



**AISSMS**  
COLLEGE OF PHARMACY

IMPARTING EXCELLENCE IN EDUCATION & RESEARCH

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## B-PHARM COURSE OUTCOME

### 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 –
<b>BP101T.1K</b>	Explain the gross morphology, structure and functions of cell and different tissues
<b>BP101T.2K</b>	Illustrate the various homeostatic mechanisms and their imbalances.
<b>BP101T.3K</b>	Enlist the features and functions of skeletal system and joints
<b>BP101T.4K</b>	Explain body fluid composition, structure and functions blood cells
<b>BP101T.5K</b>	classify and explain peripheral nervous system. Illustrate spinal and cranial nerves and special senses
<b>BP101T.6K</b>	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 –
<b>BP102T.1 S</b>	Explain and classify the methods, errors and techniques of volumetric analysis.
<b>BP102T.2 S</b>	Discuss theoretical considerations of aqueous and non-aqueous acid base titrations.
<b>BP102T.3 S</b>	Explain different methods & principles of precipitation, complexometric titrations and gravimetric analysis.
<b>BP102T.4 S</b>	Understand the basic concepts of redox titration.
<b>BP102T.5 S</b>	Describe and classify different electrodes used in electrochemical methods of analysis and refractometry.

BP103T Pharmaceutics I – Theory

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP 103T.1K</b>	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
<b>BP 103T.2K</b>	Select learning different concept of weighing and measuring pharmaceuticals calculation, pharmaceuticals powders or mixtures and liquid dosage form intended to used internally & externally,
<b>BP 103T.3K</b>	Make use of preparation of monophasic and biphasic liquid formulation preparation
<b>BP 103T.4K</b>	Inspect Semisolid Suppositories preparation, evaluation and learn associated various pharmaceutical incompatibility in formulation.
<b>BP 103T.5K</b>	Recommend different excipient used in semisolid formulation and understand mechanisms associated influencing factors for penetration of drug and develop different semisolid dosage form

BP104T BP 104 Pharmaceutical Inorganic Chemistry – Theory

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP 104T.1K</b>	Know about pharmacopoeias and learn impurity identification
<b>BP 104T.2K</b>	Describe buffers for analytical and pharmaceutical purposes , explain major extra and intracellular electrolytes and dental products
<b>BP 104T.3K</b>	Explain buffers for analytical and pharmaceutical purposes using the knowledge of dissociation constant, buffer capacity, NaCl equivalence and freezing point depression and pharmacopeia.
<b>BP 104T.4K</b>	Explain basic understanding of GIT disease formation and mechanism of action of gastro intestinal agents inorganic drugs.
<b>BP 104T.5K</b>	Discuss disease etiology and properties of inorganic compound and mechanism of drug action for expectorants, emetics, haematinics, antidotes and astringents
<b>BP 104T.6K</b>	Explain and apply radiopharmaceuticals

BP105T Communication skills – Theory

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP105T.1 K</b>	Develop the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation
<b>BP105T.2 K</b>	Adapt communicating effectively Verbal as well Non Verbal
<b>BP105T.3 K</b>	Build the qualities to effectively manage the team as a team player
<b>BP105T.4 K</b>	Develop interview skills
<b>BP105T.5 K</b>	Develop Leadership qualities and essentials

BP106RMT Remedial Mathematics – Theory\*

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP106RMT.1K</b>	Demonstrate the theory and their application in Pharmacy
<b>BP106RMT.2K</b>	Solve the different types of problems by applying theory
<b>BP106RMT.3K</b>	Appraise the important application of mathematics in Pharmacy
<b>BP106RMT.4K</b>	Outline the Partial fraction, Logarithm, matrices and Determinant, Analytical geometry
<b>BP106RMT.5K</b>	Estimate, differential equation and Laplace transform

BP106RBT Remedial Biology

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP106RBT.1 K</b>	Explain the classification and salient features of five kingdoms of life. Monera, Potista, Fungi, Animalia and Plantae, Virus
<b>BP106RBT.2 K</b>	Elaborate the basic components of anatomy & physiology of plant
<b>BP106RBT.3 K</b>	Elaborate the basic components of anatomy & physiology of animal with special reference to human.
<b>BP106RBT.4 K</b>	Explain about plant tissues, photosynthesis process, respiration process of plants and plant growth.
<b>BP106RBT.5 K</b>	Explain about cell organelles and tissues in human body.

BP107P Human Anatomy and Physiology – Practical

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP 107 P.1S</b>	Relate concept of the Human Anatomy physiology
<b>BP 107 P.2S</b>	Adapt knowledge about Human anatomy and Physiology
<b>BP 107 P.3S</b>	Analyze the physiological processes discussed in theory classes through experiments on living tissue
<b>BP 107 P.4S</b>	Examine the physiological processes discussed in theory classes through experiments on human beings
<b>BP 107 P.5S</b>	Identify Human skeletal system, Summarize knowledge about skeletal system.
<b>BP 107 P.6S</b>	Apply knowledge about Human Systems

BP108P Pharmaceutical Analysis I – Practical

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP108T.1 S</b>	Prepare and determine normality of various secondary solutions.
<b>BP108T.2 S</b>	Perform and Calculate percentage purity of some compounds (Assay).
<b>BP108T.3 S</b>	Calibrate conductometer, potentiometer & determine normality by electro analytical methods.
<b>BP108T.4 S</b>	Calibrate refractometry and evaluate refractive index of different samples

BP109P Pharmaceutics I – Practical

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP109P.1S</b>	Tell acquired skill for preparation of monophasic liquid preparation of syrup, elixer, linctus, solution
<b>BP109P.2S</b>	Classify biphasic liquid preparation and understand intended used internal and external preparation of emulsion
<b>BP109P.3S</b>	Make use of powder and granules for various therapeutic and general use in preparation
<b>BP 109P.4S</b>	Categorize semisolid preparation and acquired skill for preparation of gel, ointment and learn technique suppository preparation using different bases
<b>BP 109P.5S</b>	Compare Mouthwash and Gargles preparation for oral cavity preparation

BP110P Pharmaceutical Inorganic Chemistry – Practical

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP110P.1S</b>	Find impurities present in pharmaceutical compounds
<b>BP110P.2S</b>	Identify the given sample of pharmaceuticals by carrying out identification tests
<b>BP110P.3S</b>	Estimate the Swelling power, Acid neutralizing capacity of inorganic pharmaceuticals
<b>BP110P.4S</b>	prepare medicinally important inorganic compounds

BP111P Communication skills – Practical

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP111P.1S</b>	outline basic communication
<b>BP111P.2S</b>	summarize pronunciation and nouns
<b>BP111P.3S</b>	identify the characteristics of Listening and Comprehending
<b>BP111P.4S</b>	outline the structure of an Interview and its Handling Skills
<b>BP111P.5S</b>	explain the Presentation Skills

BP112RBP Remedial Biology – Practical

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP112RBP.1S</b>	Study and explain about microscope its parts and working. Perform section cutting and permanent slide preparation.
<b>BP112RBP.2S</b>	Perform microscopic study and identification of various plant tissues and cell organelles.
<b>BP112RBP.3S</b>	Experiment with computer model of frog for detailed study.
<b>BP112RBP.4S</b>	Apply knowledge for identification of bones
<b>BP112RBP.5S</b>	Measure blood pressure and trial volume and determine blood group.

**B-PHARM FIRST YEAR SEM II**

BP201T Human Anatomy and Physiology II – Theory

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP 201T T. 1K</b>	Elaborate the pharmacology of drugs acting on endocrine system and its relevance in the treatment of different disease.
<b>BP 201T T. 2K</b>	Justify the significance of chronopharmacology in various diseases.
<b>BP 201T T. 3K</b>	Classify drugs acting on GIT with respect to mechanism of action and its relevance in the treatment .
<b>BP 201T T. 4K</b>	Discuss in detail Chemotherapy in infectious diseases and disorders of immune origin.
<b>BP 201T T. 5K</b>	Relate the role of Free radicals and antioxidants in various diseases. .
<b>BP 201T T. 6K</b>	Discuss Recent Advances in Treatment of Alzheimer’s disease, Parkinson’s disease, Cancer, Diabetes mellitus.

BP202T Pharmaceutical Organic Chemistry I – Theory

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP 202T T. 1K</b>	Understand and explain Basic Principles of Organic Chemistry
<b>BP 202T T. 2K</b>	Classify of organic compounds, To understand and apply IUPAC nomenclature rules for naming organic compounds and to draw structure
<b>BP 202T T. 3K</b>	Discuss Preparation methods of Alkanes, Alkenes and Conjugated dienes , To study reactions and uses of Alkanes, Alkenes and Conjugated dienes
<b>BP 202T T. 4K</b>	Explain preparation methods, reactions, qualitative tests and uses of Alkyl halide and Alcohol compounds
<b>BP 202T T. 5K</b>	Explain Preparation methods, reactions, qualitative tests and uses of Carbonyl compound
<b>BP 202T T. 6K</b>	Explain Preparation methods, reactions, qualitative tests for carboxylic acids and amines. Compare acidity of Carboxylic acid and basicity of Aliphatic amines

BP203T Biochemistry – Theory

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP203T.1 S</b>	Describe the importance of nutrient molecules in physiological and pathological conditions along with the numerous metabolic cycles of carbohydrates.
<b>BP203T.2 S</b>	Elaborate and classify importance of biological oxidation and bioenergetics.
<b>BP203T.3 S</b>	Discuss and outline different metabolic pathways and its disorders of bio molecules viz., lipids, amino acids, proteins.
<b>BP203T.4 S</b>	Illustrate the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins with metabolic pathways.
<b>BP203T.5 S</b>	Explain and classify the catalytic role of enzymes and importance of enzyme in biochemical process.

BP204T Pathophysiology – Theory

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP 204T.1K</b>	Outline Basic principles of Cell injury and Adaptation, mechanism involved in the process of inflammation and repair
<b>BP 204T.2K</b>	Classify various cardiovascular, respiratory and renal diseases and interpret its pathophysiology
<b>BP 204T.3K</b>	Illustrate pathophysiology of Haematological Diseases, Endocrine Diseases
<b>BP 204T.4K</b>	Explain pathophysiology of Nervous system diseases and gastrointestinal diseases
<b>BP 204T.5K</b>	Outline pathophysiology of Cancer, Diseases of bones and joints
<b>BP 204T.6K</b>	Illustrate pathophysiology of Infectious diseases and Sexually transmitted diseases

BP205T Computer Applications in Pharmacy – Theory

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP205 T.1K</b>	Use the Appropriate method on Number system to solve the given problem.
<b>BP205 T.2K</b>	Apply the various tags in Web Technology to design a program.
<b>BP205 T.3K</b>	Use the appropriate system and application of computers in pharmacy.
<b>BP205 T.4K</b>	Apply the concepts of Bioinformatics in pharmacy.



BP206T Environmental sciences – Theory \*

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP206T.1 K</b>	Create the awareness about environmental problems among learners and impart basic knowledge about the environment and its allied problems.
<b>BP206T.2 K</b>	Develop an attitude of concern for the environment and motivate learner to participate in environment protection and environment improvement.
<b>BP206T.3 K</b>	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

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP 207 P.1S</b>	Relate concept of the Human Anatomy physiology
<b>BP 207 P.2S</b>	Analyze the physiological processes discussed in theory classes through experiments on living tissue
<b>BP 207 P.3S</b>	Adapt knowledge about Human anatomy and Physiology
<b>BP 207 P.4S</b>	Examine the Human Body System through the Model and Chart
<b>BP 207 P.5S</b>	Analyze the physiological processes discussed in theory classes through experiments on Human beings
<b>BP 207 P.6S</b>	Apply knowledge about Human Systems

BP208P Pharmaceutical Organic Chemistry I– Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 208P.1S	understand Basic Safety measures in an organic laboratory
BP 208P.2S	apply basic laboratory techniques: Calibration of thermometer, melting point, boiling point, distillation, and crystallization
BP 208P.3S	perform Systematic qualitative analysis and analyze of unknown organic compounds
BP 208P.4S	prepare derivatives' for various organic compound functional groups
BP 208P.5S	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
BP205P.1S	identify carbohydrates, amino acids and proteins
BP205P.2S	test for abnormal constituents in urine
BP205P.3S	analyze quantitatively blood sugar, cholesterol,creatinine and proteins
BP205P.4S	measure the pH of the prepared buffer solution
BP205P.5S	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
BP210P.1S	Use the appropriate tags and design web technology program.
BP210P.2S	Design and implement database using MS Access.
BP210P.3S	Generate and print reports on database.
BP210P.4S	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 –
BP301T .1K	Understand chemistry and reactivity of Benzene
BP301T .2K	Explain chemistry, synthesis and uses of phenols ,amines
BP301T .3K	Explain and apply concept of stereochemistry
BP301T .4K	Describe reactivity, stability, uses of polynuclear compounds
BP301T .5K	Discuss reactivity, stability of cycloalkanes
BP301T .6K	Understand chemistry of Fats and Oils

### BP302T Physical Pharmaceutics I – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP302T.1K	Elaborate factors affecting solubility of drugs
BP302T.2K	Study solid state and distinguish between amorphous and crystalline solids and elucidate physical properties of drugs
BP302T.3K	Explain significance of surface and interfacial phenomena
BP302T.4K	Describe complexes and their pharmaceutical applications
BP302T.5K	Explain about pH and role of buffers in formulations and of biological buffers

### P303T Pharmaceutical Microbiology – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 303T .1K	To describe basic knowledge of bacteria, it's structure, cultivation, preservation and microscopy
BP 303T .2K	To identify few bacteria and methods of microbial control
BP 303T .3K	To explain the structure and method of replication of viruses and to analyse the methods of sterility testing.
BP 303T .4K	To assess the antibiotics by invitro microbiological methods and to outline different sources of contamination in an aseptic area
BP 303T .5K	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 –
<b>BP304T.1K</b>	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.
<b>BP304T.2K</b>	Classify size reduction mills with their construction, working and applications. Classify size separators with their construction, working and applications.
<b>BP304T.3K</b>	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
<b>BP304T.4K</b>	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.
<b>BP304T.5K</b>	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.
<b>BP304T.6K</b>	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.

BP306P Physical Pharmaceutics I – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
<b>BP306P.1S</b>	Perform solubility analysis, evaluate factors affecting solubility, study thermodynamics, explain concept of partition coefficient
<b>BP306P.2S</b>	Evaluate physicochemical properties of drug like pKa and refractive index
<b>BP306P.3S</b>	Apply knowledge of interfacial properties in dosage design
<b>BP306P.4S</b>	Measure properties of complexes

BP307P Pharmaceutical Microbiology – Practical

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP 307P .1S</b>	apply usage of equipments in microbiology lab for sterilization of material
<b>BP 307P .2S</b>	distinguish the morphology of different organisms by microscopy
<b>BP 307P .3S</b>	analyze various antibiotics for their microbiological efficacy
<b>BP 307P .4S</b>	inspect the microbiological quality of sterile products
<b>BP 307P .5S</b>	examine the microbiological quality of water
<b>BP 307P .6S</b>	identify a microorganism by biochemical test.

BP 308P Pharmaceutical Engineering –Practical

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP308 P.1S</b>	Construction of drying curves (for calcium carbonate and starch), Determination of moisture content and loss on drying.
<b>BP308 P.2S</b>	Determination of humidity of air - i) From wet and dry bulb temperatures -use of Dew point method, and critical speed of Ball Mill
<b>BP308 P.3S</b>	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.
<b>BP308 P.4S</b>	To study Factors affecting Rate of Filtration and Evaporation (Surface area, Concentration and Thickness/ viscosity).
<b>BP308 P.5S</b>	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 –
BP401T .1K	Discuss reactions of chiral molecules, racemic mixture modification and asymmetric synthesis
BP401T .2K	Apply conformational analysis and mechanism of stereochemical reactions
BP401T .3K	Understand and apply IUPAC rules to heterocyclic compounds
BP401T .4K	Discuss medicinal uses ,synthesis ,chemistry of heterocyclic compounds and their derivatives
BP401T .5K	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 –
BP402T.1K	Identify Structure, IUPAC and stereochemistry of classes of drugs belonging to CNS, ANS and Analgesic Drugs.
BP402T.2K	Describe the MOA of classes of drugs belonging to CNS, ANS and Analgesic Drugs.
BP402T.3K	Discuss the SAR of all the classes of CNS, ANS and Analgesic Drugs.
BP402T.4K	Understand the schematic metabolic pathway for any given drug.
BP402T.5K	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 –
BP403T.1K	Understand properties and stability of colloids
BP403T.2K	Explain behaviour of liquids and semisolids in response to shear stress and apply knowledge to dosage design
BP403T.3K	Formulate suspensions and emulsions along with study of their stability, types, evaluation, and preservation and apply the concept of HLB for formulation of emulsions.
BP403T.4K	Evaluate properties of solids and apply to design of solid dosage forms
BP403T.5K	Distinguish principles of kinetic in stability testing

BP404T Pharmacology I – Theory

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP 404T. 1K</b>	Summarize basic Concept of Pharmacology
<b>BP 404T. 2K</b>	Analyze the pharmacological actions of different categories of drugs
<b>BP 404T.3K</b>	Analyze mechanism of drug action, at organ system/sub cellular/macromolecular levels.
<b>BP 404T.4K</b>	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases
<b>BP 404T.5K</b>	Utilize knowledge about Pharmacology ,Adapt knowledge about recent development in pharmacology
<b>BP404T.6K</b>	Construct correlation of pharmacology with other bio medical sciences

BP405T Pharmacognosy and Phytochemistry I– Theory

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP 405 T.1K</b>	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.
<b>BP 405 T. 2K</b>	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.
<b>BP 405 T. 3K</b>	To elaborate the applications of plant tissue culture in medicinal plants.
<b>BP 405 T. 4K</b>	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.
<b>BP 405 T. 5K</b>	To plan systematic pharmacognostic study of primary metabolites (carbohydrates, proteins, lipid), marine drugs and teratogens, hallucinogen, natural allergans and fibers

BP406P Medicinal Chemistry I – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP406P.1S	Apply recrystallization and Column Chromatography techniques.
BP406P.2S	Utilize TLC for reaction monitoring.
BP406P.3S	Prepare drugs and intermediates.
BP406P.4S	Estimate Partition coefficient and Ionisation constants.

BP407P Physical Pharmaceutics II – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP407P.1S	Examine properties of surfactants and stability of colloids
BP407P.2S	Demonstrate rheological properties of liquids and understand liquid behavior
BP407P.3S	Evaluate stability of suspensions and emulsions.
BP407P.4S	Elaborate powder properties and apply knowledge to dosage design
BP407P.5S	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 –
BP 408 P.1S	Summarize basic Concept of Pharmacology
BP 408 P.2S	Demonstrate the effect of drugs on animals by using simulated experiments
BP 408 P.3S	Adapt knowledge about recent development in pharmacology
BP 408 P.4S	Relate the in vivo and in vitro experiments, use of software for the study of experiments.
BP 408 P.5S	Examine the effect of drugs on animals by using simulated experiments
BP 408 P.6S	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 –
BP 408 P.1S	To remember different morphological and microscopical characteristic features of crude drugs.
BP 408 P.2S	To understand the cellular structure of crude drugs.
BP 408 P.3S	To evaluate the crude drugs by quantitative evaluation methods.
BP 408 P.4S	To evaluate the crude drugs by physical methods of evaluation.
BP 408 P.5S	To evaluate the crude drugs by chemical methods of evaluation.

**B-PHARM THIRD YEAR SEM VI**

BP601T Medicinal Chemistry III – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 601T.1K	Relate chemistry of drugs to biological activity
BP 601T.2 K	Discuss SAR of drugs
BP 601T.3 K	Apply chemistry of agonists and antagonists to study their MOA
BP 601T.4 K	Identify and analyze drug metabolic pathways, adverse effect and
BP 601T.5 K	Apply physicochemical parameters in QSAR studies

BP602T Pharmacology III – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 602T . 1K	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
BP 602T . 2K	Classify drugs acting on GIT with respect to mechanism of action and its relevance in the treatment.
BP602T . 3K	Discuss in detail Chemotherapy in infectious diseases.
BP 602T . 4K	Simplify the principles of toxicology .and treatment of various poisonings and appreciate correlation of pharmacology with related medical sciences
BP 602 T. 5K	Elaborate treatment of various poisonings and appreciate correlation of pharmacology with related medical sciences
BP 602T . 6K	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 –
BP603T.1 K	evaluate TSM formulation
BP603T.2 K	Evaluation of excipients of natural origin
BP603T.3 K	develop cosmetic and herbal formulation using standardized extract
BP603T.4 K	perform Monograph analysis of herbal drugs from recent Pharmacopoeias
BP603T.5 K	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 –
BP604T.1K	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
BP604T.2K	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
BP604T.3K	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
BP604T.4K	Definition and introduction to Pharmacokinetics, Explain and classify Compartment models
BP604T.5K	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.
BP604T.6K	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 –
BP 605 T.1K	Summarize the methods of immobilization of enzymes and list the application.
BP 605T.2K	interpret the tools and techniques in genetic engineering and compile the applications
BP 605T.3K	The students will be able to relate immunological response and outline the methods for production of vaccines and monoclonal antibodies.
BP 605 T.4K	Illustrate the immunoblotting techniques and transfer of genetic material in biological species
BP 605 T.5K	Explain the fermentation methods and its application.

BP606T Quality Assurance –Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP606T.1 K	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.
BP606T.2 K	Explain the guidelines of Organization and personnel, premises, select equipments and raw materials; plan and design the plant layout for same.
BP606T.3 K	Evaluate Quality Control of Packaging material, outline the role of CPCSEA and adapt good laboratory practices.
BP606T.4 K	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.
BP606T.5 K	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.

BP607P Medicinal chemistry III – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 607P.1S	Apply skills to synthesize compounds by conventional and Microwave irradiation technique
BP 607P.2S	Utilize software like Chem draw for drawing of chemical structures and to design reactions.
BP 607P.3 S	Utilize drug design software to analyse physicochemical properties
BP 607P.4 S	Utilize drug design software to analyse ADME properties

BP608P Pharmacology III – Practical

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP 608P.. 1S</b>	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.
<b>BP 608P. 2S</b>	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.
<b>BP608P .3S</b>	Examine the effects of drugs on animal by simulated experiments and Determine of acute oral toxicity (LD50) of a drug from a given data.
<b>BP 608P .4S</b>	Experiment with Biostatistics methods in experimental pharmacology (student's t test, ANOVA) ,Biostatistics methods in experimental pharmacology (Chi square test, Wilcoxon Signed Rank test) .
<b>BP 608P. 5S</b>	Determine acute skin irritation of a test substance.
<b>BP 608P . 6S</b>	Determine acute eye irritation of a test substance.

BP609P Herbal Drug Technology – Practical

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP603P.1 S</b>	To evaluate TSM formulation
<b>BP603P.2 S</b>	Evaluation of excipients of natural origin
<b>BP603P.3 S</b>	To develop cosmetic and herbal formulation using standardized extract
<b>BP603P.4 S</b>	to perform Monograph analysis of herbal drugs from recent Pharmacopoeias
<b>BP603P.5 S</b>	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 –
BP701T.1K	illustrate the interaction of matter with electromagnetic radiations and justify its applications in drug analysis
BP701T.2K	summarize IR spectroscopy & outline atomic spectroscopy
BP701T.3K	classify the chromatographic separation methods and explain appropriate technique for analysis of drugs
BP701T.4K	categorize column chromatographic techniques and interpret chromatographs
BP701T.5K	Outline Ion exchange chromatography and Gel Chromatography.

### BP702T Industrial Pharmacy – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP702T.1K	Outline Pilot plant scale up techniques
BP702T.2K	Outline Technology development and transfer:
BP702T.3K	Explain Regulatory requirements for drug approval:
BP702T.4K	Outline Indian Regulatory Requirements:
BP702T.5K	Explain Quality management systems:

### BP703T Pharmacy Practice – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 703T. 1K	Discuss the role of the Hospital, Hospital pharmacy and Community Pharmacist
BP 703T. 2K	Assessment of Adverse drug reactions and drug interactions
BP 703T. 3K	explain the various drug distribution systems in Hospitals, understand vital aspects of medication adherence, medication history interview and therapeutic drug monitoring.
BP 703T 4K	Apply principles of good communication for patient counseling and prescription interpretation
BP 703T. 5k	Support drug therapy monitoring of patient through medication chart review and clinical Review.
BP 703T. 6k	Plan the various components required in a Hospital Pharmacy Budget and Drug store management

BP704T Novel Drug Delivery System – Theory

<b>CO Number</b>	<b>Course Outcomes:</b> Upon completion of course students will be able to –
<b>BP704.1 T K</b>	Explain 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
<b>BP704T .2K</b>	Classify various technologies like concept of microencapsulation, merits, demerits and application, Types of Microencapsulation and Evaluation of microcapsules
<b>BP704T .3K</b>	Identify and develop novel drug delivery systems like Mucosal and implantable drug delivery
<b>BP704T .4K</b>	Identify and develop novel Systems for delivery by topical route as transdermal drug delivery, oral route as Gastroprotective and pulmonary route as Nasopulmonary
<b>BP704T .5K</b>	Apply knowledge of concepts to develop, targeted Drug Delivery systems like liposomes, niosomes, nanoparticles, and monoclonal antibodies
<b>BP704T .6K</b>	Identify and develop devices like intraocular and intrauterine

BP705P Instrumental Methods of Analysis – Practical

<b>CO Number</b>	<b>Course Outcomes:</b> Upon completion of course students will be able to –
<b>BP705P.1S</b>	summarize significance of weights and measures in analysis
<b>BP705P.2S</b>	demonstrate and apply UV-Vis Spectroscopy in pharmaceutical analysis
<b>BP705P.3S</b>	determine quantity of drugs in samples by fluorimetry
<b>BP705P.4S</b>	apply chromatographic methods to separate components
<b>BP705P.5S</b>	explain, interpret and analyze IR spectrum & outline atomic spectroscopy

## BP706PS Practice School\*

### BP810ET Experimental Pharmacology

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP706PS.1KS	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
BP706PS.2KS	Recall basic parameters including haematological, biochemical and physiological parameters
BP706PS.3KS	Perform the biochemical assay for estimation of serum glucose, cholesterol etc using appropriate kits
BP706PS.4KS	Understand the basic mechanism involved in free radicals generation and scavenging processes and perform basic assays for free radical scavenging and peroxidation
BP706PS.5KS	Understand the principles of various invitro assays used for screening of metabolic disorders and perform simple assays
BP706PS.6KS	Perform different ex vivo bioassays using chick ileum

### BP806 ET Quality control and standardization of Herbals

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 806 ET.1KS	To recall the WHO guidelines for the quality control of herbal drugs.
BP 806 ET.2KS	To illustrate and outline the quality assurance in traditional system of medicine including cGMP, GAP, GMP and GLP.
BP 806 ET.3KS	To compare the quality control parameters of drugs according to European union (EU) and ICH guidelines.
BP 806 ET.4KS	To make use of research guidelines for evaluation of safety and efficiency of herbal medicine.
BP 806 ET.5KS	To apply the knowledge of chromatography in standardization of herbal drugs and to perform the stability studies.
BP 806 ET.6KS	To improve the knowledge on regulatory issues for herbal medicine including GMP, WHO guidelines on safety monitoring of herbal medicine in Pharmacovigilance.

BP809ETCosmetic Science

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP706PS .1KS</b>	Define cosmetics and explain cosmetics used for skin hair and oral cavity and illustrate various excipients used in the same
<b>BP706PS.2KS</b>	Application of various excipients in formulating skin, hair and oral care cosmetics
<b>BP706PS 3KS</b>	cosmetic excipients, basic structure, functions and common problems associated with hair
<b>BP706PS.4KS</b>	understand the principles of formulation and building blocks of various hair care products.
<b>BP706PS.5KS</b>	Design and formulate Skin cosmetic and colour cosmetics,
<b>BP706PS.6KS</b>	Elaborate on Regulatory guidelines of Cosmetics

BP706T Pharmaceutical Marketing

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP 803 T.1KS</b>	Outline the marketing concepts
<b>BP 803 T.2KS</b>	Develop techniques and their applications in the pharmaceutical industry.
<b>BP 803 T.3KS</b>	Classify product design, explain product life cycle
<b>BP 803 T.4KS</b>	Explain various channels of marketing, describe qualities of a professional service representative
<b>BP 803 T.5KS</b>	To identify marketing mix for pharmaceutical products.
<b>BP 803 T.6KS</b>	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 –
BP801T.1K	Solve basic statistical problems with respect to measures of central tendency, dispersion, correlation of data and regression equations
BP801T.2K	Describe concepts related to probability, sample, population, hypothesis and error
BP801T.3K	Explain the various statistical techniques to solve statistical problems (parametric and non parametric)
BP801T.4K	Design experimental/research methodology from preparation of protocol to writing of report
BP801T.5K	Summarize the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of experiment)
BP801T.6K	Discuss about Factorial design and Response Surface methodology

### BP802T Social and Preventive Pharm

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP802T. 1K	Asset high consciousness or realization of current issues related to health and prevent disease and socio problems related health and disease
BP802T. 2K	How to prevent and control of disease
BP802T. 3K	Apply National health programs, its objectives, functioning and outcome of the programs
BP802T. 4K	Discuss different National health programs and current healthcare development
BP802T. 5K	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 –
BP811ET.1K	express the principle of the advanced instruments like NMR and Mass Spectroscopy and justify its applications in drug analysis
BP811ET.1K	explain the principles of thermal methods of analysis and its application in analysis of drugs
BP811ET.3K	explain the importance and methods for the calibration of various analytical instruments
BP811ET.4K	formulate and justify techniques for the analysis of drugs
BP811ET.5K	outline significance of hyphenated techniques of analysis

BP812 ET. Dietary Supplements and Nutraceuticals (Theory)

<b>CO Number</b>	<b>Course Outcomes: Upon completion of course students will be able to –</b>
<b>BP812ET.1K</b>	Define, classify and understand the functional foods, Nutraceuticals and dietary supplements.
<b>BP812ET.2K</b>	Remember the sources, chemical nature, medicinal uses and health benefits of Nutraceuticals and functional foods.
<b>BP812ET 3K</b>	explain basics of free radicals, dietary fibers and carbohydrates
<b>BP812ET.4K</b>	Understand role of free radicals in different diseases and to classify antioxidants.
<b>BP812ET.5K</b>	Analyse Effect of processing, storage and interactions of various environmental factors on the potential of nutraceuticals and illustrate Regulatory Aspects and and apply Pharmacopoeia Specifications for dietary supplements and nutraceuticals