



AISSMS

COLLEGE OF PHARMACY

IMPARTING EXCELLENCE IN EDUCATION & RESEARCH



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B-PHARM FIRST YEAR SEM I

BP101T Human Anatomy and Physiology I– Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Explain the gross morphology, structure and functions of cell and different tissues
CO2	Illustrate the various homeostatic mechanisms and their imbalances.
CO3	Enlist the features and functions of skeletal system and joints
CO4	Explain body fluid composition, structure and functions blood cells
CO5	Classify and explain peripheral nervous system. Illustrate spinal and cranial nerves and special senses
CO6	Explain the anatomy and physiology of cardiovascular system

BP102T Pharmaceutical Analysis I – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Explain and classify the methods, errors and techniques of volumetric analysis.
CO2	Discuss theoretical considerations of aqueous and non-aqueous acid base titrations.
CO3	Explain different methods & principles of precipitation, complexometric titrations and gravimetric analysis.
CO4	Understand the basic concepts of redox titration.
CO5	Describe and classify different electrodes used in electrochemical methods of analysis and refractometry.

BP103T Pharmaceutics I – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Illustrate the history of profession of pharmacy, basic introduction of different dosage form, identification and analyzing the professional way of handling the prescription and posology concept to determine the dose of drug based on different factors for to understand the pharmacy

CO2	Select learning different concept of weighing and measuring pharmaceuticals calculation, pharmaceuticals powders or mixtures and liquid dosage form intended to used internally & externally,
CO3	Make use of preparation of monophasic and biphasic liquid formulation preparation
CO4	Inspect Semisolid Suppositories preparation, evaluation and learn associated various pharmaceutical incompatibility in formulation.
CO5	Recommend different excipient used in semisolid formulation and understand mechanisms associated influencing factors for penetration of drug and develop different semisolid dosage form

BP 104 Pharmaceutical Inorganic Chemistry – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Know about pharmacopoeias and learn impurity identification
CO2	Describe buffers for analytical and pharmaceutical purposes , explain major extra and intracellular electrolytes and dental products
CO3	Explain buffers for analytical and pharmaceutical purposes using the knowledge of dissociation constant, buffer capacity, NaCl equivalence and freezing point depression and pharmacopeia.
CO4	Explain basic understanding of GIT disease formation and mechanism of action of gastro intestinal agents inorganic drugs.
CO5	Discuss disease aetiology and properties of inorganic compound and mechanism of drug action for expectorants, emetics, haematinics, antidotes and astringents
CO6	Explain and apply radiopharmaceuticals

BP105T Communication skills – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Develop the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation
CO2	Adapt communicating effectively Verbal as well Non Verbal
CO3	Build the qualities to effectively manage the team as a team player
CO4	Develop interview skills
CO5	Develop Leadership qualities and essentials

BP106RMT Remedial Mathematics – Theory*

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Demonstrate the theory and their application in Pharmacy
CO2	Solve the different types of problems by applying theory
CO3	Appraise the important application of mathematics in Pharmacy
CO4	Outline the Partial fraction, Logarithm, matrices and Determinant, Analytical geometry
CO5	Estimate, differential equation and Laplace transform

BP106RBT Remedial Biology

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Explain the classification and salient features of five kingdoms of life. Monera, Protista, Fungi, Animalia and Plantae, Virus
CO2	Elaborate the basic components of anatomy & physiology of plant
CO3	Elaborate the basic components of anatomy & physiology of animal with special reference to human.
CO4	Explain about plant tissues, photosynthesis process, respiration process of plants and plant growth.
CO5	Explain about cell organelles and tissues in human body.

BP107P Human Anatomy and Physiology – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Relate concept of the Human Anatomy physiology
CO2	Adapt knowledge about Human anatomy and Physiology
CO3	Analyze the physiological processes discussed in theory classes through experiments on living tissue
CO4	Examine the physiological processes discussed in theory classes through experiments on human beings
CO5	Identify Human skeletal system, Summarize knowledge about skeletal system.
CO6	Apply knowledge about Human Systems

BP108P Pharmaceutical Analysis I – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
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CO1	Prepare and determine normality of various secondary solutions.
CO2	Perform and Calculate percentage purity of some compounds (Assay).
CO3	Calibrate conductometer, potentiometer & determine normality by electroanalytical methods.
CO4	Calibrate refractometer and evaluate refractive index of different samples

BP109P Pharmaceutics I – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Tell acquired skill for preparation of monophasic liquid preparation of syrup, elixer, linctus, solution
CO2	Classify biphasic liquid preparation and understand intended use internal and external preparation of emulsion
CO3	Make use of powder and granules for various therapeutic and general use in preparation
CO4	Categorize semisolid preparation and acquired skill for preparation of gel, ointment and learn technique suppository preparation using different bases
CO5	Compare Mouthwash and Gargles preparation for oral cavity preparation

BP110P Pharmaceutical Inorganic Chemistry – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Find impurities present in pharmaceutical compounds
CO2	Identify the given sample of pharmaceuticals by carrying out identification tests
CO3	Estimate the Swelling power, Acid neutralizing capacity of inorganic pharmaceuticals
CO4	Prepare medicinally important inorganic compounds

BP111P Communication skills – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	outline basic communication
CO2	summarize pronunciation and nouns
CO3	identify the characteristics of Listening and Comprehending
CO4	outline the structure of an Interview and its Handling Skills

CO5	explain the Presentation Skills
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BP112RBP Remedial Biology – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Study and explain about microscope its parts and working. Perform section cutting and permanent slide preparation.
CO2	Perform microscopic study and identification of various plant tissues and cell organelles.
CO3	Experiment with computer model of frog for detailed study.
CO4	Apply knowledge for identification of bones
CO5	Measure blood pressure and tial volume and determine blood group.

B-PHARM FIRST YEAR SEM II

BP201T Human Anatomy and Physiology II – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Explain the gross morphology, structure, and functions of various organs of the human body
CO2	Describe the various homeostatic mechanisms and their imbalances
CO3	Identify the various tissues and organs of different systems of human body
CO4	Appreciate coordinated working pattern of different organs of each system
CO5	Appreciate the inter linked mechanisms in the maintenance of normal functioning(homeostasis)of human body

BP202T Pharmaceutical Organic Chemistry I – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Understand and explain Basic Principles of Organic Chemistry
CO2	Classify of organic compounds, To understand and apply IUPAC nomenclature rules for naming organic compoundse and to draw structure
CO3	Discuss Preparation methods of of Alkanes, Alkenes and Conjugated dienes , To study reactions and uses of Alkanes, Alkenes and Conjugated dienes
CO4	Explain preparation methods, reactions, qualitative tests and uses of Alkyl halide and Alcohol compounds
CO5	Explain Preparation methods, reactions, qualitative tests and uses of Carbonyl

	compound
CO6	Explain Preparation methods, reactions, qualitative tests for carboxylic acids and amines. Compare acidity of Carboxylic acid and basicity of Aliphatic amines

BP203T Biochemistry – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Describe the importance of nutrient molecules in physiological and pathological conditions alongwith the numerous metabolic cycles of carbohydrates.
CO2	Elaborate and classify importance of biological oxidation and bioenergetics.
CO3	Discuss and outline different metabolic pathways and its disorders of bio molecules viz., lipids, amino acids, proteins.
CO4	Illustrate the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins with metabolic pathways.
CO5	Explain and classify the catalytic role of enzymes and importance of enzyme in biochemical process.

BP204T Pathophysiology – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Outline Basic principles of Cell injury and Adaptation, mechanism involved in the process of inflammation and repair
CO2	Classify various cardiovascular, respiratory and renal diseases and interpret its pathophysiology
CO3	Illustrate pathophysiology of Haematological Diseases, Endocrine Diseases
CO4	Explain pathophysiology of Nervous system diseases and gastrointestinal diseases
CO5	Outline pathophysiology of Cancer, Diseases of bones and joints
CO6	Illustrate pathophysiology of Infectious diseases and Sexually transmitted diseases

BP205T Computer Applications in Pharmacy – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Use the Appropriate method on Number system to solve the given problem.
CO2	Apply the various tags in Web Technology to design a program.
CO3	Use the appropriate system and application of computers in pharmacy.
CO4	Apply the concepts of Bioinformatics in pharmacy.

BP206T Environmental sciences – Theory *

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Create the awareness about environmental problems among learners and impart basic knowledge about the environment and its allied problems.
CO2	Develop an attitude of concern for the environment and motivate learner to participate in environment protection and environment improvement.
CO3	Acquire skills to help the concerned individuals in identifying and solving environmental problems and strive to attain harmony with Nature

BP207P Human Anatomy and Physiology II –Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Relate concept of the Human Anatomy physiology
CO2	Analyze the physiological processes discussed in theory classes through experimentson living tissue
CO3	Adapt knowledge about Human anatomy and Physiology
CO4	Examine the Human Body System through the Model and Chart
CO5	Analyze the physiological processes discussed in theory classes through experimentson Human beings
CO6	Apply knowledge about Human Systems

BP208P Pharmaceutical Organic Chemistry I– Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	understand Basic Safety measures in an organic laboratory
CO2	apply basic laboratory techniques: Calibration of thermometer,melting point, boiling point, distillation, and crystallization
CO3	perform Systematic qualitative analysis and analyze of unknown organic compounds
CO4	prepare derivetives for various organic compound functional groups
CO5	demonstrate Building of molecular models of structures containing various functional groups

BP209P Biochemistry – Practical

CO number	Course Outcomes-Upon completion of course students will be able to
CO1	identify carbohydrates, amino acids and proteins
CO2	test for abnormal constituents in urine
CO3	analyze quantitatively blood sugar, cholesterol, creatinine and proteins
CO4	measure the pH of the prepared buffer solution
CO5	demonstrate salivary amylase activity under various conditions

BP210P Computer Applications in Pharmacy – Practical*

CO number	Course Outcomes-Upon completion of course students will be able to
CO1	Use the appropriate tags and design web technology program.
CO2	Design and implement database using MS Access.
CO3	Generate and print reports on database.
CO4	Exporting Tables, Queries, Forms and Reports to web pages and XML pages.

B-PHARM SECOND YEAR SEM III**BP301T Pharmaceutical Organic Chemistry II – Theory**

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Understand chemistry and reactivity of Benzene
CO2	Explain chemistry, synthesis and uses of phenols, amines
CO3	Explain and apply concept of stereochemistry
CO4	Describe reactivity, stability, uses of Polynuclear compounds
CO5	Discuss reactivity, stability of cycloalkanes
CO6	Understand chemistry of Fats and Oils

BP302T Physical Pharmaceutics I – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Elaborate factors affecting solubility of drugs
CO2	Study solid state and distinguish between amorphous and crystalline solids and elucidate physical properties of drugs
CO3	Explain significance of surface and interfacial phenomena

CO4	Describe complexes and their pharmaceutical applications
CO5	Explain about pH and role of buffers in formulations and of biological buffers

BP303T Pharmaceutical Microbiology – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	To describe basic knowledge of bacteria, its structure, cultivation, preservation and microscopy
CO2	To identify few bacteria and methods of microbial control
CO3	To explain the structure and method of replication of viruses and to analyse the methods of sterility testing.
CO4	To assess the antibiotics by invitro microbiological methods and to outline different sources of contamination in an aseptic area
CO5	To explain types of spoilage of pharmaceutical products and its prevention

BP304T Pharmaceutical Engineering – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Discuss Flow of fluids: Classify manometers, Explain Reynolds number and its significance, Bernoulli's theorem and its applications, Energy losses, Orifice meter, Venturimeter, Pilot tube and Rotameter.
CO2	Classify size reduction mills with their construction, working and applications. Classify size separators with their construction, working and applications.
CO3	Discuss the theory of heat transfer. Classify and explain heat exchangers with their construction, working and applications. Classify evaporators with their construction, working and applications
CO4	Discuss the theory of distillation. Classify and explain distillation equipments with their construction, working and applications. Construct McCabe Thiele's curve. Discuss the theory of drying. Classify and explain dryers with their construction, working and applications.
CO5	Discuss the theory of Mixing. Classify and explain mixers with their construction, working and applications. Discuss the theory of filtration. Classify and explain filtration equipments with their construction, working and applications.
CO6	Discuss the theory of centrifugation. Classify and explain centrifuges with their construction, working and applications. Classify and explain Materials of pharmaceutical plant construction. Classify and explain Corrosion and its prevention.

BP305P Pharmaceutical Organic Chemistry II – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Apply recrystallisation and distillation techniques
CO2	Perform and analyse Binary mixture separation
CO3	Estimate the Saponification value
CO4	Prepare synthetic compounds

BP306P Physical Pharmaceutics I – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Perform solubility analysis, evaluate factors affecting solubility, study thermodynamics, explain concept of partition coefficient
CO2	Evaluate physicochemical properties of drug like pKa and refractive index
CO3	Apply knowledge of interfacial properties in dosage design
CO4	Measure properties of complexes

BP307P Pharmaceutical Microbiology – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	apply usage of equipments in microbiology lab for sterilization of material
CO2	distinguish the morphology of different organisms by microscopy
CO3	analyze various antibiotics for their microbiological efficacy
CO4	inspect the microbiological quality of sterile products
CO5	examine the microbiological quality of water
CO6	identify a microorganism by biochemical test.

BP 308P Pharmaceutical Engineering –Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Construction of drying curves (for calcium carbonate and starch),Determination of moisture content and loss on drying.
CO2	Determination of humidity of air - i) From wet and dry bulb temperatures -use of Dew point method, and critical speed of Ball Mill
CO3	To describe Construction, working and application of any two Pharmaceutical Machinery such as Rotary tablet Machine, capsule filling machine, tablet coating machine, autoclave, oven and dehumidifier.Demonstration of any two equipments such as colloid mill, planetary mixer, fluidized bed dryer, Spray dryer

	Laminar Air Flow, Ball Mill and such other major equipments.
CO4	To study Factors affecting Rate of Filtration and Evaporation (Surface area, Concentration and Thickness/ viscosity).
CO5	To evaluate Size analysis by sieving -To evaluate size distribution of tablet granulations – Construction of various size frequency curves including arithmetic and logarithmic probability plots.

B-PHARM SECOND YEAR SEM IV

BP401T:Pharm.organic chemistry -III

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Discuss reactions of chiral molecules, racemic mixture modification and asymmetric synthesis
CO2	Apply conformational analysis and mechanism of stereochemical reactions
CO3	Understand and apply IUPAC rules to heterocyclic compounds
CO4	Discuss medicinal uses ,synthesis ,chemistry of heterocyclic compounds and their derivatives
CO5	To understand and implement the synthetic name reactions in synthesis

BP402T Medicinal Chemistry I – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Identify Structure, IUPAC and stereochemistry of classes of drugs belonging to CNS, ANS and Analgesic Drugs.
CO2	Describe the MOA of classes of drugs belonging to CNS, ANS and Analgesic Drugs.
CO3	Discuss the SAR of all the classes of CNS, ANS and Analgesic Drugs.
CO4	Understand the schematic metabolic pathway for any given drug.
CO5	Outline the synthesis, chemical reactions of CNS, ANS and Analgesic Drugs.

BP403T Physical Pharmaceutics II – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Understand properties and stability of colloids
CO2	Explain behaviour of liquids and semisolids in response to shear stress and apply knowledge to dosage design

CO3	Formulate suspensions and emulsions along with study of their stability, types, evaluation,preservation and apply the concept of HLB for formulation of emulsions.
CO4	Evaluate properties of solids and apply to design of solid dosage forms
CO5	Distinguish principles of kinetic in stability testing

BP404T Pharmacology I – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Summarize basic Concept of Pharmacology
CO2	Analyze the pharmacological actions of different categories of drugs
CO3	Analyze mechanism of drug action, at organ system/sub cellular/macromolecular levels.
CO4	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases
CO5	Utilize knowledge about Pharmacology ,Adapt knowledge about recent development in pharmacology
CO6	Construct correlation of pharmacology with other bio medical sciences

BP405T Pharmacognosy and Phytochemistry I– Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	To recall the history, scope and development of pharmacognosy with different sources of crude drugs and also classify them accordingly, also evaluate the crude drugs by quantitative and qualitative evaluation methods.
CO2	To illustrate students about cultivation, collection, processing and storage of crude drugs and the applications of advanced technologies like polyploidy, mutation and hybridization in medicinal plants.
CO3	To elaborate the applications of plant tissue culture in medicinal plants.
CO4	To remember different morphological and microscopical characteristic features of crude drugs parts root, leaf, Stem, Flower, Fruits etc and their nature of chemical constituents and distinguish them by Chemical test for different category of crude drugs.

CO5	To plan systematic pharmacognostic study of primary metabolites (carbohydrates, proteins, lipid), marine drugs and teratogens, hallucinogen, natural allergans and fibers
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BP406P Medicinal Chemistry I – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Apply recrystallization and Column Chromatography techniques.
CO2	Utilize TLC for reaction monitoring.
CO3	Prepare drugs and intermediates.
CO4	Estimate Partition coefficient and Ionisation constants.

BP407P Physical Pharmaceutics II – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Examine properties of surfactants and stability of colloids
CO2	Demonstrate rheological properties of liquids and understand liquid behavior
CO3	Evaluate stability of suspensions and emulsions.
CO4	Elaborate powder properties and apply knowledge to dosage design
CO5	Understand kinetics of 1st and 2nd order reactions, study principles of shelf life through accelerated stability studies

BP408P Pharmacology I – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Summarize basic Concept of Pharmacology
CO2	Demonstrate the effect of drugs on animals by using simulated experiments
CO3	Adapt knowledge about recent development in pharmacology
CO4	Relate the in vivo and in vitro experiments, use of software for the study of experiments.
CO5	Examine the effect of drugs on animals by using simulated experiments
CO6	Construct correlation of pharmacology with other bio medical sciences

BP409P Pharmacognosy and Phytochemistry I – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
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CO1	To remember different morphological and microscopical characteristic features of crude drugs.
CO2	To understand the cellular structure of crude drugs.
CO3	To evaluate the crude drugs by quantitative evaluation methods.
CO4	To evaluate the crude drugs by physical methods of evaluation.
CO5	To evaluate the crude drugs by chemical methods of evaluation.

B-PHARM THIRD YEAR SEM V

BP501T Medicinal Chemistry II – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Relate chemistry of drugs to biological activity
CO2	Analyze drug metabolic pathways, adverse effects and therapeutic uses of drugs
CO3	Learn chemical synthesis pathways of drugs
CO4	Classify various enzyme inhibitors as drugs.
CO5	Interpret Structural Activity Relationship of different class of drugs

BP502T Formulative Pharmacy– Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Define preformulation and decide which preformulation studies are required in development of a dosage form.
CO2	Select excipients & formulation procedure; decide equipments, evaluate quality and analyze defects for tablets and liquid oral dosage forms.
CO3	Select excipients & formulation procedure; decide equipments, evaluate quality and analyze defects for capsule and pellet dosage forms.
CO4	Explain & select formulation ingredients, understand production facilities and controls, filling and sealing operations and evaluate quality for various injectables.
CO5	Outline components, types and evaluation of aerosols, formulation of cosmetics and will be able to decide choice of packaging material and perform quality control of packaging material.

BP503T Pharmacology II – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Classify the drugs acting on cardiovascular system . Detail about the mechanism of drug action and its relevance in the treatment of different disease.
CO2	Categories the pharmacology of drugs acting on urinary system and evaluate diuretic activity of drugs and description of drug used in therapy of shock, Anticoagulant, Anti-platelet drugs.
CO3	Elaborate the pharmacology of drugs acting on endocrine system and its relevance in the treatment of different diseases.
CO4	Distinguish the different autacoids' and classified Non steroid anti-inflammatory drug , Anti-gout drug , and Anti rheumatic drugs.
CO5	Appreciate correlation of pharmacology with related medical science. And pharmacology of drugs acting on endocrine system Estrogen , progesterone and oral contraceptive
CO6	Demonstrate and analyses different types of bioassays of different drugs effect.

BP504T Pharmacognosy and Phytochemistry II– Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	illustrate the metabolic pathways in formation of secondary metabolites through biogenetic pathways .
CO2	elaborate application of biogenetic studies through tracer techniques.
CO3	Summarize pharmacognostic profile chemistry & chemical classes and commercial applications of secondary metabolites.
CO4	evaluate Phytoconstituents chemically and Analytically by isolations process
CO5	To utilization methods to produce phytoconstituents industrially.
CO6	To Explain the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents

BP505T Pharmaceutical Jurisprudence – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Relate the significance of Drugs and cosmetics act 1940 and its rules 1945 in relation to import and manufacture of drugs
CO2	Apply the knowledge on schedules pertaining to Drugs and cosmetics act 1940 and its rules 1945 and also administration of the act and rules
CO3	Extend the functions of pharmacy councils and implementation of education regulations in pharmacy and the importance of medicinal and toilet preparations act and narcotic drugs and psychotropic substances act and rules
CO4	Discuss the salient features of drugs and magic remedies act, prevention of cruelty to animals act and drugs price control order.

CO5	Recall the pharmaceutical legislations, ethics, right to information, medical termination of pregnancy and intellectual property rights
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BP506P Formulative Pharmacy – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Examine preformulation studies of Tablet
CO2	Formulate preparation of tablet and evaluate IQAC Test along with its coating
CO3	Formulate preparation of capsule and evaluate QC Test as per IP.
CO4	Utilize technique in preparation of injections and ophthalmic dosage form and determine quality control of glass container as per IP
CO5	Experiment with different types of cream

BP507P Pharmacology II – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Outline to in-vitro pharmacology and demonstrate the effects of drugs on heart and blood pressure by simulated experiments.
CO2	Optimize diuretic activity of drugs. And Show the DRC of acetylcholine.
CO3	Demonstrate the bioassays of different drugs.
CO4	Demonstrate the isolation of different drug from the laboratory animals.
CO5	Demonstrate the Various receptor actions using isolated tissue preparation.
CO6	demonstrate anti inflammatory and analgesic activity.

BP508P Pharmacognosy and Phytochemistry II – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	to demonstrate section cutting and and identify crude drugs in syllabus based on Morphological , Microscopical evaluation
CO2	Isolation & detection of active principles from crude drugs mentioned in syllabus
CO3	To illustrate TLC and Paper Chromatography techniques
CO4	To illustrate isolation of volatile oil from different sources
CO5	To identify crude drugs by performing phytochemical screening

B-PHARM THIRD YEAR SEM VI

BP601T Medicinal Chemistry III – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
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CO1	Relate chemistry of drugs to biological activity
CO2	Discuss SAR of drugs
CO3	Apply chemistry of agonists and antagonists to study their MOA
CO4	Identify and analyze drug metabolic pathways, adverse effect and
CO5	Apply physicochemical parameters in QSAR studies

BP602T Pharmacology III – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Classify drugs acting on Respiratory system and detail about the mechanism of action and its relevance in the treatment and to analyze the pharmacological actions of different categories of drugs
CO2	Classify drugs acting on GIT with respect to mechanism of action and its relevance in the treatment .
CO3	Discuss in detail Chemotherapy in infectious diseases .
CO4	Simplify the principles of toxicology .and treatment of various poisonings and appreciate correlation of pharmacology with related medical sciences
CO5	Elaborate treatment of various poisonings and appreciate correlation of pharmacology with related medical sciences
CO6	Interpret definition of rhythm and cycles. and elaborate biological clock and their significance leading to chronotherapy

BP603T Herbal Drug Technology – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	evaluate TSM formulation
CO2	Evaluation of excipients of natural origin
CO3	develop cosmetic and herbal formulation using standardized extract
CO4	perform Monograph analysis of herbal drugs from recent Pharmacopoeias
CO5	determine various secondary metabolites using analytical method

BP604T Biopharmaceutics and Pharmacokinetics – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Explain the process of drug absorption. Explain factors affecting drug absorption. Discuss distribution, tissue permeability of drugs, binding of drugs, apparent, volume of drug distribution, plasma and tissue protein binding of drugs, factors affecting protein-drug binding. Kinetics of protein binding, Clinical significance of protein binding of drug
CO2	Explain Elimination. Describe drug metabolism. Classify metabolic pathways renal excretion of drugs, interpret and summarize factors affecting renal excretion of drugs, renal clearance, Non renal routes of drug excretion

CO3	Define Bioavailability and bioequivalence Summarize Objectives of bioavailability, explain absolute and relative bioavailability, elaborate measurement of bioavailability, discuss in-vitro drug dissolution models, in-vitro-in-vivo correlations, compare bioequivalence studies, methods to enhance the dissolution rates and bioavailability of poorly soluble drugs
CO4	Definition and introduction to Pharmacokinetics, Explain and classify Compartment models
CO5	Explain Multicompartment models: Two compartment open model. Discuss IV bolus Kinetics of multiple dosing, assess steady state drug levels, determine loading and maintenance doses and their significance.
CO6	Define Nonlinear Pharmacokinetics. Explain Factors causing Non-linearity. Michaelis-menton method of estimating parameters, Explanation with example of drugs.

BP605T Pharmaceutical Biotechnology – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	summarize the methods of immobilization of enzymes and list the application.
CO2	interpret the tools and techniques in genetic engineering and compile the applications
CO3	The students will be able to relate immunological response and outline the methods for production of vaccines and monoclonal antibodies.
CO4	Illustrate the immunoblotting techniques and transfer of genetic material in biological species
CO5	explain the fermentation methods and its application.

BP606T Quality Assurance –Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Define Quality control, Quality assurance and GMP; discuss Regulatory agencies like CDSCO, USFDA, WHO, PIC/S; utilize ICH guidelines; apply TQM and QbD; compare ISO standards and explain NABL accreditation.
CO2	Explain the guidelines of Organization and personnel, premises, select equipments and raw materials; plan and design the plant layout for same.
CO3	Evaluate Quality Control of Packaging material, outline the role of CPCSEA and adapt good laboratory practices.
CO4	Classify Complaints and evaluate the same; and summarize handling of return good, recalling and waste disposal; elaborate on Batch Formula Record, Master Formula Record, SOP, distribution records.

CO5	Distinguish between calibration and validation; apply general principles of calibration, qualification and validation; understand importance and scope of validation; classify validation; list general principles of Analytical method Validation; apply good warehousing practice; and choose materials for its management.
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BP607P Medicinal chemistry III – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Apply skills to synthesize compounds by conventional and Microwave irradiation technique
CO2	Utilize software like Chem draw for drawing of chemical structures and to design reactions.
CO3	Utilize drug design software to analyse physicochemical properties
CO4	Utilize drug design software to analyse ADME properties

BP608P Pharmacology III – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Estimate concentration by using bioassay of serotonin using rat fundus strip by three point bioassay and bioassay of acetylcholine using rat ileum/colon by four point bioassay and Study of mydriatic and miotic effects on rabbit eye.
CO2	Study of effect of drugs on gastrointestinal motility and Study of anti-ulcer activity of a drug using pylorus ligand (SHAY) rat model and NSAIDS induced ulcer model.
CO3	Examine the effects of drugs on animal by simulated experiments and Determine of acute oral toxicity (LD50) of a drug from a given data.
CO4	Experiment with Biostatistics methods in experimental pharmacology(student's t test, ANOVA) ,Biostatistics methods in experimental pharmacology (Chi square test, Wilcoxon Signed Rank test) .
CO5	Determine acute skin irritation of a test substance.
CO6	Determine acute eye irritation of a test substance.

BP609P Herbal Drug Technology – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	To evaluate TSM formulation
CO2	Evaluation of excipients of natural origin
CO3	To develop cosmetic and herbal formulation using standardized extract

CO4	to perform Monograph analysis of herbal drugs from recent Pharmacopoeias
CO5	To determine various secondary metabolites using analytical method

B-PHARM FINAL YEAR SEM VII

BP701T Instrumental Methods of Analysis – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	illustrate the interaction of matter with electromagnetic radiations and justify its applications in drug analysis
CO2	summarize IR spectroscopy & outline atomic spectroscopy
CO3	classify the chromatographic separation methods and explain appropriate technique for analysis of drugs
CO4	categorize column chromatographic techniques and interpret chromatographs
CO5	outline Ion exchange chromatography and Gel Chromatography.

BP702T Industrial Pharmacy – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Outline Pilot plant scale up techniques
CO2	Outline Technology development and transfer:
CO3	Explain Regulatory requirements for drug approval:
CO4	Outline Indian Regulatory Requirements:
CO5	Expalin Quality management systems:

BP703T Pharmacy Practice – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Discuss the role of the Hospital, Hospital pharmacy and Community Pharmacist
CO2	Assessment of Adverse drug reactions and drug interactions
CO3	explain the various drug distribution systems in Hospitals, understand vital aspects of medication adherence, medication history interview and therapeutic drug monitoring.
CO4	Apply principles of good communication for patient counseling and prescription interpretation
CO5	Support drug therapy monitoring of patient through medication chart review and clinical Review.
CO6	Plan the various components required in a Hospital Pharmacy Budget and Drug

	store management
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BP704T Novel Drug Delivery System – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Expalin the Fundamental Concept of controlled Drug delivery systems, Drug Release and Pre requisites of drug candidates, along with various approaches and classification and illustrate the Polymers classification, types, selection, application and examples to apply for development of novel drug delivery systems
CO2	Classify various technologies like concept of microencapsulation, merits, demerits and application, Types of Microencapsulation and Evaluation of microcapsules
CO3	Identify and develop novel drug delivery systems like Mucosal and implantable drug delivery
CO4	Identify and develop novel Systems for delivery by topical route as transdermal drug delivery, oral route as Gastroprotective and pulmonary route as Nasopulmonary
CO5	Apply knowledge of concepts to develop, targeted Drug Delivery systems like liposomes, niosomes, nanaoparticles, and monoclonal antibodies
CO6	Identify and develop devices like intraocular and intrauterine

BP705P Instrumental Methods of Analysis – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	summarize significance of weights and measures in analysis
CO2	demonstrate and apply UV-Vis Spectroscopy in pharmaceutical analysis
CO3	determine quantity of drugs in samples by fluorimetry
CO4	apply chromatographic methods to separate components
CO5	explain, interpret and analyze IR spectrum & outline atomic spectroscopy

BP706PS Practice School*

COURSE CODE/COURSE NAME: BP706 PS:Practice school- CADD

CO1	Understand the design and discovery of leadmolecules
CO2	Perform Literature search
CO3	Discuss concepts of QSAR ,docking,ADMET
CO4	Explore and Demonstrate different softwares used for drug design

BP810ET Experimental Pharmacology

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Relate and interpret the regulations and ethical requirement for the usage of laboratory animals and their handling, drug administration, surgical, blood withdraw and euthanasia techniques
CO2	Recall basic parameters including haematological, biochemical and physiological parameters
CO3	Perform the biochemical assay for estimation of serum glucose, cholesterol etc using appropriate kits
CO4	Understand the basic mechanism involved in free radicals generation and scavenging processes and perform basic assays for free radical scavenging and peroxidation
CO5	Understand the principles of various invitro assays used for screening of metabolic disorders and perform simple assays
CO6	Perform different ex vivo bioassays using chick ileum

BP806 ETQuality control and standardization of Herbals

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	To recall the WHO guidelines for the quality control of herbal drugs.
CO2	To illustrate and outline the quality assurance in traditional system of medicine including cGMP, GAP, GMP and GLP.
CO3	To compare the quality control parameters of drugs according to European union (EU) and ICH guidelines.
CO4	To make use of research guidelines for evaluation of safety and efficiency of herbal medicine.
CO5	To apply the knowledge of chromatography in standardization of herbal drugs and to perform the stability studies.
CO6	To improve the knowledge on regulatory issues for herbal medicine including GMP, WHO guidelines on safety monitoring of herbal medicine in Pharmacovigilance.

BP809ETCosmetic Science

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Define cosmetics and explain cosmetics used for skin hair and oral cavity and illustrate various excipients used in the same
CO2	Application of various excipients in formulating skin, hair and oral care cosmetics
CO3	cosmetic excipients, basic structure, functions and common problems associated with hair
CO4	understand the principles of formulation and building blocks of various hair care products.
CO5	Design and formulate Skin cosmetic and colour cosmetics,
CO6	Elaborate on Regulatory guidelines of Cosmetics

BP706T Pharmaceutical Marketing

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Outline the marketing concepts
CO2	Develop techniques and their applications in the pharmaceutical industry.
CO3	Classify product design, explain product life cycle
CO4	Explain various channels of marketing, describe qualities of a professional service representative
CO5	To identify marketing mix for pharmaceutical products.
CO6	To compare pricing of the pharmaceutical products.

B-PHARM FINAL YEAR SEM VIII

BP801T Biostatistics and Research Methodology

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Solve basic statistical problems with respect to measures of central tendency, dispersion, correlation of data and regression equations
CO2	Describe concepts related to probability, sample, population, hypothesis and error
CO3	Explain the various statistical techniques to solve statistical problems (parametric and non parametric)
CO4	Design experimental/research methodology from preparation of protocol to writing of report
CO5	Summarize the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of experiment)

CO6	Discuss about Factorial design and Response Surface methodology
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BP802T Social and Preventive Pharm

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	Asset high consciousness or realization of current issues related to health and prevent disease and socio problems related health and disease
CO2	How to prevent and control of disease
CO3	Apply National health programs, its objectives, functioning and outcome of the programs
CO4	Discuss different National health programs and current healthcare development
CO5	To Develop a way of thinking based on rural, urban , school helath and any healthcare development.

BP811ET Advanced Instrumentation Techniques

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	express the principle of the advanced instruments like NMR and Mass Spectroscopy and justify its applications in drug analysis
CO2	explain the principles of thermal methods of analysis and its application in analysis of drugs
CO3	explain the importance and methods for the calibration of various analytical instruments
CO4	formulate and justify techniques for the analysis of drugs
CO5	outline significance of hyphenated techniques of analysis

BP812 ET. Dietary Supplements and Nutraceuticals (Theory)

CO Number	Course Outcomes: Upon completion of course students will be able to –
CO1	define, classify and understand the functional foods,Nutraceuticals and dietary supplements.
CO2	remember the sources, chemical nature, medicinal uses and health benefits of Nutraceuticals and functional foods.
CO3	explain basics of free radicals, dietary fibers and carbohydrates
CO4	understand role of free radicals in different diseases and to classify antioxidants.

CO5	Analyse Effect of processing, storage and interactions of various environmental factors on the potential of nutraceuticals and illustrate Regulatory Aspects and and apply Pharmacopoeial Specifications for dietary supplements and nutraceuticals
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