



**KL College of Pharmacy,  
Syllabus for Entrance Examination for PhD Admission-2018**

**I. Natural Products (Pharmacognosy):** General pathway of biosynthetic studies and basic metabolic pathways, Pharmacognosy of crude drugs that contain the following constituents. Alkaloids, Glycosides, Terpenoids, Steroids, Bioflavanoids, Purines, volatile oils, resins, seponines. Chemistry, tests, isolation, Characterization and estimation of phyto pharmaceuticals belonging to the above groups. Standardization of raw materials and herbal products. Quantitative microscopy including modern techniques used for evaluation of crude drugs. Evaluation of Crude drugs, Adulteration of Crude drugs and their detection by various methods.

**II. Pharmacology:** General pharmacological principles including Types of receptors, drug-receptor interaction including signal transduction mechanism, Toxicology. Drug interaction. Pharmacology of drugs acting on Central nervous system, Cardiovascular system, Autonomic nervous system, Gastro intestinal system and Respiratory system. Pharmacology of Autocoids, Hormones, Hormone antagonists, chemotherapeutic agents including anticancer drugs. Bioassays, Immuno Pharmacology. Drugs acting on the blood & blood forming organs. Drugs acting on the renal system. Drug – Drug interactions and Drug-Food interactions. Adverse drug reactions.

**III. Pharmaceutical & Medicinal Chemistry:** Basic organic chemistry regarding synthesis and reactions of the main organic functional groups, organic stereochemistry, substitution (free radical, nucleophilic, electrophilic); elimination reactions; addition reactions; rearrangement reactions.

Introduction to drug design. Physico-chemical and stereoisomeric (Optical, geometrical) aspects of drug molecules and biological action, Bioisosterism, Drug-receptor interactions including transduction mechanisms; General pathways of drug metabolism. Structure, nomenclature, classification, synthesis, SAR and metabolism of the following category of drugs, which are official in Indian Pharmacopoeia and British Pharmacopoeia. Hypnotics and Sedatives, Analgesics, NSAIDS, Neuroleptics, Antidepressants, Anxiolytics, Anticonvulsants, Antihistaminics, Local Anaesthetics, Cardio Vascular drugs – Antianginal agents Vasodilators, Adrenergic & Cholinergic drugs, Cardiotonic agents, Diuretics, Antiypertensive drugs, Hypoglycemic agents, Antilipedmic agents, Coagulants, Anticoagulants, Antiplatelet agents. Chemotherapeutic agents – Antibiotics, Antibacterials, Sulphadruugs. Antiproloiozoal drugs, Antiviral, Antitubercular, Antimalarial, Anticancer, Antiamoebic drugs. Diagnostic agents. Preparation and storage and uses of official Radiopharmaceuticals, Vitamins and Hormones. Eicosonoids and their application.

**IV. Pharmaceutics:** Development, manufacturing standards Q.C. limits, labeling, as per the pharmacopoeal requirements. Storage of different dosage forms (solid dosage forms, liquid dosage forms, semi-solid dosage forms) and aerosols and new drug delivery systems. A details

study of buffers and isotonic solutions, solubility of pharmaceuticals, interfacial phenomena, colloids, stability of colloids, rheology, thixotropy and its applications, micro merits. A details study of the concept of chemical kinetics and their application in pharmacy. Advanced drug delivery systems. Biopharmaceutical aspects of dosage form design, open one compartment, two compartment & three compartment models & their limitations, factors influencing bio-availability, evaluation of bioavailability, bio-equivalence, dosage regimens, repetitive dosing and dose adjustments in renal and hepatic failure, individualization of dosage regimen. Formulation and preparation of cosmetics - lipstick, shampoo, creams, nail preparations and dentifrices. Pharmaceutical calculations.

**V. Pharmaceutical Jurisprudence:** Drugs and cosmetics Act and rules with respect to manufacture, sales and storage. Pharmacy Act. Pharmaceutical ethics.

**VI. Pharmaceutical Analysis:** Principles, instrumentation and applications of the following: Absorption spectroscopy (UV, visible & IR). Fluorimetry, Flame photometry, Potentiometry. Conductometry and Plarography. Pharmacopoeial assays. Principles of NMR ( $^1\text{H}$  &  $^{13}\text{C}$ ), Mass spectroscopy. X-ray diffraction analysis and different chromatographic methods (TLC, Column, Paper, HPLC & GC).

**V. Biochemistry:** Biochemical role of hormones, Vitamins, Enzymes, Nucleic acids, Bioenergetics. Metabolism of carbohydrate, lipids and proteins. Methods to determine, kidney & liver function. Lipid profiles.

**VI. Microbiology:** Principles and different methods of microbiological assays. General principles of immunology. Methods of preparation of official sera and vaccines. Serological and diagnostics tests. Applications of microorganisms in Bio-Conversions and in Pharmaceutical industry.