

Diploma in Pharmacy Part-I

D Pharm 1st Year Syllabus

Sl.No.	Subjects	Number of Hours		
		Theory	Practical	Tutorial
1.	Pharmaceutics	75	75	25
2.	Pharmaceutical Chemistry	75	75	25
3.	Pharmacognosy	75	75	25
4.	Human Anatomy and Physiology	75	75	25
5.	Social Pharmacy	75	--	25
	Total	375	300	125
		800		

1. Pharmaceutics

Scope: This course is designed to impart basic knowledge on the art and science of formulating and dispensing of different dosage forms.

Objectives: Upon completion of the course, the student shall be able to understand

- the formulation aspects of different dosage forms
- the evaluation of pharmaceutical dosage forms
- the importance of good manufacturing practices.

Theory

75 Hours (3 hrs/week)

Chapter	Topic	Hours
1	<ul style="list-style-type: none">• History of profession of Pharmacy in India in relation to Pharmacy education, industry and associations.• Pharmacy as a career• Pharmacopoeia: Introduction to IP, BP, USP, NF and extra pharmacopoeia. Salient features of Indian Pharmacopoeia	5
2	Prescription: Definition, significance, parts and handling of prescription. Posology: Definition, factors affecting dose selection. Calculation of doses for infants & children based on age, body weight and body surface area	4
Pharmaceutical Dosage forms: Definition, classification, advantages, disadvantages, formulation, storage and quality control tests of		
3	Tablets – coated and uncoated	6
4	Capsules - hard and soft gelatin capsules	4
5	Liquid oral preparations - solution, syrup, elixir, emulsion, suspension, dry powder for reconstitution	6
6	Topical preparations - ointments, creams, pastes, gels, liniments and lotions Suppositories and pessaries	6
7	Nasal preparations	4
8	Powders and granules - Insufflations, dusting powders, effervescent powders and effervescent granules	4
9	Sterile formulations – Injectables, eye drops and eye ointments	6
10	Pharmaceutical Aerosols: Definition, types of aerosol systems, propellants, containers and valves	4
11	Immunological products: Definition, classification of sera, vaccines, toxoids and storage conditions	4
12	Quality assurance: Definition and concept of quality control, quality assurance, good manufacturing practice (GMP), calibration and validation	4
13	Packaging materials: Types, selection criteria, advantages and disadvantages of glass, plastic, metal, rubber as packaging materials	8
14	Pharmaceutical aids: Organoleptics and preservatives: Definition, types with examples and uses	5
15	Novel drug delivery systems: Introduction, Classification with examples	5

Practicals

75 Hours (3 hrs/week)

Minimum of 25 experiments to be conducted

1. Formulation of the following dosage forms
 - Liquid orals: Simple syrup, Piperazine citrate elixir, Aqueous Iodine solution, Strong Iodine solution
 - Emulsion: Castor oil emulsion, Cod liver oil emulsion
 - Suspension: Calamine lotion, Magnesium hydroxide mixture
 - Ointments: Simple ointment base, Sulphur ointment
 - Dry powder: Effervescent powder, Dusting powder,
 - Sterile Injections: Calcium gluconate Injection
 - Capsules: Indomethacin capsules, Tetracycline capsules
2. Demonstration for tablet manufacturing including all types of coated tablets
3. Demonstration of methods for evaluation of all types of above formulations as per IP

Recommended Books

1. History of Pharmacy in India by Dr. Harikishan Singh
2. Indian Pharmacopoeia, Govt. of India Publication
3. A Text book of Pharmaceuticals Formulation by B.M. Mithal, Vallabh Prakashan.
4. Bentleys' Text book of Pharmaceutics, 8th Edition, editor E.A. Rawlins, published by Elsevier Int.,
5. The Theory and Practice of Industrial Pharmacy. Leon Lachman, Herbert Lieberman and Joseph Kanig, Editors, Lea and Febiger, Philadelphia. Latest edition Verghese publishing House

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2. Pharmaceutical Chemistry

Scope: This course is designed to impart basic knowledge on the chemistry of drugs and pharmaceuticals. The course gives knowledge of chemical structure, storage conditions and medicinal uses of organic and inorganic chemicals and quality control aspects of pharmaceuticals.

Objectives: Upon completion of the course, the student shall be able to understand

- the various impurities in pharmaceuticals and tests to identify them
- the chemical nature and medicinal uses of drug substances
- the storage conditions of pharmaceuticals
- the quantitative and qualitative analysis of official compounds

Theory

75 Hours (3 hrs/week)

Chapter	Topic	Hours
1	Introduction to Pharmaceutical chemistry: 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
2	Volumetric analysis: Fundamentals of volumetric analysis, Acid-base titration, Non-aqueous titration, precipitation titration, complexometric titration, redox titration Gravimetric analysis: Principle and method.	8
3	Inorganic Pharmaceuticals: Pharmaceutical formulations, storage conditions and uses of <ul style="list-style-type: none"> • Haematinics: Ferrous sulphate, Ferrous gluconate • Antacids: Aluminium hydroxide gel, Magnesium hydroxide • Anti microbial agents: Hydrogen peroxide, Boric acid, Bleaching powder • Dental products: Calcium carbonate, Sodium fluoride • Medicinal gases: Carbon dioxide, nitrous oxide, oxygen 	7
4	Introduction to nomenclature of organic chemical systems with particular reference to heterocyclic compounds containing up to Three rings	2
Study of the following category of medicinal compounds with respect to classification, chemical name, chemical structure (compounds marked with*) uses, stability and storage conditions, different types of formulations and their popular brand names		
5	Drugs acting on Central Nervous System <ul style="list-style-type: none"> • Anaesthetics: Thiopental sodium*, Ketamine hydrochloride*. • Sedatives and Hypnotics: Diazepam*, Alprazolam*, Nitrazepam, Phenobarbital*, Antipsychotics: Chlorpromazine hydrochloride*, Haloperidol*, Droperidol, Risperidone*, Sulperide* • Anticonvulsants: Phenytoin*, Ethosuximide, Carbamazepine*, Clonazepam, Primidone, Valproic acid*, Gabapentin* • Anti-depressants: Amitriptyline hydrochloride*, Imipramine hydrochloride*, Fluoxetine*. 	9
6	Drugs acting on Autonomic Nervous System <ul style="list-style-type: none"> • Sympathomimetic agents: Direct acting: Nor-epinephrine, Epinephrine, Phenylephrine, Dopamine, Terbutaline, Salmeterol, Salbutamol, Albuterol, Naphazoline, Tetrahydrazoline, Oxymetazoline. Indirect acting agents: Hydroxyamphetamine, Pseudoephedrine, Propylhexadrine. Agents with mixed mechanism: Ephedrine, Metaraminol. • Adrenergic Antagonists: Alpha adrenergic blockers: Tolazoline, Phentolamine, 	9

	<p>Phenoxybenzamine, Prazosin, Doxazosin. Beta adrenergic blockers: Propranolol, Practolol, Acebutolol, Atenolol, Esmolol, Metoprolol, Labetolol and Carvedilol</p> <ul style="list-style-type: none"> • Cholinergic drugs and related agents: Direct acting agents: Acetylcholine, Carbachol, Bethanechol, Methacholine and Pilocarpine. Cholinesterase inhibitors: Neostigmine, Pyridostigmine, Edrophonium chloride, Tacrine hydrochloride, Ambinonium chloride, Pralidoxime chloride, Isofluorophate, Echothiophate iodide, Parathione, Malathion. • Cholinergic Blocking agents: Solanaceous alkaloids and analogues: Atropine sulphate, Homatropine hydrogen bromide, Ipratropium bromide. Synthetic cholinergic blocking agents: Tropicamide, Cyclopentolate hydrochloride, Clindinium bromide, Dicyclomine hydrochloride, Procyldine hydrochloride Tridihex ethylchloride, Isopropamide iodide, and Ethopropazine hydrochloride 	
7	<p>Drugs acting on Cardiovascular System</p> <ul style="list-style-type: none"> • Anti-arrhythmic Drugs: Quinidine sulphate, Procainamide hydrochloride, Verapamil, Diltiazem hydrochloride, Phenytoin sodium, Lidocaine hydrochloride, Tocainide hydrochloride, Mexiletine hydrochloride, Lorcanide hydrochloride, amiodarone and Sotalol. • Anti-hypertensive Agents: Propranolol, timolol, Captopril, Lisinopril, Enalapril, Benzapril hydrochloride, Quinapril hydrochloride, Methyldopate hydrochloride, Clonidine hydrochloride. Reserpine, Hydralazine hydrochloride, Nifedipine, • Antianginal agents: isosorbide dinitrate, amyl nitrite 	5
8	Diuretics: acetazolamide, frusemide, bumetanide, chlorthiazide, benzthiazide, xipmide, spiranolactone	2
9	Hypoglycemic agents: insulin and its preparations, metformin, tolbutamide, glibenclamide, glipizide, Glimepiride, pioglitazone, ripaglinide	3
10	Analgesic and anti-inflammatory agents: Morphine analogues, Narcotic antagonists; Nonsteroidal anti inflammatory agents (NSAIDs) aspirin, diclofenac, ibuprofen, piroxicam, celecoxib, mefenamic acid, paracetamol	3
11	<p>Anti-infective agents</p> <p>Antifungal agents: Amphotericin-B and Griseofulvin, Econazole nitrate, Miconazole, Ketoconazole, Itraconazole, Fluconazole, Naftifine hydrochloride, Tolnaftate.</p> <p>Urinary tract anti-infective agents: Nalidixic Acid, Cinoxacin, Norfloxacin, Ciprofloxacin, Ofloxacin, Lomefloxacin, Sparfloxacin.</p> <p>Anti-tubercular Agents: INH, Ethionamide, ethambutol, Pyrazinamide, Para amino salicylic acid, Rifampicin</p> <p>Antiviral agents: Amantadine hydrochloride, Idoxuridine, Acyclovir, Gancyclovir, Foscarnet, Zidovudine, Lamivudine, Ribavirin</p> <p>Antimalarials: Quinine sulphate, Chloroquine phosphate, Primaquine phosphate, Quinacrine hydrochloride, Mefloquine, Cycloguanil, proguanil, Pyrimethamine</p> <p>Sulfonamides: History and development, mechanism of action sulfanilamide, sulfadiazine, sulfamethoxazole, sulfacetamide, mefenide acetate and cotrimoxazole</p>	8
12	Antibiotics: Penicillin G, ampicillin, amoxicillin, cloxacillin, clavulanic acid, cephalosporins, streptomycin, neomycin, tetracycline, doxycycline, minocycline, erythromycin, azithromycin, chloramphenicol, clindamycin.	8
13	Anti-neoplastic agents: Meclorothamine, Cyclophosphamide, Busulfan, Thiotepe, Mercaptopurine, Fluorouracil, Floxuridine, Cytarabine, Methotrexate, Azathioprine, Dactinomycin, Daunorubicin hydrochloride, Doxorubicin hydrochloride, Etoposide, Vinblastin sulphate, Vincristin sulphate, Cisplatin, Mitotane and bromostanolone propionate.	3

Practical

75 hours (3 hours/week)

Minimum of 25 practicals should be conducted

1	Limit tests <ul style="list-style-type: none"> • Limit test for chlorides • Limit test for sulphate • Limit test for Iron • Limit test for heavy metals
2	Identification tests for Anions and cations as per IP
3	Fundamentals of volumetric analysis Preparation of standard solution and standardization of Sodium hydroxide, ceric ammonium sulfate, potassium permanganate
4	Assay of the following compounds <ul style="list-style-type: none"> • Ferrous sulphate- by redox titration • Calcium gluconate-by complexometry • Sodium chloride-by Modified Volhard's method • Ascorbic acid by cerimetry • Metronidazole by Non Aqueous Titration • Ibuprofen by alkalimetry
5	Fundamentals of preparative organic chemistry Determination of Melting point and boiling point of organic compounds
6	Preparation of organic compounds. <ul style="list-style-type: none"> • Acetanilide from aniline • Aspirin from salicylic acid
7	Identification and test for purity of pharmaceuticals Aspirin, caffeine, paracetamol, sulfanilamide

Recommended Books

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

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3. Pharmacognosy

Scope: This course is designed to impart knowledge of medicinal uses of various naturally occurring drugs. It also emphasizes the study of evaluation of crude drugs, alternative system of medicine nutraceuticals and herbal cosmetics.

Objectives: Upon the completion of the course, the student shall be able to

- Identify the important crude drugs of natural origin
- Know the herbs used as nutraceuticals and cosmeceuticals
- Understand the principles of alternative system of medicines
- Understand the importance of quality control of drugs of natural origin

Theory

75 Hours (3Hrs/Week)

1	Definition, history, present status and scope of Pharmacognosy	02																																		
2	Classification of drugs: <ul style="list-style-type: none">• Alphabetical• Taxonomical• Morphological• Pharmacological• Chemical• Chemo-taxonomical	04																																		
3	Quality control of crude drugs: <ul style="list-style-type: none">• Different methods of adulteration of crude drugs• Evaluation of crude drugs	06																																		
4	Brief outline of occurrence, distribution, isolation, identification tests, therapeutic activity and pharmaceutical applications of alkaloids, terpenoids, glycosides, volatile oils, tannins and resins.	06																																		
5	Biological source, chemical constituents and therapeutic efficacy of the following categories of crude drugs. <table><tr><td>Laxatives</td><td>- Aloe, Castor oil, Ispaghula, Senna</td></tr><tr><td>Cardiotonics</td><td>- Digitalis, Arjuna</td></tr><tr><td>Carminatives and G.I. regulators</td><td>-Coriander, Fennel, Cardamom, Ginger, Clove, Black Pepper, Asafoetida, Nutmeg, Cinnamon</td></tr><tr><td>Astringents</td><td>- Myrobalan, Black Catechu</td></tr><tr><td>Drugs acting on nervous system</td><td>- Hyoscyamus, Belladonna, Ephedra, Opium, Tea leaves, Coffee seeds, Coca</td></tr><tr><td>Anti-hypertensive</td><td>- Rauwolfia</td></tr><tr><td>Anti-tussives</td><td>- Tolu Balsam</td></tr><tr><td>Anti-rheumatics</td><td>- Colchicum seed</td></tr><tr><td>Anti-tumor</td><td>- Vinca, Podophyllum</td></tr><tr><td>Anti-leprotics</td><td>- Chaulmoogra oil</td></tr><tr><td>Antidiabetics</td><td>- Pterocarpus, Gymnema</td></tr><tr><td>Diuretics</td><td>- Gokhru, Punarnava</td></tr><tr><td>Anti-dysentrics</td><td>- Ipecacuanha</td></tr><tr><td>Antiseptics and disinfectants</td><td>- Benzoin, Myrrh, Neem, Turmeric</td></tr><tr><td>Antimalarials</td><td>- Cinchona, Artemisia</td></tr><tr><td>Oxytocics</td><td>- Ergot</td></tr><tr><td>Vitamins</td><td>- Cod liver oil, Shark liver oil</td></tr></table>	Laxatives	- Aloe, Castor oil, Ispaghula, Senna	Cardiotonics	- Digitalis, Arjuna	Carminatives and G.I. regulators	-Coriander, Fennel, Cardamom, Ginger, Clove, Black Pepper, Asafoetida, Nutmeg, Cinnamon	Astringents	- Myrobalan, Black Catechu	Drugs acting on nervous system	- Hyoscyamus, Belladonna, Ephedra, Opium, Tea leaves, Coffee seeds, Coca	Anti-hypertensive	- Rauwolfia	Anti-tussives	- Tolu Balsam	Anti-rheumatics	- Colchicum seed	Anti-tumor	- Vinca, Podophyllum	Anti-leprotics	- Chaulmoogra oil	Antidiabetics	- Pterocarpus, Gymnema	Diuretics	- Gokhru, Punarnava	Anti-dysentrics	- Ipecacuanha	Antiseptics and disinfectants	- Benzoin, Myrrh, Neem, Turmeric	Antimalarials	- Cinchona, Artemisia	Oxytocics	- Ergot	Vitamins	- Cod liver oil, Shark liver oil	34
Laxatives	- Aloe, Castor oil, Ispaghula, Senna																																			
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	Enzymes Pharmaceutical Aids Miscellaneous	- Papaya, Diastase, Pancreatin, Yeast - Kaolin, Lanolin, Beeswax, Acacia, Tragacanth, Sodium alginate, Agar, Guar gum, Gelatin - Squill, Galls, Pale catechu, Aswagandha, Vasaka, Tulsi, Guggul	
6	Plant fibers used as surgical dressings:	Cotton, silk, wool and regenerated fibers	03
	Sutures – Surgical Catgut and Ligatures		
7	1. Basic principles involved in the alternative system of medicine like: Ayurveda, Sidha, Unani and Homeopathy 2. Method of preparation of Ayurvedic formulations in like: Arista, Asava, Gutika, Taila, Churna, Lehya and Bhasma		08
8	Role of medicinal and aromatic plants in national economy and their export potential		02
9	Herbs as health food: Brief introduction and therapeutic applications of: Nutraceuticals, Antioxidants, Pro-biotics, Pre-biotics, Dietary fibers, Omega-3-fatty acids, Spirulina, Carotenoids, Soya and Garlic		05
10	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		05

Practicals

75 Hours (3 hrs/week)

Minimum of 25 experiments to be conducted

- 1 Morphological Identification of drug :
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:
Senna, Datura, Cinnamon, Cinchona, Coriander, Fennel, Clove,
Ginger, Nuxvomica, Ipecacuanha.
- 3 Physical and chemical tests for evaluation of drugs
Asafoetida, Benzoin, Pale catechu, Black catechu, Castor oil, Acacia,
Tragacanth, Agar, Guar gum, Gelatin.

Recommended Books

1. Text book of Pharmacognosy by C. K. Kokate, S. B. Gokhale, A.P. Purohith, Nirali Prakashan
2. Text book of Pharmacognosy by C.S. Shah and J. S. Quadry, CBS Publishers & Distributors Pvt. Ltd.
3. Text Book of Pharmacognosy by T. E. Wallis. CBS Publishers & Distributors Pvt. Ltd.
4. Study of crude drugs by M. A. Iyengar, Manipal Press Ltd, Manipal
5. Powder crude drugs by M. A. Iyengar, Manipal Press Ltd, Manipal
6. Anatomy of crude drugs by M. A. Iyengar, Manipal Press Ltd, Manipal

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4. Human Anatomy and Physiology

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

Objectives: Upon the completion of the course, the student shall be able to

- Understand the structure and functions of the various organs of the human body
- Understand the various homeostatic mechanisms and their imbalance
- Perform the haematological tests and also record the blood pressure, heart rate, pulse rate and respiratory volumes

Theory

75 Hours (3 hrs/week)

Chapter	Topic	Hours
1	Scope of Anatomy and Physiology. Definition of various terminology	2
2	Structure of Cell: components and its functions	2
3	Tissues of the human body: Epithelial, Connective, Muscular and Nervous tissues – their sub-types and characteristics.	4
4	a) Osseous system : structure and functions of bones of axial and appendicular skeleton b) Classification, types and movements of joints, disorders of joints	3 3
5	Haemopoietic system <ul style="list-style-type: none">• Composition and functions of blood• Process of Haemopoiesis• Characteristics and functions of RBC's, WBC's and platelets• Mechanism of Blood Clotting• Importance of Blood groups	8
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
7	Cardiovascular 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, Basic knowledge of ECG• Blood pressure and its regulation	8
8	Respiratory system <ul style="list-style-type: none">• Anatomy of respiratory organs and their functions.• Regulation of respiration.• Respiratory volumes and capacities (definition)	4
9	Digestive system <ul style="list-style-type: none">• Anatomy and Physiology of GIT.• Anatomy and functions of accessory glands.• Physiology of digestion and absorption	8
10	Skeletal muscles <ul style="list-style-type: none">• Histology• Physiology of muscle contraction• Disorder of skeletal muscles	2
11	Nervous system <ul style="list-style-type: none">• Classification of nervous system	8

	<ul style="list-style-type: none"> 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 nerves. Anatomy and physiology of sympathetic and parasympathetic nervous system (ANS) 	
12	Sense organs Anatomy and physiology of <ul style="list-style-type: none"> Eye, Ear, Skin Tongue and nose 	6
13	Urinary system <ul style="list-style-type: none"> Anatomy and physiology of urinary system Physiology of urine formation Renin - angiotensin system Clearance tests and micturition. 	4
14	Endocrine system (Hormones and their functions) <ul style="list-style-type: none"> Pituitary gland Adrenal gland Thyroid and parathyroid gland Pancreas and gonads 	6
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

Practicals

75 Hours (3 hrs/week)

List of experiments

- Study of compound microscope
- General techniques for the collection of blood
- Microscopic examination of Epithelial tissue, Cardiac muscle, Smooth muscle, Skeletal muscle, connective tissue and Nervous tissue.
- Study of Human Skeleton-Axial skeleton and appendicular skeleton
- Study of appliances used in Haematological experiments
- Determination of
 - Blood group
 - ESR
 - Haemoglobin content of blood
 - Bleeding time and Clotting time
- Determination of WBC count of blood
- Determination of RBC count of blood
- Determination of Differential count of blood
- Recording of Blood Pressure
- Recording of Body temperature, Pulse rate and Heart rate
- Study of various systems and organs with the help of chart, models and specimen
 - Cardiovascular system
 - Respiratory system
 - Digestive system

- d) Urinary system
- e) Endocrine system
- f) Reproductive system
- g) Nervous system
- h) Eye
- i) Ear
- j) Skin

Recommended Books:

1. Human Physiology by C. C. Chatterjee
2. Human Anatomy and Physiology by S. Chaudhary and A. Chaudhary
3. Derasari and Gandhi's elements of Human Anatomy, Physiology and Health Education
4. S.R. Kale and R.R. Kale, Textbook of Practical Anatomy and Physiology

Reference Books:

1. Ross and Wilson Anatomy and Physiology in Health and illness
2. Human Anatomy and Physiology by Tortora Gerard J
3. Fundamentals of medical Physiology by K.Sambulingam and Prana Sambulingam
4. Ranade V.G. Text book of Practical Physiology
5. Goyal R.K., Natvar M.P. and Shah S.A., Practical Anatomy, Physiology and biochemistry, Experimental Physiology

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5. Social Pharmacy

Scope: This course is designed to impart basic knowledge on public health, safe use of medicines, smoking cessation, health promotion, immunisation, de-addiction, abuse and misuse of drugs.

Objectives: Upon completion of the course, the student shall be able to understand

- the disease preventive measures
- health promotion and education
- the social responsibility of the pharmacist in public health

Theory

75 Hours (3 Hrs/Week)

Chapter	Topic	Hours
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 Pharmacist in Public Health. • Concept of Health-WHO Definition, various dimensions, determinants, and health indicators. • National Health Policy 	4
2	Preventive care <ul style="list-style-type: none"> • Demography and Family Planning. • Mother and child health, importance of breastfeeding, ill effects of weaning foods and bottle feeding • Vaccines and immunizations • 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 • Psychosocial Pharmacy: Drugs of misuse and abuse – psychotropics, narcotics, alcohol, tobacco and tobacco products. Social Impact of these habits on social health and productivity • Personal hygiene and sanitation in reproductive age group • Role of pharmacist in preventive care 	16
3	Nutrition and Health <ul style="list-style-type: none"> • Basics of nutrition – Macronutrients and Micronutrients • Fibre diet– importance and sources (Plant and animal origin), • Calorific and nutritive values of various foods • Balanced diet, nutrition deficiency diseases, ill effects of junk foods • Genetically modified foods – Definition, advantages, disadvantages • Ill effects of artificial ripening, hybridization, use of pesticides, adulteration of foods. • Nutrition/dietary recommendation for diabetes, blood pressure, Hyperlipidemia, arthritis, renal disease, liver disease. • Artificial sweeteners, zero calorie concept, glycemic index of foods • Dietary supplements, nutraceuticals, food supplements, – indications, benefits, Drug -Food Interactions 	10
4	Health Promotion and Health education Epidemiology of Communicable Diseases : Causative agents and Clinical presentations and Role of Pharmacist in educating the public in prevention of communicable diseases : <ul style="list-style-type: none"> • Respiratory infections – chickenpox, measles, rubella, mumps, influenza (including Avian-Flu, H1N1), diphtheria, whooping cough, meningococcal meningitis, acute respiratory infections, tuberculosis 	40

	<ul style="list-style-type: none"> • Intestinal infections – poliomyelitis, viral hepatitis, cholera, acute diarrhoeal diseases, typhoid, food poisoning, amebiasis, worm infestations • Arthropod-borne infections - dengue, malaria, filariasis and, chikungunya • Surface infections – trachoma, tetanus, leprosy, STDs, HIV/AIDS 	
5	Introduction to health systems and National health programs in India. Basics of disaster management.	5

Recommended Books

1. Social Pharmacy – Innovation and development edt. Geoff Harding, Sarah Nettleton and Kevin taylor. The Pharmaceutical Press.
2. Text Book of Community Pharmacy Practice. RPSGB Publication
3. Community Pharmacy Handbook- Jonathan Waterfield
4. S.Khurana, P Suresh and R Kalsi. Health Education & Community Pharmacy. S Vikas & Co
5. Social Pharmacy: Tayler,Geoffery. Pharmaceutical Press. London.

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