

**D. Pharm 1st Year  
Syllabus 2022-23**

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# Pharmaceutics D. Pharm 1st Year Syllabus 2022-23

The Pharmaceutics course is designed in a manner so that the D.Pharm students can get the basic knowledge of formulating and dispensing the different pharmaceutical dosage forms. Students will get basic knowledge of the following pharmaceutical aspects.

- The basic concept of Pharmaceutics
- Disadvantages, Advantages, Formulation and Method of Preparation of different dosage forms.
- Requirements for Packaging and Labelling
- Basic idea about GMP, Quality Tests and Quality Assurance

## **Chapter 1: Introduction**

- 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, USP, BP, NF and the Extra Pharmacopoeia. Salient features of Indian Pharmacopoeia

## **Chapter 2: Packaging Materials**

- Types of Packaging Materials
- Selection criteria of Packaging Materials
- Advantages and Disadvantages of Glass as a Packaging Material
- Advantages and Disadvantages of Plastic as a Packaging Material
- Advantages and Disadvantages of Metal as a Packaging Material
- Disadvantages and Advantages of Rubber as a Packaging Material

## **Chapter 3: (A) Pharmaceutical Aids**

- Organoleptic Agents (Flavouring, Colouring and Sweetening)

## **Chapter 3: (B) Preservatives**

- Definition of Preservatives
- Different types of Preservatives with Examples
- Uses of Preservatives

## **Chapter 4: (A) Size Reduction**

- Definition of Ball Mill and Hammer Mill
- Applications and Objectives of Ball Mill and Hammer Mill
- Principle of Hammer Mill and Ball Mill
- Construction and Working of Hammer Mill and Ball Mill

## **Chapter 4: (B) Size Separation**

- Classification of Powder according to Indian Pharmacopoeia
- Definition of Cyclone separator

- Applications and Objectives of Cyclone separator
- Principle of Cyclone separator
- Construction and Working of Cyclone separator
- Sieves and standards of sieves

#### **Chapter 4: (C) Mixing**

- Definition of Double cone blender, Triple roller mill, Turbine mixer, and Silverson mixer homogenizer
- Applications and Objectives of Double cone blender, Triple roller mill, Turbine mixer, and Silverson mixer homogenizer
- Principle of Double cone blender, Triple roller mill, Turbine mixer, and Silverson mixer homogenizer
- Construction and Working of Double cone blender, Triple roller mill, Turbine mixer, and Silverson mixer homogenizer

#### **Chapter 4: (D) Filtration**

- Theory of filtration
- Sintered Glass Filter and Membrane Filter

#### **Chapter 4: (E) Drying**

- Process of freeze-drying
- Working of fluidized bed dryer

#### **Chapter 4: (F) Extraction**

- Definition of Extraction
- Classification of Extraction
- Method of Extraction
- Applications of Extraction

#### **Chapter 5: (A) Tablets**

- Coated and Uncoated Tablets
- Different Modified Tablets (extended-release, multi-layered, sustained release, fast-dissolving etc)

#### **Chapter 5: (B) Capsules**

- Hard Gelatin Capsules
- Soft Gelatin Capsules

#### **Chapter 6: (C) Liquid Oral Preparations**

- Solutions
- Elixirs
- Syrups
- Suspension
- Emulsion
- Dry Powder for Reconstitution

#### **Chapter 6: (D) Topical Preparations**

- Creams
- Ointments

- Pastes
- Liniments
- Lotions
- Gels
- Pessaries
- Suppositories

#### **Chapter 6: (E) Nasal preparations and Ear preparations**

#### **Chapter 6: (F) Powders and Granules**

- Dusting Powders
- Effervescent Granules
- Effervescent Powders
- Insufflations

#### **Chapter 6: (G) Sterile formulations**

- Eye Drops
- Eye Ointments
- Injectables

#### **Chapter 6: (H) Immunological Products**

- Vaccines
- Sera
- Toxoids
- manufacturing methods of Sera, Toxoids and Vaccines

#### **Chapter 7: Quality Control and Quality Assurance**

- Definition and Concepts of Quality Assurance and Quality Control
- Current Good Manufacturing Practice (cGMP)
- Concept of Validation and Calibration

#### **Chapter 8: Novel Drug Delivery System**

- Introduction of Novel Drug Delivery System
- Classification of Novel Drug Delivery System with examples
- Challenges and Advantages of Novel Drug Delivery System

# Pharmaceutical Chemistry D. Pharm 1st Year Syllabus 2022-23

## Pharmaceutical Chemistry D.Pharm 1st Year Syllabus

The Pharmaceutical Chemistry course is designed to gain basic knowledge about the chemical structure, storage conditions and medicinal uses of organic and inorganic chemical substances used as drugs and pharmaceuticals along with the impurities, and quality control aspects of chemical substances used in pharmaceuticals.

### Chapter 1: (A) Introduction to Pharmaceutical chemistry

- Scope and Objective of Pharmaceutical Chemistry

### Chapter 1: (B) Sources and types of errors

- Accuracy
- Precision
- Significant Figures

### Chapter 1: (C) Impurities in Pharmaceuticals

- Source of impurities in Pharmacopoeial substances
- effect of impurities in Pharmacopoeial substances
- Importance of Limit Test
- Procedures and Principle of Limit tests for Chlorides
- Limit tests for Sulphates
- Principle and Procedures of Limit tests for Iron
- Principle and Procedures of Limit tests for Heavy Metals and Arsenic

### Chapter 2: (A) Volumetric Analysis

- Fundamentals of Volumetric Analysis
- Acid-Base Titration
- Non-Aqueous Titration
- Precipitation Titration
- Complexometric Titration
- Redox Titration

### Chapter 2: (B) Gravimetric Analysis

- Principle and Method of Gravimetry Analysis

### Chapter 3: (A) Haematinics

- Market Preparations, Pharmaceutical formulations, use and storage conditions of Ferrous sulphate, Ferrous ascorbate, Ferrous fumarate, Carbonyl iron and Ferric ammonium citrate.

### Chapter 3: (B) Gastrointestinal Agents

- Market Preparations, Pharmaceutical formulations, use and storage conditions of **Antacids**: Magnesium hydroxide, Aluminium hydroxide gel, Calcium Carbonate, Adsorbents, Cathartics, Aluminium hydroxide gel, Magaldrate, Adsorbents, Sodium bicarbonate

### **Chapter 3: (C) Topical agents**

- Market Preparations, Pharmaceutical formulations, use and storage conditions of Ionic Silver, Hydrogen peroxide, Boric acid, Potassium permanganate, Silver Nitrate, Chlorhexidine Gluconate.

### **Chapter 3: (D) Dental products**

- Market Preparations, Pharmaceutical formulations, use and storage conditions of Sodium fluoride, Denture adhesives, Calcium carbonate, Denture cleaners, Mouthwashes

### **Chapter 3: (E) Medicinal Gases**

- Market Preparations, Pharmaceutical formulations, use and storage conditions of nitrous oxide, Carbon dioxide, oxygen.

### **Chapter 4:**

- Nomenclature of Organic Systems

### **Chapter 5: Drugs Acting on Central Nervous System**

- Anaesthetics: Ketamine Hydrochloride, Thiopental Sodium, Propofol
- Sedatives and Hypnotics: Alprazolam, Phenobarbital, Diazepam, Nitrazepam
- Antipsychotics: Haloperidol, Sulpiride, Quetiapine, Chlorpromazine Hydrochloride, Risperidone, Olanzapine, Lurasidone
- Anticonvulsants: Carbamazepine, Valproic Acid, Topiramate, Lamotrigine, Phenytoin, Clonazepam, Gabapentin, Vigabatrin
- Anti-Depressants: Imipramine Hydrochloride, Venlafaxine, Sertraline, Escitalopram, Paroxetine, Amitriptyline Hydrochloride, Fluoxetine, Duloxetine, Citalopram, Fluvoxamine

### **Chapter 6: Drugs Acting on Autonomic Nervous System**

- **Sympathomimetic Agents:**
  - **Direct Acting:** Epinephrine, Dopamine, Salbutamol, Tetrahydrozoline, Nor-Epinephrine, Phenylephrine, Terbutaline, Naphazoline.
  - **Indirect Acting Agents:** Pseudoephedrine, Hydroxy Amphetamine
  - **Agents With Mixed Mechanism:** Metaraminol, Ephedrine
- Adrenergic Antagonists:
  - Alpha Adrenergic Blockers: Phentolamine, Tolazoline, Prazosin, Phenoxybenzamine
  - Beta-Adrenergic Blockers: Atenolol, Propranolol, Carvedilol
- Cholinergic Drugs and Related Agents:
  - Direct Acting Agents: Carbachol, Acetylcholine, Pilocarpine
  - Cholinesterase Inhibitors: Edrophonium Chloride, Pralidoxime Chloride, Neostigmine, Echothiopate Iodide, Pralidoxime Chloride, Tacrine Hydrochloride
- Cholinergic Blocking Agents: Ipratropium Bromide, Atropine Sulphate

- Synthetic Cholinergic Blocking Agents: Cyclopentolate Hydrochloride, Dicyclomine Hydrochloride, Tropicamide, Clidinium Bromide

### **Chapter 7: Drugs Acting on Cardiovascular System**

- Anti-Arrhythmic Drugs: Procainamide Hydrochloride, Phenytoin Sodium, Lorainide Hydrochloride, Sotalol, Quinidine Sulphate, Verapamil, Lidocaine Hydrochloride, Amiodarone
- Anti-Hypertensive Agents: Captopril, Methyldopate Hydrochloride, Hydralazine Hydrochloride, Propranolol, Ramipril, Clonidine Hydrochloride, Nifedipine
- Antianginal Agents: Isosorbide Dinitrate

### **Chapter 8: Diuretics**

- Frusemide, Chlorthalidone, Metolazone, Spironolactone, Acetazolamide, Bumetanide, Benzthiazide, Xipamide

### **Chapter 9: Hypoglycemic Agents**

- Metformin, Glimepiride, Repaglinide, Gliptins, Insulin and Its Preparations, Glibenclamide, Pioglitazone, Gliflozins.

### **Chapter 10: Analgesic And Anti-Inflammatory Agents**

- Narcotic Antagonists, Morphine Analogues
- Nonsteroidal Anti Inflammatory Agents (NSAIDs): Diclofenac, Piroxicam, Mefenamic Acid, Aceclofenac, Aspirin, Ibuprofen, Celecoxib, Paracetamol

### **Chapter 11: Anti-Infective Agents**

- Antifungal Agents: Griseofulvin, Ketoconazole, Fluconazole, Amphotericin-B, Miconazole, Itraconazole, Naftifine Hydrochloride
- Urinary Tract Anti-Infective Agents: Ciprofloxacin, Moxifloxacin, Norfloxacin, Ofloxacin
- Anti-Tubercular Agents: Ethambutol, Pyrazinamide, Bedaquiline, Pretomanid, INH, Para Amino Salicylic Acid, Rifampicin, Delamanid
- Antiviral Agents: Idoxuridine, Foscarnet, Ribavirin, Favipiravir, Amantadine Hydrochloride, Acyclovir, Zidovudine, Remdesivir
- Antimalarials: Chloroquine Phosphate, Mefloquine, Pyrimethamine, Quinine Sulphate, Primaquine Phosphate, Cycloguanil
- Sulfonamides: Sulfadiazine, Sulfacetamide, Cotrimoxazole, Sulfanilamide, Sulfamethoxazole, Mafenide Acetate, Dapsone

### **Chapter 12: Antibiotics**

- Amoxicillin, Streptomycin, Penicillin G, Cloxacillin
- Tetracyclines: Minocycline, Doxycycline
- Macrolides: Azithromycin, Erythromycin
- Miscellaneous: Clindamycin, Chloramphenicol

### **Chapter 13: Anti Neoplastic Agents**

- Busulfan, Fluorouracil, Dactinomycin, Vinblastine Sulphate, Dromostanolone Propionate, Cyclophosphamide, Mercaptopurine, Methotrexate, Doxorubicin Hydrochloride, Cisplatin

The Pharmacognosy course of the D Pharm syllabus has been designed in a manner so students can gain information about the origins of various crude drugs along with nutraceuticals, different medicine systems and evaluation of crude drugs.

## **Chapter 1: Introduction**

- Definition and History of Pharmacognosy
- Scope and present status of Pharmacognosy

## **Chapter 2: Classification of Drugs**

- Taxonomical, Pharmacological, Chemo-taxonomical, Alphabetical, Morphological, Chemical

## **Chapter 3: Quality Control of Crude Drugs**

- Different methods of adulteration of crude drugs
- Evaluation of crude drugs

## **Chapter 4:**

- Distribution, Identification tests, pharmaceutical applications, isolation, the therapeutic activity of terpenoids, volatile oils, resins, alkaloids, glycosides, tannins

## **Chapter 5:**

- Laxatives: Castor oil, Senna, Aloe, Ispaghula
- Cardiotonic: Arjuna, Digitalis
- Carminatives and G.I. regulators: Fennel, Ginger, Black Pepper, Nutmeg, Coriander, Cardamom, Clove, Black Pepper, Asafoetida, Cinnamon
- Astringents: Black Catechu, Myrobalan, Pale Catechu
- Drugs acting on the nervous system: Belladonna, Opium, Coffee seeds, Hyoscyamus, Ephedra, Tea leaves, Coca
- Anti-hypertensive: Rauwolfia
- Anti-tussive: Tolu Balsam, Vasaka
- Anti-rheumatics: Colchicum seed
- Anti-tumour: Podophyllum, Vinca
- Antidiabetics: Gymnema, Pterocarpus
- Diuretics: Punarnava, Gokhru
- Anti-dysenteric: Ipecacuanha
- Antiseptics and disinfectants: Myrrh, Turmeric, Benzoin, Neem
- Antimalarials: Artemisia, Cinchona
- Oxytocic: Ergot
- Vitamins: Shark liver oil, Cod liver oil
- Enzymes: Diastase, Yeast, Papaya, Pancreatin



- Pharmaceutical Aids: Lanolin, Acacia, Sodium alginate, Guar gum, Kaolin, Beeswax, Tragacanth, Agar, Gelatine
- Miscellaneous: Galls, Tulsi, Guggul, Squill, Ashwagandha

#### **Chapter 6: Plant fibres used as surgical dressings**

- silk, regenerated fibres, Cotton, wool

#### **Chapter 7: (A) Basic principles involved in the traditional systems of medicine**

- Siddha, Homeopathy, Ayurveda, Unani

#### **Chapter 7: (B) Method of preparation of Ayurvedic formulations**

- Asava, Taila, Lehya, Arista, Gutika, Churna, Bhasma

#### **Chapter 8: Role of medicinal and aromatic plants in the national economy and their export potential**

#### **Chapter 9: Herbs as health food**

- Therapeutic applications and Introduction of Antioxidants, Pre-biotics, Omega-3-fatty acids, Carotenoids, Garlic, Nutraceuticals, Pro-biotics, Dietary fibres, Spirulina, Soya

#### **Chapter 10: Introduction to herbal formulations**

#### **Chapter 11: Herbal cosmetics**

- chemical constituents, therapeutic and cosmetic uses, Sources, commercial preparations of Almond oil, Olive oil, Sandal Wood oil, Aloe vera gel, Lavender oil, Rosemary oil

#### **Chapter 12: Phytochemical Investigation of Drugs**

This Human Anatomy and Physiology D Pharm Syllabus for D.Pharm 1st Year Students contain topics for a better understanding of basic physiological monitoring of different systems and functions.

## **Chapter 1: Introduction**

- Scope of Human Anatomy and Physiology
- Definition of different terminologies

## **Chapter 2: Structure of Cell**

- Components of cell and the basic function of cell

## **Chapter 3: Tissues of the human body**

- Connective tissue, epithelial tissue, nervous tissue, muscular tissue – their characteristics and subtypes

## **Chapter 4: Osseous system**

- Function and Structure of bones, appendicular skeleton and axial skeleton
- Movements of Joints, Classification of Joints, Disorders of Joints

## **Chapter 5: Haemopoietic system**

- Functions and Composition of blood
- Hemopoiesis process
- functions and Characteristics of WBCs, RBCs and platelets
- Blood Clotting Mechanism
- Importance of Blood Grouping

## **Chapter 6: Lymphatic system**

- Function, composition and formation of the lymphatic system and lymph
- functions and structure of lymph node and spleen

## **Chapter 7: Cardiovascular system**

- Anatomy and Physiology of heart
- Circulation (Coronary, Pulmonary and Systemic Circulation) and Blood vessels
- Heart sounds Cardiac cycle and basics of ECG
- Blood pressure and regulation of blood pressure

## **Chapter 8: Respiratory system**

- Functions and Anatomy and Respiratory Organs
- Regulation and Mechanism of Respiration
- Definition of Respiratory volume and capacity

## **Chapter 9: Digestive system**

- Anatomy and Physiology of Gastro-Intestinal Tract
- Functions and Anatomy of Accessory Glands
- Physiology of Absorption and Digestion

## **Chapter 10: Skeletal muscles**

- Histology
- The physiology behind muscle contraction
- Disorders of Muscle contractions

### **Chapter 11: Nervous system**

- Classification of the nervous system
- Anatomy and physiology of cerebellum, cerebrum, midbrain
- The function of the medulla oblongata, hypothalamus, and basal ganglia
- Structure of Spinal Cords and reflexes
- Functions and names of cranial nerves
- Anatomy and physiology of parasympathetic nervous system (ANS) and sympathetic nervous system

### **Chapter 12: Sense organs**

- Anatomy and physiology of Eye
- Anatomy and physiology of Ear
- Anatomy and physiology of Nose
- Anatomy and physiology of Tongue
- Anatomy and physiology of Skin

### **Chapter 13: Urinary System**

- Anatomy and Physiology of the Urinary System
- The physiology behind the formation of urine
- Renin – angiotensin system
- micturition and Clearance tests

### **Chapter 14: Endocrine system**

- Adrenal gland
- Pancreas and gonads
- Pituitary gland
- Thyroid and parathyroid gland

### **Chapter 15: Reproductive system**

- Anatomy of the female reproductive system and male reproductive system
- Physiology behind menstruation
- Oogenesis and Spermatogenesis
- Parturition and Pregnancy

Social Pharmacy subject has been newly added to D.Pharm 1st Year. D Pharm syllabus for Social Pharmacy subject given below:

### **Chapter 1: Introduction to Social Pharmacy**

- Scope and Definition. The discipline of Social Pharmacy, Role of Pharmacists in Public Health
- Concept of Health – Various Dimensions, Health Indicators, WHO Definition and Determinants
- Indian Perspective of National Health Policy
- Private Health System in India, Public Health System, National Health Mission
- Introduction to Sustainable Development Goals, Millennium Development Goals and FIP Development Goals

### **Chapter 2: Preventive Healthcare – Role of Pharmacists**

- Family Planning and Demography
- Importance of Breastfeeding, Mother and child health,
- Bad effects of infant milk substitute bottle-feeding
- Bad effects of bottle-feeding
- Types of Immunity, Types of Immunization, Overview of Vaccines
- Effect of Environment on Health – the importance of safe drinking water, Water pollution, waterborne diseases, noise pollution, sewage and solid waste disposal, air pollution, occupational illnesses, Environmental pollution due to pharmaceuticals
- Psychosocial Pharmacy – Drugs of Misuse and Abuse: narcotics, tobacco products, psychotropics, alcohol, Social Impact of these bad habits on social health and productivity and suicidal behaviours

### **Chapter 3: Nutrition and Health**

- Basics of Macronutrients and Basics of Micronutrients.
- Importance of fibre and water in the diet
- A balanced diet, nutrition deficiency diseases, calorific and nutritive values of various foods, Malnutrition, ill effects of junk foods, fortification of food
- Introduction to food safety, effects of artificial ripening, genetically modified foods, adulteration of foods, use of pesticides
- Dietary supplements, food supplements – benefits and indications, Drug-Food Interactions, nutraceuticals

### **Chapter 4: Introduction to Microbiology and common microorganisms**

- Epidemiology: Introduction and Application of Epidemiology, Understanding of terms such as a pandemic, epidemic, mode of transmission, quarantine, outbreak, isolation, contact tracing, incubation period, mortality, and morbidity.
- Causative agents, clinical presentations, epidemiology and the role of Pharmacists in teaching people to prevent the below given communicable disease.

- Respiratory infections – measles, mumps, diphtheria, meningococcal meningitis, tuberculosis, chickenpox, rubella, influenza (including H1N1, MERS, Avian-Flu, SARS)
- Intestinal infections – viral hepatitis, acute diarrheal diseases, amebiasis, food poisoning, poliomyelitis, cholera, typhoid, and worm infestations
- Arthropod-borne infections – malaria, chikungunya, dengue and filariasis
- Surface infections – tetanus, trachoma and leprosy
- AIDS/HIV, STDs

## **Chapter 5**

- Introduction to health systems
- Introduction to all ongoing National Health programs and their functioning, role of pharmacists, objectives and outcome

## **Chapter 6: Pharmacoeconomics**

- Introduction, the importance of pharmacoeconomics and basic terminologies