimental techniques related to physiology. 6. They would have learnt various techniques like blood group determination, blood pressure measurement, blood cells counting	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
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0	0	3	3	-	-	80	20	100

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Reference Books	
1.	practical of human anatomy and physiology (TextBook) By R.K Gohel B.S Shah

List of Practical	
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.	Determination of a. Blood group b. ESR c. Hemoglobin content of blood d. Bleeding time and Clotting time
6.	Determination of WBC count of blood





7.	Determination of RBC count of blood
8.	Determination of Differential count of blood
9.	Recording of Blood Pressure in various postures, different arms, before and after exertion and interpreting the results
10.	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
11.	Recording Pulse Oxygen (before and after exertion)
12.	Recording force of air expelled using Peak Flow Meter
13.	Measurement of height, weight, and BMI
14.	Study of various systems and organs with the help of chart, models, and specimens 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



Course	Diploma in Pharmacy (D.Pharm.)	Year - 1
Type of Course	Core Courses	
Prerequisite		
Course Objective	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	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
3	1	0	4	80	20	-	-	100

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Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
1	Scope of Anatomy and Physiology Definition of various terminologies	2	4
2	Structure of Cell Components and its functions	2	4
3	Tissues of the human body Epithelial, Connective, Muscular and Nervous tissues – their sub-types and characteristics.	4	5
4	Osseous system structure and functions of bones of axial and appendicular skeleton Classification, types and movements of joints, disorders of joints.	6	5
5	Haemopoietic system <ul style="list-style-type: none"> Composition and functions of blood Process of Hemopoiesis Characteristics and functions of RBCs, WBCs, and platelets Mechanism of Blood Clotting Importance of Blood groups 	8	10
6	lymphatic system <ul style="list-style-type: none"> Lymph and lymphatic system, composition, function and its formation. Structure and functions of spleen and lymph node. 	3	5
7	cardio vascular system <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	15





8	Respiratory system <ul style="list-style-type: none">• Anatomy of respiratory organs and their functions.• Regulation, and Mechanism of respiration• Respiratory volumes and capacities – definitions	4	4
9	digestive system	8	10



Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
	<ul style="list-style-type: none"> Anatomy and Physiology of the GIT Anatomy and functions of accessory glands Physiology of digestion and absorption 		
10	skeletal system <ul style="list-style-type: none"> Histology Physiology of muscle contraction Disorder of skeletal muscles 	2	4
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 oblongata and basal ganglia Spinal cord-structure and reflexes Names and functions of cranial Anatomy and physiology of sympathetic and parasympathetic nervous system (ANS) 	8	10
12	sense organs- anatomy and physiology of <ul style="list-style-type: none"> Eye Ear Skin Tongue Nose 	6	5
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	6
14	Endocrine system (Hormones and their functions) <ul style="list-style-type: none"> Pituitary gland Adrenal gland Thyroid and parathyroid gland Pancreas and gonads 	6	7
15	reproductive system <ul style="list-style-type: none"> Anatomy of male and female reproductive system Physiology of menstruation Spermatogenesis and Oogenesis Pregnancy and parturition 	4	6
Total		75	100

Course Outcomes	
At the end of this course, students will be able to:	
CO1	To understand about the various organ systems of the human body





CO2	To understand the anatomical features of the important human organs and tissues.
CO3	To understand about the homeostatic mechanisms regulating the normal physiology in the human system.
CO4	To discuss the significance of various vital physiological parameters of the human body.





Reference Books

1.	Human Anatomy for Nursing & Allied Sciences (TextBook) By Dr. M.K.Anand, Dr. Meena Verma Arora Medical Publishers Pvt.Ltd 1
2.	Human physiology (TextBook) By Chatterjee
3.	Anatomy and Physiology in Health and Illness (TextBook) By Kathleen J.W. Wilson Churchill Livingstone, New York
4.	Principles of Anatomy and Physiology By Gerard J. Tortora



Course	Diploma in Pharmacy (D.Pharm.)	Year - 1
Type of Course	Core Courses	
Prerequisite		
Course Objective	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 and health promotion 5. General roles and responsibilities of pharmacists in public health	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
0	0	3	3	-	-	80	20	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Reference Books	
1.	Practical Manual of Social Pharmacy (TextBook) By Dr. G D Gupta, Dr. Shailesh Sharma, Dr. Anshu Sharma Nirali Prakashan 1st, Pub. Year 2021



List of Practical	
1.	National immunization schedule for children, adult vaccine schedule, Vaccines which are not included in the National Immunization Program.
2.	RCH – reproductive and child health – nutritional aspects, relevant national health programmes.
3.	Family planning devices
4.	Microscopical observation of different microbes (readymade slides) 5. Oral Health and Hygiene
5.	Oral Health and Hygiene
6.	Personal hygiene and etiquettes – hand washing techniques, Cough and sneeze etiquettes.
7.	Various types of masks, PPE gear, wearing/using them, and disposal.
8.	Menstrual hygiene, products used
9.	First Aid – Theory, basics, demonstration, hands on training, audio-visuals, and practice, BSL (Basic Life Support) Systems [SCA - Sudden Cardiac Arrest, FBAO - Foreign Body Airway Obstruction, CPR, Defibrillation (using AED) (Includes CPR techniques, First Responder).
10.	Emergency treatment for all medical emergency cases viz. snake bite, dog bite, insecticide poisoning, fractures, burns, epilepsy etc.
11.	Role of Pharmacist in Disaster Management.
12.	Marketed preparations of disinfectants, antiseptics, fumigating agents, antilarval agents, mosquito repellents, etc.
13.	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.
14.	Water purification techniques, use of water testing kit, calculation of Content/percentage of KMnO ₄ , bleaching powder to be used for wells/tanks
15.	Counselling children on junk foods, balanced diets – using Information, Education and Communication (IEC), counselling, etc. (Simulation Experiments).
16.	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.
17.	Tobacco cessation, counselling, identifying various tobacco containing products through charts/pictures



Course	Diploma in Pharmacy (D.Pharm.)	Year - 1
Type of Course	Core Courses	
Prerequisite		
Course Objective	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 and health promotion 5. General roles and responsibilities of pharmacists in public health	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
3	1	0	4	80	20	-	-	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
1	Introduction to Social Pharmacy <ul style="list-style-type: none"> Definition and Scope. Social Pharmacy as a discipline and its scope in improving the public health. Role of Pharmacists in Public Health. Concept of Health-WHO Definition, various dimensions, determinants, and health indicators. National Health Policy- Indian perspective Public and Private Health System in India, National Health Mission Introduction to Millennium Development Goals, Sustainable Development Goals, FIP Development Goals	9	10
2	Preventive healthcare – Role of Pharmacists in the following <ul style="list-style-type: none"> Demography and Family Planning Mother and child health, importance of breastfeeding, ill effects of infant milk substitutes and bottle feeding Effect of Environment on Health – Water pollution, importance of safe drinking water, waterborne diseases, air pollution, noise pollution, sewage and solid waste disposal, occupational illnesses, Environmental pollution due to pharmaceuticals. Psychosocial Pharmacy: Drugs of misuse and abuse -psychotropics, narcotics, alcohol, tobacco products. Social Impact of these habits on social health and productivity and suicidal behaviours Overview of Vaccines, types of immunity and immunization.	18	24
3	Nutrition and Health <ul style="list-style-type: none"> Basics of nutrition – Macronutrients and Micronutrients Importance of water and fibres in diet Balanced diet, Malnutrition, nutrition deficiency diseases, ill effects of junk foods, calorific and nutritive values of various foods, fortification of food Introduction to food safety, adulteration of foods, effects of artificial ripening, use of pesticides, genetically modified foods Dietary supplements, nutraceuticals, food supplements- indications, benefits, Drug-Food Interactions	10	14
4	Introduction to Microbiology and common microorganisms	28	37



Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
	<p>Epidemiology: Introduction to epidemiology, and its applications. Understanding of terms such as epidemic, pandemic, endemic, mode of transmission, outbreak, quarantine, isolation, incubation period, contact tracing, morbidity, mortality. Causative agents, epidemiology and clinical presentations and Role of Pharmacists in educating the public in prevention of the following communicable diseases:</p> <ul style="list-style-type: none"> Respiratory infections – chickenpox, measles, rubella, mumps, influenza (including Avian-Flu, H1N1, SARS, MERS, COVID-19), diphtheria, whooping cough, meningococcal meningitis, acute respiratory infections, tuberculosis, Ebola Intestinal infections – poliomyelitis, viral hepatitis, cholera, acute diarrheal diseases, typhoid, amebiasis, worm infestations, food poisoning Arthropod-borne infections - dengue, malaria, filariasis and, chikungunya Surface infections – trachoma, tetanus, leprosy STDs, HIV/AIDS 		
5	<p>Introduction to health systems</p> <p>Introduction to health systems and all ongoing National Health programs in India, their objectives, functioning, outcome, and the role of pharmacists.</p>	8	11
6	<p>Pharmacoeconomics</p> <p>Introduction, basic terminologies, importance of pharmacoeconomics</p>	2	4
Total		75	100

Course Outcomes	
At the end of this course, students will be able to:	
CO1	Discuss about roles of pharmacists in the various national health programs
CO2	Describe various sources of health hazards and disease preventive measures
CO3	Discuss the healthcare issues associated with food and nutritional substances
CO4	Describe the general roles and responsibilities of pharmacists in public health

Reference Books	
1.	<p>Social Pharmacy (TextBook) By Dr. S B Bhise, Mrs M S Bhise Nirali Prakashan 1st, Pub. Year 2021</p>



Course	Diploma in Pharmacy (D.Pharm.)	Year - 2
Type of Course	Core Courses	
Prerequisite	19990115-P - HUMAN ANATOMY & PHYSIOLOGY - PRACTICAL	
Course Objective	1. Describe the basic concepts of pharmacokinetics and pharmacodynamics. 2. Enlist the various classes and drugs of choices for any given disease condition. 3. Advice the dosage regimen, route of administration and contraindications for a given drug. 4. Describe the common adverse drug reaction.	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
0	0	2	2	-	-	80	20	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Reference Books

- Practical Pharmacology and Clinical Pharmacy (TextBook)**
By S.K. Kulkarni | Vallabh Publication

List of Practical

- Study of local anesthetics on rabbit eye



<p>2.</p>	<p>Study of Mydriatic effect on rabbit eye</p> <p>1. Study of Mydriatic effect on rabbit eye</p> <p>1. Study of Miotic effect on rabbit eye</p> <p>1. Effect of analgesics using Analgesiometer</p> <p>1. Study of analgesic activity by writhing test</p> <p>1. Screening of anti-convulsant using ElectroConvulsiometer</p> <p>1. Screening of Muscle relaxants using Rota-Rod apparatus</p> <p>1. Screening of CNS stimulants and depressants using Actophotometer</p> <p>1. Study of anxiolytic activity using elevated plus maze method</p> <p>1. Study of effect of drugs (any 2) on isolated heart</p> <p>1. Effect of drugs on ciliary motility on frog's buccal cavity</p> <p>1. Pyrogen testing b</p>
<p>3.</p>	<p>Study of Miotic effect on rabbit eye</p>



	<p>Study of Miotic effect on rabbit eye 1.</p> <p>Effect of analgesics using Analgesiometer 1.</p> <p>Study of analgesic activity by writhing test 1.</p> <p>Screening of anti-convulsant using ElectroConvulsiometer 1.</p> <p>Screening of Muscle relaxants using Rota-Rod apparatus 1.</p> <p>Screening of CNS stimulants and depressants using Actophotometer 1.</p> <p>Study of anxiolytic activity using elevated plus maze method 1.</p> <p>Study of effect of drugs (any 2) on isolated heart 1.</p> <p>Effect of drugs on ciliary motility on frog's buccal cavity 1.</p> <p>Pyrogen testing by rabbit method</p>
4.	<p>Effect of analgesics using Analgesiometer</p> <p>Effect of analgesics using Analgesiometer 1.</p> <p>Study of analgesic activity by writhing test 1.</p> <p>Screening of anti-convulsant using ElectroConvulsiometer 1.</p> <p>Screening of Muscle relaxants using Rota-Rod apparatus 1.</p> <p>Screening of CNS stimulants and depressants using Actophotometer 1.</p> <p>Study of anxiolytic activity using elevated plus maze method 1.</p> <p>Study of effect of drugs (any 2) on isolated heart 1.</p> <p>Effect of drugs on ciliary motility on frog's buccal cavity 1.</p> <p>Pyrogen testing by rabbit method</p>



<p>5.</p>	<p>Study of analgesic activity by writhing test</p> <p>Study of analgesic activity by writhing test</p> <p>1.</p> <p>Screening of anti-convulsant using ElectroConvulsiometer</p> <p>1.</p> <p>Screening of Muscle relaxants using Rota-Rod apparatus</p> <p>1.</p> <p>Screening of CNS stimulants and depressants using Actophotometer</p> <p>1.</p> <p>Study of anxiolytic activity using elevated plus maze method</p> <p>1.</p> <p>Study of effect of drugs (any 2) on isolated heart</p> <p>1.</p> <p>Effect of drugs on ciliary motility on frog's buccal cavity</p> <p>1.</p> <p>Pyrogen testing by rabbit method</p>
<p>6.</p>	<p>Screening of anti-convulsant using Electro Convulsiometer</p>



	<p>Screening of anti-convulsant using ElectroConvulsiometer 1.</p> <p>Screening of Muscle relaxants using Rota-Rodapparatus 1.</p> <p>Screening of CNS stimulants and depressants usingActophotometer 1.</p> <p>Study of anxiolytic activity using elevated plus mazemethod 1.</p> <p>Study of effect of drugs (any 2) on isolatedheart 1.</p> <p>Effect of drugs on ciliary motility on frog's buccalcavity 1.</p> <p>Pyrogen testing by rabbit method</p>
7.	<p>Screening of Muscle relaxants using Rota-Rod apparatus</p> <p>Screening of Muscle relaxants using Rota-Rodapparatus 1.</p> <p>Screening of CNS stimulants and depressants usingActophotometer 1.</p> <p>Study of anxiolytic activity using elevated plus mazemethod 1.</p> <p>Study of effect of drugs (any 2) on isolatedheart 1.</p> <p>Effect of drugs on ciliary motility on frog's buccalcavity 1.</p> <p>Pyrogen testing by rabbit method</p> <p>Screening of Muscle relaxants using Rota-Rodapparatus 1.</p> <p>Screening of CNS stimulants and depressants usingActophotometer 1.</p> <p>Study of anxiolytic activity using elevated plus mazemethod 1.</p> <p>Study of effect of drugs (any 2) on isolatedheart 1.</p> <p>Effect of drugs on ciliary motility on frog's buccalcavity 1.</p> <p>Pyrogen testing by rabbit method</p>
8.	<p>Screening of CNS stimulants and depressants using Actophotometer</p> <p>Pyrogen testing by rabbit methodScreening of CNS stimulants and depressants usingActophotometer 1.</p> <p>Study of anxiolytic activity using elevated plus mazemethod 1.</p> <p>Study of effect of drugs (any 2) on isolatedheart 1.</p> <p>Effect of drugs on ciliary motility on frog's buccalcavity 1.</p> <p>Pyrogen testing by rabbit method</p>





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



12.	Pyrogen testing by rabbit method



Course	Diploma in Pharmacy (D.Pharm.)	Year - 2
Type of Course	Core Courses	
Prerequisite	19990115-T - HUMAN ANATOMY & PHYSIOLOGY - THEORY	
Course Objective	1. Describe the basic concepts of pharmacokinetics and pharmacodynamics. 2. Enlist the various classes and drugs of choices for any given disease condition. 3. Advise the dosage regimen, route of administration and contraindications for a given drug. 4. Describe the common adverse drug reaction.	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
3	1	0	4	80	20	-	-	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
1	General Pharmacology <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 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	10	8
2	Drugs Acting on the Peripheral Nervous System <ul style="list-style-type: none"> Steps involved in neurohumoral transmission Definition, classification, pharmacological actions, dose, indications, and contra-indications of <ol style="list-style-type: none"> Cholinergic drugs Anti-Cholinergic drugs Adrenergic drugs Anti-adrenergic drugs Neuromuscular blocking agents Drugs used in Myasthenia gravis Local anaesthetic agents Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) 	11	12
3	Drugs Acting on the Eye <ul style="list-style-type: none"> Definition, classification, pharmacological actions, dose, indications and contraindications of <ul style="list-style-type: none"> Miotics Mydriatics Drugs used in Glaucoma 	2	4



4	Drugs Acting on the Central Nervous System	8	9
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Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
	Definition, classification, pharmacological actions, dose, indications, and contraindications of <ul style="list-style-type: none"> • Generalanaesthetics • Hypnotics and sedatives • Anti-Convulsant drugs • Anti-anxiety drugs • Anti-depressant drugs • Anti-psychotics • Nootropic agents • Centrally acting muscle relaxants Opioid analgesics		
5	Drugs Acting on the Cardiovascular System Definition, classification, pharmacological actions, dose, indications, and contraindications of <ul style="list-style-type: none"> • Anti-hypertensive drugs • Anti-anginal drugs • Anti-arrhythmic drugs • Drugs used in atherosclerosis • Congestive heart failure • Drug therapy for shock 	6	8
6	Drugs Acting on Blood and Blood Forming Organs Definition, classification, pharmacological actions, dose, indications, and contraindications of <ul style="list-style-type: none"> • Hematinic agents • Anti-coagulants • Anti-platelet agents • Thrombolytic drugs 	4	5
7	Drugs acting on respiratory system Definition, classification, pharmacological actions, dose, indications, and contraindications of <ul style="list-style-type: none"> • Bronchodilators • Expectorants • Anti-tussive agents • Mucolytic agents 	2	4
8	Drugs Acting on the Gastro Intestinal Tract Definition, classification, pharmacological actions, dose, indications, and contraindications of <ul style="list-style-type: none"> • Anti-ulcer drugs • Anti-emetics • Laxatives and purgatives • Anti-diarrheal drugs 	5	5
9	Drugs Acting on the Kidney Definition, classification, pharmacological actions, dose, indications, and contraindications of <ul style="list-style-type: none"> • Diuretics • Anti-Diuretics 	2	3
10	Hormones and Hormone Antagonists	8	15



Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
	Physiological and pathological role and clinical uses of <ul style="list-style-type: none"> • Thyroidhormones • Anti-thyroiddrugs • Parathormone • Calcitonin • VitaminD • Insulin • Oral hypoglycemicagents • Estrogen • Progesterone • Oxytocin • Corticosteroids 		
11	Autacoids <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 	3	6
12	Chemotherapeutic Agents: Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, Classification, dose, indication and contraindications of drugs belonging to following classes: <ul style="list-style-type: none"> • Penicillins • Cephalosporins • Aminoglycosides • Fluoroquinolones • Macrolides • Tetracyclines • Sulphonamides • Anti-tubercular drugs • Anti-fungal drugs • Anti-viral drugs • Anti-amoebic agents • Anti-helminthics • Anti-malarial agents • Anti-neoplastic agents 	12	16
13	Biologicals Definition, types, and indications of biological agents with examples	2	5
Total		75	100

Course Outcomes	
At the end of this course, students will be able to:	
CO1	To understand the pharmacology of drug action on Peripheral Nervous System and Central Nervous System.
CO2	To identify various classes and drugs of choices of various organs and systems.
CO3	To learn the dosage regimen, contra indications, route of administration and side effects of various classes of drugs.





Reference Books

1.	Essential of Medical Pharmacology (TextBook) By KD Tripathi
2.	Basic and clinical Pharmacology (TextBook) By Bertram G Katzung
3.	Clinical Pharmacology (TextBook) By D.R. Laurence, PN Bennet, MJ Brown
4.	Pharmacology & Pharmacotherapeutics (TextBook) By RS Satoskar, SD Bhandakar & Nirmala N Rege



Course	Diploma in Pharmacy (D.Pharm.)	Year - 2
Type of Course	Core Courses	
Prerequisite	19990115-P - HUMAN ANATOMY & PHYSIOLOGY - PRACTICAL	
Course Objective	This course will discuss the following: 1. General concepts of pharmacology including pharmacokinetics, pharmacodynamics, routes of administration, etc. 2. Pharmacological classification and indications of drugs. 3. Dosage regimen, mechanisms of action, contraindications of drugs. 4. Common adverse effects of drugs	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
0	0	3	3	-	-	80	20	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Reference Books	
1.	Community Pharmacy Practice, (TextBook) By Ramesh Adepu BSP publishers, Hyderabad

List of Practical	
1.	Handling of prescriptions with professional standards, reviewing prescriptions, checking for legal compliance and completeness (minimum 5)
2.	Identification of drug-drug interactions in the prescription and follow-up actions (minimum 2)
3.	Preparation of dispensing labels and 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, BMI measurement
5.	Providing counselling to 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 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, enemas, suppositories
8.	Use of Community Pharmacy Software and digital health tools



Course	Diploma in Pharmacy (D.Pharm.)	Year - 2
Type of Course	Core Courses	
Prerequisite	19990115-P - HUMAN ANATOMY & PHYSIOLOGY - PRACTICAL	
Course Objective	This course will discuss the following: 1. General concepts of pharmacology including pharmacokinetics, pharmacodynamics, routes of administration, etc. 2. Pharmacological classification and indications of drugs. 3. Dosage regimen, mechanisms of action, contraindications of drugs. 4. Common adverse effects of drugs	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
0	0	3	3	-	-	80	20	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

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List of Practical	
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5.	Providing counselling to 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 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, enemas, suppositories
8.	Use of Community Pharmacy Software and digital health tools



Course	Diploma in Pharmacy (D.Pharm.)	Year - 2
Type of Course	Core Courses	
Prerequisite	19990115-T - HUMAN ANATOMY & PHYSIOLOGY - THEORY	
Course Objective	This course will discuss the following: 1. General concepts of pharmacology including pharmacokinetics, pharmacodynamics, routes of administration, etc. 2. Pharmacological classification and indications of drugs. 3. Dosage regimen, mechanisms of action, contraindications of drugs. 4. Common adverse effects of drugs	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
3	1	0	4	80	20	-	-	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
1	Community Pharmacy Practice Definition, history and development of community pharmacy - International and Indian Scenarios	2	2
2	Professional responsibilities of community pharmacists. Introduction to the concept of Good Pharmacy Practice and SOPs.	3	2
3	Prescription and prescription handling 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	10
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, over the telephone) Written communicationskills and Bodylanguage Patient interview techniques 	6	5
5	Patient counseling Definition and benefits of patientcounselling , Stages of patient counselling - Introduction, counselling content, counselling process, and closing the counselling session Barriers to effective counseling - Types and strategies to overcome thebarriers Patient counselling points for chronic diseases/disorders - Hypertension, Diabetes, Asthma, Tuberculosis, Chronic obstructive pulmonary disease, and AIDS Patient Package Inserts - Definition, i mportance and benefits, Scenarios of PPI use in India and othercountries Patient Information leaflets - Definition anduses	10	20
6	Medication Adherence Definition, factors influencing non- adherence, strategies to overcome non-adherence	2	2
7	Health Screening Services in Community Pharmacy	5	5





	Introduction, scope, and importance of various health screening services- for routine monitoring of patients, early detection, and referral of undiagnosed cases		
8	Over The Counter (OTC) Medications	15	20
	Definition, need and role of Pharmacists in OTC medication dispensing OTC medications in India, counseling for OTC products Self-medication and role of pharmacists in promoting the safe practices during self-medication Responding to symptoms, minor ailments, and advice for self-care in conditions such as - Pain management, Cough, Cold, Diarrhea, Constipation, Vomiting, Fever, Sore throat, Skin disorders, Oral health (mouth ulcers, dental pain, gum swelling)		



Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
9	Community Pharmacy Management <ul style="list-style-type: none"> • Legal requirements to set up a community pharmacy • Site selection requirements • Pharmacy designs and interiors • 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, Health and Online pharmacies	25	34
Total		75	100

Course Outcomes	
At the end of this course, students will be able to:	
CO1	To describe the establishment, legal requirements, and effective administration of a community pharmacy.
CO2	To understand Handle and fill prescriptions in a professional manner.
CO3	To Acquire the knowledge for Counsel the patients disease on prescription and or non-prescription medicines.
CO4	To design and prepare patients Information leaflets.
CO5	To knowledge about basic health screening test on patients .

Reference Books	
1.	Prescription for Nutritional Healing (TextBook) By James F. Balch and Phyllis A. Balch
2.	Essentials of Community Medicine—A Practical Approach (TextBook) (TextBook) By Hiremath Lalita D, Hiremath Dhananjaya A , 2nd Edition, 2012, ISBN: 9789350250440, JAYPEE Publications
3.	Community Pharmacy Practice, (TextBook) By Ramesh Adepu BSP publishers, Hyderabad
4.	A guide for middle level management in primary health care By Rose Mary



Course	Diploma in Pharmacy (D.Pharm.)	Year - 2
Type of Course	Core Courses	
Prerequisite	19990113-P - PHARMACEUTICAL CHEMISTRY - PRACTICAL	
Course Objective	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	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
0	0	2	2	-	-	80	20	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Reference Books	
1.	Practical Biochemistry for Medical students By Rajagopal and Ramakrishna. Orient Black Swan
2.	Practical Biochemistry (TextBook) By Harold Varley. CBS Publisher

List of Practical	
1.	Qualitative analysis of carbohydrates (4 experiments)
2.	Qualitative analysis of Proteins and 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)



Course	Diploma in Pharmacy (D.Pharm.)	Year - 2
Type of Course	Core Courses	
Prerequisite	19990113-T - PHARMACEUTICAL CHEMISTRY - THEORY	
Course Objective	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	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
3	1	0	4	80	20	-	-	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
1	Introduction to biochemistry: Scope of biochemistry in pharmacy; Cell and its biochemical organization.	2	2
2	Carbohydrates <ul style="list-style-type: none"> Definition, classification with examples, chemical properties Monosaccharides - Structure of glucose, fructose, and galactose Disaccharides - structure of maltose, lactose, and sucrose Polysaccharides - chemical nature of starch and glycogen Qualitative tests and biological role of carbohydrates 	5	7
3	Proteins <ul style="list-style-type: none"> Definition, classification of proteins based on composition and solubility with examples Definition, classification of amino acids based on chemical nature and nutritional requirements with examples Structure of proteins (four levels of organization of protein structure) Qualitative tests and biological role of proteins and amino acids Diseases related to malnutrition of proteins. 	5	7
4	Lipids <ul style="list-style-type: none"> Definition, classification with examples Structure and properties of triglycerides (oils and fats) Fatty acid classification - Based on chemical and nutritional requirements with examples Structure and functions of cholesterol in the body Lipoproteins - types, composition and functions in the body Qualitative tests and functions of lipids 	5	7
5	Nucleic acids	4	6





	<ul style="list-style-type: none">• Definition, purine and pyrimidine bases• Components of nucleosides and nucleotides with examples.• Structure of DNA (Watson and Crick model), RNA and their functions		
6	Enzymes	5	7



Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
	<ul style="list-style-type: none"> Definition, properties and IUB and MB classification Factors affecting enzyme activity Mechanism of action of enzymes, Enzyme inhibitors Therapeutic and pharmaceutical importance of enzymes 		
7	Vitamins <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
8	Metabolism (Study of cycle/pathways without chemical structures) <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, &beta;-oxidation of Fatty acid (Palmitic acid) ketogenesis and ketolysis. Diseases related to abnormal metabolism of lipids such as Ketoacidosis, Fatty liver, Hypercholesterolemia Metabolism of Amino acids (Proteins): General reactions of amino acids and its significance– Transamination, deamination, Urea cycle and decarboxylation. Diseases related to abnormal metabolism of amino acids, Disorders of ammonia metabolism, phenylketonuria, alkaptonuria and Jaundice. Biological oxidation: Electron transport chain and Oxidative phosphorylation 	20	25
9	Minerals: <ul style="list-style-type: none"> Types, Functions, Deficiency diseases, recommended dietary requirements 	5	7
10	Water and Electrolytes <ul style="list-style-type: none"> Distribution, functions of water in the body Water turnover and balance Electrolyte composition of the body fluids, Dietary intake of electrolyte and Electrolyte balance Dehydration, causes of dehydration and oral rehydration therapy 	5	7
11	Introduction to Biotechnology	1	1
12	Organ function tests <ul style="list-style-type: none"> Functions of kidney and routinely performed tests to assess the functions of kidney and their clinical significances Functions of liver and routinely performed tests to assess the functions of liver and their clinical significances Lipid profile tests and its clinical significances 	6	8
13	Introduction to Pathology of Blood and Urine <ul style="list-style-type: none"> Lymphocytes and Platelets, their role in health and disease Erythrocytes - Abnormal cells and their significance Normal and Abnormal constituents of Urine and their significance 	6	8
Total		75	100



Course Outcomes

At the end of this course, students will be able to:

CO1	To understand the chemistry, Structure and functions of biomolecules like, Carbohydrate, lipid, & Protein with their synthesis and bio-modification.
CO2	To understand the Catalytic activity, diagnostic and therapeutic importance of enzymes & Vitamins.
CO3	To understand the various metabolic pathways of biomolecules in living organism and illness (metabolic disorders).
CO4	To understand the types important function of minerals with deficiency disease.
CO5	To understand the biochemical principles of organ function tests and their clinical significance.
CO6	To understand the Qualitative and quantitative determination of biomolecules / metabolites in the biological sample.

Reference Books

1.	Essentials of Biochemistry by U. Satyanarayana (TextBook)
2.	A Textbook of Biochemistry by A.V.S.S. Rama Rao



Course	Diploma in Pharmacy (D.Pharm.)	Year - 2
Type of Course	Core Courses	
Prerequisite	19990113-T - PHARMACEUTICAL CHEMISTRY - THEORY	
Course Objective	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	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
3	1	0	4	80	20	-	-	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
1	Introduction to biochemistry: Scope of biochemistry in pharmacy; Cell and its biochemical organization.	2	2
2	Carbohydrates <ul style="list-style-type: none"> Definition, classification with examples, chemical properties Monosaccharides - Structure of glucose, fructose, and galactose Disaccharides - structure of maltose, lactose, and sucrose Polysaccharides - chemical nature of starch and glycogen Qualitative tests and biological role of carbohydrates 	5	7
3	Proteins <ul style="list-style-type: none"> Definition, classification of proteins based on composition and solubility with examples Definition, classification of amino acids based on chemical nature and nutritional requirements with examples Structure of proteins (four levels of organization of protein structure) Qualitative tests and biological role of proteins and amino acids Diseases related to malnutrition of proteins. 	5	7
4	Lipids <ul style="list-style-type: none"> Definition, classification with examples Structure and properties of triglycerides (oils and fats) Fatty acid classification - Based on chemical and nutritional requirements with examples Structure and functions of cholesterol in the body Lipoproteins - types, composition and functions in the body Qualitative tests and functions of lipids 	5	7
5	Nucleic acids	4	6





	<ul style="list-style-type: none">• Definition, purine and pyrimidine bases• Components of nucleosides and nucleotides with examples.• Structure of DNA (Watson and Crick model), RNA and their functions		
6	Enzymes	5	7



Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
	<ul style="list-style-type: none"> Definition, properties and IUB and MB classification Factors affecting enzyme activity Mechanism of action of enzymes, Enzyme inhibitors Therapeutic and pharmaceutical importance of enzymes 		
7	Vitamins <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
8	Metabolism (Study of cycle/pathways without chemical structures) <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, &beta;-oxidation of Fatty acid (Palmitic acid) ketogenesis and ketolysis. Diseases related to abnormal metabolism of lipids such as Ketoacidosis, Fatty liver, Hypercholesterolemia Metabolism of Amino acids (Proteins): General reactions of amino acids and its significance– Transamination, deamination, Urea cycle and decarboxylation. Diseases related to abnormal metabolism of amino acids, Disorders of ammonia metabolism, phenylketonuria, alkaptonuria and Jaundice. Biological oxidation: Electron transport chain and Oxidative phosphorylation 	20	25
9	Minerals: <ul style="list-style-type: none"> Types, Functions, Deficiency diseases, recommended dietary requirements 	5	7
10	Water and Electrolytes <ul style="list-style-type: none"> Distribution, functions of water in the body Water turnover and balance Electrolyte composition of the body fluids, Dietary intake of electrolyte and Electrolyte balance Dehydration, causes of dehydration and oral rehydration therapy 	5	7
11	Introduction to Biotechnology	1	1
12	Organ function tests <ul style="list-style-type: none"> Functions of kidney and routinely performed tests to assess the functions of kidney and their clinical significances Functions of liver and routinely performed tests to assess the functions of liver and their clinical significances Lipid profile tests and its clinical significances 	6	8
13	Introduction to Pathology of Blood and Urine <ul style="list-style-type: none"> Lymphocytes and Platelets, their role in health and disease Erythrocytes - Abnormal cells and their significance Normal and Abnormal constituents of Urine and their significance 	6	8
Total		75	100



Course Outcomes

At the end of this course, students will be able to:

CO1	To understand the chemistry, Structure and functions of biomolecules like, Carbohydrate, lipid, & Protein with their synthesis and bio-modification.
CO2	To understand the Catalytic activity, diagnostic and therapeutic importance of enzymes & Vitamins.
CO3	To understand the various metabolic pathways of biomolecules in living organism and illness (metabolic disorders).
CO4	To understand the types important function of minerals with deficiency disease.
CO5	To understand the biochemical principles of organ function tests and their clinical significance.
CO6	To understand the Qualitative and quantitative determination of biomolecules / metabolites in the biological sample.

Reference Books

1.	Essentials of Biochemistry by U. Satyanarayana (TextBook)
2.	A Textbook of Biochemistry by A.V.S.S. Rama Rao



Course	Diploma in Pharmacy (D.Pharm.)	Year - 2
Type of Course	Core Courses	
Prerequisite		
Course Objective	Upon successful completion of this course, the students will be able to 1. Write 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 and administration of drugs, life-style modifications, and monitoring parameters.	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
0	0	1	1	-	-	80	20	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Reference Books	
1.	Pharmacotherapeutics for Advanced Practice By Virginia Poole Arcangelo Lippincott Williams & Wilkins

List of Practical	
1.	Preparation and discussion of SOAP (Subjective, Objective, Assessment and Plan) notes for at least SIX clinical cases (real / hypothetical) of the following disease conditions (Minimum 15 cases) <ol style="list-style-type: none"> 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 type as covered in theory) 15. Dermatological conditions (any one condition as covered in theory)
2.	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)
3.	Simulated cases to enable dose calculation of selected drugs in paediatrics, and geriatrics under various pathological conditions. (Minimum 4 cases)



Course	Diploma in Pharmacy (D.Pharm.)	Year - 2
Type of Course	Core Courses	
Prerequisite		
Course Objective	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 other healthcare providers to analyse drug related problems and provide therapeutic interventions 3. Participate in planning the rational medicine therapy for common diseases 4. Design and deliver discharge counselling for patients	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
3	1	0	4	80	20	-	-	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
1	Pharmacotherapeutics Introduction, scope, and objectives. Rational use of Medicines, Evidence Based Medicine, Essential Medicines List, Standard Treatment Guidelines (STGs)	8	15
2	Definition, etiopathogenesis, clinical manifestations, non- pharmacological and pharmacological management of the diseases associated with a. Cardiovascular System <ul style="list-style-type: none"> Hypertension Angina and Myocardial infarction Hyperlipidaemia Congestive Heart Failure 	8	15
3	b. Respiratory System <ul style="list-style-type: none"> Asthma COPD 	4	5
4	c. Endocrine System <ul style="list-style-type: none"> Thyroid disorders - Hypo and Hyperthyroidism Diabetes 	5	6
5	d. Central Nervous System <ul style="list-style-type: none"> Epilepsy Parkinson's disease Alzheimer's disease Stroke Migraine 	8	10
6	e. Gastro Intestinal Disorders	8	10





	<ul style="list-style-type: none">• Gastro oesophageal reflux disease• Peptic Ulcer Disease• Alcoholic liver disease• Inflammatory Bowel Diseases (Crohn's Disease and Ulcerative Colitis)		
7	f. Haematological disorders	4	5



Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
	<ul style="list-style-type: none"> Iron deficiency anaemia Megaloblastic anaemia 		
8	g. Infectious diseases <ul style="list-style-type: none"> Tuberculosis Pneumonia Urinary tract infections Hepatitis Gonorrhoea and Syphilis Malaria HIV and Opportunistic infections Viral Infections (SARS, CoV2) 	12	10
9	h. Musculoskeletal disorders <ul style="list-style-type: none"> Rheumatoid arthritis Osteoarthritis 	3	4
10	i. Dermatology <ul style="list-style-type: none"> Psoriasis Scabies Eczema 	3	4
11	j. Psychiatric Disorders <ul style="list-style-type: none"> Depression Anxiety Psychosis 	4	5
12	k. Ophthalmology <ul style="list-style-type: none"> Conjunctivitis (bacterial and viral) Glaucoma 	2	3
13	l. Anti-microbial Resistance	2	3
14	m. Women's Health <ul style="list-style-type: none"> Polycystic Ovary Syndrome Dysmenorrhea Pre-menstrual Syndrome 	4	5
Total		75	100

Course Outcomes	
At the end of this course, students will be able to:	
CO1	To Study Scope & objective of Pharmacotherapeutics, and Rational use of Medicines with Standard Treatment Guidelines (STGs)
CO2	To give information about non- pharmacological and pharmacological management of the diseases associated with various physiological system.





CO3	To describe the therapeutic approach of to manage the different disease and disorder.
CO4	To discuss the different therapeutic plans and identify the patient -specific parameters relevant in initiating the drug therapy of diseases.





Reference Books

- | | |
|----|--|
| 1. | Pharmacotherapy: A Pathophysiological Approach
By Joseph DiPiro, Robert L. Talbert, Gary Yee, Barbara Wells, L. Michael Posey; |
| 2. | Pharmacology & Pharmacotherapeutics (TextBook)
By RS Satoskar, SD Bhandakar & Nirmala N Rege |



Course	Diploma in Pharmacy (D.Pharm.)	Year - 2
Type of Course	Core Courses	
Prerequisite	19990115-P - HUMAN ANATOMY & PHYSIOLOGY - PRACTICAL	
Course Objective	Upon completion of the course, the students will be able to 1. Professionally handle and 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	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
0	0	1	1	-	-	80	20	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Reference Books	
1.	Pharmacy Management: Essentials for All Practice Settings" by Shane P. Desselle, David P. Zgarrick, and Greg Alston (TextBook)
2.	Handbook of Institutional Pharmacy Practice" by Thomas R. Brown III and Robert J. Cipolle (TextBook)
3.	Pharmacy Management: Essentials for All Practice Settings" by Shane P. Desselle, David P. Zgarrick, and Greg Alston
4.	Introduction to Hospital and Health-System Pharmacy Practice" by David A. Holdford and Marylee V. Worley
5.	Pharmacy Practice and the Law" by Richard R. Abood (TextBook)
6.	Pharmacy Practice Manual: A Guide to the Clinical Experience" by Lisa S. Kroon and Kelly C. Lee
7.	Pharmacy Practice for Technicians" by Don A. Ballington and Robert J. Anderson



List of Practical

1.	Systematic approach to 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 <ol style="list-style-type: none">1. Orthopaedic and Surgical Aids such as knee cap, LS belts, abdominal belt, walker, walking sticks, etc.2. Different types of bandages such as sterile gauze, cotton, crepe bandages, etc.3. 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 –minimum 2 cases)
7.	Vaccination and injection techniques (IV, IM, SC) using mannequins (5 activities)
8.	Use of Hospital Pharmacy Software and various digital health tools



Course	Diploma in Pharmacy (D.Pharm.)	Year - 2
Type of Course	Core Courses	
Prerequisite	19990115-T - HUMAN ANATOMY & PHYSIOLOGY - THEORY	
Course Objective	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 and address drug related problems 4. Interpret common lab investigation reports for optimizing drug therapy	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
3	1	0	4	80	20	-	-	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
1	Hospital Pharmacy <ul style="list-style-type: none"> Definition, scope, national and international scenario Organisational structure Professional responsibilities, Qualification and experience requirements, job specifications, work load requirements and inter professional relationships Good Pharmacy Practice (GPP) in hospital Hospital Pharmacy Standards (FIP Basel Statements, AHSP) Introduction to NAQS guidelines and NABH Accreditation and Role of Pharmacists	6	8
2	Different Committees in the Hospital <ul style="list-style-type: none"> Pharmacy and Therapeutics Committee - Objectives, Composition, and functions Hospital Formulary - Definition, Procedure for development and use of hospital formulary Infection Control Committee – Role of Pharmacist in preventing Antimicrobial Resistance 	4	6
3	Supply Chain and Inventory Control <ul style="list-style-type: none"> Preparation of Drug lists - High Risk drugs, Emergency drugs, Schedule H1 drugs, NDPS drugs, reserved antibiotics Procedures of Drug Purchases – Drug selection, short term, long term, and tender/e-tender process, quotations, etc. Inventory control techniques: Economic Order Quantity, Reorder Quantity Level, Inventory Turnover Inventory Management of Central Drug Store – Storage conditions, Methods of storage, Distribution, Maintaining Cold Chain, Devices used for cold storage (Refrigerator, ILR, Walk-in-Cold rooms) FEFO, FIFO methods Expiry drug removal and handling, and disposal. Disposal of Narcotics, cytotoxic drugs, Documentation - purchase and inventory 	14	18
4	Drug distribution	7	10





	<ul style="list-style-type: none">• Drug distribution (in- patients and out - patients) – Definition, advantages and disadvantages of individual prescription order method, Floor Stock Method, Unit Dose Drug Distribution Method, Drug Basket• Distribution of drugs to ICCU/ICU/NICU/Emergency wards.• Automated drug dispensing systems and devices Distribution of Narcotic and Psychotropic substances and their storage		
5	Compounding in Hospitals. Bulk compounding, IV admixture services and incompatibilities, Total parenteral nutrition	4	6



Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
6	Radio Pharmaceuticals Storage, dispensing and disposal of Radiopharmaceuticals	2	3
7	Application of computers in Hospital Pharmacy Practice, Electronic health records, Softwares used in hospital pharmacy	2	4
8	Clinical Pharmacy: Definition, scope, and development - in India and other countries Technical definitions, common terminologies used in clinical settings and their significance such as Paediatrics, Geriatric, Anti-natal Care, Post-natal Care, etc. Daily activities of clinical pharmacists: Definition, goal, and procedure of <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 related problems. Principles and procedure to provide pharmaceutical care Medication Therapy Management, Home Medication Review.	12	16
9	Clinical laboratory tests used in the evaluation of disease states - 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	10	14
10	Poisoning: Types of poisoning: Clinical manifestations and Antidotes. Drugs and Poison Information Centre and their services – Definition, Requirements, Information resources with examples, and their advantages and disadvantages	6	8
11	Pharmacovigilance <ul style="list-style-type: none"> • Definition, aim and scope, Overview of Pharmacovigilance 	2	2
12	Medication errors: Definition, types, consequences, and strategies to minimize medication errors, LASA drugs and Tallman lettering as per ISMP. Drug Interactions: Definition, types, clinical significance of drug interactions	6	5
Total		75	100





Course Outcomes

At the end of this course, students will be able to:

CO1	To Comprehend healthcare systems, drug distribution, and medication safety in hospitals.
CO2	To apply clinical knowledge to optimize patient-specific medication regimens.
CO3	To collaborate within interdisciplinary teams for comprehensive patient care.
CO4	To educate patients on medication usage and potential risks.
CO5	To educate patients on medication usage and potential risks.



Course	Diploma in Pharmacy (D.Pharm.)	Year - 2
Type of Course	Core Courses	
Prerequisite		
Course Objective	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 and practice of pharmacy in India 3. Discuss the various codes of ethics related to practice standards in pharmacy 4. Interpret the fundamentals of patent laws from the perspectives of pharmacy	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
3	1	0	4	80	20	-	-	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
1	General Principles of Law, History and various Acts related to Drugs and Pharmacy profession	2	2
2	Pharmacy Act-1948 and 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. Pharmacy Practice Regulations 2015	5	10
3	Drugs and Cosmetics Act 1940 and Rules 1945 and 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 new drug, loan license and repacking license. Study of schedule C and C1, G, H, H1, K, P, M, N, and X. Sale of Drugs – Wholesale, Retail sale and Restricted license, Records to be kept in a pharmacy. Drugs Prohibited for manufacture and sale in India. Administration of the Act and Rules- Drugs Technical Advisory Board, Central Drugs Laboratory, Drugs Consultative Committee, Government analysts, licensing authorities, controlling authorities, Drug Inspectors.	23	15
4	Narcotic Drugs and Psychotropic Substances Act 1985 and Rules	2	5





	Objectives, Definitions, Authorities and Officers, Prohibition, Control and Regulation, Offences and Penalties.		
5	Drugs and Magic Remedies (Objectionable Advertisements) Act 1954	2	2
	Objectives, Definitions, Prohibition of certain advertisements, Classes of Exempted advertisements, Offences and Penalties.		
6	Prevention of Cruelty to Animals Act-1960	2	5



Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
	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.		
7	Poisons Act-1919 Introduction, objective, definition, possession, possession for sales and sale of any poison, import of poisons.	2	2
8	FSSAI (Food Safety and Standards Authority of India) Act and Rules brief overview and aspects related to manufacture, storage, sale, and labelling of Food Supplements.	2	2
9	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	8
10	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	8
11	Medical Termination of Pregnancy Act and Rules – basic understanding, salient features, and Amendments	2	2
12	Role of all the government pharma regulator bodies – Central Drugs Standards Control Organization (CDSCO), Indian Pharmacopoeia Commission (IPC)	1	2
13	Good Regulatory practices (documentation, licenses, renewals, e-governance) in Community Pharmacy, Hospital pharmacy, Pharma Manufacturing, Wholesale business, inspections, import, export of drugs and medical devices.	3	5
14	Introduction to BCS system of classification, Introduction to BCS system of classification, Basic concepts of Clinical Trials, ANDA, NDA, New Drug development, New Drugs and Clinical Trials Rules, 2019. Brand v/s Generic, Trade name concept, Introduction to Patent Law and Intellectual Property Rights, Emergency Use Authorization.	7	8
15	Blood bank – basic requirements and functions	2	2
16	Clinical Establishment Act and Rules – Aspects related to Pharmacy	2	5





17	Biomedical Waste Management Rules 2016 – Basic aspects, and aspects related to pharma manufacture to disposal of pharma / medical waste at homes, pharmacies, and hospitals	2	5
18	Bioethics	2	3



Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
	Bioethics - Basic concepts, history and principles. Brief overview of ICMR's National Ethical Guidelines for Biomedical and Health Research involving human participants		
19	Introduction to the Consumer Protection Act	1	2
20	Introduction to the Disaster Management Act	1	2
21	Medical Devices – Categorization, basic aspects related to manufacture and sale	2	5
Total		75	100

Course Outcomes	
At the end of this course, students will be able to:	
CO1	To discuss the general perspectives, history, evolution of pharmacy law in India.
CO2	To understand the Act and Rules regulating the profession and practice of pharmacy in India.
CO3	To discuss the important code of ethical guidelines pertaining to various practice standards.
CO4	To discuss the introduction to the patent laws and their applications in pharmacy.

Reference Books	
1.	Text book of Forensic Pharmacy (TextBook) By B.M. Mithal
2.	A text book of Forensic Pharmacy (TextBook) By N.K. Jain Vallabh Prakashan
3.	Forensic Pharmacy By B. Suresh
4.	Hand book of drug law By M.L. Mehra
5.	Books on Drugs and Cosmetic Act By Nilesh Gandhi and Sudhir Deshpande



Course	Bachelor of Pharmacy (B.Pharm.)	Semester - 1
Type of Course	Skill Enhancement Courses	
Prerequisite		
Course Objective	This course will prepare the young pharmacy student to interact effectively with doctors, nurses, dentists, physiotherapists and other health workers. At the end of this course the student will get the soft skills set to work cohesively with the team as a team player and will add value to the pharmaceutical business.	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				SEE	CIA	SEE	CIA	
2	0	0	2	35	15	-	-	50

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
1	Communication Skills, Barriers to communication, Perspectives in Communication Communication Skills: Introduction, Definition, The Importance of Communication, The Communication Process – Source, Message, Encoding, Channel, Decoding, Receiver, Feedback, Context Barriers to communication: Physiological Barriers, Physical Barriers, Cultural Barriers, Language Barriers, Gender Barriers, Interpersonal Barriers, Psychological Barriers, Emotional barriers Perspectives in Communication: Introduction, Visual Perception, Language, Other factors affecting our perspective - Past Experiences, Prejudices, Feelings, Environment	7	23
2	Elements of Communication, Communication Styles Elements of Communication: Introduction, Face to Face Communication – Tone of Voice, Body Language (Non-verbal communication), Verbal Communication, Physical Communication Communication Styles: Introduction, The Communication Styles Matrix with example for each -Direct Communication Style, Spirited Communication Style, Systematic Communication Style, Considerate Communication Style.	7	24
3	Basic Listening Skills, Effective Written Communication, Writing Effectively Basic Listening Skills: Introduction, Self-Awareness, Active Listening, Becoming an Active Listener, Listening in Difficult Situations Effective Written Communication: Introduction, When and When Not to Use Written Communication - Complexity of the Topic, Amount of Discussion Required, Shades of Meaning, Formal Communication Writing Effectively: Subject Lines, Put the Main Point First, Know Your Audience, Organization of the Message	7	23
4	Interview Skills, Giving Presentations	5	17





	Interview Skills: Purpose of an interview, Do's and Dont's of an interview Giving Presentations: Dealing with Fears, Planning your Presentation, Structuring Your Presentation, Delivering Your Presentation, Techniques of Delivery		
5	Group Discussion	4	13



Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
	Group Discussion: Introduction, Communication skills in group discussion, Do's and Dont's of group discussion		
Total		30	100

Course Outcomes	
At the end of this course, students will be able to:	
CO1	Understand the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation
CO2	Communicate effectively (Verbal and Non Verbal)
CO3	Effectively manage the team as a team player
CO4	Develop interview skills
CO5	Develop Leadership qualities and essentials

Reference Books	
1.	Basic communication skills for Technology, By Andreja. J. Ruther Ford,
2.	Communication skills, By Sanjay Kumar, Pushpalata,
3.	Organizational Behaviour By Stephen .P. Robbins
4.	Brilliant- Communication skills By Gill Hasson
5.	The Ace of Soft Skills: Attitude, Communication and Etiquette for success, By Gopala Swamy Ramesh
6.	Developing your influencing skills, By Deborah Dalley, Lois Burton, Margaret, Green hall,
7.	Communication skills for professionals, By Konar nira,
8.	Personality development and soft skills, By Barun K Mitra
9.	Soft skill for everyone By Butter Field
10.	Soft skills and professional communication, By Francis Peters SJ,
11.	Effective communication, By John Adair
12.	Bringing out the best in people By Aubrey Daniels,

