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PRINCETON COLLEGE OF PHARMACY

(Affiliated to JNTUH, Approved by PCI, New Delhi & Accredited by NAAC)
Chowdariguda(V), Korremula, Ghatkesar (M), Medchal- Malkajgiri (Dist.) - 500 088
E mail: princeton.pharmacy@gmail.com, Website: pcop.ac.in

2.6.1 Programme and course outcomes for all programmes offered by the institution are stated and displayed on website

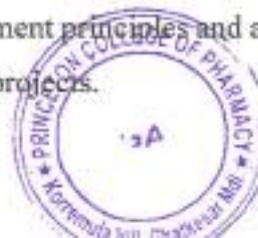


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Program Outcomes for B.Pharmacy & M.Pharmacy

- **PO1 – Pharmacy Knowledge:** Possess and apply the knowledge of chemical synthesis and evaluation, pharmaceutical technologies and pharmacology, formulation, and development of pharmaceuticals.
- **PO2 – Problem Analysis and Development of Solutions:** Develop an ability to identify and analyze problems and interpret data generated from formulation development, quality control, and quality assurance to find solutions.
- **PO3 – Conduct Investigations of Complex Problems:** Use research-based knowledge and research methods, including the design of experiments, analysis, and elucidation of data and synthesis, to provide valid conclusions.
- **PO4 – Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern IT tools to complex activities in the field of pharmacology and chemistry, with an understanding of their limitations.
- **PO5 – Competency:** Pharmacy graduates with employable skills and high technical competence for the pharmaceutical industry and healthcare sector.
- **PO6 – Environment and Sustainability:** Understand the impact of pharmacy professional solutions in societal and environmental contexts and strive for eco-friendly pharmaceutical operations/services to maintain public health.
- **PO7 – Pharmaceutical Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of pharmacy practice. Apply ethical principles while making decisions and take responsibility for the outcomes associated with those decisions.
- **PO8 – Individual and Team Work:** Function effectively as an individual and as an active member or leader in a healthcare team and in a multidisciplinary setting.
- **PO9 – Communication:** Communicate effectively in both verbal and written form.
- **PO10 – Project Management and Finance:** Demonstrate knowledge and understanding of basic pharmaceutical sciences and management principles and apply these to one's own work as a member and leader in a team to manage projects.



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- **PO11 – Entrepreneurship:** Develop entrepreneurship skills that support the growth of the pharmaceutical industry/pharmaceutical services leading to economic development.
- **PO12 – Lifelong Learning:** Recognize the need for, and have the preparation and ability to engage in, independent and lifelong learning, and develop an aptitude for continuous professional development.



A handwritten signature in blue ink, appearing to be "S. S. S.", written in a cursive style.

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Princeton College of Pharmacy
Korumula VII, Vijaypur, Gohat,
Ghankesari, Madhya Pradesh, India.



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B-PHARMACY (1st YEAR) 1st SEMESTER(PCI Regulation)			
Course	Course Code	Course Outcome Number	Course Outcome
HUMAN ANATOMY AND PHYSIOLOGY- I (Theory)	PS101		Upon completion of the course student will be able to
		1	Identify gross morphology, structure and functions of the various organs of the human body.
		2	Describe various homeostatic mechanisms and their imbalances in the human body.
		3	Identify the different tissues and different systems of the human body.
		4	Demonstrate the different types of bones in the human body.
HUMAN ANATOMY AND PHYSIOLOGY - I Lab	PS108		Upon completion of the course student will be able to
		1	Perform various experiments related to identification of the tissues indifferent systems of human body.
		2	Examine various techniques like blood group determination, blood pressure determination, blood cell counting.
		3	Evaluate various experiments related to special senses and nervous system.
		4	Practice the determination of heart rate and pulse rate.
	5	Record blood parameters like hemoglobin, clotting and bleeding time.	
			Upon completion of the course student will be able to
PHARMACEUTICAL ANALYSIS - I (Theory)	PS102	1	Explain the theoretical basis of commonly used statistical methods & correctly analyze & interpret the results of statistical data from surveys,experiments & observational studies.
		2	Illustrate sources of errors in analytical techniques, methods to minimize them andcalibration of analytical methods.
		3	Describe the various titrimetric and electrochemical methods of analysis and their application in quality control of pharmaceuticals.
		4	Develop and enhance the analytical skills
PHARMACEUTICAL ANALYSIS - I lab	PS109		Upon completion of the course student will be able to
		1	Understand the principles of volumetric and electro chemical analysis.
		2	Evaluate various volumetric and electrochemical titrations.
	3	Develop analytical skills.	
			Upon completion of the course student will be able to
PHARMACEUTICS - I (Theory)	PS103	1	Describe the history of pharmacy profession and its scope.
		2	Identify the prescription in a professional manner.
		3	Describe the basics of Pharmaceutical calculations& calculate the dose for a drug.
		4	Discuss about various dosage forms.
		5	Identify and suggest the correction methods in pharmaceutical incompatibilities in prescription.
PHARMACEUTICS - I LAB	PS110		Upon completion of the course student will be able to
		1	Explain some solid, liquid and semisolid dosage forms.
		2	Select suitable container and storage conditions for a product.
	3	Asses the pharmaceuticals.	
			Upon completion of the course student will be able to
PHARMACEUTICAL INORGANIC CHEMISTRY - I (Theory)	PS104	1	Acquire Knowledge of sources of impurities and methods to determine the impurities in inorganic drugs and Pharmaceuticals.
		2	Demonstrate the principles of limit tests.
		3	Identification of different anions, cations and different inorganic pharmaceuticals.
		4	Describe the basic concepts of acidity/basicity, buffers and tonicity applicable in pharmaceuticals.
		5	Summarize the medicinal and pharmaceutical importance of inorganic compounds.
		6	Describing concepts, principles and applications of radiopharmaceuticals.
PHARMACEUTICAL INORGANIC CHEMISTRY - LAB	PS111	1	Demonstrate with the principles of limit tests.
		2	Acquire the knowledge on identification of inorganic salts through various qualitative tests.
		3	Apply the knowledge to perform tests for purity for different compounds as per IP.
		4	Implement skills to prepare inorganic salts -boric acid, potash alum and ferrous sulphate.
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Course	Course Code	Course Outcome Number	Course Outcome
COMMUNICATION SKILLS (Theory)	HS105	1	Upon completion of the course student will be able to
		2	Explain the key terminologies of process of communication.
		3	Identify the importance of tone, body language and active listening as elements of effective communication.
		4	Interpret the factors influencing communication perspectives
		5	Explain the nuances of audience – centric presentation.
COMMUNICATION SKILLS - LAB	HS112	1	Demonstrate effective interview skills. Apply appropriate communication style in professional context.
		2	Recognize phonemes for proper articulation of words.
		3	Explain the key concepts of writing skills and listening skills.
		4	Apply listening skills and reading skills for comprehension.
		5	Demonstrate conversation skills using appropriate body language and tone.
REMEDIAL BIOLOGY (Theory)	BS106	1	Upon completion of the course student will be able to
		2	Identify and understand the components of living world, Both Plants and Animals.
		3	Classify and remember the salient features of five kingdoms of life.
		4	Understand the basic components, both anatomy and physiology of plants.
		5	Discuss and assess anatomy physiology of animals, particularly humans.
REMEDIAL BIOLOGY LAB	BS113	1	Identify and understand the various tissue systems and organ systems in plants and animals.
		2	Construct and develop microscopic sections of parts of the plant.
		3	Identify various systems of frog using computer model.
		4	Differentiate the various blood groups.
		5	Calculate the blood pressure and tidal volumes.
REMEDIAL MATHEMATICS(Theory)	BS107	1	Upon completion of the course student will be able to
		2	Know the theory and their application in Pharmacy
		3	Solve the different types of problems by applying theory.
		4	Appreciate the important application of mathematics in Pharmacy.
		5	Apply both conventional and creative techniques to the solutions of mathematical problems.
B-PHARMACY (1st YEAR) IInd SEMESTER (PCI Regulation)			
HUMAN ANATOMY AND PHYSIOLOGY- II (Theory)	PS201	1	Upon completion of the course student will be able to
		2	Recognize gross morphology, structure and functions of various organs of the human body.
		3	Explain various homeostatic mechanisms in the human body.
		4	Generalize the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body.
		5	Understand the mechanisms in the maintenance of normal functioning of human body.
HUMAN ANATOMY AND PHYSIOLOGY – II LAB	PS207	1	Understand the different coordinated working patterns of different organs of each system
		2	Perform the hematological tests like blood cell counts, hemoglobin estimation, bleeding/clotting time etc.
		3	Identify the various organs of different systems of human body.
		4	Practice the experiments like neurological reflex,body temperature measurement
		5	Study of basic physiological parameters like blood pressure, heart rate,pulse rate and respiratory volumes.
Conceptualized study of integumentary systems			



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Course	Course Code	Course Outcome Number	Course Outcome
PHARMACEUTICAL ORGANIC CHEMISTRY – I (Theory)	PS202	1	Upon completion of the course student will be able to acquire the knowledge and understanding of the basic experimental principles of pharmaceutical organic chemistry.
		2	Generalize the nomenclature, classification, structure, and types of isomerism of organic compounds
		3	Review of important physical properties, reactions (and underlying mechanisms) and methods of preparation of various functional groups.
		4	List out reactivity/stability of compounds and intermediates forming in reactions.
		5	Demonstrate the identification of organic compound. Summarize the concepts of named reactions and its applications.
PHARMACEUTICAL ORGANIC CHEMISTRY - I LAB	PS208	1	Upon completion of the course student will be able to Assessment of safety measures in organic chemistry laboratory and various laboratory techniques
		2	Evaluation of steps involved in identification of unknown organic compound.
		3	State abilities to prepare suitable solid derivatives from organic compounds
		4	Build skills to prepare stereo models containing various functional groups.
		5	Represent stereo models and its arrangement. Apply knowledge to assess safety, health and consequent responsibilities relevant to this.
Course	Course Code	Course Outcome Number	Course Outcome
BIOCHEMISTRY (Theory)	BS203	1	Upon completion of the course student will be able to The study of bio molecules gives knowledge on bio chemical organization of living organisms along with their role.
		2	It helps in understanding the catalytic role of enzymes, importance of enzyme inhibition in the design of new drugs.
		3	Study of enzymes and isoenzymes emphasizes their role in therapeutic and diagnostic applications.
		4	Metabolic pathways of bio molecules helps the students to acquire knowledge on various energy metabolisms that occur in living organisms.
		5	Understanding the concepts of mammalian genetic organization, concepts of DNA, RNA, Protein and mutations gives wide knowledge to the student community to face the future challenges in health care sector. The study of metabolic reactions and deficiency diseases gives awareness to the students to develop new alternatives in pharmaceutical industries to face the challenges of nutritional sciences.
BIOCHEMISTRY LAB	BS209	1	Upon completion of the course student will be able to Experiments on qualitative analysis of biomolecules gives practical knowledge to the students for better understanding of compositions of blood and urine samples.
		2	Quantitative analysis of blood sugars, creatinine and cholesterol levels makes the students to be aware of the health conditions like Diabetes and jaundice etc.
		3	Students can gain knowledge on different buffer preparations that helps them in research applications.
		4	Study of enzymes like Amylases give knowledge to the students related to enzyme applications in industries.
		5	Qualitative analysis of urine sample for abnormal constituents helps to know about the diseases related to urine in human beings.
Course	Course Code	Course Outcome Number	Course Outcome
PATHOPHYSIOLOGY (Theory)	BS204	1	Upon completion of the course student will be able to Study the various etiological factors for the development of diseases.
		2	Understand the concepts of pathophysiological basis of selected diseases.
		3	Learn the basics of signs and symptoms of diseases.
		4	Study of common complications of the diseases.
Course	Course Code	Course Outcome Number	Course Outcome
COMPUTER APPLICATIONS IN PHARMACY (Theory)	CS205	1	Upon completion of the course student will be able to To know the various computer applications in pharmacy.
		2	To understand various number systems in computers.
		3	To know web technologies
		4	To understand the various types of databases and applications of databases in pharmacy.
		5	To learn Computers as data analysis in Preclinical development. To know databases in the concept of bio-informatics.
COMPUTER APPLICATIONS IN PHARMACY LAB	CS210	1	Upon completion of the course student will be able to To know how to design a questionnaire using a word processing package and a form in MS Access.
		2	To understand how to create a HTML web page, invoice table and database.
		3	To learn how to create mailing labels Using Label Wizard, generating label in MS word.
		4	To understand generating report and printing the report from database.
		5	To know drug information storage and retrieval using online tools and MS Access. exporting tables, queries, forms and reports to web and XML pages.
B.Pharmacy (II nd Year) Ist Semester (PCI Regulation)			
Course	Course Code	Course Outcome Number	Course Outcome
PHARMACEUTICAL ORGANIC CHEMISTRY –II (Theory)	PS301	1	Upon completion of the course student will be able to Explain the concept of orbital picture, resonance, reactions and effects of substituent's of benzene.
		2	Understand on acidity, effect of substituent's, reaction and qualitative test of phenols.
		3	Demonstrate basicity, effect of substituent's, reaction of aromatic amines.
		4	Reproduce the concept of optical isomerism and geometrical isomerism of organic compounds. Including concept of resolution of racemic modifications.
		5	Describe the synthesis, reactions, structure and medicinal uses of some polynuclear hydrocarbons. Explain the theory of cycloalkanes and chemistry of fats and oils
PHARMACEUTICAL ORGANIC CHEMISTRY - II LAB	PS305	1	Upon completion of the course student will be able to Acquire Knowledge on separation and identification of qualitative analysis of solid-solid organic binary mixtures.
		2	Demonstrate the concept of re-crystallisation and Steam distillation.
		3	Determination of Ester value, Acid value and saponification value of oil sample.
		4	Use various techniques for the different organic compounds to understand the reaction mechanisms



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Course	Course Code	Course Outcome Number	Course Outcome
PHYSICAL PHARMACEUTICS - I (Theory)	PS302	1	Upon completion of the course student will be able to State the physicochemical properties of drug molecules, pH, solubility and formation of complexes.
		2	Explain the role of surfactants.Explain physical principles of states of matter and phase rule.
		3	Complete pKa values and estimate HLB values.
		4	Summarize the importance of pH and buffers in manufacturing pharmaceutical dosage forms and maintaining stability and Solving problems related to buffers and isotonic solutions.
		5	Summarize skills and working knowledge of the principles and concepts of surface tension and its measurement.
PHYSICAL PHARMACEUTICS – I LAB	PS306	1	Upon completion of the course student will be able to Demonstrate solubility studies for different drugs.
		2	Evaluate pKa values and estimate HLB values.
		3	Examine and determine the percentage composition.
		4	Asses Critical Micellar Concentration of various surfactants.
		5	Evaluate of stability constants and partition coefficients.
PHARMACEUTICAL MICROBIOLOGY(Theory)	BS303	1	Upon completion of the course student will be able to Study of ph. Microbiology gives overall knowledge on microorganisms, infections, treatment and their applications in pharmaceutical industries and medicine.
		2	Methods of identification, cultivation and preservation of microbes give knowledge to students for better understanding in handling them and to know their applications in human life.
		3	Understanding of sterilization concepts gives immense knowledge to the students which help them in getting knowledge in industrial processing.
		4	Concepts of sterility testing are more useful to the students pharmaceutical product manufacturing
		5	The concepts of cell culture technology are useful for various applications in industries.Study of equipments like aseptic cabinet, hot air oven and incubator updates the knowledge of students to have experience in modern tool usage in academics
PHARMACEUTICAL MICROBIOLOGY LAB	BS307	1	Upon completion of the course student will be able to Hands on experience on the equipments like BOD incubator, LMF chamber, aseptic cabinet and Hot air oven gives knowledge to the students that is useful in understanding microbiological concepts.
		2	Sterilization techniques illustrates role of sterilization and disinfection in various ph. Industries.
		3	Staining techniques helps the students to identify the morphological and cultural characteristic features of microorganisms.
		4	Pure culture (isolation) techniques helps the students in better understanding of contamination, spoilage like conditions in processing mechanism in industries.
		5	Sterility testings give knowledge to the students about the industrial production of various drugs and medicines and their safety.
		6	Biochemical and analytical tests makes the students to learn the safety issues of products that are useful for community.
PHARMACEUTICAL ENGINEERING (Theory)	PC304	1	Upon completion of the course student will be able to Explain various unit operations used in Pharmaceutical industries.
		2	To comprehend the material handling techniques.
		3	Identify various processes involved in pharmaceutical manufacturing process.
		4	Instruct the pharmaceutical applications of various unit operations.
		5	Review the significance of plant lay out design for optimum use of resources.Generalize the preventive methods used for corrosion control in Pharmaceutical industries.
PHARMACEUTICAL ENGINEERING LAB	PC308	1	Upon completion of the course student will be able to Design various experiments related to unit operations.
		2	Instruct to operate equipment's used in the manufacture of pharmaceutical products.
		3	Interpret results of the experiments conducted.
		4	Demonstrate the material and energy requirements for optimizing the pharmaceutical unit processes.
B.Pharmacy (II nd year)II nd Semester (PCI Regulation)			
PHARMACEUTICAL ORGANIC CHEMISTRY – III	PS401	1	Upon completion of the course student will be able to Summarize the medicinal uses and other applications of organic compounds.
		2	Acquire the knowledge and understanding of the basic experimental principles of heterocyclic chemistry.
		3	Instruct to draw the structures and synthesize simple pharmaceutically active organic compounds having five and six membered heterocyclic compounds.
		4	Describe detailed mechanisms for common naming reactions.
		5	Identify Stereo-chemical features including conformation and stereo electronic effects; Geometrical isomers.
MEDICINAL CHEMISTRY – I (Theory)	PC402	1	Upon completion of the course student will be able to Explain history and basic principles of Medicinal Chemistry.
		2	Study the concept of Physicochemical properties on biological action of drug molecule
		3	Describe classification, mechanism of action, structure activity relationship and uses of drugs acting on Autonomic nervous and Central Nervous system.
		4	Explanation on recent development of Prodrugs, Soft drugs and hard drugs. Scheme of synthesis of drugs from various therapeutic categories.
		5	Acquire Knowledge on structural activity relationship (SAR) of different class of drugs.Classification of centrally and peripherally acting analgesic drugs.




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MEDICINAL CHEMISTRY – I LAB	PC406		<p>Upon completion of the course student will be able to</p> <ol style="list-style-type: none"> Construct synthetic procedure and understand related reaction mechanism. Learn synthesis of medicinally important compounds / drug intermediates with Recrystallization and TLC techniques. Implement Purification methods for synthesized compounds using Column chromatography. Evaluation of Partition coefficient of drugs. Examination of Ionisation constants of drugs.
Course	Course Code	Course Outcome Number	Course Outcome
PHYSICAL PHARMACEUTICS - II (Theory)	PS403		<p>Upon completion of the course student will be able to</p> <ol style="list-style-type: none"> Explain the concept of rheology and flow properties of pharmaceutical preparations. Describe the factors leading to instability of disperse systems, effect of particle size distribution of powders on the manufacture of dosage forms. State the principles of chemical kinetics in stability testing. Apply the principles of micromeritics, rheology, chemical kinetics & stability, coarse dispersions in the formulation Development and evaluation of dosage forms
PHYSICAL PHARMACEUTICS – II LAB	PS407		<p>Upon completion of the course student will be able to</p> <ol style="list-style-type: none"> Evaluate flow properties of liquids and powders. Asses the particle size & size distribution using various methods. Demonstrate the effect of suspending agents on sedimentation volume Asses the various orders of reactions. Examine shelf – life by carrying out accelerated stability studies
Course	Course Code	Course Outcome Number	Course Outcome
PHARMACOLOGY - I(Theory)	PC404		<p>Upon completion of the course student will be able to</p> <ol style="list-style-type: none"> Describe the pharmacological actions of different classes of drugs. Recognize molecular mechanisms of drug action in the human body. Read the Basic pharmacological knowledge of drugs in the prevention and treatment of various diseases. Define the concepts of different types of drug receptors and their signaling mechanisms Enumerate the basic knowledge of drug addiction, abuse, drug interactions, and Pharmacovigilance.
PHARMACOLOGY – I LAB	PC408		<p>Upon completion of the course student will be able to</p> <ol style="list-style-type: none"> Choose different routes of drug administration in experimental animals. Demonstrate the effects of drugs on animals by simulated experiments. Define the knowledge of the interrelation of pharmacology with other biomedical sciences. Performance of laboratory investigation techniques. Basic knowledge of anesthetic and euthanasia techniques used in animal studies.
Course	Course Code	Course Outcome Number	Course Outcome
PHARMACOGNOSY AND PHYTOCHEMISTRY - I (Theory)	PC405		<p>Upon completion of the course student will be able to</p> <ol style="list-style-type: none"> know the techniques in the cultivation, storage and production of crude drugs . Learn the fundamental aspects and applications of plant tissue culture. Apply various techniques to evaluate the herbal drugs. Understand the significance of Pharmacognosy in allopathy and traditional system of medicine. Explain the Sources, chemical nature and uses of plant fibres, hallucinogens, teratogens and natural allergens and novel medicinal agents from marine sources.
PHARMACOGNOSY AND PHYTOCHEMISTRY – I LAB	PC409		<p>Upon completion of the course student will be able to</p> <ol style="list-style-type: none"> Understand the chemical nature of crude drug by chemical tests. Perform stomatal number, stomatal index, vein islet number, vein islet termination and palisade ratio of leaf drug. Understand and determine size of starch grains, calcium oxalate crystals, length and width of fiberof the sample. able to perform Ash value, Extractive values, moisture content, swelling and foaming index for the evaluation of crude drug.
B.Pharmacy(III rd Year) I stSemester (PCI Regulation)			
Course	Course Code	Course Outcome Number	Course Outcome
MEDICINAL CHEMISTRY – II (Theory)	PS501		<p>Upon completion of the course student will be able to</p> <ol style="list-style-type: none"> Evaluate basic principles and development of diuretics. Generalize History and basic and core aspects of the drug design. Summarize the development of drugs used in cardiac diseases like Arrhythmias, hypertension,diuretics and endocrine system. Describe recent development in Drugs acting on blood. To acquire knowledge about the chemotherapy for cancer.
Course	Course Code	Course Outcome Number	Course Outcome
INDUSTRIAL PHARMACY - I Theory	PS502		<p>Upon completion of the course student will be able to</p> <ol style="list-style-type: none"> Asses the physicochemical properties of drugs as a tool in the optimization of solid and liquid dosage forms. Develop Solid dosage forms and liquid dosage forms using established procedures and machinery. To learn Awareness on the facilities and required standards necessary for the industrial production of sterile dosage forms. To Formulate different types of parenteral, ophthalmic dosage forms, cosmetics Like lipsticks, shampoos, cold cream and vanishing cream Select and evaluate appropriate packaging materials for various pharmaceutical dosage forms.
INDUSTRIAL PHARMACY LAB	PS509		<p>Upon completion of the course student will be able to</p> <ol style="list-style-type: none"> Produce formulations of different dosage forms by using various excipients. Select suitable packaging container and closing and labeling requirements for the prepared dosage forms. Demonstrate different equipment's used in preparation of solid and other dosage forms. Apply the physicochemical properties of drugs to dosage form characteristics. Summarize to evaluate different dosage forms by performing quality control tests with the range of limits to pass the test.
Course	Course Code	Course Outcome Number	Course Outcome
PHARMACOLOGY - II(Theory)	PS503		<p>Upon Completion of this course student will able to</p> <ol style="list-style-type: none"> Understand the phartmacology and pharmacotherapy of common and essential medications used to treat cardiovascular disorders. Explain the principles,uses and types of bioassays. Recognize drugs interactions and adverse drug responses. Understand the relationship between pharmacology and other biomedical sciences. Discuss pharmacological mechanisms and their importance in disease treatment.
PHARMACOLOGY - II LAB	PS510		<p>Upon Completion of this course student will able to</p> <ol style="list-style-type: none"> Study of physiological salt solutions, drug solution and use in various animal experiments. Analyze the effect of drug on Concentration Response Curves (CRC) using suitable isolated tissue preparations (Synergism and Antagonism). Using computer models to demonstrate drug effects. Analyze the impact of spasmogens and spamolitics on appropriate tissue preparations. Conduct in vivo research using isolated tissue preparations.
	Course Code	Course Outcome Number	Course Outcome
			<p>Upon Completion of this course student will able to</p> <ol style="list-style-type: none"> Know the basic metabolic pathways and formation of different secondary metabolites through various biosynth



PHARMACOGNOSY AND PHYTOCHEMISTRY - II(Theory)	PS504	2	Understand the utilization of radioactive isotopes in the investigation of biogenetic studies.
		3	Understand the basic techniques like spectroscopy, chromatography and electrophoresis in the isolation, purification and identification of crude drugs.
		4	Learn the isolation, identification and analysis of phytoconstituents. Explain the source, chemistry, therapeutic uses and commercial applications of various secondary metabolites containing drugs.
		5	Discuss the method for industrial production, estimation and utilization of some therapeutically important phytoconstituents.
		Upon Completion of this course student will be able to	
PHARMACOGNOSY AND PHYTOCHEMISTRY II LAB	PS511	1	Analyze the Macroscopy, Microscopic and powder characteristics of crude drugs for detection.
		2	Apply techniques and tests for the isolation, identification of phytoconstituents.
		3	Understand the separation techniques of sugars and herbal extract by paper and thin layer chromatography.
		4	Know the separation and detection techniques of volatile oils.
		5	Distinguish the unorganized crude drugs by various chemical test.
Course	Course Code	Course Outcome Number	Course Outcome
COSMETIC SCIENCE(Open Elective - I) (Theory)	PS508	Upon Completion of this course student will be able to	
		1	Upon completion of the course the student shall be able to know the regulations pertaining to cosmetics and cosmetic excipients.
		2	They will be knowing the preparations of various skin care products like creams, antiperspirants, deodorants, hair care products etc.
		3	They also know about the role of herbs in sunscreens.
		4	Cosmetic products, cosmetic excipients, skin care products and their methods of preparation and evaluations.
B.Pharmacy (III rd Year) II ndsemester (PCI Regulation)			
Course	Course Code	Course Outcome Number	Course Outcome
MEDICINAL CHEMISTRY – III (Theory)	PS601	Upon completion of the course student will be able to	
		1	Generalize the concept and development of anti-biotic.
		2	Describe how current drugs were developed by using pharmacophore modelling and docking technique.
		3	Acquire knowledge in the chemotherapy for cancer. Impart knowledge on microbial diseases.
		4	Demonstrate the concept of viral diseases and its development.
5	To acquire knowledge about the mechanism pathways of different class of medicinal compounds.		
MEDICINAL CHEMISTRY- III LAB	PS609	Upon Completion of this course student will be able to	
		1	Apply various Synthetic, recrystallization techniques and understand reaction mechanisms involved in synthesis of medicinally important organic compound.
		2	Learn the Synthesis of medicinally important organic compounds using microwave assisted organic synthesis.
		3	Acquire Knowledge on assay principles and procedure of medicinally important drugs including antibiotic
		4	Examine and implementation of principle and operating procedure of microwave assisted synthesis in comparison with conventional procedure.
5	Apply knowledge to assess safety, health and consequent responsibilities relevant to this		
Course	Course Code	Course Outcome Number	Course Outcome
PHARMACOLOGY - III (Theory)	PS602	Upon completion of the course student will be able to	
		1	Outline classification, category and pharmacology of drugs acting on respiratory and gastrointestinal systems.
		2	Understand the significance of chemotherapeutic agents.
		3	Explain the importance of drugs used in treatment of Cancer, tuberculosis, leprosy, fungal Diseases, viral diseases, UTI, STD & immunosuppressive agents.
		4	Understand the mechanism of action and treatment of drugs act on infectious diseases.
5	Evaluate the symptoms and treatment of various drug poisoning.		
PHARMACOLOGY - III LAB	PS610	Upon Completion of this course student will be able to	
		1	Calculate animal doses for experiments in pharmacology.
		2	Examine the biochemical investigations.
		3	Record the effect of drugs on isolated preparations by using computerized simulated software.
		4	Define OECD guidelines and ethical principles in acute and chronic oral toxicity study.
5	Understand various Biostatistics methods in experimental pharmacology.		
Course	Course Code	Course Outcome Number	Course Outcome
HERBAL DRUG TECHNOLOGY(Theory)	PS603	Upon completion of the course student will be able to	
		1	Understand raw material as source of herbal drugs from cultivation to herbal drug product
		2	Utilize the plants as nutraceuticals in ailments and also understand herb-food and herb-drug interaction of various plant drugs.
		3	Identify the natural origin drugs as raw materials for preparation forms like phytosomes.
		4	Explain and understand the stability testing of herbal drugs as per WHO and ICH guidelines
5	Evaluation of herbal drugs and patenting of natural products.		
HERBAL DRUG TECHNOLOGY(LAB)	BP609	Upon completion of the course student will be able to	
		1	Evaluate the preliminary qualitative screening of crude drugs and excipients of natural sources.
		2	Determine the alcohol content of ayurvedic preparation and aldehyde content, phenol content of volatile oils.
		3	Know the formulation and evaluation techniques of herbal creams, lotions and shampoos.
		4	Apply the Preparation and standardization process for herbal syrup, mixtures and tablets
5	Analyze the monograph herbal drugs as per Pharmacopoeia.		
Course	Course Code	Course Outcome Number	Course Outcome
BIOPHARMACEUTICS AND PHARMACOKINETICS(Theory)	PS604	Upon completion of the course student will be able to	
		1	Describe the concept of ADME of drug in human body.
		2	Describe the various pharmacokinetic parameters from either plasma concentration or urinary excretion data of the drug.
		3	Apply the various regulations related to developing BA-BE study protocol for the new drug molecule
		4	Summarize the concept of multi compartment models, multiple dose administration and their significance.
5	Identify the various causes of nonlinear pharmacokinetics.		
Course	Course Code	Course Outcome Number	Course Outcome
PHARMACEUTICAL BIOTECHNOLOGY	PS606	Upon Completion of This Course Student will be able to	
		1	Ph. Biotechnology helps in understanding the applications of Immobilized enzymes in pharmaceutical industries
		2	The study of genetic engineering concepts emphasizes the applications of various r DNA products for the future therapeutics.
		3	Monoclonal antibodies by Hybridoma technology gives knowledge on future problems and their solutions in healthcare sector of our society
		4	Fermentation technology mainly illustrates the production of various fermented products in industries and their benefits to the community as well as learning skills of various techniques on fermentation process.
5	The concepts of immunology gives knowledge to the students to aware of various infections or diseases caused by different pathogens. The techniques like PCR, Blottings and ELISA are the modern tools for the usage in pharmacy and medicine		
B.Pharmacy IV th Year Ist Semester (PCI Regulation)			
Course Code	Course Outcome Number	Course Outcome	
		Upon Completion of This Course Student will be able to	
	1	Impart a fundamental knowledge on the principles and instrumentation of spectroscopic and chrc	




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INSTRUMENTAL METHODS OF ANALYSIS (Theory)	PS701	2	Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis.
		3	Describe the general methods for separation and purification of components from a mixture and their application to pharmaceutical industry.
		4	Perform quantitative & qualitative analysis of drugs using various analytical instruments.
		5	Underlines on theoretical and practical knowledge on modern analytical instruments that are used for drug testing.
			Upon completion of the course student will be able to
INSTRUMENTAL METHODS OF ANALYSIS – II LAB	PS709	1	Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis.
		2	Describe the chromatographic separation and analysis of drugs.
		3	Perform quantitative & qualitative analysis of drugs using various analytical instrument.



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Course	Course Code	Course Outcome Number	Course Outcome
INDUSTRIAL PHARMACY - II	PS702		Upon completion of the course student will be able to
		1	Summarize the scale up process in pharmaceutical industry.
		2	Review the technology transfer.
		3	Explain about various laws and acts that regulate pharmaceutical industry
		4	Implement the regulatory environment by upholding good regulatory practices.
		5	Describe the regulations and approval process in pharmaceutical industry.
PHARMACY PRACTICE	PS703		Upon completion of the course student will be able to
		1	Describe the functioning of hospital and community pharmacy. Identify and assess adverse drug reactions.
		2	Establishment of pharmacy and therapeutic committee. To develop the contents of hospital formulary and adapt to drug distribution system in the hospital.
		3	Implementation and practice patient medication history interview and patient counseling in management of diseases.
		4	To establish drug store, manage and implement inventory control techniques.
		5	To identify and interpret clinical laboratory tests of specific disease states. To describe the functions and responsibilities of hospital and clinical pharmacist.
Course	Course Code	Course Outcome Number	Course Outcome
NOVEL DRUG DELIVERY SYSTEMS	PS704		Upon completion of the course student will be able to
		1	List the Various Approaches for Development of Novel Drug Delivery Systems.
		2	Review Different Types of Oral Controlled Drug Delivery System.
		3	Recite Knowledge on Transdermal Drug Delivery Systems.
		4	Evaluate various approaches for the development of targeted drug delivery systems
		5	Describe about Mucoadhesive Delivery Systems and Their Significance. Fundamental Study of Resealed Erythrocytes: A Novel and Promising drug carrier.
Course	Course Code	Course Outcome Number	Course Outcome
PHARMACEUTICAL REGULATORY SCIENCES	PS706		Upon completion of the course student will be able to
		1	Know about the process of drug discovery and development
		2	Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
		3	Know the regulatory approval process and their registration in Indian and international markets
		4	Regulatory requirements for approval of new drugs, drug products in regulated countries like US, EU, Japan, Australia and Canada
		5	In detail on the regulatory requirements,documentation requirements, and registration procedures for marketing the drug products in regulated countries.
Course	Course Code	Course Outcome Number	Course Outcome
PRACTICE SCHOOL	PS710	1	Upon completion of the course student will be able to Institutionalized linkage between university/college and industry. Student's involvement in real life projects continues internal evaluation and monitoring the faculty help by student to understand the practical issues.
B.Pharmacy IV th Year II semester			
Course	Course Code	Course Outcome Number	Course Outcome
BIOSTATISTICS AND RESEARCH METHODOLOGY	PS801		Upon completion of the course student will be able to
		1	To Formulate a research question, hypotheses and related objectives (general and specific).
		2	To Understand and apply statistical methods for the design of biomedical research.
		3	To gain the knowledge and understanding the concept of statistical theories in evaluation of research.
		4	To gain the knowledge how to and interpret results from specialized computer software.
		5	To Know the various statistical techniques to solve statistical problems.To Know the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of Experiment).
SOCIAL AND PREVENTIVE PHARMACY	PS802		Upon completion of the course student will be able to perform
		1	Understand the concept of health and health education.
		2	To create awareness about various preventive measures of stated communicable and non communicable diseases.
		3	Applying the mentioned knowledge of national health program serving the community in the real world.
		4	To describe the several vaccines included in the national immunization program and their schedule.
		5	To illustrate the influence of urbanization and socio-cultural influences on health. To assess the issue with pharmacy and health from a societal perspective.
Course	Course Code	Course Outcome Number	Course Outcome
PHARMACEUTICAL JURISPRUDENCE	PS803		Upon completion of the course student will be able to
		1	The Pharmaceutical legislations and their implications in the development and marketing
		2	Various Indian pharmaceutical Acts and Laws
		3	The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
		4	The code of ethics during the pharmaceutical practice
		5	Impart basic knowledge on several important legislations related to the profession of pharmacy in India.
Course	Course Code	Course Outcome Number	Course Outcome
NANO TECHNOLOGY (Open Elective – III)	PS805		Upon completion of the course student will be able to
		1	Define nano technology and list out sizes of nano materials
		2	Discuss the synthesis of nano materials
		3	Describe the applications of nano technology
		4	Explain the nano materials for drug deliver systems
		5	Write the characterization ,drug release and stability of nano materials




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