B.PHARMACY - COURSE OUTCOMES (Cos)

Upon completion of course the student will be able to

Programme : I/IV B.Pharmacy

Semester/Year of Study : 1st Semester

Course Name : Human Anatomy and Physiology

Course Code : BP101T (Theory)

CO1	Recall the structure (gross and histology) and functions of various organs of the human body
CO2	Describe the various homeostatic mechanisms and their imbalances of various systems
CO3	Identify the various tissues and organs of the different systems of the human body
CO4	Recognize coordinated working pattern of different organs of each system
CO5	Analyse the interlinked mechanisms in the maintenance of normal functioning of human body

Programme : I/IV B.Pharmacy

Semester/Year of Study : 1st Semester

Course Name : Pharmaceutical Analysis - I

Course Code : BP102T (Theory)

CO1	Apply the basic principles of analysis in standardization of some compounds.
CO2	Identify the possible sources of impurities in medicinal agents and errors in analytical methods.
CO3	Analyze the pharmaceuticals by different volumetric methods.
CO4	Explain the principles of electro analytical methods, in analyzing various compounds
CO5	Determine the endpoint of titrations by electro analytical methods

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Programme : I/IV B.Pharmacy

Semester/Year of Study : 1st Semester

Course Name : Pharmaceutics - I

Course Code : BP103T (Theory)

CO1	Learn the historical background and profession of pharmacy and basics of pharmaceutical dosage forms
CO2	Solve pharmaceutical calculations and understand the formulation of powders and liquid dosage forms.
CO3	Prepare and dispense monophasic and biphasic liquid dosage forms.
CO4	Explain the concepts of suppositories and pharmaceutical incompatibilities
CO5	Summarize formulation and evaluation of semi solid dosage forms.

Programme : I/IV B.Pharmacy

Semester/Year of Study : 1st Semester

Course Name : Pharmaceutical Inorganic Chemistry - I

Course Code : BP104T (Theory)

CO1	Discuss the history of different types of pharmacopoeias and know principles involved in identification of impurities in inorganic pharmaceuticals
CO2	Select buffers in pharmaceutical systems and choose the appropriate electrolytes in therapy
CO3	Classify and study the preparation, properties and assay of inorganic compounds
CO4	Recognize types and applications of radiopharmaceuticals in pharmaceutical industry
CO5	Know the classification, preparation, properties and assay of poisonous compounds

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Programme : I/IV B.Pharmacy

Semester/Year of Study : 1st Semester

Course Name : Communication Skills

Course Code : BP105T (Theory)

CO1	Describe the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation
CO2	Define the Verbal and Non Verbal Communication skills effectively
CO3	Discuss effectively how to manage the team as a team player
CO4	Explains the interview skills to face challenges which arises in interviews
CO5	Develops the Leadership qualities and essentials

Programme : I/IV B.Pharmacy

Semester/Year of Study : 1st Semester

Course Name : Remedial Biology

Course Code : BP106RBT (Theory)

CO1	Recall the classification and salient features of five kingdoms of life and explains the basic components of anatomy and physiology of a plant
CO2	Describe the structure and functions of cardiovascular, digestive and respiratory systems of human boby
CO3	Discuss the physiology of excretory system ,structure of spinal cord and brain, functions of hormones in humans
CO4	Determine the macronutrients and micronutrients and process of photosynthesis, factors effecting photosynthesis
CO5	Elaborate the various life processes in plants like plant respiration, cell division and different types of tissues

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Programme : I/IV B.Pharmacy

Semester/Year of Study : 1st Semester

Course Name : Remedial Mathematics

Course Code : BP106RMT (Theory)

CO1	Recall the importance of mathematics in pharmacy
CO2	Analyse the mathematical equation in solving problems
CO3	Know the application of logarithms and matrics in pharamacy
CO4	Analyse geometry and method of pratial fractions, integration
CO5	Discuss differential equations, write properties and elementary functions using laplace transforms

Programme : I/IV B.Pharmacy

Semester/Year of Study : 1st Semester

Course Name : Human Anatomy and Physiology

Course Code : BP107P (Practical)

CO1	Recall the handling of compound microscope
CO2	Enumerate the WBC and RBC count
CO3	Determine and measure the heart rate, pulse rate and blood pressure
CO4	Estimate the heamaglobin content and electrolyte sedimentation rate
CO5	Determine the blood group, bleeding time and clotting time

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Programme : I/IV B.Pharmacy

Semester/Year of Study : 1st Semester

Course Name : Pharmaceutical Analysis

Course Code : BP108P (Practical)

CO1	Identify the various impurities present in compounds by performing limit tests
CO2	Analyze the compounds by acid base and nonaqueous titrations
CO3	Estimate different Pharmaceuticals by redox titration
CO4	Determine the medicinal compounds by precipitation and complexometric titrations.
CO5	Evaluate the strength of different standard/sample solutions by electro analytical techniques.

Programme : I/IV B.Pharmacy

Semester/Year of Study : 1st Semester

Course Name : Pharmaceutics

Course Code : BP109P (Practical)

CO1	Recall the principles used in the preparation of solid, liquid and semi solid dosage formssis
CO2	Compound and dispense monophasic liquid dosage forms for internal and external administration.
CO3	Compound and dispense biphasic liquid dosage forms
CO4	Compound and dispense powders and granules
CO5	Compound and dispense different semi solid dosage forms and suppositories

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Programme : I/IV B.Pharmacy

Semester/Year of Study : 1st Semester

Course Name : Pharmaceutical Inorganic Chemistry

Course Code : BP110P (Practical)

CO1	Recall the handling of apparatus and glassware in the chemistry laboratory
CO2	Perform the limit tests for different types of impurities
CO3	Identify different types of inorganic compounds
CO4	Perform the test for purity for different types of pharmaceutical compounds as per pharmacopoeial standards
CO5	Discuss the requirements and methods for preparation of selected compounds

Programme : I/IV B.Pharmacy

Semester/Year of Study : 1st Semester

Course Name : Communication Skills

Course Code : BP111P (Practical)

CO1	Define the communication skills required in day to day life
CO2	Apply the elements of communication and make use of communication styles
CO3	Explain the interview handling and presentation skills
CO4	Use of proper pronounciation by using consonant and vowel sounds
CO5	Discuss compose of email writing and to apply online job application

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Programme : I/IV B.Pharmacy

Semester/Year of Study : 1st Semester

Course Name : Remedical Biology

Course Code : BP112P (Practical)

CO1	Know the handling of microscopic and slide preparation techniques
CO2	Explain structure of cell and it organelles, identify various parts of plant and its modifications
CO3	Assess the microscopic study and identification of tissues pertinent in stem, leaves, root, seed, fruit and flower
CO4	Determine blood pressure, blood group and tidal volume
CO5	Detail study of frog by using different models

Programme : I/IV B.Pharmacy

Semester/Year of Study : 2nd Semester

Course Name : Human Anatomy and Physiology

Course Code : BP201T (Theory)

CO1	Recall the organization of nervous system, electrophysiology, action potential and impulse
CO2	Understand the anatomy of GIT, production &regulation of acid production, disorders
CO3	Identify the structure and function of respiratory system and explain the regulations and mechanism and regulations of respiration
CO4	Summarize the anatomy of urinary system and physiology of urine formation
CO5	Analyze Classification of hormones, mechanism of hormone action and predict physiology of male and female reproductive system

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Programme : I/IV B.Pharmacy

Semester/Year of Study : 2nd Semester

Course Name : Pharmaceutical Organic Chemistry -I

Course Code : BP202T (Theory)

CO1	Recall the classification, nomenclature, isomerism and concepts of hybridization in organic compounds
CO2	Select the method of preparation of various classes of organic compounds
CO3	Compare the kinetics, reactivity, stereochemistry and factors influencing reactions in alkyl halides and alcohols
CO4	Explain the named reactions of carbonyl compounds, acidity of carboxylic acids and basicity of amines
CO5	Discuss the qualitative tests, structure and uses of selected organic compounds

Programme : I/IV B.Pharmacy

Semester/Year of Study : 2nd Semester

Course Name : Biochemistry

Course Code : BP203T (Theory)

CO1	Illustrate the concepts of biosynthesis and metabolism and associated disorders of carbohydrates and importance of biological oxidation
CO2	Understand the basic concepts of Biomolecules and Bioenergetics
CO3	Identify the physiological and pathological conditions of lipids and amino acids
CO4	Distinguish the genetic organization of prokaryotes and eukaryotes
CO5	Assess the role of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes.

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Programme : I/IV B.Pharmacy

Semester/Year of Study : 2nd Semester

Course Name : Pathophysiology

Course Code : BP204T (Theory)

CO1	Identify the basic principles of cell injury, morphology of cell injury and cellular adaptations.
CO2	Explain the etiology and pathogenesis of various diseases
CO3	Apply the principles of pathogenesis in understanding symptoms, signs and complications of disease states
CO4	Appraise the principles of physical, chemical and biologic carcinogenesis
CO5	Adapt the principles of inflammation in understanding pathogenesis of various disease states

Programme : I/IV B.Pharmacy

Semester/Year of Study : 2nd Semester

Course Name : Computer Applications in Pharmacy

Course Code : BP205T (Theory)

CO1	Outline the fundamentals and Principles of Number System and Information System Software.
CO2	Develop pharmacy drug databases using proper web technologies
CO3	Apply the knowledge of Computers in Community Pharmacy.
CO4	Choose a relevant bioinformatics data base in vaccine discovery
CO5	Select an appropriate computing tool for data analysis in preclinical development.

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Programme : I/IV B.Pharmacy

Semester/Year of Study : 2nd Semester

Course Name : Environmental Sciences

Course Code : BP206T (Theory)

CO1	Understand and develop an attitude of concern for the various components of the environment.
CO2	Impart basic knowledge about environmental resources, ecosystems, biodiversity and pollution
CO3	Apply the concepts of environment in environment protection and environment improvement.
CO4	Identify the environment related problems and Strive to attain harmony with nature
CO5	Take part in helping the concerned individuals in identifying and solving environmental problems.

Programme : I/IV B.Pharmacy

Semester/Year of Study : 2nd Semester

Course Name : Human Anatomy and Physiology

Course Code : BP207P (Practical)

CO1	Recall the integumentary and special senses using specimen, models, etc
CO2	Identify the functions of cranial nerves by various sensory and motor activities
CO3	Examine tidal volume and vital capacity
CO4	Analyze recording of basal mass index and evaluate body temperature
CO5	Elaborate the knowledge on family planning devices, pregnancy diagnostic tests, tissues of vital organ and gonads

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Programme : I/IV B.Pharmacy

Semester/Year of Study : 2nd Semester

Course Name : Pharmaceutical Organic Chemistry -I

Course Code : BP208P (Practical)

CO1	Recall the molecular models of organic compounds and their preliminary qualitative tests
CO2	Compare the physical constants of unknown organic compounds with reference from the literature
CO3	Synthesize different type of organic compounds and their derivatives
CO4	Analyze organic compounds qualitatively and appropriate method of purification of organic compounds
CO5	Experiment the detection of elements and analysis of functional groups

Programme : I/IV B.Pharmacy

Semester/Year of Study : 2nd Semester

Course Name : Biochemistry

Course Code : BP209P (Practical)

CO1	Test for qualitative analysis of carbohydrates, proteins and urine
CO2	Analyze quantitatively reducing sugars and proteins
CO3	Assess the blood creatinine, blood sugar and serum total cholesterol
CO4	Measure PH of the prepared buffer solutions
CO5	Determine salivary amylase activity and the effect of temperature and substrate concentration on it

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Programme : I/IV B.Pharmacy

Semester/Year of Study : 2nd Semester

Course Name : Computer Applications in Pharmacy

Course Code : BP210P (Practical)

CO1	Make use of computing fundamentals in pharmaceutical sciences
CO2	Apply efficiently the online tools to all pharmaceutical related activities
CO3	Develop solutions for pharmaceutical problems using computer applications.
CO4	Create HTML web pages and XML pages to export patient database
CO5	Support drug information storage and retrieval using MS Access

Programme : II/IV B.Pharmacy

Semester/Year of Study : 3rd Semester

Course Name : Pharmaceutical Organic Chemistry -II

Course Code : BP301T (Theory)

CO1	Recall the structure, properties and reactions of benzene
CO2	Outline the properties of fats and oils and study their analytical constants
CO3	Identify the effect of substituent's on properties of carboxylic acids, phenols and amines
CO4	Categorize the organic compounds and study their structure and uses
CO5	Discuss the polynuclear hydrocarbons and explain their synthesis and reactants

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Programme : II/IV B.Pharmacy

Semester/Year of Study : 3rd Semester

Course Name : Physical Pharmaceutics I

Course Code : BP302T (Theory)

CO1	Recollect the states of matter and understand the applications of various physiochemical properties to design dosage forms
CO2	Gain knowledge of ph and buffers and their use in the stabilization of pharmaceutical formulations.
CO3	Understand the principle of interfacial tension and the applications of surface active agents in drug solubilization.
CO4	Perceive and apply the concepts of complexation and protein binding in pharmacy
CO5	Elaborate the significance of physical properties of drug molecules in design and stability of dosage forms.

Programme : II/IV B.Pharmacy

Semester/Year of Study : 3rd Semester

Course Name : Pharmaceutical Microbiology

Course Code : BP303T (Theory)

CO1	Develop methods for qualitative and quantitative analysis of microorganisms
CO2	Apply sterilization and disinfection methods in pharmaceutical industry
CO3	Analyze antimicrobial agents
CO4	Assess microbial contaminants of pharmaceutical products
CO5	Select appropriate methods for microbiological standardization and cell culture techniques.

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Programme : II/IV B.Pharmacy

Semester/Year of Study : 3rd Semester

Course Name : Pharmaceutical Engineering

Course Code : BP304T (Theory)

CO1	Understand the laws governing Flow of fluids and Heat transfer.
CO2	Apply the size reduction and size separation techniques on pharmaceutical powders.
CO3	Identify suitable operating methods of Evaporation and Distillation for different types of products
CO4	Distinguish among various techniques used for Drying and Mixing of Pharmaceutical products
CO5	Categorize equipment used for Filtration and Centrifugation of Pharmaceutical products.

Programme : II/IV B.Pharmacy

Semester/Year of Study : 3rd Semester

Course Name : Pharmaceutical Organic Chemistry -II

Course Code : BP305P (Practical)

CO1	Recall the principles involved in the analysis of fixed oils
CO2	Illustrate about recrystallization and the concept of Steam distillation
CO3	Synthesize different type of organic compounds using various kinds chemical reactions
CO4	Investigate the purity of the synthesized products & fats and oils quantitatively
CO5	Relate the experimental values of fat constants with reference values

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Programme : II/IV B.Pharmacy

Semester/Year of Study : 3rd Semester

Course Name : Physical Pharmaceutics -I

Course Code : BP306P (Practical)

CO1	Understand the significance of physical properties such as solubility, surface tension, partition coefficient and pKa in the design of dosage forms.
CO2	Explain adsorption isotherms and determine Freundlich-Langmuir constant using activated charcoal
CO3	Apply Henderson – Hasselbalch equation for interpretation of pKavalue of drugs and deduce the HLB value and critical micellar concentration of a surfactant.
CO4	Determine the surface tension of sample liquids by drop count and drop weight methods
CO5	Estimate the stability constants of complexes by solubility and pH titration methods

Programme : II/IV B.Pharmacy

Semester/Year of Study : 3rd Semester

Course Name : Pharmaceutical Microbiology

Course Code : BP307P (Practical)

CO1	Apply aseptic techniques for culturing of microbes and differentiate bacteria by staining techniques
CO2	Identify bacteria based on motility characteristics and biochemical tests
CO3	Analyze the bacteria in water and sterility of pharmaceutical products
CO4	Estimate the colonies isolated by pure culture techniques
CO5	Determine the potency of antibiotics by microbiological assays

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Programme : II/IV B.Pharmacy

Semester/Year of Study : 3rd Semester

Course Name : Pharmaceutical Engineering

Course Code : BP308P (Practical)

CO1	Demonstrate Pharmaceutical machinery such as Rotary tablet machine, Fluidized energy mill, Ball mill.
CO2	Construct the drying rate curves of Calcium Carbonate and Starch.
CO3	Analyze the effect of various factors (Concentration, Surface area, Thickness/ Viscosity) on the rate of filtration and evaporation.
CO4	Examine the effect of time on the Rate of Crystallization.
CO5	Determine the radiation rate constant of painted glass and unpainted glass

Programme : II/IV B.Pharmacy

Semester/Year of Study : 4th Semester

Course Name : Pharmaceutical Organic Chemistry -III

Course Code : BP401T (Theory)

CO1	Recall the elements of symmetry and nomenclature of stereoisomer's
CO2	Explain concept of optical isomerism, geometrical isomerism and conformational isomerism
CO3	Apply stereoisomerism in biphenyl compounds and study stereospecific and stereoselective reactions
CO4	Classify and study the nomenclature, synthesis, reactions and medicinal uses of heterocyclic compounds and their derivatives
CO5	Discuss the named reactions and their synthetic importance

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Programme : II/IV B.Pharmacy

Semester/Year of Study : 4th Semester

Course Name : Medicinal Chemistry -I

Course Code : BP402T (Theory)

CO1	Understand the effect of physicochemical properties of drugs with respect to their pharmacological activity
CO2	Explain the drug metabolic pathways, adverse effect and therapeutic importance of drugs
CO3	Summarize the Structural Activity Relationship (SAR) of different class of drugs
CO4	Solve the synthesis of drugs by using standard protocols
CO5	Discuss the importance of natural products as drugs

Programme : II/IV B.Pharmacy

Semester/Year of Study : 4th Semester

Course Name : Physical Pharmaceutics - II

Course Code : BP403T (Theory)

CO1	Outline the types and properties of Colloidal dispersions
CO2	Characterize the pharmaceutical materials based on their rheological properties.
CO3	Develop stable formulations of various kinds of suspensions and emulsions.
CO4	Inspect the micromeritic characteristics of powders using various techniques.
CO5	Analyze the stability of drug products by using principles of kinetics.

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Programme : II/IV B.Pharmacy

Semester/Year of Study : 4th Semester

Course Name : Pharmacology - I

Course Code : BP404T (Theory)

CO1	Understand various terminologies in general pharmacology and categorize based on pharmacology
CO2	Explain various drug action principles, mechanisms, adverse drug reactions and drug interactions
CO3	Employ concepts of drug discovery and clinical evaluation of new drugs.
CO4	Distinguish various drugs acting on peripheral & central nervous system
CO5	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases

Programme : II/IV B.Pharmacy

Semester/Year of Study : 4th Semester

Course Name : Pharmacognosy and Phytochemistry -I

Course Code : BP405T (Theory)

CO1	Know the handling of microscopic and slide preparation techniques
CO2	Explain structure of cell and it organelles, identify various parts of plant and its modifications
CO3	Assess the microscopic study and identification of tissues pertinent in stem, leaves, root, seed, fruit and flower
CO4	Determine blood pressure, blood group and tidal volume
CO5	Detail study of frog by using different models

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Programme : II/IV B.Pharmacy

Semester/Year of Study : 4th Semester

Course Name : Medicinal Chemistry -I

Course Code : BP406P (Practical)

CO1	Illustrate different organic reactions employed for synthesis of drugs or intermediates
CO2	Judge the solvent for purification of some medicinal compounds and their analogues by recrystallization
CO3	Determine different classes of drugs by quantitative methods of analysis.
CO4	List out the requirements for analysis of drugs
CO5	Investigate the partition coefficient value of drugs

Programme : II/IV B.Pharmacy

Semester/Year of Study : 4th Semester

Course Name : Physical Pharmaceutics - II

Course Code : BP407P (Practical)

CO1	Choose a good suspending agent to formulate a stable suspension
CO2	Interpret the shelf life of a given formulation by accelerated stability studies
CO3	Make use of derived and flow properties of powders to ensure a stable solid formulation.
CO4	Distinguish the rate constants as per the chemical reaction.
CO5	Determine the viscosity using Ostwald's and Brookfield's viscometer, Predict the flux by Franz diffusion cell.

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Programme : II/IV B.Pharmacy

Semester/Year of Study : 4th Semester

Course Name : Pharmacology - I

Course Code : BP408P (Practical)

CO1	Apply basics of pharmacology in understanding experimental pharmacology
CO2	Administer different drugs through different routes of drug administration in animals
CO3	Examine various Pharmacological laboratory techniques
CO4	Determine the effect of drugs on animals by simulated experiments
CO5	Predict various screening models for anticonvulsants and anxiolytic activities

Programme : II/IV B.Pharmacy

Semester/Year of Study : 4th Semester

Course Name : Pharmacognosy and Phytochemistry -I

Course Code : BP409P (Practical)

CO1	Apply basics of pharmacology in understanding experimental pharmacology
CO2	To administer different drugs through different routes of drug administration in animals
CO3	Examine various Pharmacological laboratory techniques
CO4	Determine the effect of drugs on animals by simulated experiments.
CO5	Predict various screening models for anticonvulsants and anxiolytic activities

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Programme : III/IV B.Pharmacy

Semester/Year of Study : 5th Semester

Course Name : Medicinal Chemistry -II

Course Code : BP501T (Theory)

CO1	Understand the chemistry of drugs with respect to their pharmacological activity
CO2	Apply the Structural Activity Relationship of different classes of drugs
CO3	Classify and illustrate the drugs mentioned in the course.
CO4	Explain the drug metabolic pathways, adverse effect and therapeutic value of drugs
CO5	Develop the synthesis of the selected medicinally active agents

Programme : III/IV B.Pharmacy

Semester/Year of Study : 5th Semester

Course Name : Industrial Pharmacy -I

Course Code : BP502T (Theory)

CO1	Discusss various physicochemical properties and their significance in the development and stability of dosage forms
CO2	Illustrate the classification, preparation, evaluation and packing of Solid dosage forms
CO3	Explain the formulation and manufacturing aspects of Liquid orals and Pellets.
CO4	Categorize preformulation factors, excipients, production facilities and aseptic techniques followed in the formulation of parenteral products and ophthalmic preparations
CO5	Summarize the formulation and evaluation of aerosols and cosmetics and importance of containers and closures

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Programme : III/IV B.Pharmacy

Semester/Year of Study : 5th Semester

Course Name : Pharmacology -II

Course Code : BP503T (Theory)

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 stimulated experiments
CO3	Demonstrate the various receptor actions using isolated tissue preparation
CO4	Appreciate correlation of pharmacology with related medical sciences

Programme : III/IV B.Pharmacy

Semester/Year of Study : 5th Semester

Course Name : Pharmacognosy -II

Course Code : BP504T (Theory)

CO1	Illustrate and use radioisotopes to ascertain biogenetic pathway of secondary metabolites in plants.
CO2	Explain phytochemistry of secondary metabolites of commercial importance.
CO3	Illustrate and interpret phytochemicals of industrial significance.
CO4	Explain the process of isolation, identification or analysis of phytoconstituents
CO5	Analyse the quality, identity and purity of crude drugs by modern methods

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Programme : III/IV B.Pharmacy

Semester/Year of Study : 5th Semester

Course Name : Pharmaceutical Jurisprudence

Course Code : BP505T (Theory)

CO1	Recall the Pharmaceutical legislations, ethics, right to information, medical termination of pregnancy and intellectual property rights
CO2	Relate the significance of Drugs and Cosmetics act 1940 and its rules 1945 in relation to import and manufacture of drugs.
CO3	Apply the knowledge on schedules pertaining to Drugs and Cosmetics Act 1940 and its rules 1945 and also administration of the act and rules
CO4	Understand the functions of pharmacy council and implementation of education regulations in pharmacy
CO5	Appraise the importance of medicinal and toilet preparations act and narcotic drugs and psychotropic substances act and rules

Programme : III/IV B.Pharmacy

Semester/Year of Study : 5th Semester

Course Name : Industrial Pharmacy -I

Course Code : BP506P (Practical)

CO1	Illustrate the formulation and evaluation of unit solid dosage forms
CO2	Explain the formulation of sterile preparations
CO3	Evaluate tablets, capsules and containers as per pharmacopoeial specifications
CO4	Formulate skin care cosmetics
CO5	Find the applications of preformulation studies

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Programme : III/IV B.Pharmacy

Semester/Year of Study : 5th Semester

Course Name : Pharmacology -II

Course Code : BP507P (Practical)

CO1	Understand effect of drugs on blood pressure and heart rate of dog.
CO2	Remember effect of of physostigmine and atropine on DRC of acetylcholine using frog rectus abdominis muscle and rat ileum respectively.
CO3	Evaluate bioassay of oxytocin using rat uterine horn by interpolation method..
CO4	Analyze effect of spasmogens and spasmolytics using rabbit jejunum.
CO5	Predict various screening models for analgesic and anti-inflammatory activities

Programme : III/IV B.Pharmacy

Semester/Year of Study : 5th Semester

Course Name : Pharmacognosy and pytochemistry -II

Course Code : BP508P (Practical)

CO1	Examine the morphological or histological characters of crude drugs
CO2	Inspect the authenticity or adulteration of crude drugs by chemical tests
CO3	Choose the relevant method to isolate or extraction phytochemical from crude drugs
CO4	Assess the purity, identity or separate phytoconstituents using relevant chromatographic techniques
CO5	Analyse and evaluate the powdered crude drugs by morphological and microscopical characteristics

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Programme : III/IV B.Pharmacy

Semester/Year of Study : 6th Semester

Course Name : Medicinal Chemistry -III

Course Code : BP601T (Theory)

CO1	Remember the definition, classification and mode of action and contrast the different chemotherapeutic drugs and its uses.
CO2	Understand the chemistry of drugs with respect to their biological activity
CO3	Apply the Structural Activity Relationship and importance of different class of drugs
CO4	Distinguish the drug metabolic pathways, adverse effect and therapeutic value of drugs based on their chemical structures.
CO5	Plan the synthesis of selected medicinally active chemotherapeutic agents

Programme : III/IV B.Pharmacy

Semester/Year of Study : 6th Semester

Course Name : Pharmacology -III

Course Code : BP602T (Theory)

CO1	Students will be able to identify the drugs for treating various respiratory and gastrointestinal complications.
CO2	Explain the principles of chemotherapy and illustrate the mechanism of action of antibiotics.
CO3	Analyze the chemotherapy of UTI's, STD's, and anti-cancer drugs and to categorize the immunopharmacology.
CO4	Assess the various types of toxicity studies, principles of treatment of poisoning and management of various poisoned conditions.
CO5	Compile the biological clock and its significance leading to chronotherapy.

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Programme : III/IV B.Pharmacy

Semester/Year of Study : 6th Semester

Course Name : Herbal Drug Technology

Course Code : BP603T (Theory)

CO1	Understand the raw materials as a source of herbal drugs and know the importance of Herbal preparations and Indian system of medicine
CO2	Discuss the significance of nutraceuticals in the management of life style disorders with a focus on herb-food interactions.
CO3	Illustrate various herbal formulations and herbal cosmetics formulated using excipients of natural origin.
CO4	Explain WHO and ICH guidelines for the evaluation and stability of herbal drugs and patenting procedures .
CO5	Summarize the concept, components, objectives and GMP of herbal industry

Programme : III/IV B.Pharmacy

Semester/Year of Study : 6th Semester

Course Name : Biopharmaceutics and Pharmacokinetics

Course Code : BP604T (Theory)

CO1	Understand biopharmaceutics concepts, various Pharmacokinetic process, their significance and applications
CO2	Illustrate the concept of bioavailability and bioequivalence in drug products and relate the concept in enhancement of solubility of poorly soluble drugs .
CO3	Construct various pharmacokinetic models for estimation of pharmacokinetic parameters of a drug administered through various routes.
CO4	Analyze dosage regimen based on pharmacokinetics of drug administered at multiple doses.
CO5	Interpret pharmacokinetic parameters for the drug which follow capacity limited kinetics

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Programme : III/IV B.Pharmacy

Semester/Year of Study : 6th Semester

Course Name : Pharmaceutical Biotechnology

Course Code : BP605T (Theory)

CO1	Choose an immobilization engineering approach to upgrade industrial enzymes.
CO2	Identify vectors for the production of rDNA products.
CO3	Develop immunological and therapeutic products. .
CO4	Distinguish genetic organization of cells by immunoblotting techniques..
CO5	Select a biocatalytic process for the production of pharmaceutical products.

Programme : III/IV B.Pharmacy

Semester/Year of Study : 6th Semester

Course Name : Quality Assurance

Course Code : BP606T (Theory)

CO1	Apply c GMP aspects in pharmaceutical Industry and plan the various quality tools.
CO2	Distinguish the regulatory requirements of packaging materials, evaluation of packaging materials and examine the regulatory requirements of Non-Clinical Trials,.
CO3	Examine the importance of documentation and evaluate complaints and handling of returned goods. .
CO4	Explain the principals of validation, calibration and validation and determine the importance of validation and validation master plan. .
CO5	Determine the general principals of Analytical validation and qualification of analytical instruments and explain the concepts of material management. .

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Programme : III/IV B.Pharmacy

Semester/Year of Study : 6th Semester

Course Name : Medicinal chemistry III

Course Code : BP607P (Practical)

CO1	Synthesize important medicinal compounds and intermediates in the laboratory, calculate the percentage yield
CO2	Explain the principle, scheme, and mechanism involved in drug synthesis and develop practical skills
CO3	Judge the label claim of selected drugs after performing assay.
CO4	Compare the advantages of microwave technique over conventional synthesis of drugs.
CO5	Predict the relation between physicochemical properties and biological activity.

Programme : III/IV B.Pharmacy

Semester/Year of Study : 6th Semester

Course Name : Pharmacology III

Course Code : BP608P (Practical)

CO1	Recall the dose calculations in pharmacological experiments, and to relate the antiallergic activity / anti-ulcer activity in rat models.
CO2	Demonstrate of effect of drugs on gastrointestinal motility and the effect of agonist/antagonists on guinea pig ileum
CO3	Construct serum biochemical parameters by using semi auto analyzer.
CO4	Analyze effect of saline purgative on frog intestine, insulin hypoglycemic effect and test for pyrogens using rabbit method.
CO5	Evaluate acute oral toxicity (LD50), acute skin irritation / corrosion and acute eye irritation / corrosion of a test substance

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Programme : III/IV B.Pharmacy

Semester/Year of Study : 6th Semester

Course Name : Herbal Drug Technology

Course Code : BP609P (Practical)

CO1	Recall the reagents used for the identification of crude drugs.
CO2	Experiment on herbal syrup and mixtures and their evaluation as per standards
CO3	Prepare tablets using herbal excipients and their evaluation as per pharmacopeia
CO4	Design herbal cosmetics using plant extracts.
CO5	Estimate the presence of various substances in traditional dosage forms

Programme : IV/IV B.Pharmacy

Semester/Year of Study : 7th Semester

Course Name : Instrumental Methods of Analysis

Course Code : BP701T (Theory)

CO1	Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis by UV-Visible and Fluorimetry.
CO2	Apply the principles of IR, FES, AA Spectroscopic techniques for the estimation of pharmaceuticals.
CO3	Distinguish the principles and implement procedures of various types of chromatographic and electro chromatographic separations and analysis of drugs
CO4	Compare the principles, instrumentation and applications of GLC and HPLC.
CO5	Estimate drugs qualitatively and quantitatively using various analytical techniques like Ion-exchange Chromatography, Gel and Affinity Chromatography

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Programme : IV/IV B.Pharmacy

Semester/Year of Study : 7th Semester

Course Name : Industrial Pharmacy II

Course Code : BP702T (Theory)

CO1	Understand the process of pilot plant and scale up of pharmaceuticals and various guidelines involved.
CO2	Summarize the principals of quality management systems and accreditations for quality standards.
CO3	Apply the regulatory requirements of Clinical Trials, and analyze Phase –I, II, III & IV studies and study designs.
CO4	Utilize the importance of documentation and filling dossier requirements for IND, NDA and ANDA and plan the management of clinical trials.
CO5	Apply the principals of technology development and transfer. To identify the technology transfer agencies in india.

Programme : IV/IV B.Pharmacy

Semester/Year of Study : 7th Semester

Course Name : Pharmacy Practice

Course Code : BP703T (Theory)

CO1	Awareness on drug distribution systems in hospital.
CO2	Appreciate drug store, inventory control and rational drug therapy.
CO3	Identify drug related problems and ADRs in the prescription .
CO4	Execute medication history interview and interpret the lab parameters with disease state.
CO5	Execute medication history interview and interpret the lab parameters with disease state.

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Programme : IV/IV B.Pharmacy

Semester/Year of Study : 7th Semester

Course Name : Novel Drug Delivery System

Course Code : BP704T (Theory)

CO1	Understand various approaches to controlled drug delivery systems and criteria selection of polymers and drugs for the development drug delivery systems.
CO2	Device micro encapsulated products as well as mucosal and implantable drug delivery systems.
CO3	Design transdermal, gastro retentive and nasopulmonary drug delivery systems.
CO4	Formulate targeted drug delivery systems.
CO5	Develop ocular drug delivery systems and intra uterine drug delivery systems..

Programme : IV/IV B.Pharmacy

Semester/Year of Study : 7th Semester

Course Name : Instrumental Methods of Analysis

Course Code : BP705P (Practical)

CO1	Apply the basics to calculate λ- max of drugs
CO2	Determine the drug content by different analytical methods
CO3	Estimate the compounds by chromatographic methods of separation.
CO4	Develop the practical skills inhandling HPLC and Gas chromatographic instruments.
CO5	Experiment with estimation of drugs by colorimetry, flourimetry and UV spectrophotometry

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Programme : IV/IV B.Pharmacy

Semester/Year of Study : 7th Semester

Course Name : Practice School

Course Code : BP706PS

CO1	Acquire knowledge and hands-on experience on the latest technologies and research domains beyond the syllabus.
CO2	Practically apply the knowledge and skills previously learned through conventional classroom teaching and laboratory experiments.
CO3	Develop the ability to adapt to rapidly changing requirements and challenges of a professional workplace in the real world.
CO4	Exhibit the acquired professional skills in unfamiliar and open-ended real-life situations that the student is not exposed to in a conventional classroom.
CO5	Improve their employability and establish a professional network before graduation.

Programme : IV/IV B.Pharmacy

Semester/Year of Study : 8th Semester

Course Name : Biostatistics and Research Methodology

Course Code : BP801T

CO1	Understand the applications of biostatistics in Pharmacy.
CO2	Make use of various statistical techniques to solve statistical problems
CO3	Apply the statistical techniques in analyzing statistical data
CO4	Operate various statistical software's in designing the experiments and in treatment of clinical study data
CO5	Explain the need of research, research designs and to build up the ability to use various statistical problems

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Programme : IV/IV B.Pharmacy

Semester/Year of Study : 8th Semester

Course Name : Social and Preventive Pharmacy

Course Code : BP802T

CO1	Acquire high consciousness on issues related to health in country and worldwide..
CO2	Derive the health care development strategies in view of current strategies.
CO3	Evaluate alternative ways for solving health related problems
CO4	Evaluate alternative ways for solving pharmaceutical issues.

Programme : IV/IV B.Pharmacy

Semester/Year of Study : 8th Semester

Course Name : Pharma Marketing Management

Course Code : BP803ET

CO1	Explain the general concepts of marketing and selling. Analyzing marketing environment.
CO2	Understand the quantitative and qualitative aspects of market. Summarize the market segmentation and analyzing the market
CO3	Explain the principles of product life cycle and product management in pharmaceutical industry
CO4	Contrast Pharma industry distribution management and tasks. Roles of professional sales representative
CO5	Analyze determinants of price and pricing methods, DPCO, NPPA. To understand the emerging concepts in marketing.

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Programme : IV/IV B.Pharmacy

Semester/Year of Study : 8th Semester

Course Name : Pharmaceutical Regulatory Science

Course Code : BP804ET

CO1	Recall the Concepts of Drug discovery, development process, clinical studies ad generic drug product development.
CO2	Perceive the regulatory approval process and timelines for IND, NDA and ANDA and to know about changes to an approved NDA/ANDA.
CO3	Familiar with Regulatory authorities and agencies like India, USA, Europe, Australia, Japan and Canada
CO4	Know the regularory registration process of Indian drugs in overseas market which include to understand about technical documents like DMF, CTD, eCTD and ACTD
CO5	Understand the concepts of Regulatory Science in pharmaceutical industry as well as to make use of regulatory guidelines, laws, acts, orange and purple book

Programme : IV/IV B.Pharmacy

Semester/Year of Study : 8th Semester

Course Name : Pharmacovigilance

Course Code : BP805ET

CO1	Awareness on drug safety monitoring, history and development of pharmacovigilance
CO2	Establishment of pharmacovigilance centers in hospitals.
CO3	Awareness on dictionaries used in pharmacovigilance and ICD classification of diseases
CO4	Appreciate drug evaluation, ICH guidelines CIOMS requirements for ADR reporting

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Programme : IV/IV B.Pharmacy

Semester/Year of Study : 8th Semester

Course Name : Quality Control and Standardization of Herbals

Course Code : BP806ET

CO1	Recall the basic tests and quality control (QC) tests as per World Health Organization (WHO) guidelines for evaluating commercial herbal medicines
CO2	Explain cgmp, GLP, GAP and GACP for quality assurance in herbal industry as per WHO.
CO3	Outline research methods as per EU or ICH guidelines for assessing safety, efficacy and QC of Herbal medicines.
CO4	Design stability testing protocol and documents for export registration of new drug application (NDA) common technical document etc.
CO5	Assess and improve the safety of herbal medicines by markers, Pharmacovigilance, herbal pharmacopoeias and other regulatory guidelines.

Programme : IV/IV B.Pharmacy

Semester/Year of Study : 8th Semester

Course Name : Computer Aided Drug Design

Course Code : BP807ET

CO1	Apply the CADD techniques in various stages of drug discovery
CO2	Examine the Role of CADD in drug discovery
CO3	Analyze the physicochemical Properties and the techniques involved in QSAR
CO4	Execute the various structure based drug design methods (Molecular docking, De novo drug design)
CO5	Evaluate the various techniques in Virtual Screening

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Programme : IV/IV B.Pharmacy

Semester/Year of Study : 8th Semester

Course Name : Cell and Molecular Biology

Course Code : BP808ET

CO1	Make use of microbial or mammalian cellular properties in drug discovery.
CO2	Apply molecular information in genetic engineering.
CO3	Categorize regulatory proteins that regulate genes.
CO4	Choose an appropriate molecular genetics mechanism in the development of transgenics.
CO5	Assess cellular communication in regulating cellular activities.

Programme : IV/IV B.Pharmacy

Semester/Year of Study : 8th Semester

Course Name : Cosmetic Science

Course Code : BP809ET

CO1	Understand the concepts of various classes of cosmetics and cosmeceutical products
CO2	Make use of drug absorption, drug distribution and protein binding with an emphasis on factors influencing each process.
CO3	Apply the formulation principles in building various skin care, hair care and oral care products.
CO4	Distinguish the role of herbs in formulating various skin care, hair care and oral care products
CO5	Evaluate various skin care, hair care and oral care cosmetic products.

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Programme : IV/IV B.Pharmacy

Semester/Year of Study : 8th Semester

Course Name : Experimental Pharmacology

Course Code : BP810ET

CO1	Recall the CPCSEA/OECD guidelines for maintenance, breeding and conduct of experiments on laboratory animals and to demonstrate different laboratory/transgenic/ mutant animals, various routes of administration, techniques of blood collection and euthanasia
CO2	Outline various preclinical screening models for diuretics, nootropics, anti-asthmatics and drugs acting on CNS.
CO3	Construct preclinical screening models for drugs acting on ANS, eye and local anesthetics.
CO4	Analyze the preclinical screening models for drugs acting on CVS.
CO5	Appraise the preclinical screening models for drugs like antiulcer, antidiabetic and anticancer agents.

Programme : IV/IV B.Pharmacy

Semester/Year of Study : 8th Semester

Course Name : Advanced Instrumentation Techniques

Course Code : BP811ET

CO1	Understand the basic principles involved in advanced instruments used for drug analysis.
CO2	Apply the principles of NMR and Mass spectrometry for estimation of drugs.
CO3	Make use of the principles of thermal and X -ray diffraction techniques to analyze different compounds.
CO4	Carryout the calibration procedure for UV -Visible, IR, Fluorimeter, Flame Photometer, HPLC, GC.
CO5	Distinguish the principles and implement procedures of various types of sample extraction and RIA procedure for analysis of drugs.

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Programme : IV/IV B.Pharmacy

Semester/Year of Study : 8th Semester

Course Name : Project Work

Course Code : BP813PW

CO1	Understand basic concept on project work, Literature survey of various research & review articles.
CO2	Explain aim, objective & plan of work of present investigation.
CO3	Describe the materials and equipment used in project work
CO4	Excipient profiles used in preparation of dosage form. Drug analysis determining absorption maxima.
CO5	Apply their knowledge, skill related to a current trend research topic and develops a project towards research area.
CO6	Assemble the obtained results, summary &references and able to write thesis and present to panel/examiners.

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M.PHARMACY PHARMACEUTICS I SEMESTER

After successful completion of this course students will be able to:

Modern Pharmaceutical Analytical Techniques MPH 101 T (Theory)	1. To understand the basic knowledge on assay of single and multiple component pharmaceuticals by using various analytical instruments 2. To develop basic practical skills using instrumentation techniques 3. Skills in selecting the suitable techniques for analysis of drugs and pharmaceuticals 4. To expand the theoretical knowledge on various instrumental techniques available for analysis of organic 5. Substances. 6. To apply the knowledge learnt in developing new procedures of their own design 7. Comparing various methods of analysis and their outcomes
Pharmaceutics MPH 102 T (Theory)	1. To recall the basic concepts of sustained release, controlled release, polymer science and personalized medicine. 2. explain (impart) the principles and fundamentals of controlled drug delivery systems, protein-peptide drug delivery and vaccine drug delivery systems. 3. To (train) develop the formulations of gastro retentive, ocular, transdermal, protein-peptide and vaccine drug delivery systems. 4. To analyze the formulations of gastro retentive and ocular drug delivery systems. 5. To assess the transdermal and protein-peptide drug delivery systems. 6. To evaluate the formulated vaccine drug delivery systems.
Modern Pharmaceutics MPH 103 T (Theory)	1. To recall the concepts of preformulation and relate them to formulation development. 2. To illustrate the parameters of optimization and its applications in formulation development. 3. To develop validation and calibration master plan as per regulatory guidelines. 4. To categorize the policies of cGMP, layout of buildings, equipment and management of production. 5. To explain the principles of tablet compression and compaction. 6. To compile the consolidation parameters to determine the stability of a dosage form.
IPR & Regulatory Affair MPH 104 T (Theory)	1. To recall the concepts of drug product development, innovator and generic products, their drug master file 2. To outline the scale up post approval changes, post marketing surveillance and outsourcing of bioavailability studies to CRO. 3. To apply the regulatory agencies like USFDA, EU, MHRA, TGA and BOW.countries for product approval 4. To contrast CTD and eCTD format for combination products and medical devices. 5. To compare the submission process of IND, NDA, ANDA and preparation of Medicinal Products Dossier 6. To build the ability to develop clinical trial protocol, pharmacovigilance and safety monitoring in clinical trials.

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Pharmaceutics Practical-I MPH 105 P (Practical)	1. To recall the basic principles of analytical techniques instrumentation used for drug analysis. 2. To summarize the preformulation studies and basic excipients used for various controlled/sustained drug delivery systems 3. To make use of various analytical instruments for estimation of drugsin various formulations. 4. To simplify the formulation techniques, prepare matrix tablets, floating tablets and cosmetics. 5. To assess the drug release from sustained and controlled drug delivery systems. 6. To evaluate the dosage forms, similarity factor.

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M.PHARMACY PHARMACEUTICS II SEMESTER

After successful completion of this course students will be able to:

Molecular Pharmaceutics MPH 201 T (Theory)	1. To define the concepts involved in targeting drug delivery specific to tumor and brain. 2. To outline the formulation, optimization and evaluation of nanoparticles, liposomes and multiparticulate drug carrier systems. 3. To develop nanoparticles, liposomes and multiparticulate and other drug delivery systems for drug delivery. 4. To simplify the formulation of pulmonary drug delivery systems and their evaluation. 5. To perceive the concepts of gene therapy and liposomal gene delivery. 6. To discuss the concepts of therapeutic antisense molecules
Advanced Biopharmaceutics and Pharmacokinetics MPH 202 T (Theory)	1. To recall the basic concepts of absorption, distribution, metabolism and excretion of drugs. 2. To understand the mechanisms, interpret various factors affecting drug absorption, distribution, metabolism and excretion of drugs. 3. To apply the pharmacokinetic models for the determination of pharmacokinetic parameters. 4. To analyze the drug product performance by in-vitro, in-vivo and in-situ models. 5. To determine the bioavailability testing protocol of a drug and compare the bioequivalence among marketed products. 6. To predict pharmacokinetic and pharmacodynamic drug interactions
Computer Aided Drug Delivery System MPH 203 T (Theory)	1. To recall the basics of computers in pharmaceutical research and development. 2. To illustrate the computational modeling of drug disposition. 3. To utilize the concepts for computer-aided formulation development. 4. To simplify the pharmacokinetic and pharmacodynamic characteristics of drugs by simulations. 5. To assess the applications of computers in clinical data management. 6. To discuss the impact of artificial intelligence, robotics and computational fluid dynamics.
Cosmetic and Cosmeceuticals MPH 204 T (Theory)	1. To remember Indian regulatory requirements for manufacture, sale, import and labeling of cosmetics. 2. To outline the biological aspects of cosmetics, basic structure, functions, common problems associated with skin, hair and oral cavity. 3. To apply the principles of formulation building blocks for different cosmetic/cosmeceutical products. 4. To simplify the controversial ingredients used in the formulation of cosmetics. 5. To justify the cosmeceutical products for solving problems related to skin, hair and oral cavity. 6. To elaborate the regulatory guidelines forherbal cosmetics, herbal

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	ingredients used in hair care, skin care and oral care.
Pharmaceutics Practical-II MPH 205 P (Practical)	1. To recall the basic techniques for preparation of microspheres, liposomes, niosomes and solid dispersions. 2. To compare the dissolution studies of various marketed products. 3. To develop various novel drug delivery systems. 4. To test for drug binding characteristics, cell permeation and bioavailability of the formulations. 5. To evaluate the novel drug delivery systems. 6. To design formulations by QbD concept, use simulations for estimation of pharmacokinetics and pharmacodynamics.

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M.PHARMACY PHARMACOLOGY I SEMESTER

After successful completion of this course students will be able to:

Modern Pharmaceutical Analytical Techniques MPL 101 T (Theory)	1. To recall selected instrumental analytical techniques (spectroscopic, chromatographic, electrochemical methods) and relate with volumetric analysis 2. To gain knowledge on interaction of EMR with matter, affinity of matter with stationary phase and mobile phase, physical and chemica changes of matter on heating, potential differences in different aqueous and organic solution 3. To build the analytical understanding in the level of ion, atom, group and molecular structure of organic and inorganic compounds with different functional groups and their applications in pharmacy 4. To categorize different organic and inorganic compounds using suitable spectroscopy, chromatography, electrophoresis, thermal and immuno assay. 5. To elaborate principle, theory and instruments employed for the analysis of drugs. 6. To maximize knowledge of electrophoresis, immunological, thermal and X-Ray crystallographic techniques.
Advanced Pharmacology –I MPL 102 T (Theory)	1. To learn basic principles of pharmacokinetic and pharmacodynamic parameters of drugs. 2. To understand various Neurotansmitters and their physiology and to Illustrate pharmacology of Drugs acting on peripheral nervous system. 3. To construct the pharmacology of drugs acting on central nervous system 4. To contrast the relative pros and cons in the use of drugs for various cardiac complications. 5. To assess the drugs acting on hematopoietic system 6. To compile the role of autocoids and related drugs.
Pharmacological and Toxicological Screening Methods – I MPL 103 T (Theory)	1. To gain basic knowledge on regulations and ethical requirement for the maintenance and breeding of laboratory animals and the role of transgenic animals in preclinical research 2. To outline General principles of invivo, in vitro, screening techniques for drugs acting on CNS and ANS 3. To identify the newer screening methods for drug acting on respiratory, reproductive and gastrointestinal system. 4. To distinguish the screening methods for new substances acting on cardiovascular system 5. To appraise the screening methods of the newer drugs for metabolic disorders 6. To predict the invivo, in vitro screening models for immunomodulators, to discuss General principles of immunoassay and extrapolation of in vitro/preclinical data to human
Cellular and Molecular Pharmacology MPL 104 T (Theory)	1. To learn basic structure and function of genome in the living organism and the importance of siRNA and micro RNA 2. To summarize various phases of cell cycle, apoptosis,

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	necrosis and autophagy 3. To construct the role of receptors and secondary messengers in cellsignaling pathways 4. To analyse the principles and applications of genomic and proteomic tools DNA ecletrphorsosis, PCR, SDS page, ELISA, western blotting Recombinant DNA technology and gene therapy 5. To evaluate significance of Pharmacogenomics and immunotherapeutics 6. Toconstruct the various cell culture techniques, Principles and applications of cell viability/ glucose uptake/Calcium influx assays, flow cytometry and biosmilars
Pharmacology Practical – I MPL 105 P (Practical)	1. To recall handling of laboratory animals, various routes of drug administrations, blood collection, anaesthesia and euthanasia techniques. 2. To demonstrate the CNS stimulant, depressant, anxiogenics anxiolytic, anticonvulsant, analgesic, anti-inflammatory, local anesthetic, mydriatic and miotic activities using animal models. To Identify the concentration test compounds using HPLC,UV,GC, fluorimetry and flame photometry To examine diuretic, antiulcer activities and to analyse Oral glucose tolerance test. 3. To interpret the isolation of DNA/RNA and to assess PCR, Western Blotting, gel electrophoresis techniques and Enzyme based in- vitro/Cell viability assays 4. To predict Comet assay and to elaborate the pharmacokinetics parameters of drugs by using biological samples and software

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M.PHARMACY PHARMACOLOGY II SEMESTER

After successful completion of this course students will be able to:

Advanced Pharmacology – II MPL 201 T (Theory)	1. To relate functions of hormones and to list out drugs acting on endocrine system. 2. To outline the principles of chemotherapy and illustrate the mechanism of action of antibiotics, Antifungal, antiviral, and anti-TB drugs 3. To identify the chemotherapeutic agents for Protozoal Helimenthetic infections and cancer. 4. To categorize the inflammatory mediators, allergic /hypersensitivity reactions and simplify pharmacotherapy of asthma and COPD. 5. To assess the mechanism of drugs acting on GIT and applications of chronopharmacology to treat disorders. 6. To elaborate the role of free radicals in etiopathology of various diseases and adapt the recent Advances in treatment of various diseases.
Pharmacological and Toxicological Screening Methods II MPL 202 T (Theory)	1. To recall types of toxicology, to list out the regulatory guide lines for conducting toxicity studies and its importance in drug development 2. To Illustrate Acute, sub-acute and chronic oral, dermal and inhalational toxicity studies as per OECD guidelines. To construct reproductive toxicology, tearatogenicity, Genotoxicity and In vivo carcinogenicity studies. 3. To categorize IND enabling studies 4. To appraise and importance of safety pharmacological studies (Tier-1 and 2) 5. To compile the Importance and applications of toxicokinetic studies and alternative methods to animal toxicity testing.
Principles of Drug Discovery MPL 203 T (Theory)	1. To recall the modern drug discovery process, target Discovery and validation and role of transgenic animalsin target validation. 2. To relate the concepts of combinatorial chemistry, high throughput screening and in silico lead discovery techniques 3. To identify the prediction of protein structure and the NMR and X-ray crystallography in protein structure prediction 4. To contrast the Rational Drug Design Methods and Virtual Screening techniques 5. To interpret the various molecular Docking studies and to assess the importance of QSAR and SAR studies 6. To elaborate the Statistical methods used in QSAR and compile the Prodrug design process
Clinical Research and Pharmacovigilance MPL 204 T (Theory)	1. To label various regulatory requirements for clinical trials. 2. To demonstrate the types and designs of clinical trial and to infer roles and responsibilities of Clinical Trial

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	Personnel 3. To construct the documentation process of clinical trials and to identify Adverse Drug Reactions contrast the roles and responsibilities of Pharmacovigilance 4. To appraise various methods of ADR reporting and tools used inPharmacovigilance 5. To predict principles and concepts of Pharmacoepidemiology, Pharmacoeconomics and safety pharmacology
Pharmacology Practical-II MPL 205 P (Practical)	1. To understand the dose response relationship, effect of drugs on DRC and PD2 value 2. To outline the acute, sub acute and chronictoxicity studies as per OECD guidelines 3. To identify the effects of various drugs on isolated heart preparations, and to Illustratethe rat BP, heart rate and ECG. 4. To evaluate the drug concentrations by various bioassay methods using isolated tissue preparations 5. To prioritize the Repeated dose toxicity studies and evaluate Drug mutagenicity study using mice bone-marrow chromosomal aberration. 6. To elaborate Protocol for clinical trial, ADR monitoring. In-silico docking studies/pharmacophore based screening/QSAR studies and ADR reporting

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M.PHARMACY PHARMACOLOGY & PHARMACEUTICS III SEMESTER & IV SEMESTER

After successful completion of this course students will be able to:

1. To select the scientific concept based on literature and define the objectives of research.
2. To outline the hypothesis and summarize the concept for presentation.
3. To plan for a meeting, discuss SOWT analysis, the design and methods used in concept.
4. To analyze the variables and their inter relationships.
5. To conclude the results and to discuss its significance.
6. To appraise the concept for societal needs, acknowledge and improve presentation skills.
7. To recall the fundamentals, carry out literature review on proposed research topic and identify research problem.
8. To outline the requirements toper forms the proposed research.
9. To construct the research hypothesis.
10. To take part in research experiments meticulously and documentation as per format.
11. To evaluate and conclude the results using statistical analysis.
12. To appraise societal application and appreciation.

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	PHARM.D COURSE OUTCOMES
	I Year Pharm.D
	After studying this course student will be able to:
1	Describe the structure (gross and histology) and functions of various organs of the human body
2	Discuss the various homeostatic mechanisms and their imbalances of various systems
3	Identify the various tissues and organs of the different systems of the human body
4	Recognize coordinated working pattern of different organs of each systems
5	Recognize the interlinked mechanisms in the maintenance of normal functioning of human body
	Human Anatomy and Physiology (Practical)
1	Illustrate different types of Tissues and explain various Anatomical models
2	Identify the bones of Skeletal system
3	Determine Blood cell count, Hemoglobin, Blood grouping, ESR, Bleeding time and Clotting time
4	Record Blood Pressure, Pulse rate, Body temperature
5	Identify family planning devices and conduct Pregnancy diagnosis test
6	Conduct planned experiments and prepare laboratory report in a standard format
	Pharmaceutics (Theory)
1	Describe the evolution of Pharmacy and Pharmacopoeias
2	Discuss the need and identification of different dosage forms
3	Design a suitable formulation/dosage form with the use of appropriate ingredients
4	Discuss the different techniques involved in formulation of a dosage form
6	Prepare appropriate labels and recommend storage conditions for dosage forms
	Pharmaceutics (PRACTICAL)
1	Formulate various solid and liquid dosage forms
2	Demonstrate different techniques involved in formulation
3	Identify and apply the suitable remedial measures to solve instabilities observed in formulations
4	Prepare appropriate labels for dosage forms
5	Conduct planned experiments and prepare laboratory report in a standard format
	Medicinal Biochemistry(Theory) Course Outcomes
1	Describe the concepts of biological oxidation and bio energetics
2	Explain the metabolism of carbohydrate, proteins and lipids
3	Discuss various concepts of nucleotides and nucleic acids
4	Recognise and discuss the role of catalytic activity of enzymes and importance of isoenzymes in diagnosis of disease
5	Discuss the principles, significance and methods of different biochemical tests
6	Interpret the results of biochemical tests such as lipid profile test, liver and kidney function tests
	Medicinal Biochemistry(Practical) Course Outcomes
1	Determine the biomolecules by qualitative and quantitative analysis of urine and blood samples

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2	Interpret the metabolic disorders based on laboratory values
3	Interpret the lipid profile and liver function tests
4	Determine various electrolytes in serum
5	Operate and handle appropriate standard instruments
6	Conduct planned experiments and prepare laboratory report in a standard format
	Pharmaceutical Organic Chemistry(Theory) Course Outcomes
1	Explain the physical properties of organic compounds
2	Identify the structures of a given organic compound and give the nomenclature
3	Explain the mechanisms involved in various organic reactions
4	Discuss the reactivity, orientation and stability of organic reactions
5	Identify the products obtained through simple organic reactions
6	Summarize the studies on some important official organic compounds
	Pharmaceutical organic chemistry (Practical)
1	Synthesize simple organic compounds by different organic reactions
2	Apply stereo models and explain the structural aspects of organic compounds
3	Detect the extra elements (N,S and X) present in the compounds
4	Identify various classes of organic compounds by systematic qualitative analysis
5	Prepare suitable solid derivatives from organic compounds
6	Conduct planned experiments and prepare laboratory report in a standard format
	Pharmaceutical Inorganic Chemistry(Theory) Course Outcomes
1	Explain the effects of impurities in pharmaceuticals
2	Discuss the principles and methodology of limit tests for common impurities in pharmaceutical substances
3	Suggest methods to prepare inorganic pharmaceuticals
4	Recommend storage conditions for inorganic pharmaceuticals
5	Estimate the inorganic medicinal substances and interpret their percentage purity
6	Explain basics of radio activity and recognize the role of essential trace elements
	Pharmaceutical Inorganic Chemistry(Practicals) Course Outcomes
1	Identify the impurities in given inorganic compounds by performing limit tests.
2	Analyze the purity of compound quantitatively by performing assays.
3	Use different methods to prepare inorganic pharmaceuticals.
4	Perform identification tests as per Indian Pharmacopoeia.
5	Determine the impurities qualitatively by performing test for purity
6	Conduct planned experiments and prepare laboratory report in a standard format
	Remedial Biology-(Theory)
1	Explain the classification of plants, plant cell and its organelles, types of tissues and their functions
2	Explain physiological aspects of plants
3	Describe taxonomical characters of various families
4	Classify plants based on morphological and microscopical characters

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5	Identify a given plant part based on its morphological and microscopical characters
6	Discuss structure and life history of parasites/insects
	Remedial Biology(Practical)
1	Identify cell wall constituents and cell inclusions
2	Identify the crude drugs by its morphological characteristics and study the anatomical characters by preparing slides
3	Perform experiments related to plant physiology
4	Identify different parts of frog digestive system
5	Conduct planned experiments and prepare laboratory report in a standard format
	Remedial Mathematics-(Theory)
1	Explain the principles of matrix algebra, determinants, Trigonometry, Analytical Geometry, Differential Calculus, Integral Calculus, Differential Equations and Laplace Transforms
2	State and explain the important theorems such as Cayley□Hamilton Theorem, adjoint Cramer's rule and Leibritz Theorem
3	Identify the appropriate standard form for a given differential equation
4	Solve simple and complex mathematical problems associated with on trigonometry and analytical geometry
5	Solve simple mathematical problems associated with on matrix algebra, differential and integral calculus as well as Laplace Transforms
6	Solve complex mathematical problems associated with on matrix algebra, differential equations, differential and integral calculus as well as Laplace Transforms
	II Year Pharm.D Pathophysiology-(Theory)
1	Explain the pathogenesis and morphology of reversible and irreversible cell injury; enumerate various lipoproteins and describe lipoprotein disorders
2	Illustrate events involved in acute and chronic inflammation
3	Recognize the biological significance of various hypersensitivity disorders
4	Discuss the mechanisms involved in autoimmune diseases and allograft rejection
5	Discuss the etiopathogenesis of selected diseases
6	Describe the general biology of cancer, mechanism of shock and effects of radiation exposure
	Pharmaceutical Microbiology Course Outcomes
1	Identify the key growth parameters required by micro□organisms
2	Explain the principles of sterilization used in the pharmaceutical industry
3	Explain the principles of sterility testing and microbiological quality control of pharmaceuticals
4	the concepts of immunology and interpolate the same in disease diagnosis
5	Analyze the techniques for microbiological assays
	Pharmaceutical Microbiology(Practical) Course Outcomes
1	After studying this course, student will be able to:
2	Prepare various culture media for the growth of microorganisms
3	Identify and isolate bacteria
4	Demonstrate aseptic procedures
5	Carry out sterilization and sterility testing of pharmaceuticals

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6	Evaluate antimicrobials and determine the MIC of antimicrobial agents
7	Conduct planned experiments and prepare laboratory report in a standard format
	Pharmacognosy & Phytopharmaceuticals
1	Define Pharmacognosy and describe its evolution
2	Explain the classification of crude drugs and discuss their primary and secondary metabolites
3	Discuss various parameters related to cultivation, collection, processing and storage of crude drugs
4	Analyse morphological and microscopical characters of crude drugs
5	Discuss the production, evaluation, uses and adulterants of crude drugs
6	Identify the market samples of drugs containing proteins, carbohydrates and lipids
	Pharmacognosy & Phytopharmaceuticals(Practicals) Course Outcomes
1	Identify cell wall constituents and cell inclusions
2	Identify the crude drugs by its morphological characteristics and study the anatomical characters by preparing slides
3	Perform chemical tests to identify unorganized crude drugs and lipids
4	Prepare herbarium sheets
5	Conduct planned experiments and prepare laboratory report in a standard format
	Pharmacology I
	Course Outcomes
1	Discuss pharmacokinetics and pharmacodynamics of a drug
2	Recognize the factors modifying drug action
3	Identify drug interactions and detect adverse drug reactions
4	Classify and explain the pharmacology of drugs acting on various systems
	Community Pharmacy
	Course Outcomes
1	Discuss the roles and responsibilities of community pharmacist
2	Outline the layout and infrastructure requirements for community pharmacy
3	Recognise the need of inventory control and discuss the various methods
4	Discuss the factors affecting medication adherence
5	Perform general patient counseling
6	Apply health screening services in community pharmacy
	Pharmacotherapeutics I (Theory) Course Outcomes
1	Explain the etiopathogenesis of selected diseases
2	Explain the general prescribing guidelines and rational use of drugs
3	Discuss the therapeutic approach in the management of selected diseases and controversies in drug therapy
4	Prepare individualized therapeutic plans based on diagnosis
5	Recognise the role of pharmacist in essential and rational drug use

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	Pharmacotherapeutics I (Practicals) Course Outcomes
1	Identify drug interactions and rationalize the prescription
2	Discuss the therapeutic approach to management of selected diseases
3	Prepare individualized therapeutic plans based on diagnosis
4	Perform patient counseling
5	Conduct planned experiments and prepare laboratory report in a standard format
	Pharmacology II (Theory) Course Learning Outcomes
1	Discuss the pharmacological aspects of drugs acting on blood and renal System
2	Discuss the pharmacological aspects of chemotherapeutic agents used in various diseases
3	Explain the pharmacology of immunosuppresants and principles of of animal
4	Illustrate the chromosome structure and DNA replication
5	Recognise the fundamentals and importance of cell biology in cell signaling pathways
6	Analyse the principles and processes of Recombinant DNA technology
	Pharmacology II (Practical) Course Learning Outcomes
1	Demonstrate intraperitoneal and intramuscular routesof administration of drugs in animals and describe different anaesthetics used in laboratory animals
2	Identify and select laboratory appliances used in experimental pharmacology
3	Recommend the physiological salt solution for different isolated tissue preparations
4	Perform a bioassay procedure and create a Dose Response Curve
5	Demonstrate the screening of a drug for CNS activity
6	Conduct planned experiments and prepare laboratory report in a standard format
	Pharmaceutical Analysis (Theory) Course Outcomes
1	Explain the importance of modern instrumentation in pharmaceutical analysis
2	Describe the fundamental principles and applications of UV□visible, IR, NMR, Mass spectroscopy
3	Describe the fundamental principles and applications of Flame photometry, , X□ray diffraction, atomic emission and atomic absorption spectroscopy
4	Interpret various spectra such as IR, NMR and Mass to identity the given compound
5	Identify appropriate instrumentation for the analysis of various compounds
6	Discuss the concepts of total quality management, quality validation methods and quality review
	Pharmaceutical Analysis(Practical) Course Outcomes
1	Operate and handle instruments such as UV□visible and IR spectrophotometer to obtain the spectra of a given sample
2	Interpret spectra of UV□visible, IR, NMR and Mass to identity the given compound
3	Correlate spectral data with chemical structure
4	Estimate the quantity of a drug in a given mixture or solution
5	Conduct planned experiments and prepare laboratory report in a standard format
	Course Outcomes

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	III Year Pharm.D Pharmacotherapeutics II (Theory)
1	Explain the etiopathogenesis of selected infectious diseases, musculoskeletal and renal disorders
2	Discuss the principles of cancer therapy and dermatological disorders
3	Identify the patient□specific parameters relevant in initiating and monitoring drug therapy and adverse effects
4	Discuss the therapeutic controversies in drug therapy
5	Prepare individualized therapeutic plans based on diagnosis
6	Recognise the role of pharmacist in essential and rational drug use
	Pharmacotherapeutics □ II(Practical)
	Course Outcomes
1	Identify drug interactions and rationalize the prescription
2	Discuss the therapeutic approach to management of selected diseases
3	Prepare individualized therapeutic plans based on diagnosis
4	Perform patient counseling
5	Conduct planned experiments and prepare laboratory report in a standard format
	Pharmaceutical Jurisprudence(Theory) Course Outcomes
1	Explain the evolution of pharmacy as a profession in India and emergence of regulatory bodies
2	Discuss the importance of code of pharmaceutical ethics
3	Recognize the provisions of various acts pertaining to drugs and cosmetics
4	Explain the latest amendments with respect to New Drug policy, DPCO and Patent and design act
5	Discuss the concepts of price fixation of pharmaceutical products
6	Outline the concepts of Narcotic and Psychotropic Substances Act, Pharmacy Act and Excise duties Act
	Medicinal Chemistry(Theory)
	Course Outcomes
1	Discuss the relationship between the structures of medicinal compounds with their biological activity
2	Explain the concept of rational drug design including combinatorial chemistry and computer aided drug design
3	Identify the structures of a given medicinal compound and give the nomenclature
4	Synthesise a drug molecule using available synthetic and new path ways
5	Explain the mode of action, mode of resistance, therapeutic uses and side effects of drugs
	Medicinal Chemistry(Practical)
	Course Outcomes
1	Synthesis compounds of medicinal interest
2	Conduct monograph analysis of the pharmaceutical compounds
3	Determine the amount of drug present in an unknown solution
4	Estimate the purity of drugs by performing assays

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5	Determine partition coefficient and dissociation constant of a given compound
6	Conduct planned experiments and prepare laboratory report in a standard format
	Pharmaceutical Formulations(Theory) Course Outcomes
1	Explain the significance of formulation, preparation and evaluation of various pharmaceutical dosage forms
2	Discuss formulation additives for various dosage forms
3	Explain suitable measures for stability of the dosage forms
4	Evaluate different dosage forms with appropriate quality control test for a given drug
5	Recommend suitable packaging material for a dosage form of a given drug
	Pharmaceutical Formulations □ Practical
	Course Outcomes
1	Prepare formulations of different dosage forms as per the batch formula
2	Operate different equipments and instruments used in preparation of dosage forms
3	Select suitable packaging container for a dosage form
4	Evaluate different dosage forms by performing quality control tests
5	Prepare and evaluate cosmetics such as lipstick, cold cream and shampoo
6	Conduct planned experiments and prepare laboratory report in a standard format
	IV Year Pharm.D Pharmacotherapeutics □III(Theory)
	Course Outcomes
1	Explain the etiopathogenesis of selected gastrointestinal, haematological, neurological and psychiatric diseases
2	Discuss the principles of evidence based therapy and pain management
4	Discuss the therapeutic approach in the management
5	Prepare individualized therapeutic plans based on diagnosis
6	Recognise the role of pharmacist in essential and rational drug use
	Pharmacotherapeutics III
	Course Outcomes
1	Identify drug interactions and rationalize the
2	Discuss the therapeutic approach to management of selected diseases
3	Prepare individualized therapeutic plans based on diagnosis
4	Conduct patient counseling
5	Conduct planned experiments and prepare laboratory report in a standard format
	Hospital Pharmacy
	Course Outcomes
1	Discuss the roles and responsibilities of hospital pharmacist, hospital drug policies and guidelines for hospital pharmacy
2	Discuss various drug distribution methods in a hospital pharmacy
3	Apply various methods of inventory control

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4	Formulate parenteral preparations
5	Contribute to a newsletter for providing continuous education and awareness
6	Explain about handling and packaging of radiopharmaceuticals
	Hospital Pharmacy
	Course Outcomes
	After studying this course, student will be able to:
1	Analyse prescriptions for drug interaction
2	Formulate and prepare parenteral formulations and powders
3	Perform inventory analysis
4	Answer drug information queries through literature search
5	Conduct planned experiments and prepare laboratory report in a standard format
	Clinical Pharmacy (Theory) Course Outcomes
1	Explain the roles and responsibilities of clinical pharmacist
2	Analyse and interpret the laboratory test results for clinical diagnosis
3	Conduct interview to elicit medication history and perform patient counseling
4	Identify, monitor, assess, manage, prevent, document and report suspected adverse drug reactions
5	Provide drug and poison information through critical analysi
6	Recognise the potential sources of medication errors and act for its prevention
	Clinical Pharmacy(Practical) Course Outcomes
1	Assess prescriptions for drug interaction and answer drug information query
2	Perform patient counseling on medication and conduct medication history interview
3	Analyse and interpret the data obtained through laboratory tests
4	Conduct planned experiments and prepare laboratory report in a standard format
5	4. Discuss biopharmaceutics, pharmacokinetics, pharmacodynamics with their applications
	Biostatistics and research methodology(Theory)
	Course Outcomes
1	Recognise the importance of biostatistics in pharmacy
2	Explain the importance of research methods in the design of pharmacoepidemiological study
3	Discuss the methods of collection of data and its analysis and interpretation
4	Identify appropriate statistical methods for data analysis
5	Discuss and evaluate various software for statistical analysis of data
6	Explain the various methods of testing hypothesis
	Biopharmaceutics and Pharmacokinetics(Theory) Course Outcomes
1	Discuss biopharmaceutics, pharmacokinetics, pharmacodynamics with their applications
2	Explain the mechanisms and factors affecting ADME processes
3	Discuss the significance of pharmacokinetics in the design and evaluation of dosage forms

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4	Differentiate between bioavailability and bioequivalence along with their measurement
5	Identify and select the right pharmacokinetic model for drugs administered by different routes
1	**Biopharmaceutics and Pharmacokinetics(Practical) Course Outcomes**
1	Compare the *in vitro* drug release profile of different marketed products
2	Perform the solubility enhancement techniques for improvement of drug release of poorly water soluble drugs
3	Estimate the bioavailability (absolute and relative) and bioequivalence from the given clinical data
4	Calculate the drug content in blood sample using Area Under Curve approach
5	Calculate and interpret various pharmacokinetic parameters from the given clinical data
6	Conduct planned experiments and prepare laboratory report in a standard format
	Clinical Toxicology(Theory)
	Course Outcomes
1	Describe the mechanism of action of common poisons and antidotes
2	Describe the mechanism of action of common poisons and antidotes
3	Detect and differentiate acute and chronic poisoning by clinical symptoms
4	Select appropriate laboratory tests to identify and determine the severity of poisoning
5	Detect signs and symptoms of drug abuse and suggest suitable remedial measures
6	Recommend the standard procedures to deal with cases of poisoning
	V Year Pharm.D
	Clinical Research (Theory)
	Course Outcomes
1	Discuss the Pharmacological and Toxicological considerations in process of development of new drugs
2	Discuss the principles and phases in clinical trial of drug
3	Explain the guidelines for ethics and safe monitoring in clinical trial of a drug
4	Design the documents of clinical trial
5	Distinguish the guidelines of national and international regulatory bodies for clinical trial
6	Recognise differing roles and obligations of the Investigator, Sponsor and Institutional Review Board
	Pharmacoepidemiology and Pharmacoeconomics(Theory) Course Outcomes
1	Discuss the scope, need, origin and evaluation of Pharmacoepidemiology
2	Explain the importance of Measurement of outcomes in Pharmacoepidemiology
3	Recommend suitable method for measuring the outcome of Pharmacoepidemiology for a disease
4	Suggest an appropriate Pharmacoepidemiological method for a given drug and address the risks associated with Pharmacoepidemiological study

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5	Discuss the basic principles, role and relevance of Pharmacoeconomics in the development of a new drug
6	Identify and justify an appropriate evaluation method for Pharmacoeconomics study of a disease
	Clinical Pharmacokinetics and Pharmacotherapeutic Drug Monitoring
	Course Outcomes
1	Discuss the pharmacokinetic principles to individualize drug therapy in patient care situ ations
2	Determine dose ,dosing intervals and dosage adjustments of a drug for a given patient
3	Apply the principles of pharmacokinetics to analyse and predict drug interactions
4	Prepare protocol for TDM of drugs for selected diseases
5	Discuss the concept of genetic polymorphism in metabolism, transport and target of a drug
	CLERKSHIP
	Course Outcomes
1	Discuss the role of Pharmacist in clinical pharmacy services
2	Demonstrate the skills of a clinical Pharmacist
3	Discuss the available therapeutic options in the management of diseases
4	Prepare a pharmaceutical care plan for a given case
5	Detect ,Interpret and report medication errors and drug interactions
	PROJECT WORK
	Course Outcomes
1	Address a problem related to Pharmacy practice in hospital, community service or clinical set up with a wider perspective and generality
2	Define the problem to be addressed and translate it into a statement of aim,objectives, scope and plan for the project
3	Carry out and report an information survey and take account of findings in executing project
4	Evaluate, select and apply relevant theories and techniques from the full range of courses studied using conceptual models and frameworks to enhance depth of understanding
5	Select appropriate methodology for investigative work, taking into account the pros and cons of the alternatives available and develop solution proposals based on reasoned judgement
6	Present a coherent, logically argued, fully referenced report and engage in a professional manner in a viva□voce discussion about the project
	VI Year Pharm.D INTERNSHIP
	Course Outcomes
1	Explain the pathophysiology of disease states and the rationale for drug therapy
2	Discuss the available therapeutic options to provide patient care in co□operation with patients, prescribers, and other members of an interprofessional health care team
3	Identify, manage and use resources of the health care system, in cooperation with patients, prescribers, other health care providers
4	Analyse the therapeutic approaches to promote health improvement, wellness, and disease prevention
5	Demonstrate skills in monitoring of the National Health Programmes and schemes
6	Develop leadership qualities to function effectively as a member of the health care team

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7	Communicate effectively with patients and the community

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