

AIPHD Syllabus 2022

Subject: Pharmaceutical Sciences

Subjects	Topics
Physical Chemistry	<ul style="list-style-type: none">• Composition & physical states of matter• Refractive index• Solutions• Electrochemistry,• Kinetics• Colligative Properties• Thermodynamics• Ionic equilibrium
Physical Pharmacy	<ul style="list-style-type: none">• Buffer• Solubility• Matter, properties of matter• Viscosity and rheology• Surface and interfacial phenomenon• Dispersion systems• Complexation• Micromeritics and powder rheology
Organic Chemistry	<ul style="list-style-type: none">• General principles• Pericyclic reactions• Aromaticity & chemistry of aromatic compounds• Different classes of compounds• Amino acids & proteins• Different aromatic classes of compounds• Polycyclic aromatic hydrocarbons• Stereochemistry• Carbohydrates• Carbonyl Chemistry• Heterocyclic Chemistry• Protection & deprotection of groups• Bridged rings• Kinetic & thermodynamic control
Pharmaceutical Chemistry	<ul style="list-style-type: none">• Pharmaceutical Inorganic Chemistry• Dentifrices, desensitizing agents, & anticaries agents• Pharmaceutical Impurities• Isotopes• Monographs

	<ul style="list-style-type: none"> • Medicinal Chemistry • Various classes of therapeutic agents • Different classes of therapeutic drugs • Therapeutic classes of drugs • Different classes of therapeutic drugs
Pharmaceutics	<ul style="list-style-type: none"> • Pharmacy Profession & Introduction to Pharmaceutics • Introduction to dosage form • Biological products • Pharmaceutical Plant, location, layout • Ophthalmic preparations • Preformulations • Packaging Materials • Cosmetics • Pilot plant scale-up techniques • Dosage Form Necessities and Additives • Powders • Sources of drug information • Tablets • Parenteral - product requiring sterile packaging • Suspensions • Emulsions • Suppositories • Stability of formulated products • Prolonged Action Pharmaceuticals • Novel Drug delivery system • GMP and Validation • Semisolids • Allopathic dosage form • Crude extract • Allergenic extract • Capsules • Liquids(solutions, syrups, elixirs, spirits, aromatic water, liquid for external uses) • Pharmaceutical Aerosols
Pharmacology	<ul style="list-style-type: none"> • General Pharmacology • Principles of toxicology • Drugs acting on urinary system • Pharmacology of peripheral nervous system • Pharmacology of central nervous System • Pharmacology of cardiovascular system • Immunopharmacology

	<ul style="list-style-type: none"> • Drugs acting on Respiratory system • Pharmacology of Endocrine system • Neurohumoral transmission in autonomic and central nervous system • Vitamins & Minerals • Chemotherapy • Autacoids and their Antagonists • Pharmacology of drug acting on the gastrointestinal tract • Chronopharmacology
Pharmacognosy	<ul style="list-style-type: none"> • Introductory Pharmacognosy • Classification of crude drugs • Plant products • Principles of plant classification • Pharmaceutical aids • Animal products • Traditional herbal drugs • Plants based industries and research institutes in India • Patents • Ayurvedic system of medicine • Homeopathic system of medicine • Toxic drugs • Enzymes • Natural pesticides and insecticides • Adulteration and evaluation of crude drugs • Quantitative microscopy • Factors influencing quality of crude drugs • Techniques in microscopy • Introduction to phytoconstituents • Biogenetic pathways • Carbohydrates & lipids • Tannins • Volatile oils • Resinous drugs • Glycosides • Alkaloids • Extraction and Isolation Techniques • Phytopharmaceuticals • Quality control and Standardization of herbal drugs • Herbal formulations • Worldwide trade of crude drugs and volatile oils • Herbal cosmetics

Pharmaceutical Analysis	<ul style="list-style-type: none"> • Importance of quality control in pharmacy • Acid-base titrations • Gravimetry • Extraction techniques • Potentiometry • Calibration • General principles of spectroscopy • Mass spectrometry • Polarography • Nephelometry & Turbidimetry • Ultraviolet-visible Spectrometry • Spectrofluorimetry • Flame photometry & atomic absorption spectrometry • Infrared spectrometry • Miscellaneous methods of analysis • Non-aqueous titrations • Oxidation-reduction titrations • Precipitation titrations • Complexometric titrations • Proton nuclear magnetic resonance spectrometry • Chromatography • Miscellaneous
Biochemistry	<ul style="list-style-type: none"> • Cell • Lipids • Enzymes • Nucleic acids • Vitamins • Biological oxidations & reductions • Carbohydrates • Proteins • Hereditary diseases
Biotechnology	<ul style="list-style-type: none"> • Plant Cell and Tissue Culture • Fermentation Technology and Industrial Microbiology • Recombinant DNA Technology • Process and Applications • Animal Cell Culture • Biotechnology-Derived Products
Microbiology	<ul style="list-style-type: none"> • Introduction to Microbiology • Microscopy and staining technique • Biology of Microorganisms

	<ul style="list-style-type: none"> • Microbial spoilage • Vaccines & Sera • Fungi and Viruses • Aseptic Technique • Sterilization & Disinfection • Microbial Assay
Pathophysiology	<ul style="list-style-type: none"> • Basic principles of cell injury and adaptation • Neoplastic diseases • Pathophysiology of common diseases • Laboratory tests for Liver function tests and kidney function tests • Immunopathology including amyloidosis • Infectious diseases • Basic mechanisms of inflammation and repair • Disorders of fluid, electrolyte and acid-base balance • Disorders of homeostasis: white blood cells, lymphoid tissues, and red blood cells related diseases
Biopharmaceutics and Pharmacokinetics	<ul style="list-style-type: none"> • Bio-pharmaceutics • Bio-pharmaceutical statistics • Bio-availability & Bio-equivalence
Clinical Pharmacy and Therapeutics	<ul style="list-style-type: none"> • Drug information services, Drug interactions • Drug interaction in pediatric and geriatric patients, drug treatment during pregnancy, lactation and menstruation • Therapeutic drug monitoring, adverse drug reaction (ADR), types of ADR, Mechanism of ADR. Drug interaction, Monitoring and reporting of ADR and its significance • Age-related drug therapy: concept of posology, drug therapy for neonates, paediatrics and geriatrics. Drugs used in pregnancy and lactation • Drug therapy in gastrointestinal, hepatic, renal, cardiovascular and Respiratory Disorders • Pharmacovigilance, Therapeutic drug monitoring, Neutraceuticals, essential drugs and rational drug usage • General Principles, preparation, maintenance, analysis of observational records in Clinical Pharmacy • Drug therapy in infections of respiratory system, urinary system, infective meningitis, TB, HIV, malaria and filaria • Drug therapy for thyroid and parathyroid disorders, diabetes mellitus, menstrual cycle disorders, menopause and male sexual dysfunction • Drug therapy for malignant disorders like leukaemia, lymphoma

	<p>and solid tumours</p> <ul style="list-style-type: none"> • Drug therapy for rheumatic, eye and skin disorders • Clinical trials, type and phases of clinical trials, placebo, ethical and regulatory issues including Good clinical practice in clinical trials • Drug therapy for neurological and psychological disorders
Dispensing and Hospital Pharmacy	<ul style="list-style-type: none"> • Introduction to laboratory equipment, weighing methodology, handling of prescriptions, labelling instructions for dispensed products • Posological calculations involved in the calculation of dosage for infants. • Study of current patent and proprietary products, generic products and selected brand products, indications, contraindications, adverse drug reactions, available dosage forms and packing • Compounding and dispensing of following prescriptions • Reading and counselling of prescriptions from the clinical practice • Enlarging and reducing formula, displacement value • Preparations of formulations involving allegation, alcohol dilution, isotonic solution
Human Anatomy and Physiology	<ul style="list-style-type: none"> • Cell physiology • Endocrine Glands • Reproductive System • Gastrointestinal tract • Respiratory System • Autonomic nervous system • Cardiovascular system • Lymphatic system • The Blood • Sense organs • Skeletal System • Central Nervous system • Urinary System
Pharmaceutical Engineering	<ul style="list-style-type: none"> • Material of constructions • Drying • Size reduction and size separation • Extraction • Mixing • Crystallization • Automated process control systems • Industrial hazards & safety precautions

	<ul style="list-style-type: none"> • Evaporation • Distillation • Fluid flow • Heat transfer • Filtration and Centrifugation • Dehumidification and humidity control • Refrigeration and air conditioning
Pharmaceutical Management	<ul style="list-style-type: none"> • Introduction to management • Inventory Management • Communication • Research Management • Human resource and development (HRD) • Planning and Forecasting • Organization • World trade organization (WTO) and trade-related intellectual property rights (TRIPS) • Standard institutions and regulatory authorities • GATT • Marketing Research • Leadership and motivation
Pharmaceutical Jurisprudence	<ul style="list-style-type: none"> • Narcotic Drugs and Psychotropic Substances Act, and Rules there under • Factory Act • Shops and Establishment Act • Introduction to Intellectual Property Rights and Indian Patent Act 1970 • An Introduction to Standard Institutions and Regulatory Authorities such as BIS, ASTM, ISO, TGA, USFDA, MHRA, ICH, WHO • Minimum Wages Act 1948 • Prevention of Food Adulteration Act 1954 and Rules • Industrial Development and Regulation act 1951 • Drugs and Magic Remedies (Objectionable Advertisements) Act 1954 • Medicinal and Toilet Preparations (Excise Duties) Act 1955, Rules 1976 • Historical background Drug legislation in India, Code of Ethics for Pharmacists • The Pharmacy Act 1948 • Drugs and Cosmetics Act 1940, Rules 1945, including New Drug applications

	<ul style="list-style-type: none">• Consumer Protection Act• Indian Pharmaceutical Industry- An Overview• Medical Termination of Pregnancy Act 1970 and Rules 1975• Prevention of Cruelty to Animals Act 1960• Drug (Price Control) Order
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