



AISSMS

COLLEGE OF PHARMACY

IMPARTING EXCELLENCE IN EDUCATION & RESEARCH



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2F,12B recognition by UGC, Affiliated to Savitribai Phule Pune University
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FIRST YEAR

SEM I

BP101T Human Anatomy and Physiology I– Theory

BP107P Human Anatomy and Physiology – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP101T. 1KS	Explain the gross morphology, structure and functions of various organs of the human body.
BP101T. 2KS	Justify the various homeostatic mechanisms and their imbalances.
BP101T. 3KS	Identify the various tissues and organs of different systems of human body.
BP101T. 4KS	Experiments with related to Body, special senses and nervous system.
BP101T. 5KS	Analyze coordinated working pattern of different organs of each system

BP102T Pharmaceutical Analysis I – Theory

BP108P Pharmaceutical Analysis I – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP102T.1KS	To explain the methods, errors and techniques of volumetric analysis.
BP102T.2KS	To discuss and perform aqueous and non-aqueous acid base titrations.
BP102T.3KS	To explain and perform precipitation, complexometric titrations and gravimetric analysis.
BP102T.4KS	To describe the basic concepts of redox titration.
BP102T.5KS	To discuss and perform electrochemical methods of analysis

BP103T Pharmaceutics I – Theory
BP109P Pharmaceutics I – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 103T.1KS	To 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
BP 103T.2KS	To Demonstrate learning different concept of weighing and measuring pharmaceuticals calculation, Classify pharmaceuticals powders or mixtures and liquid dosage form intended to used internally & externally,
BP 103T.3KS	To understand preparation of monophasic and biphasic liquid formulation preparation and develop skill required to formulate various conventional liquid dosage forms
BP 103T.4KS	Outline Semisolid Suppositories preparation and evaluation. Also to learn associated various pharmaceutical incompatibility in formulation.
BP 103T.5KS	To utilize different excipient used in semisolid formulation and understand mechanisms associated influencing factors for penetration of drug and develop different semisolid dosage form
BP 103.6KS	To justify Skill required for preparation of label and its evaluation

BP 104 Pharmaceutical Inorganic Chemistry – Theory
Pharmaceutical Inorganic Chemistry – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 104T.1KS	To know how to collect physiochemical standards of inorganic compounds from official and non-official pharmacopoeia.
BP104T.2 KS	Identify the source of impurities for a pharmaceuticals based on its methods of synthesis, preparation and packaging. Analyse those impurities using limit tests and assays as per pharmacopoeial procedures.
BP104T.3 KS	Prepare buffers for analytical and pharmaceutical purposes using the knowledge of dissociation constant, buffer capacity, Henderson–Hasselbalch equation, NaCl equivalence and freezing point depression and pharmacopoeia.
BP104T.4 KS	Understand physiological role of major intra and extra cellular electrolytes, the mechanisms of acid base balance in human body and relate them to disease conditions and formulate treatment options using inorganic drugs such as ORS

BP 104T.5 KS	Select inorganic drugs as treatment options for diseases such as acholrhydria, acidity, constipation, microbial infection and dental problems using the basic understanding of disease formation and mechanism of action of inorganic drugs.
BP 104T.6 KS	Suggest use of inorganic compounds and radioactive elements as expectorants, emetics, haematinics, antidotes and astringents based on the understanding of disease etiology and properties of inorganic compound and mechanism of drug action.

BP105T Communication skills – Theory *
BP111P Communication skills – Practical*

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP105T.1KS	To Define and Explain Communication Skills, Barriers to communication and Perspectives in Communication.
BP105T.2KS	To Demonstrate with Elements of Communication and Communication Styles
BP105T.3KS	To Develop Basic Listening Skills and Effective Written Communication Skills.
BP105T.4KS	To Develop & inculcate interview skills, Presentation Skills & techniques of presentation.
BP105T.5KS	5. To know the group discussion & to develop Leadership qualities and essentials.

BP106RBT Remedial Biology/
BP112RBP Remedial Biology – Practical*

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP112T.1KS	To build knowledge & Understand the core and basic knowledge associated with Biology and the profession of pharmacy
BP112T.2KS	Compare to correlate the role of biology in pharmacy
BP112T.3KS	Utilize effectively plan including time management, resource management, delegation skills and organizational skills
BP112T.4KS	Discuss the role of living organisms and its correlation with other subjects of pharmacy
BP112T.5KS	Develop to learn basic techniques ,handle equipments and sample of biological source

BP106RMT Remedial Mathematics – Theory*

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

SEM-II

BP201T Human Anatomy and Physiology II – Theory
BP207P Human Anatomy and Physiology II –Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 201T.1KS	Recall organization of nervous system and summarize structure and functions of parts of brain
BP 201T.2KS	Demonstrate physiology of Digestive system
BP 201T.3KS	Explain mechanism of respiration and urinary system and demonstrate respiratory volumes
BP 201T. 4KS	Interpret the role of Endocrine system involved in regulation and functions of hormones to control overall activity of human body.
BP 201T.5KS	Outline the physiology of reproductive system. Recall chromosomes, genes

BP202T Pharmaceutical Organic Chemistry I – Theory
BP208P Pharmaceutical Organic Chemistry I– Practical

CO No	Course Outcomes: Upon completion of course students will be able to –
BP202T.1KS	Understand principles and applications of Green chemistry
BP202T.2KS	The concept of stereochemistry and asymmetric synthesis
BP202T.3KS	Apply the concept of peptide chemistry
BP202T.4KS	Discuss principles and methods of various Photochemical and pericyclic reactions
BP202T.5KS	Discuss Principle and application of different catalyst

BP203T Biochemistry – Theory
BP209P Biochemistry – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP203T.1KS	To illustrate the importance of nutrient molecules in physiological and pathological conditions alongwith the numerous metabolic cycles of carbohydrates and to identify, to analyze carbohydrate sample qualitatively and quantitatively
BP203T.2KS	To elaborate and classify importance of biological oxidation and bioenergetics.
BP203T.3KS	To discuss different metabolic pathways and its disorders of bio molecules viz., lipids, amino acids, proteins and to identify, to estimate the protein sample qualitatively and quantitatively.
BP203T.4KS	To illustrate the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins with metabolic pathways.
BP203T.5KS	To explain, classify and analyze 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 –
BP 204T.1 K	Outline Basic principles of Cell injury and Adaptation and mechanism involved in the process of inflammation and repair
BP 204T.2 K	Classify various cardiovascular, respiratory and renal diseases and interpret its pathophysiology
BP 204T. 3K	Illustrate pathophysiology of Haematological Diseases, Endocrine Diseases, Nervous system diseases and gastrointestinal diseases
BP 204T. 4K	Outline pathophysiology of Cancer, Diseases of bones and joints
BP 204T.5 K	Summarise pathophysiology of Infectious diseases and Sexually transmitted diseases

BP205T Computer Applications in Pharmacy – Theory
BP210P Computer Applications in Pharmacy – Practical*

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 205T. 1KS	To understand different types of databases, applications of computers and databases in pharmacy.
BP 205T. 2KS	To illustrate the concept of number system in computers.
BP 205T.3KS	To make use of web technologies such as HTML, XML, CSS, Programming languages, Web servers and pharmacy drug database.
BP 205T.4KS	To appraise the applications of computers in pharmacy such as drug information services, pharmacokinetics, mathematical model in drug design, hospital and clinical pharmacy etc.,
BP 205T.5KS	To explain about bioinformatics and its impact in vaccine discovery.
BP 205T.6KS	To elaborate the applications of computers for data analysis in preclinical development.

BP206T Environmental sciences – Theory *

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP206T.1K	To build Knowledge Create the awareness about environmental problems among learners
BP206T.2K	Interpret basic knowledge about the environment and its allied problems
BP206T.3K	Develop an attitude of concern for the environment.
BP206T.4K	Make use of Motivation learner to participate in environment protection and environment improvement.
BP206T.5K	identifying and solving environmental problems skill acquired to help the concerned individual
BP206T.6K	Construct Strive to attain harmony with Nature.

SECOND YEAR

SEM-III

BP301T Pharmaceutical Organic Chemistry II – Theory
BP305P Pharmaceutical Organic Chemistry II – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP301T .1KS	Apply chemistry, uses of Benzene, perform synthesis of derivatives
BP301T .2KS	Apply chemistry, uses of phenols ,amines and perform synthesis of derivatives their derivatives
BP301T .3KS	Understand and write nomenclature of stereoisomers
BP301T .4KS	Discuss reactivity, stability, uses of Polynuclear compounds
BP301T .5KS	Explain reactivity, stability of cycloalkanes
BP301T .6KS	Understand chemistry and determine sap value of Fats and Oils

BP302T Physical Pharmaceutics I – Theory
BP306P Physical Pharmaceutics I – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP302T.1KS	To investigate and apply various laws and theories, equations related to different states of matter & To examine effect of various factors on states of matter and To prove concepts, theories and laws through calculations and graphs
BP302T.2KS	To distinguish the principles of complexation/protein binding and to use them for calculations of drug release and stability constant.

BP302T.3KS	To demonstrate the use of physicochemical properties of drugs in the formulation development and evaluation of dosage forms
BP302T.4KS	To solve mathematical problems
BP302T.5KS	To experiment with different pharmaceutical laboratory instruments used in determining various physicochemical properties such as surface tension, viscosity, adsorption and solubility, HLB and partition coefficient.
BP302T.6KS	To compare complexation by different methods

BP303T Pharmaceutical Microbiology – Theory
BP307P Pharmaceutical Microbiology – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 303T .1KS	To describe basic knowledge of bacteria, its structure, cultivation, preservation and microscopy
BP 303T .2KS	To identify few bacteria and methods of microbial control
BP 303T .3KS	To explain the structure and method of replication of viruses and to analyse the methods of sterility testing.
BP 303T .4KS	To access the antibiotics by invitro microbiological methods and to outline different sources of contamination in an aseptic area
BP 303T .5KS	To explain types of spoilage of pharmaceutical products and its prevention

BP304T Pharmaceutical Engineering – Theory
BP 308P Pharmaceutical Engineering –Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP304T.1KS	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.
BP304T.2KS	Classify size reduction mills with their construction, working and applications Classify size separators with their construction, working and applications
BP304T.3KS	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
BP304T.4KS	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.
BP304T.5KS	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.
BP304T.6KS	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

SEM-IV

BP401T Pharmaceutical Organic Chemistry III– Theory

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	Discuss medicinal uses ,synthesis ,chemistry of heterocyclic compounds
BP401T .4K	Discuss medicinal uses ,synthesis ,chemistry of heterocyclic compounds and their derivatives
BP401T .5K	Apply synthetic name reactions in synthesis

BP402T Medicinal Chemistry I – Theory

BP406P Medicinal Chemistry I – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP402T.1KS	Identify Structure, IUPAC and stereochemistry of classes of drugs belonging to CNS, ANS and Analgesic Drugs.
BP402T.2KS	Describe the MOA of classes of drugs belonging to CNS, ANS and Analgesic Drugs.
BP402T.3KS	Discuss the SAR of all the classes of CNS, ANS and Analgesic Drugs.
BP402T.4KS	Understand the schematic metabolic pathway for any given drug.
BP402T.5KS	Outline the synthesis, chemical reactions of CNS, ANS and Analgesic Drugs.

BP403T Physical Pharmaceutics II – Theory

BP407P Physical Pharmaceutics II – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP403T.1KS	To relate various physicochemical properties of drug and excipient molecules in designing dosage forms and To Study effect of various factors on suspensions and colloids
BP403T.2KS	To Distinguish the principles of chemical kinetics and to use them for stability testing and determination of expiry date of formulations and various kinetic parameters
BP403T.3KS	To Demonstrate the use of physicochemical properties of drugs in the formulation development and evaluation of dosage forms
BP403T.4KS	To solve mathematical problems
BP403T.5KS	To Study various micromeritic and rheological properties
BP403T.6KS	To prove concepts,theories and laws through calculations and graphs

BP404T Pharmacology I – Theory
BP408P Pharmacology I – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 404T. 1KS	To Analyze the pharmacological actions of different categories of drugs
BP 404T. 2KS	To Analyze mechanism of drug action, Pharmacokinetic, Pharmacodynamics, Adverse effect, at organ system/sub cellular/macromolecular levels
BP 404T.3KS	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases
BP 404T.4KS	Examine the effects of drugs on animal by simulated experiments
BP 404T.5KS	Construct correlation of pharmacology with other bio medical sciences

BP405T Pharmacognosy and Phytochemistry I– Theory
BP409P Pharmacognosy and Phytochemistry I – Practical

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

THIRD YEAR

SEM-V

BP501T Medicinal Chemistry II – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 501T.1K	To relate and make use of receptors and their chemistry as agonists and antagonists
BP 501T.2 K	To explain mechanism of action (pharmacology) of drugs and classify various enzyme inhibitors as drugs.
BP 501T.3 K	To identify and analyze drug metabolic pathways, adverse effect and therapeutic value of drugs
BP 501T.4 K	To develop skill required to learn chemical synthesis of drugs
BP 501T.5 K	To interpret Structural Activity Relationship of different class of drugs

BP502T Formulative Pharmacy– Theory

BP506P Formulative Pharmacy – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP502T.1 KS	Student should be able to understand and apply concept of preformulation studies in development of dosage forms.
BP502T.2 KS	The students will be able to know excipients explain their use, make use of formulation procedure, equipments, and evaluate the dosage form using quality control procedures. He will be able to understand and remedy product defects for tablets and liquid oral dosage forms.
BP502T.3 KS	The students will be able to know excipients and explain their use, make use of formulation procedure, equipments. They will be able to evaluate the product using quality control procedure and identify product defects capsule and pellets.
BP502T.4 KS	The student will be able to know formulation ingredients and explain their use. Make use of production facilities and controls; perform filling and sealing operations and quality control for various injectables.
BP502T.5 KS	Student will know components of aerosols, classify the aerosol product, understand evaluation. The student will be able to classify cosmetics, explain formulation of cosmetics and will be able to decide choice of packaging material and perform quality control of packaging material.

BP503T Pharmacology II – Theory
BP507P Pharmacology II – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP503T. 1KS	Classify the drugs acting on cardiovascular system and demonstrate the effects of drugs on heart and blood pressure by simulated experiments
BP503T. 2KS	Categorise the drugs acting on urinary system and evaluate diuretic activity of drugs
BP503T. 3KS	Distinguish the different autocooids and demonstrate the anti-inflammatory and analgesic activity
BP503T. 4KS	Elaborate the pharmacology of drugs acting on endocrine system and its relevance in the treatment of different disease
BP503T. 5KS	Demonstrate the bioassays of different drugs

BP504T Pharmacognosy and Phytochemistry II– Theory
BP508P Pharmacognosy and Phytochemistry II – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP504T.1KS	To explain and demonstrate extraction techniques to carryout isolation of phytoconstituents.
BP504T.2KS	To identify and characterize phytoconstituents analytically.
BP504T.3KS	To explain Identification methods (Morphological , Microscopical , Chemical and Analytical) of the herbal /crude drugs.
BP504T.4KS	To examine methods to produce phytoconstituents industrially.
BP504T.5KS	To explain the metabolic pathways in formation of secondary metabolites through biogenetic pathways
BP504T.6KS	To elaborate application of biogenetic studies through tissue culture and tracer techniques.

BP505T Pharmaceutical Jurisprudence – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 505 T.1K	To relate the significance of Drugs and cosmetics act 1940 and its rules 1945 in relation to import and manufacture of drugs
BP 505 T.2K	To apply the knowledge on schedules pertaining to Drugs and cosmetics act 1940 and its rules 1945 and also administration of the act and rules
BP 505 T.3K	To understand 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
BP 505 T.4K	To discuss the salient features of drugs and magic remedies act, prevention of cruelty to animals act and drugs price control order.
BP 505 T.5K	To recall the pharmaceutical legislations, ethics, right to information, medical termination of pregnancy and intellectual property rights

SEM VI

BP601T Medicinal Chemistry III – Theory

BP607P Medicinal chemistry III – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 601T.1KS	To know what are different synthetic pathways and adapt skills to prepare important compounds or intermediates by Microwave irradiation technique.
BP 601T.2 KS	To understand what is importance of QSAR and drug design is and utilize different drug design software like chem draw®, V-Life etc.
BP 601T.3 KS	To know the drug SAR, metabolism, adverse effects and therapeutic value of drugs and make use of drug design software to analyze drug likeness properties in designing new drugs.
BP 601T.4 KS	To know what is Molecular Docking and Evaluate the Docking poses to relate drug action.
BP 601T.5 KS	To define concept of combinatorial chemistry and apply this to know solid phase and solution phase synthesis.

BP602T Pharmacology III – Theory

BP608P Pharmacology III – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 602T. 1KS	Classify drugs acting on Respiratory system and apply the mechanism of action and its relevance in the treatment and to analyze the pharmacological actions of different categories of drugs and 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.
BP 602 T. 2KS	Classify drugs acting on GIT and apply the mechanism of action and its relevance in the treatment and to analyze the pharmacological actions of different categories of drugs and to analyze mechanism of drug action, Pharmacokinetic, Pharmacodynamics, and adverse effects and 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
BP 602T.3KS	Classify drugs acting on Chemotherapy and apply the mechanism of action and its relevance in the treatment and to analyze the pharmacological actions of different categories of drugs and apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
BP 602 T.4KS	Simplify the principles of toxicology and treatment of various poisonings and

	appreciate correlation of pharmacology with related medical sciences and examine the effects of drugs on animal by simulated experiments and Determine of acute oral toxicity (LD50) of a drug from a given data.
BP 602T.5KS	Interpret definition of rhythm and cycles. And elaborate biological clock and their significance leading to chronotherapy and experiment with Biostatistics methods in experimental pharmacology (student's t test, ANOVA) ,Biostatistics methods in experimental pharmacology (Chi square test, Wilcoxon Signed Rank test) and determine acute skin irritation or acute eye irritation of a test substance.

BP603T Herbal Drug Technology – Theory
BP609P Herbal Drug Technology – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP603.1KS	To summarize raw material as source of herbal drugs from cultivation to herbal drug product.
BP603.2KS	To explain the WHO and ICH guidelines for evaluation of herbal drugs.
BP603.3KS	To experiment with processing, production and use of herbal cosmetics, natural sweeteners, Nutraceuticals and Excipients.
BP603.4KS	To apply patenting of herbal drugs, GMP in ASU manufacturing.
BP603.5KS	To recall various ancient/ traditional system of medicines.
BP603.6KS	To illustrate Monograph analysis of herbal drugs from recent Pharmacopoeias

BP604T Biopharmaceutics and Pharmacokinetics – Theory

CO : BP604T	Course Outcomes: Upon completion of course students will be able to –
BP604T.1K	Define ADME. Explain Absorption; classify Mechanisms of drug absorption through GIT, summarize factors influencing drug absorption though 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	To summarize the methods of immobilization of enzymes and list the application.
BP 605T.2K	To 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	To Illustrate the immunoblotting techniques and transfer of genetic material in biological species
BP 605 T.5K	To 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	Student should be able to apply concept of Quality control, Quality assurance and GMP; understand 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	The students will be able to explain the guidelines of Organization and personnel, Premises and Equipments and raw materials; and plan and design the plant layout for same.
BP606T.3 K	The students will be able to apply Quality Control of Packaging material, understand the role of CPCSEA and apply good laboratory practices.
BP606T.4 K	The student will be able to know formulation ingredients, production facilities and controls, perform filling and sealing operations and quality control for various injectables.
BP606T.5 K	Student will know 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.

FINAL YEAR

SEM VII

BP701T Instrumental Methods of Analysis – Theory

BP705P Instrumental Methods of Analysis – Practical

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP701T.1KS	To demonstrate and apply UV-Vis Spectroscopy and Fluorimetry in pharmaceutical analysis
BP701T.2KS	To explain, identify and analyze IR spectrum & outline atomic spectroscopy
BP701T.3KS	Classify the chromatographic separation methods and choose appropriate technique for analysis of drugs
BP701T.4KS	To categorize column chromatographic techniques and interpret chromatographs.
BP701T.5KS	To outline Ion exchange chromatography and Gel Chromatography.

BP702T Industrial Pharmacy – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 702T.1K	Demonstrate understanding of the process of pilot plant and scale up of pharmaceutical dosage forms
BP 702T.2K	Understand the process of technology transfer from lab scale to commercial batch
BP 702T.3K	Know different Laws and Acts that regulate pharmaceutical industry
BP 702T.4K	Understand the approval process and regulatory requirements for drug products
BP 702T.5K	Quality management & Certifications: Understanding

BP703T Pharmacy Practice – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP 703T. 1KS	Describe the role of the Hospital and Community Pharmacist including assessment of Adverse drug reactions and drug interactions
BP 703T. 2KS	Compare and explain the various drug distribution systems in Hospitals, understand vital aspects of medication adherence, medication history interview and therapeutic drug monitoring. Apply principles of good communication for patient counselling and prescription interpretation
BP 703T. 3KS	Apply principles of good communication for patient counselling and prescription interpretation
BP 703T. 4KS	Support drug therapy monitoring of patient through medication chart review and clinical Review. Plan the various components required in a Hospital Pharmacy Budget
BP 703T. 5KS	Discuss Drug store management, inventory control, investigational use of Drugs and Interpret the results of Clinical Laboratory Tests

BP704T Novel Drug Delivery System – Theory

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP704.1 T K	Build Knowledge about the Fundamental Concept of controlled Drug delivery systems, Drug Release and Pre requisites of drug candidates, along with various approaches and classification and about Polymers classification, types, selection, application and examples to apply for development of novel drug delivery systems
BP704T .2K	Classify and explain various technologies like concept of microencapsulation, merits, demerits and application, Types of Microencapsulation and Evaluation of microcapsules
BP704T .3K	Identify and develop novel drug delivery systems like Mucosal and implantable drug delivery
BP704T .4K	Identify and develop novel Systems for delivery by topical route as transdermal drug delivery, oral route as Gastroprotective and pulmonary route as Nasopulmonary
BP704T .5K	Apply knowledge of concepts to develop, targeted Drug Delivery systems like liposomes, niosomes, nanaoparticles, and monoclonal antibodies
BP704T .6K	Identify and develop devices like intraocular and intrauterine

BP706PS Practice School*

Experimental Pharmacology BP810ET

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP810ET.1KS	To 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, study of basic parameters including of haematological, biochemical and physiological parameters
BP810ET.2KS	To understand the basic mechanism involved in free radicals generation and scavenging processes and able to design, analysed and interpret the various invitro antioxidant assays
BP810ET.3KS	To explain the mechanistic process involved in pharmacokinetics as well as to predict by using various invitro approaches. To understand the principles of various invitro assays used for screening of metabolic disorders
BP810ET.4KS	To relate the importance of alternative methods of toxicity and efficacy studies including their model design, analysis and interpretations.
BP810ET.5KS	To explain, design and analysed the various infectious modules for testing of drugs including the application of TLC-Bioautography.

Quality control and standardization of Herbals BP806 ET

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.

Cosmetic Science BP809ET

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP809ET.1KS	To illustrate the Nanotechnology used in cosmetic preparation
BP809ET.2KS	To Explain the Regulatory Requirement of cosmeceutical preparation
BP809ET.3KS	Survey carry out of the newer excipient used in cosmetic/cosmeceutical preparation
BP809ET.4KS	Applying proper packaging & labelling condition of cosmetic preparation
BP809ET.5KS	To Classify and study various herbal excipient used in cosmetic/cosmeceutical Preparation
BP809ET.6KS	To Discuss the preparation and manufacturing of cosmetic/Cosmeceutical product.

PHARMACEUTICAL MARKETING BP706T

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP706T.1KS	To illustrate the Nanotechnology used in cosmetic preparation
BP706T.2KS	To Explain the Regulatory Requirement of cosmeceutical preparation
BP706T.3KS	Survey carry out of the newer excipient used in cosmetic/cosmeceutical preparation
BP706T.4KS	Applying proper packaging & labelling condition of cosmetic preparation
BP706T.5KS	To Classify and study various herbal excipient used in cosmetic/cosmeceutical Preparation
BP706T.6KS	To Discuss the preparation and manufacturing of cosmetic/Cosmeceutical product.

SEM VIII

BP801T Biostatistics and Research Methodology

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP801.1K	Compute basic statistical measures of central tendency, spread, correlation of data and regression equations
BP801.2K	Describe concepts related to probability, sample, population, hypothesis and error
BP801.3K	Know the various statistical techniques to solve statistical problems (parametric and non parametric)
BP801.4K	Design experimental/research methodology from preparation of protocol to writing of report
BP801.5K	Know the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of 2. Experiment)
BP801.6K	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 How to prevent disease and socio problems related health and disease
BP802T.2K	Discuss general principles of preventive 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	Evaluate alternative ways of solving problems related to health

BP811ET Advanced Instrumentation Techniques

CO Number	Course Outcomes: Upon completion of course students will be able to –
BP811ET.1K	To Express the principle of the advanced instruments like NMR and Mass Spectroscopy and justify its applications in drug analysis
BP811ET.2K	To explain the principles of thermal methods of analysis and its application in analysis of drugs
BP811ET.3K	To explain the importance and methods for the calibration of various analytical instruments
BP811ET.4K	To Formulate and justify techniques for the analysis of drugs
BP811ET.5K	To 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 –
BP812ET.1K	To define, classify and understand the functional foods, Nutraceuticals and dietary supplements.
BP812ET.2K	To remember the sources, chemical nature, medicinal uses and health benefits of Nutraceuticals and functional foods.
BP812ET 3K	To explain basics of free radicals, dietary fibers and carbohydrates
BP812ET.4K	To understand role of free radicals in different diseases and to classify antioxidants.
BP812ET.5K	To study Effect of processing, storage and interactions of various environmental factors on the potential of nutraceuticals and understand Regulatory Aspects and Pharmacopoeial Specifications for dietary supplements and nutraceuticals

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