



# Navsahyadri Institute of Pharmacy

(D. Pharmacy / B. Pharmacy)

Sr. No. 69, 70, 71, Naigaon (Nasarapur), Pune - 412 213

Approved by AICTE and PCI, New Delhi | Recognized by Govt. of Maharashtra and DTE, Mumbai | Affiliated to DBATU, Lonere and MSBTE, Mumbai



## PROGRAM OUTCOMES (POs)

<b>PO1</b>	<b>Pharmacy Knowledge</b>	The Pharmacy graduates possess score and basic knowledge associated with the pharmaceutical and allied sciences.
<b>PO2</b>	<b>Planning Ability</b>	The Pharmacy graduates possess effective planning abilities including time management, resource management, delegation skills and organizational skills.
<b>PO3</b>	<b>Problem Analysis</b>	Develop an ability to solve, analyze and interpret data generated from Formulation Development, Quality Control & Quality Assurance.
<b>PO4</b>	<b>Modern Tool Usage</b>	Graduates will learn appropriate use of modern pharmacy-related computing tools.
<b>PO5</b>	<b>Leadership Skills</b>	Develop team spirit, apart from responding to the social needs and professional ethics.
<b>PO6</b>	<b>Professional Identity</b>	Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
<b>PO7</b>	<b>Pharmaceutical Ethics</b>	Honor personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles.
<b>PO8</b>	<b>Communication</b>	Develop written and oral communication skills in order to communicate effectively the outcomes of the Pharmaceutical problems.
<b>PO9</b>	<b>The Pharmacist and society</b>	Develop an understanding for the need of pharmaceutical sciences and technology towards giving quality life to people in society.
<b>PO10</b>	<b>Environment &amp; sustainability</b>	Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO11</b>	<b>Life-long learning</b>	Develop an aptitude for lifelong learning and continuous professional development



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## COURSE OUTCOME (CO)

First Year – SEM I	
<b>Course Name: Human Anatomy and Physiology I</b> <span style="float: right;"><b>Course Code: BP101T</b></span>	
CO-1	Explain the gross morphology structure and functions of various organs of the human body
CO-2	Describe the various homeostatic mechanisms and their imbalances
CO-3	Identify the various tissues and organs of different skeleton systems of human body
CO-4	Perform the various experiments related to special senses and nervous system
CO-5	Appreciate coordinated working pattern of different organs of each system
<b>Course Name: Pharmaceutical Analysis I</b> <span style="float: right;"><b>Course Code: BP102T</b></span>	
CO-1	Understand the fundamentals of Pharmaceutical analysis.
CO-2	Elucidate the preparation and standardization of solution of different to prepare different strength of solutions and can predict the source of Errors
CO-3	Explain knowledge on principle, classification and applications of different types of titrimetric methods.
CO-4	Understand Principles Instrumentation and Application of electrochemical analytical techniques.
CO-5	Develop skills in terms of choice of analytical techniques to perform the estimation of different category drugs.
<b>Course Name: Pharmaceutics I</b> <span style="float: right;"><b>Course Code: BP103T</b></span>	
CO-1	Describe the history of profession of pharmacy, pharmacopoeia.
CO-2	Understand the professional procedure of handling prescription.
CO-3	Define various pharmaceutical dosage forms along with its classification formulations and methods of preparations.
CO-4	Evaluate various conventional dosage forms and discuss about pharmaceutical incompatibility.
CO-5	Calculate the problems through the application of fundamental principles of pharmaceutical metrology and posology.
<b>Course Name: Pharmaceutical Inorganic Chemistry-I</b> <span style="float: right;"><b>Course Code: BP104T</b></span>	
CO-1	Know the history of pharmacopoeia, types and sources of impurities and understand the principle of limit test of different pharmaceutical inorganic compounds.
CO-2	Explain the method of preparation ,assay, properties, medicinal uses of inorganic compounds.
CO-3	Discuss the different classes of inorganic pharmaceuticals and their importance.
CO-4	Describe the properties, storage condition, applications and precautions while handling the radioactive substance
CO-5	Measure the tonicity and radioactivity of inorganic compounds and able to adjust the isotonicity of inorganic pharmaceuticals.
<b>Course Name: Communication skills</b> <span style="float: right;"><b>Course Code: BP105T</b></span>	
CO-1	Develops language skills like listening, speaking, reading and writing.
CO-2	Organize and deliver discussions, presentations effectively with proper syntax
CO-3	Apply their skills in interviews or in Group Discussions.
CO-4	Adapts good pronunciation, good communicative styles.
CO-5	Plan their presentations and seminars in an organized manner.
<b>Course Name: Remedial Biology</b> <span style="float: right;"><b>Course Code: BP106RBT</b></span>	
CO-1	Explain the Cell biology ( Basic Nature of Plant cell and Animal cell)



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CO-2	Explain the classification and salient features of five kingdoms of life.
CO-3	Describe the basic components and anatomical characteristics of plant.
CO-4	Describe the basic components of anatomy & physiology of animal.
CO-5	Describe the various organ systems of the body.
<b>Course Name: Remedial Mathematics</b> <span style="float: right;"><b>Course Code: BP106RMT</b></span>	
CO-1	Apply the basic knowledge of algebra to apply in Pharmaceutical Sciences when they require in higher studies
CO-2	Apply the basics of trigonometry and co-ordinate geometry to solve simple problems and use the knowledge in pharmaceutical calculations.
CO-3	Understand and apply basic differential equations to solve the problems errors.
CO-4	Understand and apply basic differential equations for approximations which arises in Pharmaceutical Sciences.
CO-5	Use the knowledge of integral calculus to find the areas and apply the knowledge in Pharmaceutical Sciences accurately.
<b>Course Name: Human Anatomy and Physiology I</b> <span style="float: right;"><b>Course Code: BP107P</b></span>	
CO-1	Identify the major tissue types and locate examples of each in the body.
CO-2	Describe the different types of bones and provide an example of each type.
CO-3	Locate and identify anatomical structures that surround and protect the brain.
CO-4	Locate and identify anatomical structures of the special senses.
CO-5	Describe the somatic reflex arc.
<b>Course Name: Pharmaceutical Analysis I</b> <span style="float: right;"><b>Course Code: BP108P</b></span>	
CO-1	Perform limit test of various Metal ions
CO-2	Preparation and standardize solutions of different strength in terms of Normality and Molarity
CO-3	Determine percentage purity of some inorganic compounds.
CO-4	Determine Normality of acids bases by electrochemical methods
<b>Course Name: Pharmaceutics I</b> <span style="float: right;"><b>Course Code: BP109P</b></span>	
CO-1	Calculate the quantity taken for working formula from the given master formula.
CO-2	Formulate the dosage form and dispense in proper dosage form.
CO-3	Design the label with the proper and necessary product information.
CO-4	Perform the basic evaluation parameters to check the quality of preparation.
<b>Course Name: Pharmaceutical Inorganic Chemistry I</b> <span style="float: right;"><b>Course Code: BP110P</b></span>	
CO-1	Evaluate the levels of impurities in Inorganic Pharmaceuticals by performing limit test.
CO-2	Perform the identification tests for inorganic compounds.
CO-3	Analyse the purity of Inorganic compounds.
CO-4	Prepare the inorganic pharmaceuticals.
<b>Course Name: Communication skills</b> <span style="float: right;"><b>Course Code: BP111P</b></span>	
CO-1	Adapts good pronunciation, identifying the correct speech sounds and excel to communicate well in the professional and personal contexts.
CO-2	Creates a consistent accent and builds confidence
CO-3	Identifies the errors in pronunciation and facilitates students in speaking Target language i.e. English without the influence of mother tongue.



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CO-4	Demonstrates , public speaking skills with clarity and confidence through appropriate verbal and non-verbal communication.
CO-5	Develop the comprehension skills and improves appropriate language for public speaking, group discussions and Interviews.
<b>Course Name: Remedial Biology</b> <span style="float: right;"><b>Course Code: BP112RBP</b></span>	
CO-1	Identify the Cell biology ( Basic Nature of Plant cell and Animal cell)
CO-2	Classify the System of both Plants & Animals
CO-3	Isolate various tissue system and organ system in plant and animals
CO-4	Explain the theory of evolution
CO-5	Demonstrate the Anatomy and Physiology of plants and animals.

First Year – SEM II	
<b>Course Name: Human Anatomy and Physiology II</b> <span style="float: right;"><b>Course Code: BP201T</b></span>	
CO-1	Explain the anatomy and physiology of various organs of the nervous system, digestive system, respiratory system, urinary system, endocrine system and reproductive system.
CO-2	Understand the various homeostatic mechanisms and their imbalances
CO-3	Understand the structure and function of different organs.
CO-4	Elaborate on interlinked mechanism of normal functioning of human body.
CO-5	Explain the disorders related to the GIT, kidney and endocrine system.
<b>Course Name: Pharmaceutical Organic Chemistry I</b> <span style="float: right;"><b>Course Code: BP202T</b></span>	
CO-1	Explain the classification, IUPAC name and types isomerism of organic compounds.
CO-2	Outline the chemical reaction and Orientation of reaction of pharmaceutical drugs.
CO-3	Discuss the hybridizations and stability of organic compounds.
CO-4	Describe the Reactions of acidity and basicity of organic compounds.
<b>Course Name: Biochemistry</b> <span style="float: right;"><b>Course Code: BP203T</b></span>	
CO-1	Define and classify biomolecules with their structure and function.
CO-2	Explain the metabolic pathways of biomolecules in physiological and pathological condition.
CO-3	Understand how physiological condition influence the structure and reactivities of biomolecule.
CO-4	Describe the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.
CO-5	Discuss the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes.
<b>Course Name: Pathophysiology</b> <span style="float: right;"><b>Course Code: BP204T</b></span>	
CO-1	To explain the basic principal of cell injury and adaptation and mechanism involved in the process of inflammation, repair.
CO-2	Describe the etiology and parthenogenesis of various diseases.
CO-3	Discuss the clinical manifestations, diagnosis for various diseases.
CO-4	Explain the treatment implications for various diseases.
CO-5	Discuss the lifestyle modification for various diseases.
<b>Course Name: Computer Applications in Pharmacy</b> <span style="float: right;"><b>Course Code: BP205T</b></span>	
CO-1	Apply the knowledge of mathematics and computing fundamental to pharmaceutical application for any given requirement.



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CO-2	To know the various types of web technologies.
CO-3	To know the various applications of computers in pharmacy
CO-4	Explain about the objective, concept of various databases.
CO-5	To know the various computers as data analysis in preclinical development.
<b>Course Name: Environmental sciences</b> <span style="float: right;"><b>Course Code: BP206T</b></span>	
CO-1	Make up awareness about environmental problems.
CO-2	Apply basic knowledge of environment and its allied problems.
CO-3	Develop an attitude of concerned for the environment.
CO-4	Survey of environment protection, improvement and solving environmental problems.
<b>Course Name: Human Anatomy and Physiology II</b> <span style="float: right;"><b>Course Code: BP207P</b></span>	
CO-1	Explain the gross morphology, structure and function of various organs of the human body.
CO-2	Demonstrate the different types of activities like visual, reflex, functions of olfactory nerves, positive and negative feedback system, and total blood count by cell analyzer.
CO-3	Examine the different types of taste and neurological function.
CO-4	Determine body temperature, tidal volume, vital capacity and basal mass index.
CO-5	Explain the gross morphology, structure and function of various organs of the human body.
<b>Course Name: Pharmaceutical Organic Chemistry I</b> <span style="float: right;"><b>Course Code: BP208P</b></span>	
CO-1	Analyse the element and functional group of organic compounds.
CO-2	Determine melting point and boiling point of organic compounds.
CO-3	Identify different organic compounds by performing chemical tests.
CO-4	Develop solid derivatives from organic compounds.
CO-5	Construct molecular models.
<b>Course Name: Biochemistry</b> <span style="float: right;"><b>Course Code: BP209P</b></span>	
CO-1	Perform qualitative analysis to identify biomolecules.
CO-2	Determine the quantity of biomolecules by performing quantitative analysis.
CO-3	Analyse the abnormal constituents of urine and predict the pathological conditions.
CO-4	Examine salivary amylase activity and study the effect of temperature and substrate concentration on it.
<b>Course Name: Computer Applications in Pharmacy</b> <span style="float: right;"><b>Course Code: BP210P</b></span>	
CO-1	To know the various types of applications of computers in pharmacy.
CO-2	To know the various types of web technologies like HTML, XML, CSS.
CO-3	To know the various types of databases like MYSQL, MS ACCESS, Pharmacy drug database.
CO-4	Describe the various applications of databases in pharmacy.

## Second Year – SEM III

<b>Course Name: Pharmaceutical Organic chemistry-II</b> <span style="float: right;"><b>Course Code: BP301T</b></span>	
CO-1	Understand the concepts of chemistry, aromaticity, reactivity and orientation of benzene and its derivatives along with their applications.
CO-2	Discuss the acid base properties, reactivity, stability and synthetic uses of phenols, aromatic amines, acids and their derivatives.
CO-3	Describe and interpret the physicochemical properties and reactions of bio-molecules like fats and oils.



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CO-4	Elucidate chemistry of polycyclic hydrocarbons and their applications.
CO-5	Apply different theories to elucidate stability of cycloalkanes.
<b>Course Name: Physical Pharmaceutics-I</b> <span style="float: right;"><b>Course Code: BP302T</b></span>	
CO-1	Understand concepts related to solubility, mechanisms of solute solvent interactions and to study Distribution law.
CO-2	Study the use of physicochemical properties of drug in pharmaceutical formulation.
CO-3	Acquire knowledge of the principles, concepts and methods of determination of surface tension and Complexation.
CO-4	Know the methods of preparation of pharmaceutical buffers and its importance.
CO-5	Outline the diagrams of instruments and equipment's related to formulation and evaluation of different dosage forms.
<b>Course Name: Pharmaceutical Microbiology</b> <span style="float: right;"><b>Course Code: BP303T</b></span>	
CO-1	Define pharmaceutical microbiology, pure culture, and able to choose nutrient media for isolation of different microorganisms by using different microscopes
CO-2	Understand staining, preservation and sterilization techniques accordingly they can compare and classify the microorganisms.
CO-3	Develop a new method for cultivation of virus and fungi, they got to know make use of disinfectants and testing of sterilizing agents.
CO-4	Classify clean areas and analyze antimicrobial activity of a new substance
CO-5	Evaluate microbial spoilage of pharmaceutical products and apply cell cultures in pharmaceutical industry
<b>Course Name: Pharmaceutical Engineering</b> <span style="float: right;"><b>Course Code: BP304T</b></span>	
CO-1	Adapt the concepts of fluid flow & discuss the phenomenon of size reduction and size separation for effective practices sizing on pharmaceutical field.
CO-2	Outline the concepts of heat transfer mechanisms and summarize the importance of various unit operations used in pharmaceutical industries like evaporation and distillation.
CO-3	Demonstrate the principles and applications of unit operations like drying, mixing filtration and centrifugation.
CO-4	Discuss the various material handling systems, types of corrosion and their preventive methods in pharmaceutical industries.
CO-5	Emphasis on various factors affecting the materials selected for pharmaceutical plant construction
<b>Course Name: Pharmaceutical Organic chemistry-II</b> <span style="float: right;"><b>Course Code: BP305P</b></span>	
CO-1	Utilize basic laboratory techniques for separation and purification of organic compounds.
CO-2	Analyze fats & oils quantitatively.
CO-3	Perform synthesis and recrystallization of organic compounds.
<b>Course Name: Physical Pharmaceutics-I</b> <span style="float: right;"><b>Course Code: BP306P</b></span>	
CO-1	Apply the knowledge of phase diagram to determine consolute temperatures
CO-2	Understand the concept of solubility and recognize basic rules and equations regarding physical principles.
CO-3	Utilize the knowledge of Complexation and adsorption isotherms
CO-4	Understand the phenomenon of partition coefficient and surface tension



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<b>Course Name: Pharmaceutical Microbiology</b>		<b>Course Code: BP307P</b>
CO-1	Understand various accessories for microbiology practical.	
CO-2	Develop basic skill in aseptic techniques.	
CO-3	Perform various staining techniques.	
CO-4	Isolate and identify microorganism from laboratory sample.	
CO-5	Standard protocols in pharmaceutical industry – IP.	
<b>Course Name: Pharmaceutical Engineering</b>		<b>Course Code: BP308P</b>
CO-1	Construct of drying curves and determine radiation constant, overall heat transfer coefficient, moisture content, loss on drying and humidity of air.	
CO-2	Describe construction, working and applications of various pharmaceutical machinery.	
CO-3	Measure the efficiency of steam distillation and evaluate the size distribution of tablet granulations and inspect the laws of size reduction	
CO-4	Demonstrate of various pharmaceutical equipment's used for formation of bulk products and calculation of uniformity index by using double cone blender.	
CO-5	Analyze the various factors affecting on rate of filtration and evaporation. Examine effect of time on rate of crystallization.	

## Second Year – SEM IV

<b>Course Name: Pharmaceutical Organic Chemistry III</b>		<b>Course Code: BP401T</b>
CO-1	Describe the general aspects of optical isomerism and compile the knowledge of stereo chemical aspects of organic compounds as well as reactions.	
CO-2	Elucidate the concept of geometrical isomerism, conformational analysis, relevance of stereochemistry & its significance in Pharmaceutical Sciences.	
CO-3	Generalize the nomenclature, properties, methods of preparation and medicinal uses of five membered heterocyclic compounds.	
CO-4	Outline the details of chemistry of six membered and fused heterocyclic compounds including their properties, reactions and applications.	
CO-5	Explain important named reactions and their synthetic applications.	
<b>Course Name: Medicinal Chemistry I</b>		<b>Course Code: BP402T</b>
CO-1	Memorize the introductory aspects along with history and development of medicinal chemistry.	
CO-2	Illustrate the Physico-chemical properties in relation to Biological action, Phase 1 and Phase 2 reactions of drug metabolism	
CO-3	Outline the structure, Structure activity relationship and uses for various therapeutic compounds.	
CO-4	Describe the classification and mechanism of action for various classes of compounds.	
CO-5	Outline the Bio-synthesis and Chemical synthesis of some important class of drugs.	
<b>Course Name: Physical Pharmaceutics II</b>		<b>Course Code: BP403T</b>
CO-1	Demonstrate use of physicochemical properties in formulation and evaluation of different dosage forms.	
CO-2	Gain knowledge related to different colloidal systems with its stability and applications.	
CO-3	Understand the flow behavior of fluids and derived properties of powders with its applicability in different pharmaceutical formulations.	
CO-4	Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations.	



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CO-5	Outline the diagrams of instruments and equipment's related to formulation and evaluation of different dosage forms.
<b>Course Name: Pharmacology I</b> <span style="float: right;"><b>Course Code: BP404T</b></span>	
CO-1	Describe the general aspects pharmacology and compile the knowledge of various terms in the field including pharmacokinetics.
CO-2	Elucidate the concept of general pharmacology with respect to Pharmacodynamics, adverse drug reactions, drug interactions and drug discovery and clinical evaluation of new drugs.
CO-3	Generalize the pharmacology of drugs acting on peripheral nervous system including local anesthetic agents and drugs used in myasthenia gravis and glaucoma.
CO-4	Outline the details of pharmacology of drugs acting on central nervous system.
CO-5	Explain pharmacology of drugs acting on central nervous system.
<b>Course Name: Pharmacognosy and Phytochemistry I</b> <span style="float: right;"><b>Course Code: BP405T</b></span>	
CO-1	Describe the general history, scope and development of pharmacognosy and classification of crude drug.
CO-2	Discuss the evaluation technique for the herbal drugs
CO-3	Know the techniques in the cultivation and production of crude drug
CO-4	Explain the concept of plant Tissue culture
CO-5	Outline the details of primary and secondary metabolites of plants
<b>Course Name: Medicinal Chemistry I</b> <span style="float: right;"><b>Course Code: BP406P</b></span>	
CO-1	Synthesize different pharmaceutical drugs and their intermediates
CO-2	Assess the purity of API in the marketed drugs.
CO-3	Analyze the Partition coefficient of the drugs using experimental methods
<b>Course Name: Physical Pharmaceutics II</b> <span style="float: right;"><b>Course Code: BP407P</b></span>	
CO-1	Relate various physicochemical properties of drug and excipient molecules in designing the dosage forms.
CO-2	Understand physicochemical properties of drug molecules in formulation research and development.
CO-3	Demonstrate use of physicochemical properties in evaluation of different dosage forms.
CO-4	Distinguish the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
<b>Course Name: Pharmacology I</b> <span style="float: right;"><b>Course Code: BP408P</b></span>	
CO-1	Understand the basic concepts of experimental Pharmacology, common laboratory techniques and animal handling.
CO-2	Describe the commonly used instruments in experimental pharmacology.
CO-3	Demonstrate the effect of various therapeutic drugs and endogenous substances on laboratory animals using software-simulated experiments and videos.
<b>Course Name: Pharmacognosy and Phytochemistry I</b> <span style="float: right;"><b>Course Code: BP409P</b></span>	
CO-1	Explain correct use of various equipment in Pharmacognosy laboratory.
CO-2	Draw morphological and microscopical diagrams, label components and judge purity of crude drugs.
CO-3	Handle simple/ compound/ digital microscope in technical correct way.
CO-4	Explain significance of qualitative and quantitative microscopy and it's social relevance.
CO-5	Analysis of unorganised crude drugs as per regulatory guidelines.





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Third Year – SEM V	
<b>Course Name: Medicinal Chemistry II</b> <span style="float: right;"><b>Course Code: BP501T</b></span>	
CO-1	Extrapolate the relationships between structure of the specific category of the drug its to its biological activity
CO-2	Outline the chemical synthesis of pharmaceutical drugs.
CO-3	Discuss the classification and mechanism of pharmaceutical drugs.
CO-4	Describe drug metabolic pathways, adverse effect, and therapeutic values of drugs.
<b>Course Name: Industrial Pharmacy - I</b> <span style="float: right;"><b>Course Code: BP502T</b></span>	
CO-1	Illustrate physicochemical properties of drugs as a tool in the optimization of solid and liquid dosage forms.
CO-2	Formulate and prepare tablets and liquid orals using established procedures and technology & evaluate the dosage forms for quality and stability and compare with standards prescribed in the pharmacopoeia
CO-3	Understand production, formulation aspects, quality control tests for capsules and pellets.
CO-4	Describe the facilities and standards necessary for the industrial production of sterile dosage forms with formulation and evaluation of different types of parenteral and ophthalmic dosage forms.
CO-5	Select ingredients and formulate cosmetics such as lipsticks, shampoos, cold cream and vanishing cream, tooth pastes, hair dyes and sunscreens Identify containers, closures, valves and propellants for different types of aerosol systems. Select and evaluate appropriate packaging materials for various pharmaceutical dosage forms.
<b>Course Name: Pharmacology II</b> <span style="float: right;"><b>Course Code: BP503T</b></span>	
CO-1	Describe the classification and mechanism of drugs acting on cardiovascular, urinary and endocrine system.
CO-2	Discuss the mechanism of drug action and its relevance in the treatment of different diseases.
CO-3	Analyze bioassay of different drugs.
CO-4	Relate the correlation of pharmacology with related medical science.
CO-5	Apply the knowledge of drugs in disease condition.
<b>Course Name: Pharmacognosy &amp; Phytochemistry - II</b> <span style="float: right;"><b>Course Code: BP504T</b></span>	
CO-1	know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents
CO-2	Understand the preparation and development of herbal formulation.
CO-3	Know the herbal drug interactions
CO-4	Understanding isolation and identification of phytoconstituents
CO-5	Explain Basics of Phytochemistry
<b>Course Name: Pharmaceutical Jurisprudence</b> <span style="float: right;"><b>Course Code: BP505T</b></span>	
CO-1	Illuminate relevance and significance of jurisprudence to pharmaceutical Sciences
CO-2	Fundamentals of legislation to regulate import manufacture, distribution and sales of drug and cosmetics
CO-3	Brief study of legislation
CO-4	Concepts of intellectual property right patent system, drug regulatory affairs etc.
<b>Course Name: Industrial Pharmacy - I</b> <span style="float: right;"><b>Course Code: BP506P</b></span>	
CO-1	Predict importance of preformulation of drugs in formulation of dosage forms.



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CO-2	Take part in preparation of tablet and liquid dosage forms and evaluation of the formulation.
CO-3	Take part in preparation and evaluation of capsules.
CO-4	Take part in sterile product preparation and their evaluation.
CO-5	Develop formulation of cosmetics and knowledge on packaging material science.
<b>Course Name: Pharmacology II</b> <span style="float: right;"><b>Course Code: BP507P</b></span>	
CO-1	Describe the various receptor actions using isolated tissue preparation.
CO-2	Discuss isolation of different organs/tissues from the laboratory animals by simulated experiments.
CO-3	Analyze bioassay of different drugs by simulated experiments.
CO-4	Relate the correlation of pharmacology with preclinical & clinical studies.
<b>Course Name: Pharmacognosy and Phytochemistry - II</b> <span style="float: right;"><b>Course Code: BP508P</b></span>	
CO-1	Define Primary metabolites. Explain about shikimic acid path way.
CO-2	Determination of leaf constants
CO-3	List out factors effecting tracer technique.
CO-4	Define Alkaloids and glycosides with extraction procedure.
CO-5	Determination of Extractive values of crude drugs

Third Year – SEM VI	
<b>Course Name: Medicinal Chemistry III</b> <span style="float: right;"><b>Course Code: BP601T</b></span>	
CO-1	Describe the nomenclature, SAR, Stereochemistry of pharmaceutical drugs.
CO-2	Outline the synthesis of pharmaceutical drugs.
CO-3	Discuss the classification and mechanism of pharmaceutical drugs.
CO-4	Describe the various approaches used in drug design
CO-5	Describe the concept of combinatorial chemistry
<b>Course Name: Pharmacology III</b> <span style="float: right;"><b>Course Code: BP602T</b></span>	
CO-1	Describe the chemotherapy of drugs.
CO-2	Discuss the mechanism of drug action and its relevance in the treatment of different infectious disease.
CO-3	Describe the principles of toxicology and treatment of various poisoning.
CO-4	Relate the correlation of pharmacology with related medical science.
CO-5	Apply the knowledge of drugs in disease condition.
<b>Course Name: Herbal Drug Technology</b> <span style="float: right;"><b>Course Code: BP603T</b></span>	
CO-1	Understand raw material as source of herbal drugs from cultivation to herbal drug product.
CO-2	Learn about to know the WHO and ICH guidelines for evaluation of herbal drugs.
CO-3	Know the herbal cosmetics, natural sweeteners, nutraceuticals.
CO-4	Understanding patenting of herbal drugs, GMP.
CO-5	Explain important traditional dosage forms
<b>Course Name: Biopharmaceutics and Pharmacokinetics</b> <span style="float: right;"><b>Course Code: BP604T</b></span>	
CO-1	Describe the basic concepts in Biopharmaceutics and pharmacokinetics and their significance.
CO-2	Compare with plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination



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CO-3	Explain the concepts of bioavailability and bioequivalence of drug products and their significance.
CO-4	Summarize the various pharmacokinetic parameters, their significance & applications
CO-5	Illustrate the concept of non linear pharmacokinetics
<b>Course Name: Pharmaceutical Biotechnology</b> <span style="float: right;"><b>Course Code: BP605T</b></span>	
CO-1	Understand basic concepts of enzyme biotechnology and protein engineering.
CO-2	Study about recombinant DNA technology and Immunity.
CO-3	Use the knowledge of hybridoma technology and vaccines.
CO-4	Study immune blotting techniques and genetic organization.
CO-5	Describe about mutants, use of microorganisms in fermentation technology.
<b>Course Name: Quality Assurance</b> <span style="float: right;"><b>Course Code: BP606T</b></span>	
CO-1	Explain the concepts of quality control and quality assurance during entire manufacturing practices. Understand the c GMP aspects in a pharmaceutical industry.
CO-2	Understand the importance and Construct the documentation.
CO-3	Develop Knowledge and understand the scope of quality certifications applicable to Pharmaceutical industry, Demonstrate sterilization of packaging materials.
CO-4	Describe various aspects of documentation, SOPs and records. Develop basic knowledge and understand the responsibilities of QA & QC Departments.
CO-5	Develop basic knowledge Manufacturing operations and controls. Elaborate on the role of validation in assurance of quality in pharmaceutical industry
<b>Course Name: Medicinal chemistry III</b> <span style="float: right;"><b>Course Code: BP607P</b></span>	
CO-1	Perform the chemical synthesis reactions by outlining the mechanism of reaction of the selected category of the drugs using traditional and microwave assisted methods.
CO-2	Determine the assay of various drugs.
CO-3	Estimate physicochemical properties of drugs using drug design software.
CO-4	Generate the structures of drugs with the help of software ChemDraw.
<b>Course Name: Pharmacology III</b> <span style="float: right;"><b>Course Code: BP608P</b></span>	
CO-1	Calculate dose in pharmacological experiments.
CO-2	Discuss toxicity studies as per OECD guidelines.
CO-3	Analyze biostatistics methods in experimental pharmacology.
CO-4	Assess pharmacological activity by using experimental animal models by simulated experiments.
<b>Course Name: Herbal Drug Technology</b> <span style="float: right;"><b>Course Code: BP609P</b></span>	
CO-1	To perform preliminary phytochemical screening of crude drugs.
CO-2	Determination of the alcohol content of Asava and Arista
CO-3	Evaluation of excipients of natural origin
CO-4	Incorporation of prepared and standardized extract in cosmetic formulations
CO-5	Monograph analysis of herbal drugs from recent Pharmacopoeias

## Final Year – SEM VII

<b>Course Name: Instrumental Methods of Analysis</b> <span style="float: right;"><b>Course Code: BP701T</b></span>	
CO-1	Describe the interaction of matter with electromagnetic radiations and Understand concept of absorption and emission spectroscopy.



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CO-2	Explain the instrumentations of different analytical instruments and its applications in drug analysis.
CO-3	Discuss the principles of chromatographic separation techniques and Recall the advantages and disadvantages of different chromatographic techniques.
CO-4	Choose the most appropriate analytical technique for a variety of samples and demonstrate chromatographic separation techniques.
CO-5	Integrate, interpret and compare the analytical and graphical data for analysis of drugs.
<b>Course Name: Industrial Pharmacy-II</b> <span style="float: right;"><b>Course Code: BP702T</b></span>	
CO-1	Know the process of pilot plant and scale up of pharmaceutical dosage forms.
CO-2	Understand the process of technology transfer from lab scale to commercial batch.
CO-3	Know different Laws and Acts that regulate pharmaceutical industry
CO-4	Understand the Quality Management Systems.
CO-5	Understand the approval process and regulatory requirements for drug products
<b>Course Name: Pharmacy Practice</b> <span style="float: right;"><b>Course Code: BP703T</b></span>	
CO-1	knows various drug distribution methods in a hospital
CO-2	appreciates the pharmacy stores management and inventory control
CO-3	monitor drug therapy of patient through medication chart review and clinical review
CO-4	obtains medication history interview and counsel the patients
CO-5	identifies drug related problems and detect and assess adverse drug reactions
<b>Course Name: Novel Drug Delivery System</b> <span style="float: right;"><b>Course Code: BP704T</b></span>	
CO-1	Understand various formulation approaches involved in developing Novel drug delivery systems.
CO-2	Determine the criteria for selection of drugs and polymers for the formulation and evaluation of various Novel dosage forms.
CO-3	Outline the various factors influencing formulation and development of novel drug delivery systems.
CO-4	Describe the advantages, disadvantages, approaches and applications of various novel dosage forms.
<b>Course Name: Instrumental Methods of Analysis</b> <span style="float: right;"><b>Course Code: BP705P</b></span>	
CO-1	Understand and explain the methods assuring the quality and safety of pharmaceuticals.
CO-2	Make use of various analytical instruments and take part research activity.
CO-3	Perform quantitative & qualitative analysis of drugs using various analytical instruments compare/correlate with standard methods.
<b>Course Name: Practice School</b> <span style="float: right;"><b>Course Code: BP706PS</b></span>	
CO-1	Operate different Analytical Instruments.
CO-2	Understand the formulation development process and step involved.
CO-3	Basic Scientific Knowledge required for development of cosmeceuticals.
CO-4	Know different conventional methods and modern methods of extraction and isolation of herbal drugs.
CO-5	Gain Knowledge about Pharmacovigilance and Surveys.



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Final Year – SEM VIII	
<b>Course Name: Biostatistics and Research Methodology</b> <span style="float: right;"><b>Course Code: BP801T</b></span>	
CO-1	Describe basic statistical concepts like Sampling, frequency distribution, Regression etc.
CO-2	Make use of various Statistical tests and concepts to solve Pharmaceutical problems
CO-3	Describe the basic concepts of Research and various study designs in clinical trials.
CO-4	Design Clinical trial protocols and Research experiments using statistical software like SPSS, MINITAB® etc.
<b>Course Name: Social and Preventive Pharmacy</b> <span style="float: right;"><b>Course Code: BP802T</b></span>	
CO-1	Relate food to nutrition health, balanced diet, deficiencies and its prevention
CO-2	Acquire high realization of current issues related to health and pharmaceutical problems within the country and worldwide.
CO-3	Have a critical way of thinking based on current healthcare development.
CO-4	Identify National health programs its objectives functioning and outcomes
CO-5	Evaluate alternative ways of solving problems related to health and pharmaceutical issues.
<b>Course Name: Pharmaceutical Regulatory Science</b> <span style="float: right;"><b>Course Code: BP804ET</b></span>	
CO-1	Describe the process of drug discovery and development.
CO-2	Discuss the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals.
CO-3	Outline the concept of Clinical trials and their protocols, GCP, Pharmacovigilance etc.
CO-4	Illustrate the regulatory approval process and their registration in Indian and international markets.
<b>Course Name: Pharmacovigilance</b> <span style="float: right;"><b>Course Code: BP805ET</b></span>	
CO-1	Discuss the importance of drug safety monitoring and the development of pharmacovigilance program
CO-2	Describe about national and international pharmacovigilance program and the terminologies used.
CO-3	Develop and establish pharmacovigilance program in an organization.
CO-4	Explain the methods to generate safety data during the phases of clinical trial and recognize the role of ICH and GCP guidelines
CO-5	Explain pharmacogenomics of adverse drug reactions and evaluate drug safety in special population.
CO-6	Explain international standards for classification of diseases and drugs
<b>Course Name: Project Work</b> <span style="float: right;"><b>Course Code: BP813PW</b></span>	
CO-1	Study on multidisciplinary areas related to pharmacy profession.
CO-2	Develop required skills for technical presentation.
CO-3	Concentrate on specific topic in scientific and pharmacy fields.
CO-4	Gain more advanced knowledge of the research and manuscript writing.
CO-5	Describe new trends among group of students and faculties.