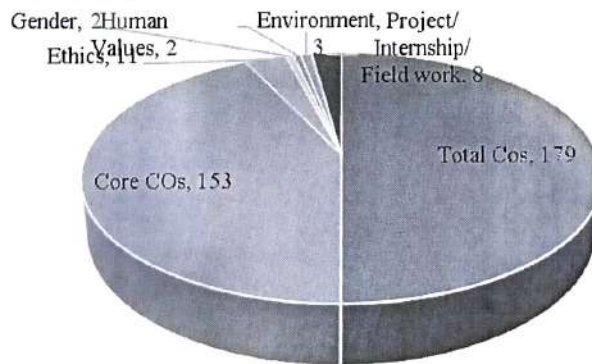




DEPARTMENTAL WISE - COURSE OUTCOME'S (COS) WITH CROSS CUTTING ISSUES

ACADEMIC YEAR - 2022-2023

Department	Total Cos	Core COs	Ethics	Gender	Human Values	Environment	Project/ Internship/ Field work
B. Pharm	179	153	11	2	2	3	8
M. Pharm	84	70	4	0	1	1	8
Pharm D	106	96	7	0	0	0	3
TOTAL	369	319	22	2	3	4	19



B. Pharm

T. Padma

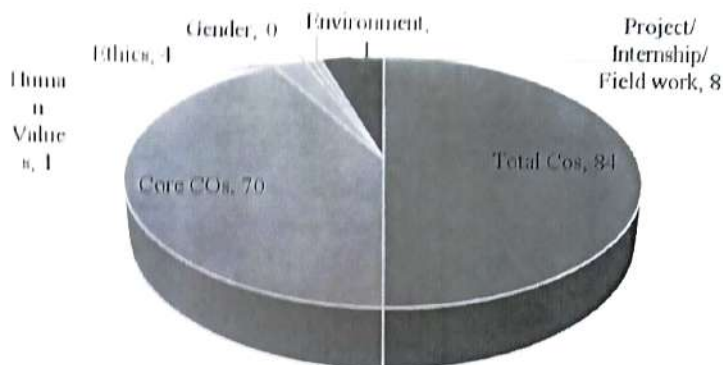




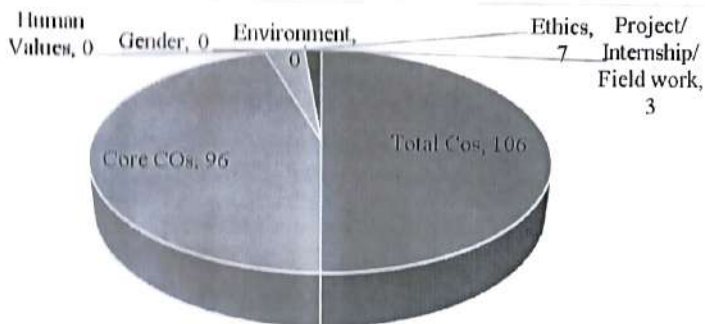
Children's Education Society (Regd.)
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(Recognised by the Govt. of Karnataka, Affiliated to Rajiv Gandhi University of Health Sciences, Karnataka;
 Approved by Pharmacy Council of India, New Delhi)

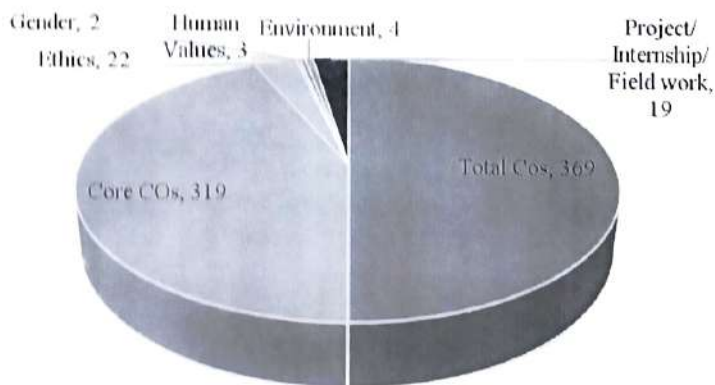
Accredited by NAAC and International Accreditation Organization (IAO)



M.Pharm



Pharm D



Total

Dean Academic

Principal

P. Padma



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CLASS	COURSE	Column8	COURSE OUTCOME	Ethics	Human values	Gender equality	Environmental sustainability	Dissertation/Field visit/Internship
I Pharm D	Human Anatomy and 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.					

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	Medicinal biochemistry	1	Understand the catalytic activity of enzymes and importance of isoenzymes in diagnosis of diseases;					
		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					
		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						
		2	Solve the problems of different types by applying theory; and						
		3	Appreciate the important applications of mathematics in pharmacy.						
IIPharm 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				
Community Pharmacy	1	Know pharmaceutical care services.				
	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				
Pharmacotherapeutics I	1	The pathophysiology of selected disease states and the rationale for drug therapy.				
	2	The therapeutic approach to management of these diseases.				
	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					
		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					
	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	Pharmaceutical Analysis	1	Understand the principles of volumetric and electrochemical 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.					
	Pharamcotherapeutics II	1	Know the pathophysiology of selected disease states and the rationale for drug therapy					
		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					
	Pharamceutical Jurisprudence	1	Practice the Professional ethics	1				
		2	Understand the various concepts of the pharmaceutical legislation in India;	1				
		3	Know the various parameters in the Drug and Cosmetic Act and rules;	1				
		4	Know the Drug policy, DPCO, Patent and design act;	1				
		5	Understand the labeling requirements and packaging guidelines for drugs and cosmetics;	1				
		6	Be able to understand the concepts of the Dangerous Drugs Act, Pharmacy Act and Excise duties Act; and	1				


		7	Other laws as prescribed by the Pharmacy Council of India from time to time including International Law.	1				
	Medicinal Chemistry	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 Structural Activity Relationship of different class of drugs					
		4	Study the chemical synthesis of selected drugs.					
	Pharmaceutical Formulations	1	Understand the principle involved in formulations of various pharmaceutical dosage forms;					
		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.					
IV PD	Pharmacotherapeutics III	1	The pathophysiology of selected disease states and the rationale for drug therapy;					
		2	The therapeutic approach to management of these diseases;					
		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						
		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-						
	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 medication history interview and counsel the patients;						
		3	Identify and resolve drug related problems;						1
		4	Detect, assess and monitor adverse drug reaction;						1
		5	interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states; and						1
		6	Retrieve, analyse, interpret and formulate drug or medicine information.						

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CLASS	COURSE	SL NO	COURSE OUTCOMES	Ethics	Human values	Gender equality	Environmental sustainability	Dessertation/Field visit/Internship		
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.							
	Pharmaceuti cal Analysis-I	1	Understand the principles of volumetric and electro chemical analysis.							
		2	Carryout various volumetric and electrochemical titrations.							


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		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							
		4	Preparation of various conventional dosage forms.							
	Pharmaceutical Inorganic Chemistry	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			1				
		2	Communicate effectively (Verbal and Non-Verbal)	1	1	1				
		3	Effectively manage the team as a team player							1

		4	Develop interview skills								
		5	Develop Leadership qualities and essentials								
	Remedial Biology	1	Know the classification and salient features of five kingdoms of life								
		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.								
	Remedial Mathematics	1	Know the theory and their application in Pharmacy								
		2	Solve the different types of problems by applying theory								
		3	Appreciate the important application of mathematics in Pharmacy								
II SEM B.PHARM	Human Anatomy and Physiology - II	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 haematological tests like blood cell counts, haemoglobin estimation, bleeding/clotting time etc and also record blood pressure, heart rate.								
		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								
	Pharmaceutical Organic Chemistry -I	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	Identify/confirm the identification of organic compound.								
	Biochemistry	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.						
	Pathophysiology	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						
	Computer Applications in Pharmacy	1	Know the various types of application of computers in pharmacy						
		2	Know the various types of databases						
		3	Know the various applications of databases in pharmacy						
	Environmental Sciences	1	Create the awareness about environmental problems among learners.						
		2	Impart basic knowledge about the environment and its allied problems.				1		
		3	Develop an attitude of concern for the environment.					1	

		4	Motivate learner to participate in environment protection and environment improvement																
III SEM B.PHARM	Pharmaceuti cal 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 Pharmaceuti cs -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																
	Pharmaceuti cal Microbiolog y	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.							
		5	Understand the cell culture technology and its applications in pharmaceutical industries.							
	Pharmaceutical Engineering	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 corrosion control in Pharmaceutical industries							

IV SEM B.PHARM	Pharmaceuti cal 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							
		3	Know the medicinal uses and other applications of organic compounds							
	Medicinal Chemistry-I	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 Structural Activity Relationship (SAR) of different class of drugs							
		4	Write the chemical synthesis of some drugs							
	Physical Pharmaceuti cs -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/sub 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	1	The Pharmaceutical legislations and their implications in the development and marketing 2. Various Indian pharmaceutical Acts and Laws	1									
		2	The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals	1									
		3	The code of ethics during the pharmaceutical practice	1									
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 as source of herbal drugs from cultivation to herbal drug product 2. know the WHO and ICH guidelines for evaluation of herbal drugs								
	2	Know the herbal cosmetics, natural sweeteners, nutraceuticals								
	3	Appreciate patenting of herbal drugs, GMP								
Biopharmaceutics and Pharmacokinetics	1	Understand the basic concepts in biopharmaceutics and pharmacokinetics.								
	2	Use plasma data and derive the pharmacokinetic parameters to describe the process of drug absorption, distribution, metabolism and elimination.								
	3	Critically evaluate biopharmaceutic studies involving drug product equivalency								
	4	Design and evaluate dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.								
	5	Detect potential clinical pharmacokinetic problems and apply basic pharmacokinetic principles to solve them								
Pharmaceutical Biotechnology	1	Understanding the importance of Immobilized enzymes in Pharmaceutical Industries								
	2	Genetic engineering applications in relation to production of pharmaceuticals								

		3	Importance of Monoclonal antibodies in Industries							
		4	Appreciate the use of microorganisms in fermentation technology							
	Pharmaceutical Quality Assurance	1	Understand the cGMP aspects in a pharmaceutical industry							
		2	Appreciate the importance of documentation							
		3	Understand the scope of quality certifications applicable to pharmaceutical industries							
		4	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							
	Industrial Pharmacy	1	Know the process of pilot plant and scale up of pharmaceutical dosage forms						1	

		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						
		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)							
		2	Know the various statistical techniques to solve statistical problems							
		3	Appreciate statistical techniques in solving the problems							
	Social and Preventive Pharmacy	1	Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide.							1
		2	Have a critical way of thinking based on current healthcare development.							1

		3	Evaluate alternative ways of solving problems related to health and pharmaceutical issues	1									
	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 (PVPI)							
		11	ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning							
		12	. CIOMS requirements for ADR reporting							
		13	Writing case 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							
	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	
	Cell and Molecular Biology	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						
	Experimenta l Pharmacology	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						
	Advanced Instrumentat ion Techniques	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		

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CLASS	COURSE	SL NO	COURSE OUTCOMES	Ethics	Human values	Gender equality	Environmental sustainability	Dessertation/Field visit/Internship
M.PHARM I SEM (PHARMA CEUTICS)	Modern Pharmaceutica l Analytical Techniques	1	The analysis of various drugs in single and combination dosage forms					
		2	Theoretical and practical skills of the instrument					
	Drug Delivery System	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					
	Modern pharmaceutics	1	To understand the Active Pharmaceutical Ingredients and Generic drug Product development					
		2	To learn Industrial Management and GMP Considerations.					

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		3	To understand Optimization Techniques & Pilot Plant Scale Up Techniques						
		4	To study Stability Testing, sterilization process & packaging of dosage forms						1
	Regulatory Affairs	1	The Concepts of innovator and generic drugs, drug development process						
		2	The Regulatory guidance's and guidelines for filing and approval process					1	
		3	Preparation of Dossiers and their submission to regulatory agencies in different countries						
		4	Post approval regulatory requirements for actives and drug products						
M.PHARM II SEM (PHARMACEUTICS)	Modern Pharmaceutics (NTDS)	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						
	Advanced Biopharmaceutics and Pharmacokinetics	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						
		3	The critical evaluation of biopharmaceutic studies involving drug product equivalency. The design and						1
		4	The potential clinical pharmacokinetic problems and apply basic pharmacokinetic						
		5	The principles to solve them						
	Computer Aided Drug Design	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						

		7	Artificial Intelligence (AI) and Robotics							
		8	Computational fluid dynamics (CFD)							
	Cosmetics and Cosmeceuticals	1	The key ingredients used in cosmetics and cosmeceuticals.							
		2	The key building blocks for various formulations.							
		3	The current technologies in the market							
		4	The various key ingredients and basic science to develop cosmetics and cosmeceuticals							
M.PHARM I SEM (PHARMACOLOGY)	Modern Pharmaceutics I Analytical Techniques	1	The analysis of various drugs in single and combination dosage forms							1
		2	Theoretical and practical skills of the instrument							
	Advanced Pharmacology - I	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						
	Pharmacological and Toxicological Screening	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						
		3	Describe the various newer screening methods involved in the drug discovery process						1
		4	Appreciate and correlate the preclinical data to humans						
	Cellular and Molecular Biology	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 (PHARMA COLOGY)	Toxicological Screening	1	Explain the various types of toxicity studies.					
		2	Appreciate the importance of ethical and regulatory requirements for toxicity studies.	1				
		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.					
		2	Appreciate the importance of the role of genomics, proteomics and bioinformatics in drug					
		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					
M.PHARM I SEM (PHARMA COGNOSY		7	Perform the adverse drug reaction reporting systems and communication in Pharmacovigilance					
	Modern Pharmaceutica I 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					

		3	Know the various nutraceuticals/ herbs and their health benefits						
	Phytochemistry	1	Know the various phytoconstituents and their properties & general process of natural product drug						1
		2	TO 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						
		3	To know the patenting /IPR of herbals and trade of raw and finished materials						
	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						
M.PHARM II SEM (PHARMA COGNOSY	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 herbals for various biological properties							1
	Indian systems of Medicine	1	To understand the basic principles of various Indian systems of medicine							
		2	To know the clinical research of traditional medicines, Current Good Manufacturing Practice of Indian systems of							
	Herbal Cosmetics	1	Understand the basic principles of various herbal/natural cosmetic preparations							
		2	Current Good Manufacturing Practices of herbal/natural cosmetics as per the regulatory authorities						1	
SEMESTE R-III AND IV RESEARC		1	The research methodology.							
	M.Pharm III SEM and IV SEM	2	The biostatistical methods.							
		3	To write the review and research articles							


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