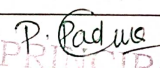


			COURSE OUTCOMES					Ethics	Human values	Gender equality	Environmental sustainability	Devotion/Field visit/Internship
CLASS	COURSE	SLNO	COURSE OUTCOMES									
I SEM B.PHARM	Human Anatomy and Physiology -I	1	Explain the gross morphology, structure and functions of various organs of the human body.									
		2	Describe the various homeostatic mechanisms and their imbalances.									
		3	Identify the various tissues and organs of different systems of human body.									
		4	Perform the various experiments related to special senses and nervous system.									
		5	Appreciate coordinated working pattern of different organs of each system.									
	Pharmaceutical Analysis-I	1	Understand the principles of volumetric and electro chemical analysis.									
		2	Carryout various volumetric and electrochemical titrations.									
		3	Develop analytical skills									
	Pharmaceutics-I	1	Know the history of profession of pharmacy									
		2	Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations									
		3	Understand the professional way of handling the prescription									
	Pharmaceutical Inorganic Chemistry	4	Preparation of various conventional dosage forms.									
		1	Know the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals									
		2	Understand the medicinal and pharmaceutical importance of inorganic compounds									
	Communication Skills	1	Understand the behavioural needs for a Pharmacist to function effectively in the areas of pharmaceutical operation									
		2	Communicate effectively (Verbal and Non-Verbal)									
		3	Effectively manage the team as a team player									
	Remedial Biology	4	Develop interview skills									
		5	Develop Leadership qualities and essentials									
		1	Know the classification and salient features of five kingdoms of life									
	Remedial Mathematics	2	Understand the basic components of anatomy & physiology of plant									
3		Know understand the basic components of anatomy & physiology animal with special reference to human.										
1		Know the theory and their application in Pharmacy										
II SEM B.PHARM	Human Anatomy and Physiology -II	2	Solve the different types of problems by applying theory									
		3	Appreciate the important application of mathematics in Pharmacy									
		1	Explain the gross morphology, structure and functions of various organs of the human body.									
		2	Describe the various homeostatic mechanisms and their imbalances.									
		3	Identify the various tissues and organs of different systems of human body.									
	Pharmaceutical Organic Chemistry -I	4	Perform the haematological tests like blood cell counts, haemoglobin estimation, bleeding/clotting time etc and also record blood pressure, heart rate, pulse and respiratory volume.									
		5	Appreciate coordinated working pattern of different organs of each system									
		6	Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body									
	Biochemistry	1	Write the structure, name and the type of isomerism of the organic compound									
		2	Write the reaction, name the reaction and orientation of reactions									
		3	Account for reactivity/stability of compounds,									
	Pathophysiology	4	Identify/confirm the identification of organic compound.									
		1	Understand the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes.									
		2	Understand the metabolism of nutrient molecules in physiological and pathological conditions.									
		3	Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.									
		1	Describe the etiology and pathogenesis of the selected disease states.									
		2	Name the signs and symptoms of the diseases;									
			3	Mention the complications of the diseases								

  
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	Computer Applications in Pharmacy	1	Know the various types of application of computers in pharmacy						
		2	Know the various types of databases						
	Environmental Sciences	3	Know the various applications of databases in pharmacy						
		1	Create the awareness about environmental problems among learners						
		2	Impart basic knowledge about the environment and its allied problems.						
		3	Develop an attitude of concern for the environment.						
		4	Motivate learner to participate in environment protection and environment improvement						
III SEM B.PHARM	Pharmaceutical Organic Chemistry-II	1	Write the structure, name and the type of isomerism of the organic compound						
		2	Write the reaction, name the reaction and orientation of reactions						
		3	Account for reactivity/stability of compounds.						
		4	Prepare organic compounds						
	Physical Pharmaceutics -I	1	Understand various physicochemical properties of drug molecules in the designing the dosage form						
		2	Know the principles of chemical kinetics & to use them in assigning expiry date for formulation						
		3	Demonstrate use of physicochemical properties in evaluation of dosage forms.						
		4	Appreciate physicochemical properties of drug molecules in formulation research and development						
	Pharmaceutical Microbiology	1	Understand methods of identification, cultivation and preservation of various microorganisms						
		2	Importance of sterilization in microbiology and pharmaceutical industry						
		3	Learn sterility testing of pharmaceutical products						
		4	Microbiological standardization of Pharmaceuticals.						
	Pharmaceutical Engineering	5	Understand the cell culture technology and its applications in pharmaceutical industries						
		1	To know various unit operations used in Pharmaceutical industries						
		2	To understand the material handling techniques						
		3	To perform various processes involved in pharmaceutical manufacturing process						
		4	To carry out various test to prevent environmental pollution.						
		5	To appreciate and comprehend significance of plant lay out design for optimum use of resources.						
		6	To appreciate the various preventive methods used for pest control in Pharmaceutical industries						
IV SEM B.PHARM	Pharmaceutical Organic Chemistry -III	1	Understand the methods of preparation and properties of organic compounds						
		2	Explain the stereo chemical aspects of organic compounds and stereo chemical reactions						
	Medicinal Chemistry-I	3	Know the medicinal uses and other applications of organic compounds						
		1	Understand the chemistry of drugs with respect to their pharmacological activity						
		2	Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs						
		3	Know the Structure Activity Relationship (SAR) of different class of drugs						
		4	Write the chemical synthesis of some drugs						
	Physical Pharmaceutics -II	1	Understand various physicochemical properties of drug molecules in the designing the dosage form						
		2	Know the principles of chemical kinetics & to use them in assigning expiry date for Formulation						
		3	Demonstrate use of physicochemical properties in evaluation of dosage forms.						
		4	Appreciate physicochemical properties of drug molecules in formulation research and development						
	Pharmacology-I	1	Understand the pharmacological actions of different categories of drugs						
		2	Explain the mechanism of drug action at organ system/cell/ cellular/ macromolecular levels.						
		3	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.						
		4	Observe the effect of drugs on animals by simulated experiments						
		5	Appreciate correlation of pharmacology with other bio medical sciences						
	Pharmacognosy and Phytochemistry -I	1	To know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents						
		2	To understand the preparation and development of herbal formulation.						
		3	To understand the herbal drug interactions						
		4	To carryout isolation and identification of phytoconstituents						
	Pharmaceutical Jurisprudence		The Pharmaceutical legislations and their implications in the development and marketing						
		1	2. Various Indian pharmaceutical Acts and Laws						
		2	The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals						
		3	The code of ethics during the pharmaceutical practice						
V SEM B.PHARM	Medicinal Chemistry-III	1	Understand the importance of drug design and different techniques of drug design.						
		2	Understand the chemistry of drugs with respect to their biological activity						
		3	Know the metabolism, adverse effects and therapeutic value of drugs.						
		4	Know the importance of SAR of drugs						
	Pharmacology-III	1	Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases						
		2	Comprehend the principles of toxicology and treatment of various poisonings and						
		3	Appreciate correlation of pharmacology with related medical sciences						
	Herbal Drug Technology	1	Understand raw material at source of herbal drugs from cultivation to herbal drug product						
		2	Know the WHO and ICH guidelines for evaluation of herbal drugs						
		3	Appreciate patenting of herbal drugs, GMP						
	Biopharmaceutics and Pharmacokinetics	1	Understand the basic concepts in biopharmaceutics and pharmacokinetics						

			Use plasma data and derive the pharmacokinetic parameters to describe the process of drug absorption, distribution, metabolism and elimination.						
			Critically evaluate biopharmaceutical studies involving drug product equivalency.						
			Design and evaluate dosage regimens of the drugs using pharmacokinetic and biopharmaceutical parameters.						
			Detect potential clinical pharmacokinetic problems and apply basic pharmacokinetic principles to solve them.						
			Understanding the importance of Immobilized enzymes in Pharmaceutical Industries						
			Genetic engineering applications in relation to production of pharmaceuticals						
			Importance of Monoclonal antibodies in Industries						
			Appreciate the use of microorganisms in fermentation technology						
			Understand the cGMP aspects in a pharmaceutical industry						
			Appreciate the importance of documentation						
			Understand the scope of quality certifications applicable to pharmaceutical industries						
			Understand the responsibilities of QA & QC departments						
B.PHARM VII SEM	Instrumental Methods Of Analysis	1	Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis						
		2	Understand the chromatographic separation and analysis of drugs.						
		3	Perform quantitative & qualitative analysis of drugs using various analytical instruments						1
	Industrial Pharmacy	1	Know the process of pilot plant and scale up of pharmaceutical dosage forms						
		2	Understand the process of technology transfer from lab scale to commercial batch						
		3	Know different laws and acts that regulate pharmaceutical industry in India and US			1			
		4	Understand the approval process and regulatory requirements for drug products			1			
	Pharmacy Practice	1	Know various drug distribution methods in a hospital						
		2	Appreciate the pharmacy stores management and inventory control						
		3	Monitor drug therapy of patient through medication chart review and clinical review			1			1
		4	Obtain medication history interview and counsel the patients						
		5	Identify drug related problems						
		6	Detect and assess adverse drug reactions						1
		7	Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states						
		8	Know pharmaceutical care services						
		9	Do patient counselling in community pharmacy,						
		10	Appreciate the concept of Rational drug therapy						
	Novel Drug Delivery System	1	To understand various approaches for development of novel drug delivery systems.						
		2	To understand the criteria for selection of drugs and polymers for the development of Novel drug delivery systems, their formulation and evaluation						
B.PHARM VIII SEM	Biostatistics and Research Methodology	1	Know the operation of M.S. Excel, SPSS, R and MINITAB ®, DoE (Design of Experiment)			1			
		2	Know the various statistical techniques to solve statistical problems			1			
		3	Appreciate statistical techniques in solving the problems			1			
	Social and Preventive Pharmacy	1	Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide.						
		2	Have a critical way of thinking based on current healthcare development.						
		3	Evaluate alternative ways of solving problems related to health and pharmaceutical issues						
	Pharmaceutical Marketing	1	to provide an understanding of marketing concepts and techniques and the application of the same in the pharmaceutical industry						
	Pharmaceutical Regulatory Science	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						
	Pharmacovigilance	1	The importance of drug safety monitoring						
		2	History and development of pharmacovigilance						
		3	National and international scenario of pharmacovigilance						
		4	Dictionaries, coding and terminologies used in pharmacovigilance						
		5	Detection of new adverse drug reactions and their assessment						
		6	International standards for classification of diseases and drugs						
		7	Adverse drug reaction reporting systems and communication in pharmacovigilance						
		8	Methods to generate safety data during pre-clinical, clinical and post approval phases of drugs 'life cycle						
		9	Drug safety evaluation in paediatrics, geriatrics, pregnancy and lactation						
		10	Pharmacovigilance Program of India (PPI)						
		11	ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning						
		12	CIQM requirements for ADR reporting						
		13	Writing narratives of adverse events and their quality.						
	Quality Control and Standardisation of Herbals	1	WHO guidelines for quality control of herbal drugs						
		2	Quality assurance in herbal drug industry						
		3	The regulatory approval process and their registration in Indian and international markets						
		4	Appreciate EU and ICH guidelines for quality control of herbal drugs						1
	Computer Aided Drug Design	1	Design and discovery of lead molecules						



		2	The role of drug design in drug discovery process							
		3	The concept of QSAR and docking							1
		4	Various strategies to develop new drug like molecules.							1
	<b>Cell and Molecular Biology</b>	1	Summarize cell and molecular biology history.							
		2	Summarize cellular functioning and composition.							
		3	Describe the chemical foundations of cell biology.							
		4	Summarize the DNA properties of cell biology.							
		5	Describe protein structure and function.							
		6	Describe cellular membrane structure and function.							
		7	Describe basic molecular genetic mechanisms.							
		8	Summarize the Cell Cycle							
	<b>Experimental Pharmacology</b>	1	Appreciate the applications of various commonly used laboratory animals.							1
		2	Appreciate and demonstrate the various screening methods used in preclinical research.							1
		3	Appreciate and demonstrate the importance of biostatistics and research methodology.							1
		4	Design and execute a research hypothesis independently.							
	<b>Advanced Instrumentation Techniques</b>	1	Understand the advanced instruments used and its applications in drug analysis.							
		2	Understand the chromatographic separation and analysis of drugs.							
		3	Understand the calibration of various analytical instruments.							
		4	Know analysis of drugs using various analytical instruments.							1

Sl. No.	Course	Unit	Topic	Learning Objectives	Assessment	Internal	External	Practical	Project	Dissertation/Field Visit/Research
I/Pharm D	Human anatomy n physiology	1	Describe the structure (gross and histology) and functions of various organs of the human body							
		2	Describe 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	Perform the hematological tests and also record blood pressure, heart rate, pulse and Respiratory volumes							
		5	Appreciate coordinated working pattern of different organs of each system, and							
		6	Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of the human body							
	Pharmaceutics	1	Know the formulation aspects of different dosage forms.							
		2	Do different pharmaceutical calculation involved in the formulation.							
		3	Formulate different types of dosage forms; and							
		4	Appreciate the importance of good formulation for effectiveness.							
		1	Understand the catalytic activity of enzymes and importance of isoenzymes in diagnosis of diseases.							
	Medicinal biochemistry	2	Know the metabolic process of biomolecules in health and illness (metabolic disorders);							
		3	Understand the genetic organization of mammalian genome; protein synthesis, replication, mutation and repair mechanism;							
		4	Know the biochemical principles of organ function tests of kidney, liver and endocrine gland; and							
		5	Do the qualitative analysis and determination of biomolecules in the body fluids.							
	Pharmaceutical organic chemistry	1	IUPAC/ Common system of nomenclature of simple organic compounds belonging to different classes of organic compounds;							
		2	Some important physical properties of organic compounds;							
		3	Free radical/ nucleophilic [alkyl/ acyl/ aryl] / electrophilic substitution, free radical/ nucleophilic / electrophilic addition, elimination, oxidation and reduction reactions with mechanism, orientation of the reaction, order of reactivity, stability of compounds;							
		4	Some named organic reactions with mechanisms; and							
		5	Methods of preparation, test for purity, principle involved in the assay, important medicinal uses of some important organic compounds							
	Pharmaceutical inorganic chemistry	1	Understand the principles and procedures for analysis of drugs and also regarding the application of inorganic pharmaceuticals;							
		2	Know the analysis of the inorganic pharmaceuticals their applications; and							
		3	Appreciate the importance of inorganic pharmaceuticals in preventing and curing the disease.							
	Remedial mathematics/ Biology	1	Know Trigonometry, Analytical geometry, Matrices, Determinant, Integration, Differential equation, Laplace transform and their applications;			1				
		2	Solve the problems of different types by applying theory; and							
		3	Appreciate the important applications of mathematics in pharmacy.							
I/Pharm D	Pathophysiology	1	Describe the etiology and pathogenesis of the selected disease states.							
		2	Name the signs and symptoms of the diseases; and							
		3	Mention the complications of the diseases.							
	Pharmaceutical microbiology	1	Know the anatomy, identification, growth factors and sterilization of microorganisms;							
		2	Know the mode of transmission of disease causing microorganism, symptoms of disease, and treatment aspect;							
		3	Do estimation of RNA and DNA and thereby identifying the source;							
		4	Do cultivation and identification of the microorganisms in the laboratory;							
		5	Do identification of diseases by performing the diagnostic tests; and							
		6	Appreciate the behavior of motility and behavioral characteristics of microorganisms							
	Pharmacognosy and phytopharmaceuticals	1	Understand the pharmacological aspects of drugs falling under the above mentioned chapters;							
		2	Handle and carry out the animal experiments;							
		3	Appreciate the importance of pharmacology subject as a basis of therapeutics; and							
		4	Correlate and apply the knowledge therapeutically.							
		1	Know pharmaceutical care services.							
	Community Pharmacy	2	Know the business and professional practice management skills in community pharmacies;							
		3	Do patient counselling & provide health screening services to public in community pharmacy;							
		4	Respond to minor ailments and provide appropriate medication;							
		5	Show empathy and sympathy to patients; and							
		6	Appreciate the concept of Rational drug therapy.							
		1	The pathophysiology of selected disease states and the rationale for drug therapy;							
		2	The therapeutic approach to management of these diseases,							
	Pharmotherapeutics I	3	The controversies in drug therapy;							

		4	The importance of preparation of individualised therapeutic plans based on diagnosis;						
		5	Needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).						
		6	Describe the pathophysiology of selected disease states and explain the rationale for drug therapy;						
		7	Summarise the therapeutic approach to management of these diseases, including reference to the latest available evidence;						
		8	Discuss the controversies in drug therapy;						
		9	Discuss the preparation of individualised therapeutic plans based on diagnosis; and						
		10	Identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects)						
	Pharmacology II	1	Understand the pharmacological aspects of drugs falling under the above mentioned chapters,						
		2	Carry out the animal experiments confidently,						
		3	Appreciate the importance of pharmacology subject as a basis of therapeutics, and						
		4	Correlate and apply the knowledge therapeutically						
	III PD	1	Understand the principles of volumetric and electrochemical analysis						
	Pharmaceutical analysis	2	Carry out various volumetric and electrochemical titrations						
		3	Develop analytical skills						
		4	Understand the chromatographic separation and analysis of drugs						
		5	Perform quantitative & qualitative analysis of drugs using various analytical instruments						
		1	Know the pathophysiology of selected disease states and the rationale for drug therapy						
	Pharmacotherapeutics II	2	Know the therapeutic approach to management of these diseases.						
		3	Know the controversies in drug therapy;						
		4	Know the importance of preparation of individualised therapeutic plans based on diagnosis; and						
		5	Appreciate the needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects)						
		1	1. Practice the Professional ethics;						
		2	2. Understand the various concepts of the pharmaceutical legislation in India;						
	Pharmaceutical Jurisprudence	3	3. Know the various parameters in the Drug and Cosmetic Act and rules;						
		4	4. Know the Drug policy, DPCO, Patent and design act;						
		5	5. Understand the labeling requirements and package guidelines for drugs and cosmetics;						
		6	6. Be able to understand the concepts of the Dangerous Drugs Act, Pharmacy Act and License duties Act; and						
		7	7. Other laws as prescribed by the Pharmacy Council of India from time to time including International Laws						
		1	Understand the chemistry of drugs with respect to their pharmacological activity						
	Medicinal chemistry	2	Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs						
		3	Know the Structural Activity Relationship of different class of drugs						
		4	Study the chemical synthesis of selected drugs						
		1	Understand the principles involved in formulations of various pharmaceutical dosage forms.						
	Pharmaceutical formulations	2	Prepare various pharmaceutical formulations;						
		3	Perform evaluation of pharmaceutical dosage forms; and						
		4	Understand and appreciate the concept of bioavailability and bioequivalence, their role in clinical situations.						
		1	The pathophysiology of selected disease states and the rationale for drug therapy;						
	IV PD	2	The therapeutic approach to management of these diseases;						
	Pharmacotherapeutics III	3	The controversies in drug therapy;						
		4	The importance of preparation of individualised therapeutic plans based on diagnosis;						
		5	Needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).						
		6	Describe the pathophysiology of selected disease states and explain the rationale for drug therapy;						
		7	To summarize the therapeutic approach to management of these diseases including reference to the latest available evidence;						
		8	To discuss the controversies in drug therapy;						
		9	To discuss the preparation of individualised therapeutic plans based on diagnosis; and						
		10	Identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects)						
	Hospital Pharmacy	1	Know various drug distribution methods;						
		2	Know the professional practice management skills in hospital pharmacies;						
		3	Provide unbiased drug information to the doctors;						
		4	Know the manufacturing practices of various formulations in hospital set up;						
		5	Appreciate the practice based research methods; and						
		6	Appreciate the stores management and inventory control.						
	Clinical Pharmacy	1	monitor drug therapy of patient through medication chart review and clinical review;						
		2	obtain medical, an history interview and counsel the patients;						
		3	identify and resolve drug related problems;						
		4	Detect, assess and monitor adverse drug reaction;						
		5	interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states; and						
		6	retrieve, analyse, interpret and formulate drug or medicine information.						



	Cellular and Molecular Biology	3	Describe the various newer screening methods involved in the drug discovery process							1
		4	Appreciate and correlate the preclinical data to humans							
		1	Explain the receptor signal transduction processes							
		2	Explain the molecular pathways affected by drugs							
		3	Appreciate the applicability of molecular pharmacology and biomarkers in drug discovery process.							
		4	Demonstrate molecular biology techniques as applicable for pharmacology.							
	Advanced Pharmacology-II	1	Explain the mechanism of drug actions at cellular and molecular level							
		2	Discuss the Pathophysiology and pharmacotherapy of certain diseases							
		3	Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases							
M.PHARM II SEM (Pharmaceutical Chemistry)	Toxicological Screening	1	Explain the various types of toxicity studies							
		2	Appreciate the importance of ethical and regulatory requirements for toxicity studies.							
		3	Demonstrate the practical skills required to conduct the preclinical toxicity studies.			1				
	Principles of Drug Discovery	1	Explain the various stages of drug discovery.							1
		2	Appreciate the importance of the role of genomics, proteomics and bioinformatics in drug discovery							
		3	Explain various targets for drug discovery.							
		4	Explain various lead seeking method and lead optimization							
	Clinical Research and Pharmacovigilance	1	Explain the regulatory requirements for conducting clinical trial							
		2	Demonstrate the types of clinical trial designs							
		3	Explain the responsibilities of key players involved in clinical trials							
		4	Execute safety monitoring, reporting and close-out activities							
		5	Explain the principles of Pharmacovigilance			1				
		6	Detect new adverse drug reactions and their assessment							
		7	Perform the adverse drug reaction reporting systems and communication in Pharmacovigilance							
M.PHARM I SEM (PHARMACOLOGY)	Modern Pharmaceutical Analytical Techniques	1	The analysis of various drugs in single and combination dosage forms							1
		2	Theoretical and practical skills of the instrument							
	Advanced Pharmacognosy-I	1	Know the advances in production and cultivation of drugs							
		2	Know the various phyto- pharmaceuticals and their source, medical use and utilisation							
		2	Know the various nutraceuticals/ herbs and their health benefits							1
	Phytochemistry	1	Know the various phytoconstituents and their properties & general process of natural product drug discovery							1
		2	Know the process of identification, purification and isolation of phytoconstituents							
	Industrial Pharmacognostical technology	1	Know the requirements for the setting up of herbal/natural drug industry							
		2	To know and understand the guidelines for quality or herbal medicines			1				
		3	To know the patenting /IPR of herbs and trade of raw and finished materials			1				
	Medicinal plant biotechnology	1	Know the process like genetic engineering in medicinal plants for higher yield of Phytopharmaceuticals							1
		2	Use the biotechnological techniques for obtaining and improving the quality of natural products/medicinal plants							
M.PHARM I SEM (PHARMACOLOGY)	Advanced Pharmacognosy -II	1	Know the validation of herbal remedies							
		2	Know the methods of detection of adulteration and evaluation techniques for the herbal drugs							
		3	To know the methods of screening of herbs for various biological properties							
	Indian systems of Medicine	1	To understand the basic principles of various Indian systems of medicine			1			1	1
		2	To know the clinical research of traditional medicines, Current Good Manufacturing Practice of Indian systems of medicine and formulation							
	Herbal Medicines	1	Understand the basic principles of various herbal/natural cosmetic preparations			1				
		2	Current Good Manufacturing Practices of herbal/natural cosmetics as per the regulatory authorities							
SEMESTER-III AND IV RESEARCH WORK		1	The research methodology.			1				
	M.Pharm III SEM and IV SEM	2	The biostatistical methods.							
		3	To write the review and research articles							

CLASS	COURSE	SLNO	COURSE OUTCOMES	Ethics	Human values	Gender equality	Environmental sustainability	Dissertation/Field visit/Internship
M.PHARM I SEM (PHARMACEUTICS)	Modern Pharmaceutical Analytical Techniques Drug Delivery System Modern pharmaceuticals Regulatory Affairs	1	The analysis of various drugs in single and combination dosage forms					
		2	Theoretical and practical skills of the instrument					
		1	The various approaches for development of novel drug delivery systems.					
		2	The criteria for selection of drugs and polymers for the development of the formulation and evaluation of Novel drug delivery systems.					
		1	To understand the Active Pharmaceutical Ingredients and Generic drug Product development					
		2	To learn Industrial Management and GMP Considerations.					
		3	To understand Optimization Techniques & Pilot Plant Scale Up Techniques					
		4	To study Stability Testing, sterilization process & packaging of dosage forms					
		1	The Concepts of innovator and generic drugs, drug development process					
		2	The Regulatory guidance's and guidelines for filing and approval process					
		3	Preparation of Dossiers and their submission to regulatory agencies in different countries			1		
		4	Post approval regulatory requirements for actives and drug products					
M.PHARM II SEM (PHARMACEUTICS)	Modern Pharmaceutics (NTDS) Advanced Biopharmaceutics and Pharmacokinetics Computer Aided Drug Design Cosmetics and Cosmeceuticals	1	The various approaches for development of novel drug delivery systems.					
		2	The criteria for selection of drugs and polymers for the development of NTDS					
		3	The formulation and evaluation of novel drug delivery systems					
		1	The basic concepts in biopharmaceutics and pharmacokinetics.					
		2	The use raw data and derive the pharmacokinetic models and parameters the best describe the process of drug absorption, distribution, metabolism and elimination					
		3	The critical evaluation of biopharmaceutic studies involving drug product equivalency. □ The design and evaluate dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.					
		4	The potential clinical pharmacokinetic problems and apply basic pharmacokinetic					
		5	The principles to solve them					
		1	History of Computers in Pharmaceutical Research and Development					
		2	Computational Modelling of Drug Disposition					
		3	Computers in Preclinical Development					
		4	Optimization Techniques in Pharmaceutical Formulation					
5	Computers in Market Analysis							
6	Computers in Clinical Development				1			
7	Artificial Intelligence (AI) and Robotics				1			
8	Computational fluid dynamics (CFD)							
1	The key ingredients used in cosmetics and cosmeceuticals.							
2	The key building blocks for various formulations.				1			
3	The current technologies in the market							
4	The various key ingredients and basic science to develop cosmetics and cosmeceuticals							
M.PHARM I SEM (Pharmaceutical Chemistry)	Modern Pharmaceutical Analytical Techniques Advanced Pharmacology -I Pharmacological and Toxicological Screening Method Cellular and Molecular Biology	1	The analysis of various drugs in single and combination dosage forms					
		2	Theoretical and practical skills of the instrument					
		1	Discuss the pathophysiology and pharmacotherapy of certain diseases					
		2	Explain the mechanism of drug actions at cellular and molecular level					
		3	Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases					
		1	Appraise the regulations and ethical requirement for the usage of experimental animals.					
		2	Describe the various animals used in the drug discovery process and good laboratory practices in maintenance and handling of experimental animals					
		3	Describe the various newer screening methods involved in the drug discovery process					
		4	Appreciate and correlate the preclinical data to humans					
		1	Explain the receptor signal transduction processes.					

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