

Shree Sureshdada Jain Institute of Pharmaceutical Education and Research, Jamner

Program Outcomes

(B.Pharm)

- 1. Pharmacy Knowledge:** Possess basic knowledge and intellectual ability related to the profession of pharmacy including biomedical science; Pharmaceutical Sciences; Behavioral, social and organizational pharmacy science and manufacturing practices.
- 2. Planning Abilities:** Graduates demonstrate effective planning abilities along with time management, Resource management, Delegation skills, and Organizational skills.
- 3. Problem analysis:** Use the principles of scientific inquiry, and think analytically, clearly, and critically, when solving problems and making decisions in everyday practice. Systematically seek, analyze, evaluate, and apply information and make valid decisions.
- 4. Modern tool usage:** Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools while understanding limitations.
- 5. Leadership skills:** Understand and consider human reactions to change, motivation issues, leadership, and team building when planning the changes necessary to meet practice, professional and social responsibilities. Believe in participatory roles such as responsible society or leadership roles when appropriate to improve health and well-being.
- 6. Professional Identity:** Understand, analyze, and communicate the value of their professional roles in society as healthcare professionals, health promoters, teachers, managers, employers, and employees.
- 7. Pharmaceutical Ethics:** Apply noble personal values and ethical principles in professional and social contexts. Express behavior that recognizes cultural and individual variability in values, communication, and lifestyle. Use a moral framework; Apply ethical principles when making decisions and take responsibility for the consequences associated with decisions.
- 8. Communication:** Correspond effectively with the pharmacy community and society, such as knowing and writing effective information, presenting and documenting effectively, and giving and collecting clear instructions.
- 9. The Pharmacist and Society:** Apply reasoning informed by sound knowledge to assess social, health, safety and officially sanctioned issues and ensuing responsibilities related to professional pharmacy practice.
- 10. Environment and sustainability:** Understand the impact of commercial pharmacy solutions in social and environmental contexts and demonstrate the knowledge and skills required for sustainable development.
- 11. Life-long learning:** Recognize the need for independent and lifelong learning in the broader context of technological change, and maintain readiness and competence. Assess yourself and use feedback effectively from others to identify learning needs and address ongoing core needs.

Program Outcomes (M.Pharm)

- 1: Advanced Pharmaceutical Knowledge:** Possess advanced knowledge and understanding of pharmaceuticals, quality assurance, and pharmaceutical chemistry, including formulation development, drug delivery systems, quality control, quality assurance principles, analytical techniques, and chemical synthesis.
- 2: Research and Development:** Acquire research skills to design and conduct experiments, analyze data, interpret research findings, and contribute to the development of novel drug formulations, dosage forms, and analytical methods.
- 3: Drug Formulation and Development:** Demonstrate proficiency in developing and optimizing various dosage forms, such as tablets, capsules, parenteral formulations, transdermal systems, and inhalation products, considering factors like stability, bioavailability, and patient acceptability.
- 4: Quality Control and Quality Assurance:** Understand and apply quality control and quality assurance principles, including good manufacturing practices (GMP), quality management systems (QMS), validation protocols, and regulatory requirements, to ensure the safety, efficacy, and quality of pharmaceutical products.
- 5: Analytical Techniques;** Gain expertise in a wide range of analytical techniques, including spectroscopy, chromatography, dissolution testing, particle size analysis, and microbiological testing, to evaluate drug substances and products for their identity, purity, potency, and stability.
- 6: Drug Stability Studies:** Design and conduct stability studies to assess the degradation mechanisms, shelf-life, and storage conditions of pharmaceutical products, ensuring their quality and efficacy throughout their shelf life.
- 7: Pharmaceutical Synthesis:** Develop skills in chemical synthesis, understanding reaction mechanisms, optimizing synthetic routes, and purifying pharmaceutical compounds, ensuring the synthesis of pure and safe drug substances.
- 8: Regulatory Compliance:** Understand and comply with regulatory requirements and guidelines related to pharmaceuticals, quality assurance, and pharmaceutical chemistry. Ensuring adherence to relevant legal and ethical standards in drug development, Manufacturing, and distribution.
- 9: Quality Auditing and Compliance:** Demonstrate the ability to perform audits and inspections of pharmaceutical manufacturing facilities, assess compliance with regulatory standards, identify and rectify quality-related issues, and contribute to continuous improvement in quality systems.
- 10: Professional Communication and Collaboration:** Communicate effectively with diverse stakeholders, including healthcare professionals, regulatory authorities, and manufacturing personnel, demonstrating teamwork, leadership, and ethical conduct to achieve common goals in pharmaceutical research, development, and quality assurance.
- 11: Lifelong Learning and Professional Development:** Recognize the importance of continuous professional development, engage in lifelong learning, and stay updated with emerging trends, new therapies, and advancements in pharmaceutical sciences, ensuring competence and excellence in pharmacy practice.

Program Educational Objectives (PEO)

PEO No.	PEO Nomenclature	Description
PEO1	Knowledge	Graduates of the program will acquire theoretical knowledge along with essential practical skill sets of pharmaceutical sciences and will be able to use these tools in the pharmaceutical industry, hospitals and institutions, or any business sector required for success.
PEO2	Core competence	To complete a perfect blend of fundamentals in pharmaceutical, pharmaceutical chemistry, pharmacology, pharmaceutical and pharmaceutical industries, and pharmaceutical analysis as per the needs of community and hospital pharmacy. The objective of the program is to develop students competently for the future
PEO3	Extensiveness	To train students with good knowledge in compounding, dispersing, drug properties, synthesis, formulation and development, analytical aspects, medicinal plants and herbal formulations, pharmacodynamics, pharmacokinetics, and molecular modeling with practical performance. Also applying all this in research and development to create new herbal and synthetic pharmaceutical products for the benefit of society.
PEO4	Training	The ideology of the institute is to train graduates to excel in higher education in India and abroad and to succeed in the pharmaceutical professional field. A profession in which the student chooses innovative teaching methods that engage the student in self-learning.
PEO5	Professionalism	To inculcate character, self-confidence, and self-discipline in the student and make them proficient in their professional and ethical attitude, effective communication skills- and teamwork skills. Multidisciplinary approach and ability to relate problems of pharmaceutical sciences to the wider social context.
PEO6	Assessment	Graduates of the program will be able to evaluate the advantages and disadvantages, advantages and disadvantages, the strengths and weaknesses of the subject studied in pharmaceutical technology that they need, and the ideology they see in the field of pharmaceutical science.

Course Outcome B. Pharmacy (PCI) Syllabus:

First-year B. Pharmacy (Semester-I)	Course outcome statements
<p align="center">BP101T. Human Anatomy & Physiology-I (Theory)</p>	Understand the various parts of the human body, Structural and functions of cells and classification of tissue and types of tissue.
	Describe the structure and function of skin & different salient features and functions of Joints and also the structural and function of bones.
	Explain the body fluids & composition and function of blood; as well as the Lymphatic organ and functions of the lymphatic system.
	Gain the knowledge about Structure and functions of the sympathetic and parasympathetic nervous system and the structure and functions of Sensory organ and their disorder.
	Understand the anatomy of the heart; Structure and function of the Cardiovascular system
<p align="center">BP102T. Pharmaceutical Analysis-I</p>	Explain the Different techniques of analysis; expressing Concentration; 1 ⁰ & 2 ⁰ standards. Preparation & standardization of various molar & normal solutions & explain the source, types, and methods of minimizing errors.
	Understands theories of acid-base titration, neutralization curves; Solvents, acidimetry, and alkalimetry titration, and estimation of Sodium benzoate and Ephedrine HCl
	Explain the different methods like Mohr's, Volhard's, Modified Volhard's, and Fajans method. Principle and steps involved in gravimetric analysis.
	Explain the concept of Oxidation and reduction, Types of redox titrations their principles, and applications.
	Learn the Electrochemical methods of analysis like conductometry, potentiometer, polarography and understand their application.
<p align="center">BP103T. Pharmaceutics-I</p>	Knowledge of pharmacopoeias also studies the dosage forms; Parts of prescription; and dose calculations based on age, body weight, and body surface area.
	Study the Pharmaceutical calculations; Study the definition classification, official preparations of powders & liquid dosage forms.
	Understand the definition, advantages, and disadvantages of classification and preparation of monophasic and biphasic dosage forms.
	Types and preparation evaluation suppositories. Identify the physical & chemical incompatibilities.
	Composition of ointments, pastes, creams, and gels. Evaluation of semi-solid dosages forms.

BP104T. Pharmaceutical Inorganic Chemistry	Explain the Sources and types of impurities & method of preparation of inorganic drugs and pharmaceuticals.
	Explain the different buffers, their preparation and use in pharmaceutical systems; Functions of major physiological ions.
	Explain the medicinal importance of pharmaceutical inorganic compounds.
BP105T. Communication skills	Understand the behavioral needs of a pharmacist to function effectively in the areas of pharmaceutical operation.
	Basic listening skills, writing skills to communicate effectively and manage the team as a team player.
	Effectively develop presentation skills with the confidence to crack interviews.
	Communication skills in group discussion; effectively stand in group/businesswise.
BP106T.RBT Remedial-biology	The student must be able to Know the cell biology and classification
	Learn and comprehend various tissue organ systems in plants and animals.
	Understands and explains anatomy and physiology of animals and plants.
BP106T.RMT Remedial-Mathematics	Study the theoretical concept of various topics and their application in pharmacy.
	Solve the different types of pharmaceutical problems by applying theoretical concepts.
	Appreciate the important application of mathematics and statistics in pharmacy.
BP107P. Human Anatomy & Physiology-I	Explain the microscope parts and apply this knowledge to study the histology of different tissues.
	Explain the components of the skeletal system and identify and describe parts in detail.
	Methods used in the diagnosis of disease using hematological tests like bleeding time, clotting time, WBC, RBC, and Blood group.
	Describe the basic principle of the cardiovascular system-bright to increase heart rate, pulse rate, and blood pressure.
BP108P. Pharmaceutical Analysis-I	Perform a limit test of Chloride, Sulphate, Iron, and Arsenic.
	Preparation and standardization of Sodium hydroxide, Sulphuric acid, Sodium thiosulfate, Potassium permanganate, Ceric ammonium sulfate
	Perform, Record, and calculate Assay with Standardization of Titrant.
	To understand electro-analytical methods by determination of Normality

BP109P. Pharmaceutics-I	Prepare monophasic, biphasic, powder, and semisolid systems.
	Experiment according to GLP & record in the journals.
BP110P. Pharmaceutical Inorganic Chemistry	Perform qualitative analysis of given inorganic compound.
	Carry out qualitative test of given inorganic compound
	Perform Limit test Chloride, sulfate Iron etc.
	Preparation of inorganic pharmaceuticals
BP111P. CommunicationSkills	Demonstrate and apply basic communication & pronunciation skills and advanced learning skills.
	Practice skill and presentation skills.
BP112RBP. Remedialbiology	Demonstrate microscope, section cutting technique its significance.
	Perform blood group detection, Measurement of blood pressure, and Tidal volume.
	Identify microscopy of tissue pertinent to stem, root, leaf, seed, fruit, and flower.

First-year B. Pharmacy (Semester-II)	Course outcome statements
BP201T. Human Anatomy & Physiology-II	Explain the anatomy and physiology of the nervous & system and the structure and function of the brain.
	Describe the anatomy and functions of the stomach, the formation and role of ATP.
	Discuss the anatomy of lungs Volumes and capacities transport of respiratory gases tidal volume, artificial respiration, and resuscitation methods as well as the anatomy of the respiratory system
	Understands structure and function of pituitary gland, thyroid gland, Parathyroid gland and adrenal gland.
	Described anatomy and function of male and female reproductive system and sex hormones.
BP202T. Pharmaceuticalorganic chemistry-I	Classify & give IUPAC nomenclature of various organic compounds along with types of isomerization.
	Described and explain the hybridization and stability in alkanes, alkenes, and conjugated dienes.
	Described and explain the different nucleophilic substitution and addition reaction in alkyl halides.
	Described and explain the method of preparation, reaction, chemical properties, uses, structure and their qualitative identification test for compounds of different functional group Alcohol, Carbonyl compounds (Aldehydes & ketones), Carboxylic acids, Aliphatic amines.

BP203T. Biochemistry	Understand classification, structure, function, digestion and metabolism of bio molecules.
	Study thermodynamic and bio energetic aspect of biochemical reaction
	Reproduce name structure, product and enzymes are involved in all metabolic process.
	Understand the catalytic role of enzyme, importance of enzyme inhibitor in digestion of new molecule.
	Explain three corner central paradigm of biochemistry i.e. replication, transcription, translation.
BP204T. Pathophysiology	Explain the principle related to cell injury, adaption, repair, growth, inflammation.
	Describe the etiology and Pathophysiology of disease related to CVS & Skeletal, joints.
	Describe the etiology and Pathophysiology of disease related to Infectious disease.
	Apply the knowledge of related to diseases and symptoms to identify the disease.
BP205T. Computer application in pharmacy	Understand the basics of computers.
	Differentiate among different web technologies and database.
	Delate various application of computers in pharmacy.
BP206T. Environmental science	Describe the basics of environmental sciences like need and purpose of study the subject.
	Classify and compare different sources of energies.
	Describe the Structure and function of an ecosystem.
BP207P. Human Anatomy & Physiology-II	Identify and explain histology structure of various tissues and organs of differed systems of human body.
	Plan, execute and conclude the experiment by different methodologies.
	Explain construction and working of spirometer for the measurement of lung volume and capacities.
	Explain the response of human body visual acuity, reflex activity, body temperature.
BP208P. Pharmaceutical-organic chemistry-I	Practice and follow safety rule and precautionary measure in laboratory.
	Identify and systematic qualitative analysis of organic compounds
	Preparation of suitable solid derivatives from organic compounds & Construction of molecular models.
BP209P. Biochemistry	Able to perform qualitative and quantitative analysis of various samples of carbohydrates, protein.
	Understand the clinical application of biochemical method throw experiment like blood Creatinine, blood sugar, serum total cholesterol & Salivary amylase activity.

Second year B. Pharmacy (Semester-III)	Course outcome statements
<p align="center">BP301T. Pharmaceutical organic chemistry-II</p>	Explain different reaction and aromatic character, resonance, orientation effect of substituent in benzene and its derivatives.
	Explain and described the method of preparation reaction chemical properties and uses structure and qualitative identification test for phenols, aromatic amines, aromatic acids and hydrocarbon.
	Understand the chemistry of fats and oils along with determine their analytical constants like acid value, Saponification value, iodine value and RM value
	Synthesis, reactions, Structure and medicinal uses polynuclear hydrocarbons.
	Explain different conformational Stabilities & reactions of cyclopropane and cyclobutene
<p align="center">BP302T. Physical Pharmaceutics-I</p>	Understand the different physicochemical properties of drug molecule in the designing of the dosage form.
	Know the principle of the chemical Kinetic & to use them for stability testing and determination of expiry date of formulation.
	Demonstrate the use of physicochemical properties in the formulation development and evaluation of dosage forms.
<p align="center">BP303T. Pharmaceutical Microbiology</p>	Understand classification and method of identification isolation and cultivation and preservation of various classes of microorganisms.
	Understand the uses of various microscopic technique staining technique and biochemical test for adaptation of microorganism
	Describe various method for control microorganism their evolution and factor affecting their efficiency.
	Describe various method used for sterilization of pharmaceutical product and evaluation of efficiency of method of sterilization.
	Outline cell culture technology and its applications in pharmaceutical industries.

BP304T. Pharmaceutical Engineering	Explain the various unit operations used in pharmaceutical industries.
	Perform various processes involved in pharmaceutical manufacturing process.
	Appreciate and comprehend significance of plant layout design for optimum use of resources like Evaporation, Distillation, Filtration, Centrifugation, Size Separation.
	Describe various preventive methods used for corrosion control in pharmaceutical industries
BP305P. Pharmaceutical organic chemistry-II	Perform experiment involving laboratory techniques like recrystallization & distillation.
	Determine analytical constants like acid value, Saponification value, iodine value of fats and oil
	Explain the theoretical aspect of organic synthesis and perform various organic synthetic reactions.
	Plan, execute and conclude the experiment using various methodologies.
BP306P. Physical Pharmaceutics-I	Understand the principle & method for determination of various physical parameters of formulation & drug.
	Analyze HLB number of a surfactant by Saponification method.
	Compare and contrast between different methods used in the determination of the same physicochemical parameters.
BP307P. Pharmaceutical Microbiology	Select and utilize different equipment and processing in experimental microbiology.
	Identify and isolate various microorganisms.
	Perform sterility testing of pharmaceutical products.
	Perform microbiological standardization of Pharmaceuticals.
BP308P. Pharmaceutical Engineering	Impact knowledge of different unit operations process.
	Perform numerical calculations involved in calculating process related determinants.
	Analyze and interpret the data generated from the experiments performed.

Second year B. Pharmacy (Semester-IV)	Course outcome statements
<p align="center">BP401T. Pharmaceutical organic chemistry-III</p>	Basic knowledge and various terminologies involved in stereochemistry.
	Understand nomenclature and classification Synthesis, reactions and medicinal uses heterocyclic compounds/derivatives.
	Remembers the reaction Metal hydride, Clemmensen, Birch reduction, Wolff Kishner reduction. Oppenauer-oxidation & Dakin reaction. Beckmanns and Schmidt rearrangement. Claisen- Schmidt condensation
<p align="center">BP402T. Medicinal Chemistry-I</p>	Correlate the physico-chemical properties of drug with biological response and metabolism of drugs with biological activity
	Explain the chemistry, metabolic pathways & SAR of drug acting on CNS like adrenergic, cholinergic drug.
	Explain the chemistry & SAR of Benzodiazepines, Barbiturates & Phenothiazines
	Explain the chemistry, metabolic pathways & SAR of narcotic & non-narcotic drugs.
<p align="center">BP403T. Physical Pharmaceutics- II</p>	Understand the concept of coarse & colloidal dispersion, rheology and powder technology and drug stability.
	Identify the different type of dispersion, rheological properties of the different dosage forms.
	Understand different type of orders of reaction and ways of drug degradation.
	Explain methods for determine particle size by different methods
	Explain with illustration the principles of chemical kinetics & to use for stability testing and determination expiry date of formulations.
<p align="center">BP404T. Pharmacology-I</p>	Explain terminologies used in pharmacology like synergism agonist, antagonist.
	Explain the pharmacodynamic & their principles and mechanisms drug action, receptor theories and classification of receptors.
	Explain the mechanism of drug acting on peripheral nervous system
	Explain the pharmacology drug use in central nervous system.
	Apply the knowledge of basic principle of pharmacology in predicting adverse drug reaction, drug interaction and drug development process.

<p align="center">BP405T. Pharmacognosy & Phytochemistry-I</p>	Outline the alternative system medicine, Classify the drug according to origin, quality & quantitative control parameter of drug.
	Describe the primary and secondary plant metabolite their biosynthesis and evaluation and therapeutics application.
	Describe the application of plant tissue culture technique to with value to production secondary metabolite
	Cultivation, Collection, Processing and storage of drugs, Factors influencing cultivation of medicinal plants. Plant hormones and their applications.
	Detailed study with respect to chemistry, sources, preparation, evaluation, preservation, storage, therapeutic used and commercial utility as Pharmaceutical Aids and Medicines.
<p align="center">BP406P. Medicinal Chemistry-I</p>	Demonstrate skills of handling synthetic procedure and quantitative evaluation technique.
	Synthesize and explain reaction mechanism of medicinally important compounds by using conventional methods.
	Perform quantitative analysis of drug such as Chlorpromazine, Phenobarbitone, Atropine, Ibuprofen, Aspirin and furosemide.
	Design the experimental requirement of Determination of Partition coefficient of organic molecule and evaluation.
<p align="center">BP407P. Physical Pharmaceutics- II</p>	Determine physico-chemical properties in the formulation development and, evaluation of dosage form.
	Determine reaction rate constant, order of different reaction.
	Carrying out Accelerated stability studies.
	Find out properties of powder & liquid dosage forms and observe on quality.
<p align="center">BP408P. Pharmacology-I</p>	Explain, Understand, evaluate and apply basic technique related instrument and animal handling for experiment purpose. Route of administration.
	Understand the CPCSEA guideline for ethical animal handling & Care of laboratory animal.
	Explain common laboratory techniques, like blood withdrawal, serum plasma separation, anesthetizes and euthanasia used for animal studies.
	Demonstrate the effect of drugs on animals by simulated experiments.
<p align="center">BP409P. Pharmacognosy & Phytochemistry-I</p>	Determination the quantitative microscopy for leaf constant.
	Determine different extractive, ash value, moisture content, swelling index and foaming index by official books.
	Determination of histological feature of plant of diagnostic significance like size of starch grains, calcium oxalate crystals. Analysis of crude drugs by chemical tests.

Third year B. Pharmacy (Semester-V)	Course outcome statements
<p align="center">BP501T. Medicinal Chemistry-II</p>	Understand the chemistry of drugs with respect to their pharmacological activity.
	Be aware of the drug metabolic pathways, adverse effect and therapeutic value of drugs.
	Know the Structural Activity Relationship of different class of drugs.
	Study the chemical synthesis of selected drugs.
<p align="center">BP502T. Industrial Pharmacy-I</p>	Understand the various dosage form and their manufacturing technique.
	All the related and practical aspect of solid, liquid and semisolid dosage form and their development & evaluation.
	Correlate the theoretical knowledge with professional and practical need of pharmaceutical industry.
<p align="center">BP503T. Pharmacology-II</p>	Classify the drug use for cardiovascular, urinary and endocrine system and explain their pharmacology.
	Explain autacoids and their drug and role in inflammatory disorder like gout & rheumatoid.
	Explain & understand the concept of bioassay, types of bioassays, method and applications of with different example of drug.
<p align="center">BP504T. Pharmacognosy & Phytochemistry-II</p>	Explain the modern process of extraction by using different method principles, isolation, purification, identification and analysis of diverse phytoconstituents.
	To develop the skill of general method of extraction, evaluation and chemical test of crude drug containing secondary metabolite.
	Establish the characterization & identification of the herbal drugs like Forskolin, Sennoside, Artemisinin, Diosgenine Digoxin.
	Study of utilization of radioactive isotopes in the investigation of Biogenetic studies.
<p align="center">BP505T. Pharmaceutical Jurisprudence</p>	The Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals.
	Various Indian pharmaceutical Acts and Laws
	The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals.
	The code of ethics during the pharmaceutical practice.

BP506P. Industrial Pharmacy-I	Proper use of various equipment's in pharmaceutical laboratory related to tablets, capsules and tablet coating.
	Include knowledge of formulation evaluation and labeling of Tablets and capsules
	Use necessary tools and equipment for preparation as per SOP
	Describe the evaluation criteria for glass containers as per I.P.
BP507P. Pharmacology-II	Understand methods of blood collection from experimental animals and various routes of drug administration and experimental principles for experiments.
	Describe the composition of physiological salt solutions and basic tools used in pharmacology
	Perform experiments using different isolated preparations and describe the effect of different drugs on the concentration response curve, interpret the action of different drugs using simulation software.
BP508P. Pharmacognosy & Phytochemistry-II	Identify crude drugs based on morphological and microscopic characters and assign biological source chemical constituents and therapeutic uses.
	Apply the knowledge of microscopic characters for powder drug formulation.
	Understanding the processes behind the extraction and isolation of alkaloids.
	Perform TLC on herbal extract.
	Analysis of crude drugs by chemical tests.

Third year B. Pharmacy (Semester-VI)	Course outcome statements
BP601T. Medicinal Chemistry-III	Understand the chemistry of drugs such as B-lactam antibiotics in relation to their pharmacological activity.
	Learn the metabolism, adverse effects and therapeutic value of drugs such as antibiotics and anti-malarial.
	Know the Structural Activity Relationship of different class of drugs like anti-tubercular agents, Quinolones & antiviral agents.
	Understand the importance of metabolism, SA& IUPAC of sulphonamides and sulfones.
	Understand the importance of drug design and different techniques of drug design.
BP602T. Pharmacology-III	Understand the mechanism of action of drugs and its relevance in the treatment of various infectious diseases.
	Comprehend the principles of toxicology and treatment of various poisoning.
	Appreciate correlation of pharmacology with related medical sciences.

BP603T. Herbal DrugTechnology	Understand raw material as source of herbal drugs from cultivation to herbal drug product.
	Know the WHO and ICH guidelines for evaluation of herbal drugs.
	Know the herbal cosmetics, natural sweeteners, nutraceuticals
	Appreciate patenting of herbal drugs, GMP.
BP604T. Biopharmaceutics & Pharmacokinetics	Understand the basic concepts and their importance in biopharmaceutics and Pharmacokinetics
	Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination.
	To understand the concepts of bioavailability and bioequivalence of drug products and their significance.
	Understand various pharmacokinetic parameters, their significance & applications
BP605T. Pharmaceutical Biotechnology	Understanding the importance of Immobilized enzymes in Pharmaceutical Industries.
	Genetic engineering applications in relation to production of pharmaceuticals.
	Importance of Monoclonal antibodies in Industries
	Appreciate the use of microorganisms in fermentation technology
BP606T. Quality Assurance	Understand the cGMP aspects in a pharmaceutical industry
	To appreciate the importance of documentation
	Understand the scope of quality certifications applicable to pharmaceutical industries
	Be aware of the responsibilities of QA & QC departments
BP607P. Medicinal Chemistry-III	Preparation of medicinally important compounds or intermediates by Microwave irradiation technique.
	Perform assay on drug.
	Apply the principle of green chemistry.
	Determination of physicochemical properties using drug design software.
BP608P. Pharmacology-III	Problem based on dose calculation in pharmacological experiment and calculation of pharmacokinetic parameter like Student's t test, ANOVA, Chi square test, Wilcoxon Signed Rank test
	The effect of drugs on animals by simulated software's.
	Determination of different toxicity study.
	Different biostatistics methods in experimental pharmacology.

BP609P. Herbal DrugTechnology	Perform preliminary photochemical screening of crude drugs.
	Understanding the process behind extraction and isolation of alkaloids.
	Analysis of herbal drugs from recent pharmacopoeias
	Determine Phenol content, Aldehydes content etc.

Final year B. Pharmacy (Semester-VII)	Course outcome statements
BP701T. Instrumental Method Of Analysis	Explain and illustrate the theory and application of UV Visible spectroscopy, Fluorimetry, IR spectroscopy, Flame Photometry, Atomic absorption spectroscopy, HPLC, GC, TLC, Paper chromatography, Ion exchange, Affinity chromatography, Gel chromatography.
	Perform mathematical calculation to obtain quantitative result from UV & chromatography parameter.
	Understand the chromatographic separation and analysis of drugs.
	Recall the terminologist associated with spectroscopy & chromatography.
BP702T. Industrial Pharmacy-II	Know the process of pilot plant and scale up of pharmaceutical dosage forms.
	Understand the process of technology transfer from lab scale to commercial batch.
	Know different Laws and Acts that regulate pharmaceutical industry.
	Understand the approval process and regulatory requirements for drug products.
BP703T. Pharmacy Practice	Understand the management of hospital, community, clinical pharmacy and therapeutic committee.
	ADR classification, therapeutic drug monitoring, drug store management and inventory control.
	Précis the OTC medication, investigational use of drug and interpretation of clinical lab tests.
	Understanding of drug delivery systems, prescribed drug orders and communication skills inpractical situations.
	Evaluation of patient counselling and Rational drug therapy
BP704T. Novel Drug Delivery System	To understand various approaches for the development of new drug delivery systems.
	To understand the criteria for selecting drugs and polymers for the development
	New drug delivery systems, their design and evaluation.

BP705P. Instrumental Method of Analysis	Perform analyze and determine and report the content of drug by using UV Visible spectroscopy, Fluorimetry, IR spectroscopy, Flame Photometry, Atomic absorption spectroscopy, colorimetry and turbidometry.
	The separation of mixture component by applying separation principle on chromatographic technique.
	Elaborate the Demonstration experiment on HPLC' Gas Chromatography.
Practice school	Development of skill in the modern tools.
	Acquire skill of documentation and record keeping.
	Plan academic carrier, and personal interests via research experiences.

Final year B. Pharmacy (Semester-VIII)	Course outcome statements
BP801T. Biostatistics and Research Methodology	Understand various approaches in Biostatistics & Mean, Median, Mode used in pharmaceutical field
	Know the operation of M.S. Excel, SPSS, R and MINITAB, DoE (Design of Experiment)
	Know the various statistical techniques to solve statistical problems.
	Appreciate statistical techniques in solving the problems
BP802T. Social and Preventive Pharmacy	Gain a higher consciousness/awareness of current issues related to health and pharmaceutical issues in the country and around the world.
	A critical way of thinking is based on current healthcare developments.
	Evaluate alternative ways of solving health related problems and pharmaceutical problems.
BP804ET. Pharmaceutical Regulatory Science	Learn about the drug discovery and development process
	Know the regulatory authorities and agencies that regulate production and sales of pharmaceuticals.
	Know the regulatory approval process and their Indian and registration international markets.
BP806ET. Quality Control and Standardization of Herbals	Know the WHO guidelines for quality control of herbal medicines.
	Learn about quality assurance in the herbal medicine industry.
	Regulatory approval process and their registration in India and International markets.
	Appreciate EU and ICH guidelines for quality control of herbal medicines.

**Course Outcome M. Pharmacy
(Pharmaceutics)**

First year M Pharmacy (Semester-I)	Course outcome statements
MPH 101T Modern Pharmaceutical Analytical Techniques	Know about analysis of various drugs in single and combination dosage forms.
	Study the chromatographical and spectroscopical method of analysis.
	Know about advanced analytical instrumental techniques for identification, characterization of drugs
	Understand the analytical instrumental techniques for quantification of drugs.
MPH 102 T Drug Delivery System	Understand the various approaches for development of novel drug delivery systems
	Know the criteria for selection of drugs and polymers for the development of delivering system.
	Know about Controlled Release formulations.
	Get an idea about formulation and evaluation of Novel drug delivery systems.
MPH 103 T Modern Pharmaceutics	Understand the various approaches for development of novel drug delivery systems.
	Know the criteria for selection of drugs and polymers for the development of delivering system.
	Know about Controlled Release formulations.
	Get an idea about formulation and evaluation of Novel drug delivery systems.
MPH 104T Regulatory Affairs	Know the Concepts of innovator and generic drugs, drug development process
	Learn about Regulatory guidance's and guidelines for filing and approval process
	Get the knowledge about Preparation of Dossiers and their submission to regulatory agencies in different countries
	Learn the Post approval regulatory requirements for actives and drug products.
First year M Pharmacy (Semester-II)	Course outcome statements
MPH 201T Molecular Pharmaceutics (Nano Technology & Targeted DDS) (NTDS)	Learn about various approaches for development of novel drug delivery systems.
	Understand about drug targeting
	Study the criteria for selection of drugs and polymers for the development of NTDS
	Study the formulation and evaluation of novel drug delivery systems
MPH 202T Advanced Biopharmaceutics & Pharmacokinetics	Understand the concepts in biopharmaceutics and pharmacokinetics.
	Study the critical evaluation of biopharmaceutic studies involving drug product equivalency
	Design and evaluate the dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.
	Get an idea about potential clinical pharmacokinetic problems and application of basics of pharmacokinetic
MPH 203T Computer Aided Drug Development	Know about Computational Modeling of Drug Disposition
	Study the use of Computers in Preclinical Development
	Get a knowledge about Optimization Techniques in Pharmaceutical Formulation Computers in Market Analysis

	Know about Artificial Intelligence (AI), Robotics and Computational fluid dynamics (CFD)
MPH 204T Cosmetics and Cosmeceuticals	Know the Key ingredients used in cosmetics and cosmeceuticals
	Know about current technologies in the market for development of cosmetics and cosmeceuticals
	Know about Various key ingredients and basic science to develop cosmetics and cosmeceuticals
	Get a scientific knowledge to develop cosmetics and cosmeceuticals with desired Safety, stability, and efficacy.
First year M Pharmacy (Semester-III)	Course outcome statements
MRM 301T Research Methodology & Biostatistics	Know about the research and some basis things about research.
	Learn about statistical test for analysis of samples.
	Understand about informed consent, ethics conflicts of interest and online business practices committees,
	Study about the CPCSEA guidelines.
	Know about the basic principles for all medical research.