SRI AUROBINDO INSTITUTE OF PHARMACY, INDORE (M.P.)

COURSE OUTCOMES

B.PHARM

B. PHARM I SEM	
COURSE NAME & CODE	**COURSE OUTCOME (COs)**
BP 101T HUMAN ANATOMY & PHYSIOLOGY-II	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. Perform the various experiments related to special senses and nervous system.
	CO5. Appreciate coordinated working pattern of different organs of each system
BP102T PHARMACEUTICAL ANALYSIS	CO1. understand the principles of volumetric and electro chemical analysis
	CO2. carryout various volumetric and electrochemical titrations
	CO3. develop analytical skills
BP103T PHARMACEUTICS- I	CO1. Know the history of profession of pharmacy
	CO2. Understand the basics of different dosage forms, pharmaceutical incompatibilities
	CO3. Understand the professional way of handling the prescription
	CO4. pharmaceutical calculations Preparation of various conventional dosage forms
BP104T PHARMACEUTICAL INORGANIC CHEMISTRY	CO1. Know the sources of impuritiesin inorganics
	CO2 Know methods to determine the impurities in inorganic
	CO3 understand the medicinal and pharmaceutical importance of inorganic compounds, drugs and pharmaceuticals
BP105T COMMUNICATION SKILLS	CO1. Understand the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation
	CO2. Communicate effectively (Verbal and Non Verbal)
	CO3. Effectively manage the team as a team player
	CO4. Develop interview skills
	CO5. Develop Leadership qualities and essentials
BP 106 RBT REMEDIAL BIOLOGY	CO1. understand the basic components of anatomy
	CO2. know the classification and salient features of five kingdoms of life & know understand the basic components of anatomy
	CO3. physiology of plant & physiology animal with special reference to human
BP 106 RMT.REMEDIAL MATHEMATICS	CO1. Know the theory and their application in Pharmacy
	CO2. Solve the different types of problems by applying theory
	CO3. Appreciate the important application of mathematics in Pharmacy
BP-107P HUMANANATOMY & PHYSIOLOGY	CO1. Model physiological processes discussed in theory classes through experiments on normal human beings.
	CO2. Study microscopic demonstration ofthe cells& tissues
	CO3. Identify various systems using charts,models& specimens
	CO4. Analyze human blood sample
	CO1. Learn the art ofperforming limit tests ofsome common impurities

BP108T PHARMACEUTICAL ANALYSIS	CO2. Demonstrate the art ofpreparation and standardization of primary and secondary standards
	CO3. Perform and learn the technique ofassay
	CO4. DetermineNormality using various electro-analytical methods.
BP109P PHARMACEUTICS- I	CO1. Make use ofdifferent techniques leaned on theory to prepare and dispense various dosage forms
	CO2. Formulation and dispensing of liquid dosage forms
	CO3. Formulation and dispensing ofsolid dosage form
	CO4. Formulation and dispensing ofsemi-solid dosage form
BP110P PHARMACEUTICAL INORGANIC CHEMISTRY	CO1. Analyze qualitative determination ofimpurities via Limit Test
	CO2. Learn to identify different inorganic compounds
	CO3. Determine the purity ofBentonite, Aluminium Hydroxide Geletc,
	CO4. Elaborate preparation and use of Boric Acid, Potash Alum, and Ferrous Sulphate
BP111P COMMUNICATION SKILLS	CO1. Identify and learn socializing and etiquette
	CO2. Adapting the correct use of pronunciation (Consonantal and vowel sounds)
	CO3. Develop the use of narration and figures of speech c.llt.4 Improve writing skills and e-mail etiquette
	CO4. Improve writing skills and e-mail etiquette
	CO5. Take part in mock personal interview sessions
	CO6. lllustrate presentations
BP 1112P REMEDIAL BIOLOGY	CO1. Demonstrate the basic concepts of experimental biology
	CO2. Discuss the anatomy of the frog through computer-assisted techniques
	CO3. Model physiological processes discussed in theory classes
	CO4. ldentification and microscopic study of plant parts

B. PHARM II SEM	
COURSE NAME & CODE	**COURSE OUTCOME (COs)**
BP201T HUMAN ANATOMY & PHYSIOLOGY-II	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. Perform the hematological tests like blood cell counts, hemoglobin estimation, bleeding/clotting time etc and also record blood pressure, heart rate, pulse and respiratory volume.
	CO5. Appreciate coordinated working pattern of different organs of each system
	CO6. Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human
BP202T PHARMACEUTICAL ORGANIC CHEMISTRY	CO1. Able to write the structure, name and the type of isomerism of the organic compound
	CO2. Able to write the reaction, name the reaction and orientation of reactions
	CO3. Able to account for reactivity/stability of compounds,
	CO4. Able to identify/confirm the identification of organic compound
BP203T BIOCHEMISTRY	CO1. Understand the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes
	CO2. Understand the metabolism of nutrient molecules in physiological and pathological conditions.
	CO3. Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins
BP 204T. PATHOPHYSIOLOGY	CO1. Describe the etiology and pathogenesis of the selected disease states
	CO2. Name the signs and symptoms of the diseases
	CO3. Mention the complications of the diseases.
BP205 T COMPUTER APPLICATIONS IN PHARMACY	CO1. know the various types of application of computers in pharmacy
	CO2. know the various types of databases
	CO3. know the various applications of databases in pharmacy
BP 206T ENVIRONMENTAL SCIENCES	CO1. Create the awareness about environmental problems among learners.
	CO2. Impart basic knowledge about the environment and its allied problems.
	CO3. Develop an attitude of concern for the environment.
	CO4. Motivate learner to participate in environment protection and environment improvement.
	CO5. Acquire skills to help the concerned individuals in identifying and solving environmental problems.
	CO6. Strive to attain harmony with Nature.
BP207P HUMAN ANATOMY & PHYSIOLOGY-II	CO1. Take part in the study ofphysiological processes by using models and specimens of a few organ systems of the human body
	CO2. Illustrate and experiment with human subjects to understand normal body functioning
	CO3. Outline family planning devices and pregnancy diagnostic methods
	CO4. Relate the histology ofvital organs with the help of slides c.207.5 Construct blood report by using a cell analyzer
	CO1. Take part in preliminary testing and functional group testing oforganic compounds

BP208P PHARMACEUTICAL ORGANIC CHEMISTRY	CO2.Test for melting point and boiling point oforganic compounds
	CO3. Create derivatives of organic compounds
	CO4. Develop solid derivatives from organic compounds
BP209P BIOCHEMISTRY	CO1. Take part in qualitative analysis ofbiomolecules
	CO2. Test for the presence ofabnormal constitutes in blood and urine
	CO3. Create buffers ofvarious strengths for use in biochemistry practical
	CO4. Develop and learn methods for testing enzyme activity
	CO5. Demonstrate and related methods used in polymers
BP210P COMPUTER APPLICATIONS IN PHARMACY	CO1. Create HTML web-page
	CO2. Design questionnaire, forms, and reports using MS-Access
	CO3. Create invoice tables databases using MS-Access
	CO4. Develop and learn methods for content export using web pages
	CO5. Demonstrate and relate methods for drug information retrieval using online tools

B. PHARM III SEM	
COURSE NAME & CODE	**COURSE OUTCOME (COs)**
BP301T. PHARMACEUTICAL ORGANIC CHEMISTRY – II	CO1. write the structure, name and the type of isomerism of the organic compound
	CO2. write the reaction, name the reaction and orientation of reactions
	CO3. account for reactivity/stability of compounds,
	CO4. prepare organic compounds
BP302T. PHYSICAL PHARMACEUTICS-I	CO1. Understand various physicochemical properties of drug molecules in the designing the dosage forms
	CO2. Know the principles of chemical kinetics & to use them for stability testing nad determination of expiry date of formulations
	CO3. Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.
BP 304 T. PHARMACEUTICAL ENGINEERING	CO1. To know various unit operations used in Pharmaceutical industries.
	CO2. To understand the material handling techniques.
	CO3. To perform various processes involved in pharmaceutical manufacturing process.
	CO4. To carry out various test to prevent environmental pollution.
	CO5. To appreciate and comprehend significance of plant lay out design for optimum use of resources.
	CO6. To appreciate the various preventive methods used for corrosion control in Pharmaceutical industries
BP305P PHARMACEUTICAL ORGANIC CHEMISTRY – II	CO1. Apply the common laboratory techniques like recrystallization and steam distillation.
	CO2. Demonstrate the significance and process of determination of oil values including acid values, saponification values and iodine value
	CO3. Outline the synthesis ofbasic organic compounds by various reaction mechanisms including nitration, bromination, acetylation
	CO4. Outline the synthesis ofbasic organic compounds by various reaction mechanisms including hydrolysis, oxidation, and some name reactions
BP306P PHYSICAL PHARMACEUTICS-I	CO1. Explain a basic understanding of solubility determination. surface tension by various methods.
	CO3. Demonstrate the the significance and process of determination of pKa and partition coefficient.
	CO4. Determine the stability of the compounds by various Methods
	CO5. Determination of HLB number and CMC of surfactants
BP 307P PHARMACEUTICAL MICROBIOLOGY	CO1. Demonstrate and choose amongst different types of equipment and processing
	CO2. Illustrate the art of sterilization of glassware and refrigeration and sterilization of media.
	CO3. Illustrate the process of culturing, subculturing, and multiple streaking methods
	CO4. Make use of various staining techniques (Simple staining acid-fast staining) and the hanging drop method for determining the motility of microorganisms.
BP 308P PHARMACEUTICAL ENGINEERING	CO1. Determine the radiation constant ofdifferent materials used in pharmaceutical manufacturing
	CO2. Demonstrate the various factors influencing filtration and evaporation rate
	CO3. Explain humidity and drying and construct psychometric chart and drying curve
	CO4. Demonstrate the principle and working of ball mill and sieve shaker

B. PHARM IV SEM	
COURSE NAME & CODE	**COURSE OUTCOME (COs)**
BP401T. PHARMACEUTICAL ORGANIC CHEMISTRY –III	CO1. understand the methods of preparation and properties of organic compounds
	CO2. explain the stereo chemical aspects of organic compounds and stereo chemical reactions
	CO3. know the medicinal uses and other applications of organic compounds
BP402T. MEDICINAL CHEMISTRY – I	CO1.understand the chemistry of drugs with respect to their pharmacological activity
	CO2. understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
	CO3. know the Structural Activity Relationship (SAR) of different class of drugs
	CO4. write the chemical synthesis of some drugs
BP 403T. PHYSICAL PHARMACEUTICS-II	CO1. Understand various physicochemical properties of drug molecules in the designing the dosage forms
	CO2. Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
	CO3. Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.
BP 404T. PHARMACOLOGY-I	CO1.Understand the pharmacological actions of different categories of drugs
	CO2. Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.
	CO3. Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
	CO4. Observe the effect of drugs on animals by simulated experiments
	CO5. Appreciate correlation of pharmacology with other bio medical sciences
BP 405 T. PHARMACOGNOSY AND PHYTOCHEMISTRY I	CO1. to know the techniques in the cultivation and production of crude drugs
	CO2. to know the crude drugs, their uses and chemical nature
	CO3. know the evaluation techniques for the herbal drugs
	CO4. to carry out the microscopic and morphological evaluation of crude drugs
BP406P MEDICINAL CHEMISTRY – I	CO1. Assess synthesis and characterization of Benzimidazole having anti microbial property
	CO2. Examine the antipyretic property of 1, 3 pyrazole with synthesis and characterization
	CO3. Assess different drugs with assay
	CO4. Estimate partition coefficient of two drugs
BP 407P PHYSICAL PHARMACEUTICS-II	CO1. Understand the importance of physical characteristics of powder and liquid
	CO2. Understand the effect of excipients on physical properties i.e. flow property
	CO3. Understand the working principal of different types of viscometer
	CO4. Understand how to conduct stability testing
BP 408 P PHARMACOLOGY-I	CO1. Identify and study common laboratory animals
	CO2. Analyze commonly used instruments in experimental pharmacology
	CO3. Illustrated the maintenance of laboratory animals
	CO3. Explain common laboratory practice like blood withdrawal etc.
	CO4. Estimate the effect of drug with different animal models
BP 409 P PHARMACOGNOSY AND PHYTOCHEMISTRY I	CO1. Understand the concept of swelling and foaming index
	CO2. Examine the chemical properties of different secondary metabolites
	CO3. Estimate the different leaf constant
	CO3. Appraise the knowledge of quantitative microscopy
	CO4. Analyze the crude drug on the basis of physical parameters

B. PHARM V SEM	
COURSE NAME & CODE	**COURSE OUTCOME (COs)**
BP501T. MEDICINAL CHEMISTRY – II	CO1. Understand the chemistry of drugs with respect to their pharmacological activity
	CO2. Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
	CO3. Know the Structural Activity Relationship of different class of drugs
	CO4. Study the chemical synthesis of selected drugs
BP 502 T. INDUSTRIAL PHARMACY-I	CO1. Know the various pharmaceutical dosage forms and their manufacturing techniques.
	CO2. Know various considerations in development of pharmaceutical dosage forms
	CO3. Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality
BP503.T. PHARMACOLOGY-II	CO1. Understand the mechanism of drug action and its relevance in the treatment of different diseases
	CO2. Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments
	CO3. Demonstrate the various receptor actions using isolated tissue preparation
	CO4. Appreciate correlation of pharmacology with related medical sciences
BP504 T. PHARMACOGNOSY AND PHYTOCHEMISTRY II	CO1. To know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents
	CO2. To understand the preparation and development of herbal formulation.
	CO3. To understand the herbal drug interactions
	CO4. To carryout isolation and identification of phytoconstituents
BP 505 T. PHARMACEUTICAL JURISPRUDENCE	CO1. The Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals.
	CO2. Various Indian pharmaceutical Acts and Laws
	CO3. The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
	CO4. The code of ethics during the pharmaceutical practice
BP 506 P INDUSTRIAL PHARMACY-I	CO1. Explain the preformulation study of paracetamol/ aspirin or any drug
	CO2. Formulate and evaluate solid dosage form (paracetamol tablet/Aspirin Tablet/ film coating tablet or granules / Tetracyclines capsules)
	CO3. Formulate Liquid dosage form (Gluconate injection, Ascorbic acid injection and eye drop.)
	CO3. Formulate semisolid dosage form (eye ointment. cold cream and vanishing cream)
	CO4. Evaluation of glass test as per Ip
BP507 P PHARMACOLOGY-II	CO1. Relate the techniques and mechanism DRC of various drugs.
	CO2. Demonstrate isolation of different organs from the laboratory animal by simulated experiments.
	CO3. Demonstrate isolation of different tissues from the laboratory animal by simulated experiments.
	CO4. Demonstrate various receptor action using isolated tissue preparation
BP508 P PHARMACOGNOSY AND PHYTOCHEMISTRY II	CO1. Evaluate the plants and phytochemicals from plant tissue culture on the basis of morphology, histology and characteristics
	CO2. Demonstrate isolation and detection of active constituents of various plants various plants.
	CO3. Demonstrate separation and detection of phytoconstituents with te help of TLC and paper chromatography
	CO4. Analyze the crude drug by chemical test

B. PHARM VI SEM	
COURSE NAME & CODE	**COURSE OUTCOME (COs)**
BP601T MEDICINAL CHEMISTRY III	CO1. Understand the importance of drug design and different techniques of drug design
	CO2. Understand the chemistry of drugs with respect to their biological activity.
	CO3. Know the metabolism, adverse effects and therapeutic value of drugs.
	CO4. Know the importance of SAR of drugs.
BP602T PHARMACOLOGY III	CO1. Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases
	CO2. Comprehend the principles of toxicology and treatment of various poisonings
	CO3. Appreciate correlation of pharmacology with related medical sciences.
BP603T HERBAL DRUG TECHNOLOGY	CO1. Understand raw material as source of herbal drugs from cultivation to herbal drug product
	CO2. Know the WHO and ICH guidelines for evaluation of herbal drugs
	CO3. Know the herbal cosmetics, natural sweeteners,nutraceuticals, appreciate patenting of herbal drugs, GMP .
BP604T BIOPHARMACEUTICS AND PHARMACOKINETICS	CO1. Understand the basic concepts in biopharmaceutics and pharmacokinetics and their significance.
	CO2. Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination.
	CO3. To understand the concepts of bioavailability and bioequivalence of drug products and their significance.
	CO4. Understand various pharmacokinetic parameters, their significance & applications.
BP605T PHARMACEUTICAL BIOTECHNOLOGY	CO1. Understanding the importance of Immobilized enzymes in Pharmaceutical Industries
	CO2. Genetic engineering applications in relation to production of pharmaceuticals
	CO3. Importance of Monoclonal antibodies in Industries
	CO4. Appreciate the use of microorganisms in fermentation technology
BP606T QUALITY ASSURANCE	CO1. Understand the cGMP aspects in a pharmaceutical industry·
	CO2. Appreciate the importance of documentation
	CO3. Understand the scope of quality certifications applicable to pharmaceutical
	CO4. Understand the responsibilities of QA & QC departments
BP 607 P MEDICINAL CHEMISTRY III	CO1. Design and build drugs along with their intermediates
	CO2. Perform and understand the assay methods of some important antibiotics
	CO3. Perform the synthesis of important intermediate and drugs using microwave irradiation methods
	CO4. Learn how to use the computer programs to draw chemical structures
	CO5. Learn, apply and appraise Lipinski's rule of five using computer-assisted methods
BP 608 P PHARMACOLOGY III	CO1. Outline the concept of dose calculation in pharmacology experiments
	CO2. Demonstrate the action of drugs on the respiratory and gastrointestinal tract using software
	CO3. Determine acute toxicity ofdrugs by given data
	CO4. Illustrate calculation of Pharmacokinetic parameters
	CO5. Learn the application of biostatistics methods in experimental pharmacology
BP 609 P HERBAL DRUG TECHNOLOGY	CO1. Perform preliminary phytochemical screening of crude drugs
	CO2. Evaluate the excipients of natural origin
	CO3. Perform monograph analysis of some pharmacopeial drugs
	CO4. Prepare and standardize formulations containing crude drug extracts
	CO5. Analyze crude drugs for secondary metabolite content

B. PHARM VII SEM	
COURSE NAME & CODE	**COURSE OUTCOME (COs)**
BP 701T INSTRUMENTAL METHOD OF ANALYSIS	CO1. Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis
	CO2. Understand the chromatographic separation and analysis of drugs.
	CO3. Perform quantitative & qualitative analysis of drugs using various analytical instruments.
BP 702T INDUSTRIAL PHARMACY-II	CO1. Know the process of pilot plant and scale up of pharmaceutical dosage forms
	CO2. Understand the process of technology transfer from lab scale to commercial batch
	CO3. Know different Laws and Acts that regulate pharmaceutical industry
	CO4. Understand the approval process and regulatory requirements for drug products
BP703T PHARMACY PRACTICE	CO1. Know various drug distribution methods in a hospital
	CO2. Appreciate the pharmacy stores management and inventory control
	CO3. Monitor drug therapy of patient through medication chart review and clinical review
	CO4. Obtain medication history interview and counsel the patients
	CO5. Identify drug related problems
	CO6. Detect and assess adverse drug reactions
	CO7. Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states
	CO8. Know pharmaceutical care services
	CO9. Do patient counseling in community pharmacy;
	CO10. Appreciate the concept of Rational drug therapy.
BP704T NOVEL DRUG DELIVERY SYSTEM	CO1. To understand various approaches for development of novel drug delivery systems.
	CO2. To understand the criteria for selection of drugs and polymers for the development of Novel drug delivery systems, their formulation and evaluation
BP 705 P INSTRUMENTAL METHOD OF ANALYSIS	CO1. Determination of absorption maxima of various organic compounds
	CO2. Perform assay and simultaneous estimation of by UV spectroscopy
	CO3. separation of compounds by paper chromatography
	CO4. Demonstrate the analysis of compounds using spectroscopic methods
	CO5. Demonstration of instrumentation of HPLC and Gas chromatography
BP 706P PRACTICE SCHOOL	CO1. To understand NABH rules of prescription writing and IPD auditing system
	CO2. To understand the errors found in prescription writing and IPD
	CO3. To know about high risk medicines and how to be mentioned in prescription, therapeutic duplication, consolation
	CO4. To develop communication skill, learn how to do patient counseling
	CO5. To understand the working culture of hospital.

B. PHARM VIII SEM	
COURSE NAME & CODE	**COURSE OUTCOME (COs)**
BP 801T BIOSTATISITCS AND RESEARCH METHODOLOGY	CO1. Know the operation of M.S. Excel, SPSS, R and MINITAB® , DoE (Design of Experiment)
	CO2. Know the various statistical techniques to solve statistical problems Appreciate statistical techniques in solving the problems.
BP- 802T SOCIAL AND PREVENTIVE PHARMACY	CO1. Acquire high consciousness/realization of current issuesrelated to health and pharmaceutical problems within the country and worldwide.
	CO2. Have a critical way of thinking based on current healthcare development.
	CO3. Evaluate alternative ways of solving problems related tohealth and pharmaceutical issues
BP- 805ET PHARMACOVIGILANCE	CO1. Why drug safety monitoring is important?
	CO2. History and development of pharmacovigilance National and international scenario of pharmacovigilance Dictionaries, coding and terminologies used in pharmacovigilance
	CO3. Detection of new adverse drug reactions and their assessment International standards for classification of diseases and drugs Adverse drug reaction reporting systems and communication in pharmacovigilance
	CO4. Methods to generate safety data during pre-clinical, clinical and post approval phases of drugs' life cycle Drug safety evaluation in pediatrics, geriatrics, pregnancy and lactation
	CO5. Pharmacovigilance Program of India (PvPI) requirement for ADR reporting in India ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning CIOMS requirements for ADR reporting
	CO6. Writing case narratives of adverse events and their quality.
BP-809ET COSMETIC SCIENCE	CO1. Upon completion of the course the student shall be able to understand:
	CO2. Cosmetics and cosmeceutical products.
	CO3. Formulation and building blocks of skin care products, antiperspirants, deodorants and hair care products.
	CO4. The role of herbs in cosmetics and analysis of cosmetics.
	CO5. Principles of cosmetics evaluation.
	CO6. Problems associated with hair and skin.