

Regd. No. MH/4775/Satara

DTE Code : 6394, MSBTE Code : 2144



Shree Santkrupa Shikshan Sanstha's

SHREE SANTKRUPA COLLEGE OF PHARMACY

Ghogaon (Shivajinagar), Tal: Karad, Dist: Satara, (Maharashtra State) Pin-415111

Ph : (02164) 257374 | Email : principalsntk@rediffmail.com | Web : www.sscop.org

**Course Outcomes****PROGRAM: B. PHARM**

Name of Subject with Code	CO Code	Course Outcomes
B. Pharm -I (Semester-I)		
BP101T Human Anatomy and Physiology I– Theory	BP101T_CO1	Define the basic anatomical terminologies and discuss the molecule, cell, tissue, organ, their functions and, interrelationships.
	BP101T_CO2	Explain the anatomy and physiology of blood, lymphatic and other body fluids.
	BP101T_CO3	Recognize and differentiate the autonomic nervous system.
	BP101T_CO4	Describe in detail the anatomy and physiology of musculoskeletal system.
	BP101T_CO5	Discuss the gross morphology, and functions of various parts of the cardiovascular system.
	BP101T_CO6	Summarize the anatomy and physiology of sense organs.
BP102T Pharmaceutical Analysis I – Theory	BP102T_CO1	Recall the fundamental analytical techniques used in quality control.
	BP102T_CO2	Explain the accuracy, precision, significant figure and error concepts.
	BP102T_CO3	Discuss in detail the aqueous, non- aqueous acid-base titration.
	BP102T_CO4	Discuss in detail volumetric and gravimetric analytical techniques.
	BP102T_CO5	Estimate some mentioned pharmaceutical compounds.
	BP102T_CO6	Explain the principle and applications of electrochemical methods of analysis.
BP103T Pharmaceutics-I Theory	BP103T_CO1	Summarize the historical background and development of profession of pharmacy.
	BP103T_CO2	Describe the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations.
	BP103T_CO3	Understand the ethical and professional way of handling the prescriptions with importance effective patient communication.
	BP103T_CO4	Discuss the properties of ingredients used in the formulation of various conventional dosage forms.
	BP103T_CO5	Comprehend formulation of various conventional dosage forms.
	BP103T_CO6	Know the evaluation parameters of the various conventional dosage forms.

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BP104T Pharmaceutical Inorganic Chemistry – Theory	BP104T_CO1	Explain the history of pharmacopoeia and concepts of quality control tests including sources of impurities.
	BP104T_CO2	Describe acids, bases, buffers and different gastrointestinal agents
	BP104T_CO3	Explain in detail the Major extra and intracellular electrolytes: its physiological role with special emphasis to the acid base balance, replacement therapy and oral rehydration salt
	BP104T_CO4	Describe the preparation, properties and medicinal uses of inorganic compounds like Dental products, Antimicrobials, Expectorants, Emetics, Hematinic, Antidotes and Astringents.
	BP104T_CO5	Write the assay method of some selected inorganic compounds.
	BP104T_CO6	Explain the basic concepts, biological effects, diagnostics and therapeutic applications of radiopharmaceuticals.
BP105T Communication skills – Theory	BP105T_CO1	Explain the types of communication and develop ethical practice for sustaining the reputation of pharmacy profession.
	BP105T_CO2	Develop basic listening skills to be an active listener
	BP105T_CO3	Communicate effectively by verbal and nonverbal techniques.
	BP105T_CO4	Inculcate Interview skills essential for professional development.
	BP105T_CO5	Prepare, deliver and defend presentations competently in front of professionals.
	BP105T_CO6	Utilize soft skills to work cohesively with the team as a member or leader and add value to the pharmaceutical business.
BP106RBT Remedial Biology - Theory	BP105T_CO1	Explain the classification and salient features of five kingdom of life.
	BP105T_CO2	Discuss the basic components of anatomy and physiology of plant.
	BP105T_CO3	Explain the basic components of anatomy and physiology of animal with special reference to human.
	BP105T_CO4	Discuss the various system of human being.
	BP105T_CO5	Discuss the plant and mineral nutrition with basic structural and functional activities of plant.
	BP105T_CO6	Describe the structure and function of cell and cell organelles.

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BP106RMT Remedial Mathematics – Theory	BP106RMT_CO1	Describe the partial fraction, logarithms, functions, limits and continuity Describe the partial fraction, logarithms, functions, limits and continuity.
	BP106RMT_CO2	Find the matrices and determinants.
	BP106RMT_CO3	Discuss the Analytical Geometry.
	BP106RMT_CO4	Solve the different types of calculations.
	BP106RMT_CO5	Determine the differential equations and Laplace transform.
	BP106RMT_CO6	Explain the important applications of Mathematics in Pharmacy.
BP107P Human Anatomy and Physiology- I – Practical	BP107P_CO1	Summarize the utilization of the laboratory equipment and other tools.
	BP107P_CO2	Perform and interpret the basic hematological experiments.
	BP107P_CO3	Identify the tissues using specimen and categorize skeletal system.
	BP107P_CO4	Measure and interpret the blood pressure, pulse rate and heart rate.
	BP107P_CO5	Discuss health counseling for community.
BP108P Pharmaceutic al Analysis I – Practical	BP108P_CO1	Prepare primary and secondary standard solutions.
	BP108P_CO2	Perform standardization of secondary standard solutions.
	BP108P_CO3	Determine percentage purity of given pharmaceutical drugs..
	BP108P_CO4	Determine normality of a solution by electro-analytical methods.
	BP108P_CO5	Identify the impurity in Pharmaceuticals by limit test.
	BP108P_CO6	Explain the concept of Normality, Molarity, mEq, Percent Concentration etc.

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BP109P Pharmaceutics I – Practical	BP109P_CO1	Discuss and use instructions and safety measures for working in laboratory.
	BP109P_CO2	Refer and use various Pharmacopoeias for the formulation of various conventional dosage forms.
	BP109P_CO3	Select and describe the properties of ingredients used in the formulation of various conventional dosage forms.
	BP109P_CO4	Formulate some of the conventional dosage forms.
	BP109P_CO5	Evaluate (preliminary) prepared of the conventional dosage forms.
	BP109P_CO6	Elaborate and prepare label for the preparation of the conventional dosage forms.
BP110P Pharmaceutical Inorganic Chemistry – Practical	BP110P_CO1	Identify the impurities from pharmaceutical substances by performing limit tests.
	BP110P_CO2	Identify the cations and anions present in the inorganic sample through systematic qualitative analysis.
	BP110P_CO3	Perform the tests for purity.
	BP110P_CO4	Prepare the inorganic compounds and understand the chemical reactions.
	BP110P_CO5	Determine the theoretical, practical and percentage yield of inorganic pharmaceutical compounds.
	BP110P_CO6	Recognize the important safety precautions before using hazardous chemicals.
BP111P Communication skills – Practical	BP111P_CO1	Summarize and apply basic communication skills effectively in pharmacy profession.
	BP111P_CO2	Utilize various types of pronunciations in pharmacy practice.
	BP111P_CO3	Compare verbal and nonverbal communications.
	BP111P_CO4	Build effective skills of writing letters, E-mails with etiquettes.
	BP111P_CO5	Adapt sufficient interview skills essential for professional development.
	BP111P_CO6	Show effective presentations in front of professionals.

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BP112RBP Remedial Biology – Practical	BP112RBP_CO1	Discuss the parts of microscope ,section cutting techniques ,mounting and staining ,permanent slide preparation
	BP112RBP_CO2	Describe the cell ,stem , root, leaf ,seed ,fruit, flower and their modifications
	BP112RBP_CO3	Explain the computer models for study of frog
	BP112RBP_CO4	Explain the microscopic evaluation and identification features of tissues of different parts of plant
	BP112RBP_CO5	Determine the blood group, blood pressure ,total volume
	BP112RBP_CO6	Discuss the parts of microscope ,section cutting techniques ,mounting and staining ,permanent slide preparation
B. Pharm I (Semester-II)		
BP201T Human Anatomy and Physiology II – Theory	BP201T_CO1	Discuss the anatomy and physiology of Central Nervous system.
	BP201T_CO2	Discuss the anatomy and physiology of respiratory system and urinary system.
	BP201T_CO3	Describe the anatomy and physiology of endocrine glands and explain the role of each hormone.
	BP201T_CO4	Outline the anatomy and physiology of male and female reproductive system.
	BP201T_CO5	Describe the anatomy and coordination of different organs of digestive system.
	BP201T_CO6	Explain the energetics and genetics.
BP202T Pharmaceutical Organic Chemistry I – Theory	BP202T_CO1	Differentiate organic compounds based on their functionalities.
	BP202T_CO2	Propose methods for preparing specific compounds using smaller compounds based on their chemical properties.
	BP202T_CO3	Discuss possible applications of physical, chemical properties of organic compounds for qualitative and quantitative analysis.
	BP202T_CO4	Describe methodologies and mechanisms for adding small molecules across unsaturated compounds.
	BP202T_CO5	Explain methods for introducing unsaturation in an organic compound.
	BP202T_CO6	Suggest possible applications of physical, chemical properties of organic compounds for commercial and medicinal purposes.

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BP203T Biochemistry – Theory	BP203T_CO1	Define, classify and write the structures of various classes of amino acids, proteins, nucleic acids and their role in biological functions.
	BP203T_CO2	Explain biosynthesis and metabolism of proteins.
	BP203T_CO3	Discuss the role of nucleic acid in biosynthesis of proteins.
	BP203T_CO4	Elaborate enzymes, their role in catalytic reactions including kinetics.
	BP203T_CO5	Explain electron transport chain and oxidative phosphorylation associated with living cells.
	BP203T_CO6	Define, classify and write the structures of various classes of amino acids, proteins, nucleic acids and their role in biological functions.
BP204T Pathophysiology – Theory	BP203T_CO1	Explain the basics of cell injury, inflammation and tissue repair.
	BP203T_CO2	Discuss the etio-pathogenesis, clinical manifestations and complications of Cardiovascular, respiratory, renal, endocrine, nervous, haematological and gastrointestinal disorders.
	BP203T_CO3	Explain the diseases of musculoskeletal system.
	BP203T_CO4	Describe the etio-pathogenesis of infectious diseases and sexually transmitted diseases.
	BP203T_CO5	Describe the etiopathogenesis of Cancer.
	BP203T_CO6	Discuss the etio-pathogenesis of inflammatory bowel diseases and liver diseases.
BP205T Computer Applications in Pharmacy – Theory	BP205T_CO1	Discuss various Number systems used in computer and calculate their inter conversion.
	BP205T_CO2	Describe various information systems and outline their flow diagrams.
	BP205T_CO3	Recall the knowledge of web technologies, databases and demonstrate their applications in pharmacy.
	BP205T_CO4	Apply the knowledge to select proper software to carry out various operations in pharmacy.
	BP205T_CO5	Explain the importance of bioinformatics in drug development and vaccine discovery.
	BP205T_CO6	Explain the use of computer for data analysis in preclinical evaluation.

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BP206T Environmental sciences – Theory*	BP206T_CO1	Discuss the mechanism of functioning of the ecosystem.
	BP206T_CO2	Explain how the environment influences us in all dimensions of life.
	BP206T_CO3	Discuss methodologies of conserving natural resources and to find alternative renewable sources.
	BP206T_CO4	Explain the interrelationships of components of the ecosystem.
	BP206T_CO5	Describe sources of ecological system.
	BP206T_CO6	Suggest methods for preventing pollution.
BP207P Human Anatomy and Physiology II – Practical	BP207P_CO1	Discuss and perform the different general neurological examinations.
	BP207P_CO2	Measure and interpret the body temperature and basal mass index.
	BP207P_CO3	Assess the physiological data of different respiratory volumes.
	BP207P_CO4	Discuss health counseling and family planning for community.
	BP207P_CO5	Describe the integumentary and special senses using specimen, models, etc.
	BP207P_CO6	Explain the nervous system and endocrine system using specimen, models, etc.
BP208P Pharmaceutical Organic Chemistry I– Practical	BP208P_CO1	Handle, store, and dispose chemicals and glassware as per norms.
	BP208P_CO2	Identify organic compounds through systematic qualitative analysis.
	BP208P_CO3	Prepare complex organic compounds using smaller ones based on known chemical reactions,
	BP208P_CO4	Read observations of experiments properly and record the same in a specified manner.
	BP208P_CO5	Interpret results and make conclusions.
	BP208P_CO6	Prepare models of organic compounds using molecular model kit and recognize the importance of structure and its relation to bond angle, length, shape, molecular volume and thereby its properties.

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BP209P Biochemistry – Practical	BP209P_CO1	Analyze qualitatively the given sample of protein.
	BP209P_CO2	Discuss significance of reagents used in protein analysis.
	BP209P_CO3	Propose Isolation of casein and perform the qualitative test.
	BP209P_CO4	Analyze quantitatively the given sample of protein from biological fluid.
	BP209P_CO5	Make use of observations, interpret results and draw conclusion.
BP210P Computer Applications in Pharmacy – Practical	BP210P_CO1	Explain the various Applications of Computer in Pharmacy
	BP210P_CO2	Create the HTML Web Page mailing labels using label wizards
	BP210P_CO3	Utilize the knowledge of designing the questionnaires' and retrieve the information of drug using online tool
	BP210P_CO4	Analyse the data base, Invoice table, queries, design a form and generating labels in MS Access.
	BP210P_CO5	Describe the generating report and printing the report from patient database
	BP210P_CO6	Demonstrate the export tables, queries, forms report to the web and XML page.
B. Pharm II (Semester-III)		
BP301T Pharmaceutical Organic Chemistry II – Theory	BP301T_CO1	Outline chemical, physicochemical properties of chemical compounds belonging to: phenols, amines, arenes, PAHs, carboxylic acids and their derivatives.
	BP301T_CO2	Describe the strategies and approaches used to determine the structure, stability of arenes and cycloalkanes.
	BP301T_CO3	Elaborate how chemical properties / physical constants of molecules can be used for evaluating their purity and quality.
	BP301T_CO4	Compare the stability and reactivity of benzene, polynuclear hydrocarbons and their derivatives.
	BP301T_CO5	Discuss mechanism; types; factors influencing and applications of EAS.
	BP301T_CO6	Elaborate on mechanism; uses and application of diazotization reaction.

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BP302T Physical Pharmaceutics I – Theory	BP302T_CO1	Explain the various physicochemical properties of drug molecules in the designing the dosage forms.
	BP302T_CO2	Explain the states of matter, its properties and applications in pharmaceuticals.
	BP302T_CO3	Utilize the concept of surface tension and interfacial tension in the formulation of liquid and semisolid dosage forms.
	BP302T_CO4	Explain the concept and applications of complexation and protein binding.
	BP302T_CO5	Apply the principles of pH, buffers and isotonic buffers.
	BP302T_CO6	Solve the numerical problems related to course content.
BP303T Pharmaceutical Microbiology – Theory	BP303T_CO1	Explain the basics of Microbiology
	BP303T_CO2	Categorize microorganism into bacteria, actinomycetes, yeast and fungi, rickettsia and viruses.
	BP303T_CO3	Discuss methods of identification, cultivation and preservation of various microorganisms.
	BP303T_CO4	Explain characteristics, clinical significance and applications of Yeast, Fungi and Rickettsia in pharmacy.
	BP303T_CO5	Use various methods of sterilization and disinfection in Microbiology and Pharmaceutical industry.
	BP303T_CO6	Recall the fundamentals of Immunology
BP304T Pharmaceutical Engineering – Theory	BP304T_CO1	Explain various unit operations used in Pharmaceutical industries.
	BP304T_CO2	Describe the properties of material used in pharmaceutical industry correlate with its handling techniques.
	BP304T_CO3	Illustrate the mechanics of fluid, fluid flow and its measurement in accordance with statics & movement of fluids.
	BP304T_CO4	Perform various processes involved in pharmaceutical manufacturing process.
	BP304T_CO5	Appreciate the various preventive methods used for corrosion control in Pharmaceutical industries.
	BP304T_CO6	Apply basic principles including description of equipment and accessories involved in unit operations of crystallization, evaporation, distillation and refrigeration.

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BP305P Pharmaceutical Organic Chemistry II – Practical	BP305P_CO1	Use general equipment's in the organic chemistry laboratory, including the fume-hood to carry out an organic reaction.
	BP305P_CO2	Recognize the importance and the use of personnel and general safety measures to be followed while handling, storing and disposing chemicals and glass ware.
	BP305P_CO3	Plan, extend and execute methods of preparing compounds. Choose a method based on the yield, safety measures needed, ease, economy and possible impurities in the product.
	BP305P_CO4	Plan, extend and execute GREEN methods of preparing compounds. Choose a method based on the yield, safety measures needed, ease, economy and possible impurities in the product.
	BP305P_CO5	Discuss the reactions involved, principle, theory and mechanism involved in the preparation /analysis of a compound.
	BP305P_CO6	Record, interpret the observations and document the same in a suitable format.
BP306P Physical Pharmaceutics I – Practical	BP306P_CO1	Utilize the skills to operate laboratory instruments used in the determination of various physical properties.
	BP306P_CO2	Determine the physicochemical properties of liquids like, surface tension, PKa, solubility etc.
	BP306P_CO3	Estimate the partition coefficient and discuss its significance.
	BP306P_CO4	Determine Freundlich and Langmuir constants by using activated charcoal.
	BP306P_CO5	Estimate the hydrophilic lipophilic balance (HLB) value and critical micelle concentration (CMC) of the surfactants.
	BP306P_CO6	Determine stability constant and donor acceptor ratio of different complexes by solubility and pH titration method.
BP307P Pharmaceutical Microbiology – Practical	BP307P_CO1	Operate and handle different laboratory equipment.
	BP307P_CO2	Prepare and standardize nutrient broth, agar slants and plates.
	BP307P_CO3	Apply practical skills for inoculation and isolation of microorganisms
	BP307P_CO4	Differentiate various types of Bacteria by staining techniques.
	BP307P_CO5	Estimate potency of antibiotics by various microbial assay.
	BP307P_CO6	Perform stability test of water for injection.

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BP308P Pharmaceutical Engineering – Practical	BP308P_CO1	Explain various unit operations used in Pharmaceutical industries.
	BP308P_CO2	Determine overall heat transfer coefficient.
	BP308P_CO3	Perform size reduction and size separation using suitable equipment's.
	BP308P_CO4	Determine various parameters of distillation, humidity and crystallization.
	BP308P_CO5	Determine rate of drying, filtration and evaporation.
	BP308P_CO6	Utilize the knowledge of various Pharmaceutical unit operations required in manufacturing industries.
B. Pharm II (Semester-IV)		
BP401T Pharmaceutical Organic Chemistry III– Theory	BP401T_CO1	Elaborate on the stereo chemical aspects of organic compounds and stereo chemical reactions.
	BP401T_CO2	Write the nomenclature and classification of heterocyclic compounds.
	BP401T_CO3	Explain the synthesis, reactions of some heterocyclic compounds.
	BP401T_CO4	Discuss the medicinal uses of heterocyclic compounds.
	BP401T_CO5	Describe the relative aromaticity and reactivity of pyrrole, furan and thiophene.
	BP401T_CO6	Discuss the reactions, detailed mechanism and applications for reactions of synthetic importance.
BP402T Medicinal Chemistry I – Theory	BP402T_CO1	Describe the exhibition of drug action and factors influencing drug action.
	BP402T_CO2	Explain the metabolic pathways of drugs.
	BP402T_CO3	Classify the therapeutic agents and outline the synthetic routes for medicinal agents
	BP402T_CO4	Analyse the correlation of structure and biological activity of medicinal agents.
	BP402T_CO5	Discuss the factors influencing the drug metabolism.
	BP402T_CO6	Elaborate the mechanism of action and efficacy of drug.

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BP403T Physical Pharmaceutics II – Theory	BP403T_CO1	Summarize the colloidal dispersion and its properties with its applications in pharmaceuticals.
	BP403T_CO2	Utilize the deformation of solids in understanding pre-formulation study of tablets.
	BP403T_CO3	Illustrate the pharmaceutical applications of micrometric and derived properties of powders in formulation of the solid dosage forms.
	BP403T_CO4	Discuss the dispersed systems emphasizing on theories, types and properties of suspensions and emulsions.
	BP403T_CO5	Explain the concept and significance of drug stability in half life, shelf life determination and accelerated stability study.
	BP403T_CO6	Utilize the knowledge of Rheology for manufacturing of pharmaceutical dosage forms and differentiate between Newtonian and non-Newtonian fluids.
BP404T Pharmacology I – Theory	BP404T_CO1	Discuss the basic principles of pharmacokinetics and pharmacodynamics for safe and effective therapeutic management of drug in patients.
	BP404T_CO2	Discuss the adverse drug reactions, pharmacovigilance, drug interactions, drug discovery and clinical trials.
	BP404T_CO3	Discuss the pharmacology of the drugs acting on autonomic nervous system to restore physiological functions.
	BP404T_CO4	Describe the pharmacology of local anesthetics, neuromuscular blocking agents and skeletal muscle relaxants.
	BP404T_CO5	Explain the pharmacology and pharmacotherapeutics of Central Nervous system disorders.
	BP404T_CO6	Discuss the Pathophysiology and pharmacotherapy of neurodegenerative disorders, myasthenia gravis and glaucoma.
BP405T Pharmacognosy and Phytochemistry I– Theory	BP405T_CO1	Recall the knowledge of historical development and scope of Pharmacognosy.
	BP405T_CO2	Discuss the sources and classification of crude drugs
	BP405T_CO3	Describe the fundamental principles involved in cultivation, collection and processing of crude drugs along with the effect of environmental factors on quality of crude drugs and agricultural techniques used for crop improvement.
	BP405T_CO4	Apply quality control procedures for qualitative, quantitative evaluation and detection of adulteration in crude drugs.
	BP405T_CO5	Summarize the active chemical constituents generally found in medicinal plants.
	BP405T_CO6	Explain the medicinal, commercial benefits of primary metabolite and different plant products.

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BP406P Medicinal Chemistry I – Practical	BP406P_CO1	Explain the principle, reaction and mechanism involved in the synthesis of compounds.
	BP406P_CO2	Synthesize the drugs or intermediates by using processes employed in synthetic chemistry.
	BP406P_CO3	Perform the assay of drugs.
	BP406P_CO4	Determine the impurity present in drug compounds.
	BP406P_CO5	Determine the Partition co-efficient of the drug molecule.
	BP406P_CO6	Determine the physicochemical properties such as molecular weight, Melting Point hydrogen bond donors and acceptors.
BP407P Physical Pharmaceutics II – Practical	BP407P_CO1	Utilize skills to operate laboratory instruments used in the determination of various physical properties.
	BP407P_CO2	Determine the density, viscosity of solvents.
	BP407P_CO3	Measure the particle size of powders by various methods.
	BP407P_CO4	Predict its flow ability and compressibility of granules and powders.
	BP407P_CO5	Determination sedimentation volume with effect of different suspending agent.
	BP407P_CO6	Determination of reaction rate constant first and second order reactions.
BP408P Pharmacology I – Practical	BP408P_CO1	Identify the basics and instruments used in experimental pharmacology.
	BP408P_CO2	Summarize the common laboratory animals and their maintenance as per the Committee for purpose of control and supervision on experimental animals (CPCSEA) guidelines.
	BP408P_CO3	Explain the common laboratory techniques and different routes of drug administration in experimental animals.
	BP408P_CO4	Discuss the effect of hepatic microsomal enzyme inducers and skeletal muscle relaxants by using suitable method.
	BP408P_CO5	Demonstrate the effect of drugs on rabbit eye, ciliary motility of frog's esophagus and locomotor activity by using suitable method.
	BP408P_CO6	Demonstrate the anticonvulsant activity, anxiolytic activity, local anesthetic activity, stereotype and anti-catatonic activity by appropriate methods.

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BP409P Pharmacognosy and Phytochemistry I – Practical	BP409P_CO1	Evaluate the crude drugs by microscopic and chemical examination.
	BP409P_CO2	Identify crude drugs by physical and chemical examination.
	BP409P_CO3	Use the analytical microscopic techniques to determine dimension of starch grains, calcium oxalate crystals and phloem fibres.
	BP409P_CO4	Analyse the leaf constants such as stomatal number, stomatal index, and vein-islet and vein-termination number.
	BP409P_CO5	Develop the basic knowledge of qualitative and quantitative microscopy.
	BP409P_CO6	Use the physicochemical methods for evaluation of crude drugs.
B. Pharm III (Semester-V)		
BP501T Medicinal Chemistry II – Theory	BP501T_CO1	Discuss the development, classification, mechanism of action, uses and adverse effects of antihistaminic, anti-neoplastic, anti-anginal, diuretics, antihypertensive, anti-arrhythmic, anti-hyperlipidaemic, coagulants and anticoagulants, drugs used in congestive heart failure.
	BP501T_CO2	Explain the nomenclature, stereochemistry, metabolism, and classification, mechanism of action, uses and adverse effects of steroids.
	BP501T_CO3	Describe the insulin and its preparations, development, classification, mechanism of action, uses and adverse effects of antidiabetic agents.
	BP501T_CO4	Explain the classification, mechanism of action, uses and adverse effects of thyroid and anti-thyroid, local anesthetic agents.
	BP501T_CO5	Write the SAR of different class of drugs.
	BP501T_CO6	Outline the synthesis of selected drugs.
BP502T Industrial Pharmacy -I– Theory	BP502T_CO1	Explain the concept, types, pharmacopoeial specifications, manufacturing techniques, equipment and evaluation of non-sterile pharmaceutical formulations
	BP502T_CO2	Outline the sterile techniques used in pharmaceutical industry to develop sterile Dosage forms.
	BP502T_CO3	Apply the basic knowledge of pre-formulation parameters for the development of new formulations.
	BP502T_CO4	Apply the evaluation and packaging skills for different forms of pharmaceutical dosage forms.
	BP502T_CO5	Design the cosmetics for different parts of body.
	BP502T_CO6	Discuss the preparation and evaluation of Aerosol.

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BP503T Pharmacology II – Theory	BP503T_CO1	Discuss the etio-pathogenesis and pharmacology of cardiovascular diseases.
	BP503T_CO2	Discuss the hematinics, coagulants, anticoagulants, fibrinolytics, anti-platelet drugs, plasma volume expanders and drug used in therapy of shock.
	BP503T_CO3	Discuss the pharmacology of Diuretics.
	BP503T_CO4	Describe the physiological, biochemical and pharmacological role of autocooids and related drugs.
	BP503T_CO5	Describe the pharmacological role of drugs used in endocrine disorders like Pituitary, Thyroid, Pancreas and gonads.
	BP503T_CO6	Explain in detail the concept of bioassay with examples like Insulin, Oxytocin, Vasopressin, ACTH, d-tubocurarine, Digitalis, Histamine and 5-HT.
BP504T Pharmacognosy and Phytochemistry II– Theory	BP504T_CO1	Discuss the biogenesis of different secondary metabolites.
	BP504T_CO2	Discuss the active chemical constituents generally found in medicinal plants.
	BP504T_CO3	Explain the sources, phytochemistry, therapeutic and commercial applications of different secondary metabolites.
	BP504T_CO4	Describe the Isolation and Analysis of Phytoconstituents.
	BP504T_CO5	Explain the Industrial production and utilization of phytoconstituents.
	BP504T_CO6	Describe the modern methods of extraction, isolation and identification of phytoconstituents from crude drugs.
BP505T Pharmaceutical Jurisprudence – Theory	BP505T_CO1	Describe the various laws, regulations, schedules, regulatory authorities and agencies governing import, manufacture, labeling, packaging, sale or distribution of pharmaceuticals under/in Drug and Cosmetic act 1940 and Rules 1945.
	BP505T_CO2	Explain constitution, functions of pharmacy council of India, educational regulations, state and Joint state pharmacy council, registration of pharmacists, offences and penalties in relation to Pharmacy act 1948.
	BP505T_CO3	Discuss the authorities, power of central and state government, offences and penalties to permit, control and regulate the operations related to Narcotic Drugs and Psychotropic Substances.
	BP505T_CO4	Discuss the Drugs Price Control Order 2013, National List of Essential Medicines and classify advertisements, offences, penalties as per Drugs and Magic Remedies Act 1954.
	BP505T_CO5	Describe the animal welfare board of India, experimentation of animal, offences, penalties under prevention of Cruelty to Animals Act 1960 and pharmacy profession in concern to code of ethics.
	BP505T_CO6	Describe in brief about Pharmaceutical Legislations, Intellectual Property Rights and the laws/regulations in relation to Medicinal and Toilet Preparation Act –1955, Medical Termination of Pregnancy Act, Right to Information Act.

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BP506P Industrial Pharmacy -I – Practical	BP506P_CO1	Revise and apply the basic knowledge of Pre-formulation parameters for the development of new formulations.
	BP506P_CO2	Prepare the manufacturing record sheets
	BP506P_CO3	Summarize the official requirements and components for different types of Parenteral.
	BP506P_CO4	Formulate and evaluate different sterile products
	BP506P_CO5	Design different types of non-sterile dosage forms
	BP506P_CO6	Select the suitable ingredients, equipment, and packaging materials and manufacture cosmetic preparations.
BP507P Pharmacology II – Practical	BP507P_CO1	Describe the different physiological salt solutions and in-vitro pharmacological experiments.
	BP507P_CO2	Discuss the effect of different drugs and ions on isolated frog heart and on blood pressure and heart rate of dog.
	BP507P_CO3	Demonstrate the bioassay of Acetylcholine, Histamine, Oxytocin and Serotonin using different methods.
	BP507P_CO4	Determine PA ₂ value and PD ₂ value by using suitable muscle preparation.
	BP507P_CO5	Demonstrate the analgesic and anti-inflammatory activity by appropriate methods.
	BP507P_CO6	Explain the effect of diuretics, spasmogens and spasmolytics using suitable method.
BP508P Pharmacognosy and Phytochemistry II – Practical	BP508P_CO1	Evaluate the crude drugs by morphological and microscopic methods.
	BP508P_CO2	Identify the crude drugs by microscopic powder characteristic examination.
	BP508P_CO3	Discuss the isolation and detection of active chemical constituents from crude drugs.
	BP508P_CO4	Apply the basic chromatographic techniques for isolation of phytoconstituents.
	BP508P_CO5	Discuss the extraction of volatile oils and detection of their constituents.
	BP508P_CO6	Identify the crude drugs by physical and chemical examination.

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B. Pharm III (Semester-VI)

BP601T Medicinal Chemistry III – Theory	BP601T_CO1	Discuss the history, nomenclature, stereochemistry, and chemical degradation, and classification, mechanism of action, uses and adverse effects of antibiotics.
	BP601T_CO2	Explain the basic concepts and application of prodrug design.
	BP601T_CO3	Describe the classification, mechanism of action, uses and adverse effects of antimalarial, antitubercular, urinary tract anti-infective, antiviral, sulphonamides, antifungal, antiprotozoal, anthelmintics agents.
	BP601T_CO4	Discuss the various approaches in drug design and concepts and applications of combinatorial chemistry.
	BP601T_CO5	Explain the SAR of different class of drugs.
	BP601T_CO6	Outline the synthesis of some drugs.
BP602T Pharmacology III – Theory	BP602T_CO1	Describe the Pathophysiology and Pharmacology of drugs used in disorders of Respiratory system.
	BP602T_CO2	Describe the Pathophysiology and Pharmacology of drugs used in disorders of Digestive system.
	BP602T_CO3	Discuss the Classification, Mechanism of action, Pharmacokinetics, Adverse effects, contraindications and uses of Antimicrobial agents.
	BP602T_CO4	Discuss the pharmacology of Antineoplastic agents.
	BP602T_CO5	Explain in detail Immuno-pharmacology.
	BP602T_CO6	Discuss the principles of Toxicology and Chrono-pharmacology.
BP603T Herbal Drug Technology – Theory	BP603T_CO1	Utilize the herbs as source of raw material for herbal medicine.
	BP603T_CO2	Describe the basic principles involved in traditional system of medicine and the methods of preparation and standardization for Ayurveda formulations.
	BP603T_CO3	Discuss the sources and description of raw materials used as herbal excipients in conventional herbal formulation.
	BP603T_CO4	Discuss the benefits of plants based nutraceuticals in prevention of disease.
	BP603T_CO5	Summarize the concept of regulation of herbal medicine in relation to assessment, patenting, and manufacturing.
	BP603T_CO6	Explain the current status and future prospects of herbal industry and GMP in accordance to the herbal drugs.

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BP604T Biopharmaceutics and Pharmacokinetics – Theory	BP604T_CO1	Determine factors affecting drug absorption, bioavailability and bioequivalence
	BP604T_CO2	Describe disposition kinetic models, first order and second order.
	BP604T_CO3	Discuss the importance of bioavailability and bioequivalence
	BP604T_CO4	Interpret plasma drug concentration measurement by the application of compartment model.
	BP604T_CO5	Estimate the Non-linear pharmacokinetics with special reference to its assessment.
	BP604T_CO6	Assess the Biopharmaceutics and Pharmacokinetics and their role in formulation development and clinical setting
BP605T Pharmaceutical Biotechnology – Theory	BP605T_CO1	Elaborate on biotechnology, enzyme technology, biosensors, protein engineering and basic principles of genetic engineering
	BP605T_CO2	Explain the rDNA technology, genetic engineering and applications in relation to production of pharmaceuticals.
	BP605T_CO3	Describe the immunology, general method of the preparation of products related to immunity and hybridoma technology.
	BP605T_CO4	Discuss the collection, processing and storage of blood products.
	BP605T_CO5	Explain the immunoblotting techniques, microbial genetics and mutation.
	BP605T_CO6	Utilize the knowledge of fermentation methods and production of various pharmaceutical products.
BP606T Quality Assurance – Theory	BP606T_CO1	Discuss concept of quality assurance, GMP, TQM, ICH, NABL, QbD and ISO.
	BP606T_CO2	Explain the quality control test for container, rubber, closures packing material.
	BP606T_CO3	Describe the master plan and calibration of PH meter and UV spectrophotometer.
	BP606T_CO4	Describe the various complaints and evaluation of complaints, good return recalling the product.
	BP606T_CO5	Discuss the training program with respects to personal record, sterile and equipment selection
	BP606T_CO6	Explain the principle quality audits, master formula records, SOP, quality documents and quality review.

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BP607P Medicinal Chemistry- III – Practical	BP607P_CO1	Explain the principle, reaction and mechanism involved in the synthesis of compounds.
	BP607P_CO2	Synthesize the drugs or intermediates by using processes employed in synthetic chemistry.
	BP607P_CO3	Perform the assay of drugs.
	BP607P_CO4	Prepare compounds or intermediates by Microwave irradiation technique.
	BP607P_CO5	Draw the structures and reactions using chem draw
	BP607P_CO6	Determine the physicochemical properties such as log P, c log P, MR, molecular weight, hydrogen bond donors and acceptors using drug design software.
BP608P Pharmacology - III – Practical	BP608P_CO1	Calculate the dose, pharmacokinetics estimates and acute oral toxicity from a given data.
	BP608P_CO2	Demonstrate the Anti-allergic activity, antiulcer activity, hypoglycemic activity and test for pyrogen by appropriate methods.
	BP608P_CO3	Estimate the serum biochemical parameters by using semi-auto-analyzer/colorimeter.
	BP608P_CO4	Explain the effect of drugs on gastrointestinal system by suitable method.
	BP608P_CO5	Evaluate the acute skin irritation and acute eye irritation by suitable method.
	BP608P_CO6	Perform the bio statistical analysis like Student's T test, Anova, Chi-square test and Wilcoxon Signed Rank test.
BP609P Herbal Drug Technology – Practical	BP609P_CO1	Identify the phytoconstituents of plants by performing phytochemical screening.
	BP609P_CO2	Analyze the herbal formulations as per WHO and ICH guidelines.
	BP609P_CO3	Evaluate the excipients of natural origin
	BP609P_CO4	Prepare and standardized the cosmetics and formulations of herbal origin.
	BP609P_CO5	Use the Pharmacopoeia for analyzing monographs of herbal drug.
	BP609P_CO6	Evaluate the crude drugs by chemical methods

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**B. Pharm IV (Semester-VII)**

BP701T Instrumental Methods of Analysis – Theory	BP701T_CO1	Discuss the role of spectroscopic techniques in qualitative analysis of organic compounds.
	BP701T_CO2	Elaborate where and how spectroscopic techniques could be used for quantitative analysis of materials.
	BP701T_CO3	Illustrate the methodology and the applications of chromatographic, electrophoretic techniques
	BP701T_CO4	Explicate the applications of molecular spectroscopic techniques for quantitative analysis of organic compounds.
	BP701T_CO5	Annotate the role of atomic absorption spectrometry in qualitative and quantitative analysis of organic compounds.
	BP701T_CO6	Describe the application of instrumental chromatographic methods for qualitative and quantitative analysis of pharmaceuticals
BP702T Industrial Pharmacy-II – Theory	BP702T_CO1	Suggest the sequence and modalities for scale up of a manufacturing process involving on API / Formulation.
	BP702T_CO2	Guide /initiate transfer of technology of a manufacturing process with all its component process.
	BP702T_CO3	Implement national regulation related to drug manufacturing and its evaluation in letter and spirit.
	BP702T_CO4	Implement international regulation related to drug manufacturing and its evaluation in letter and spirit.
	BP702T_CO5	Suggest suitable QMS to a client based on type of his activity production /service
	BP702T_CO6	To use an appropriate application for getting permission to start an industry of manufacture /import /sales of pharmaceutical type.
BP703T Pharmacy Practice – Theory	BP703T_CO1	Manage the working functioning of hospital, hospital pharmacy and duties responsibilities of hospital pharmacist professional practice management skills in hospital pharmacies.
	BP703T_CO2	Analyze objective, composition ad functions of Pharmacy and Therapeutic committee and concept of hospital formulary
	BP703T_CO3	Correlate the concept channels of distribution, forms of business organization, drug store management, purchasing and inventory control in retail trade
	BP703T_CO4	Summarize the clinical pharmacy services like obtaining medication history and its significance monitoring drug therapy , detecting and assessing adverse drug reactions interpret selected laboratory results and their significance in patient care
	BP703T_CO5	Correlate the business and professional practice management skills in community pharmacies; do patient counseling and proving drug information., Dispensing of OTC products
	BP703T_CO6	Identify the importance of Handling of Prescription and Investigation Drug Product

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BP704T Novel Drug Delivery System – Theory	BP704T_CO1	Demonstrate the Introduction and scope of Novel Drug Delivery System.
	BP704T_CO2	Differentiate controlled and sustained Drug Delivery System.
	BP704T_CO3	Select the appropriate polymers for the development of Novel Drug Delivery System.
	BP704T_CO4	Explain the various approaches for Novel Drug Delivery System
	BP704T_CO5	Discuss the formulation of Novel Drug Delivery System.
	BP704T_CO6	Describe the evaluation of Novel Drug Delivery System.
BP705P Instrumental Methods of Analysis – Practical	BP705P_CO1	Independently operate various analytical instruments viz: UV-VIS, colorimeter, flame photometer, Fluorimetry, nephelo-turbidometer.
	BP705P_CO2	Perform the assay of various APIs and formulations utilizing various analytical instruments: UV-VIS, colorimeter, flame photometer, Fluorimetry, nephelo-turbidometer as per Pharmacopoeial standards.
	BP705P_CO3	Perform separation of different components like amino acids, sugars, plant pigments using chromatographic techniques like: Paper, TLC, column chromatography.
	BP705P_CO4	Explain the working, validation by demonstration experiment for HPLC and Gas chromatography.
	BP705P_CO5	Take appropriate safety measures while handling instruments, chemicals and apparatus.
	BP705P_CO6	Independently operate various analytical instruments viz: UV-VIS, colorimeter, flame photometer, Fluorimetry, nephelo-turbidometer.
BP706PS Practice School*	BP706P_CO1	Identify a relevant, manageable scientific problem, for working out. Fix objectives for the research work.
	BP706P_CO2	Collect information about the problem from primary, secondary and internet sources, process and use it appropriately.
	BP706P_CO3	Plan, execute experiments and obtain reliable results.
	BP706P_CO4	Collect process and document data in appropriate formats.
	BP706P_CO5	Analyse, interpret and present results, if necessary using statistical and graphical tools.
	BP706P_CO6	Publish present results in an open forum and defend the same.

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B. Pharm IV (Semester-VIII)

BP801T Biostatistics and Research Methodology- Theory	BP801T_CO1	Discuss the techniques in statistics and research methodology, design of experiment
	BP801T_CO2	Illustrate the various ways to interpret and present the collected data.
	BP801T_CO3	Describe the appropriate statistical methods required for particular research design and data.
	BP801T_CO4	Develop the ability to apply methods of statistic and research methodology While working on research project work.
	BP801T_CO5	Demonstrate the operation of M.S Excel, SPSS R and MINITAB
	BP801T_CO6	Elaborate design and analysis of experiments and response surface methodology.
BP802T Social and Preventive Pharmacy- Theory	BP802T_CO1	Discuss the concept of Health and Disease
	BP802T_CO2	Explain the role of food, sociocultural factors and hygiene on health.
	BP802T_CO3	Describe the general principles of prevention and control of Communicable Diseases.
	BP802T_CO4	Describe the general principles of prevention and control of Non-communicable Diseases
	BP802T_CO5	Discuss the objectives, functioning and outcome of National Health Programmes.
	BP802T_CO6	Explain the role of Community services in rural, urban and school health.
BP805ET Pharmaco- vigilance	BP805ET_CO1	Explain importance of drug safety monitoring.
	BP805ET_CO2	Discuss History, development, National and international scenario of pharmacovigilance & comprehend dictionaries, coding and terminologies Used in pharmacovigilance.
	BP805ET_CO3	Summarize detection and assessment of new adverse drug reactions, Adverse drug reaction reporting systems and communication in pharmacovigilance, Pharmacovigilance Program of India [PvPI] requirement for ADR reporting in India, ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning, CIOMS requirements for ADR reporting
	BP805ET_CO4	Comprehend methods of safety data during pre-clinical, clinical and post Approval phases of drugs' life cycle.
	BP805ET_CO5	Elaborate case narratives of adverse events and their quality.

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BP809ET Cosmetic Science- Theory	BP809ET_CO1	Explain the physiological consideration of skin, hair and oral cavity with respect to cosmetic appliances.
	BP809ET_CO2	Access the composition of cosmetic product required for appropriate cosmetics treatment.
	BP809ET_CO3	Discuss the basics of sun protection and formulations of sunscreen, antiperspirants and deodorants.
	BP809ET_CO4	Elaborate the role of herbal cosmetics on hair, skin and oral care.
	BP809ET_CO5	Apply the evaluation and analytical skills for different forms of cosmetics.
	BP809ET_CO6	Discuss the cosmetic problems associated with skin and hair.
BP813PW Project Work	BP813PW_CO1	Identify a relevant, manageable scientific problem, for working out. Fix objectives for the research work.
	BP813PW_CO2	Collect information about the problem from primary, secondary and internet sources, process and use it appropriately.
	BP813PW_CO3	Plan, execute experiments and obtain reliable results.
	BP813PW_CO4	Collect process and document data in appropriate formats.
	BP813PW_CO5	Analyse, interpret and present results, if necessary using statistical and graphical tools.
	BP813PW_CO6	Publish present results in an open forum and defend the same.