

M.Pharmacy 1st Year 1st Semester (Pharmaceutical chemistry): University Regulation R22

S.NO	Course	Course outcomes
1	ADVANCED ORGANIC CHEMISTRY - I (Professional Core - I)	CO1: - The student would be able to design of new chemical entities (NCE) for the treatment of different diseases in new drug discovery Program. CO2: - The student would be in position to a stereoselective synthesis of new chemical entities (NCE) for the treatment of different diseases in new drug discovery Program.
2	ADVANCED MEDICINAL CHEMISTRY - I	CO1: - The student would be able to have detailed knowledge of computer aided drug design CO2: - The student would be able to which is useful to involve in new drug discovery Program by the utilization of natural leads and also with the help of structure-based drug design.
3	CHEMISTRY OF NATURAL PRODUCTS	CO1: - The student would be able to explore the natural lead compounds for the treatment of different diseases like cancer, malaria, diabetes etc. CO2: - The student would be able to synthesis the natural lead compounds for the treatment of different diseases like cancer, malaria, diabetes etc.



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4	MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES	CO1: - The student would be able to apply the theories in the Analysis of various bulk drugs and their formulations. CO2: - The students will also be in a position to apply their knowledge in developing the new methods for the determination and validate the procedures
5	DRUG REGULATORY AFFAIRS	CO1: - Students will be able know the different competent regulatory authorities globally. CO2: - Students be able to know technical aspects pertaining to the marketing authorization application (MAA) CO3: - Students be able to Know regulatory guidelines and directions framed by the regulatory authorities will be helpful to place the drug products in market for marketing approvals
6	DRUG DISCOVERY AND DESIGN	CO1: - The students will be able to know to get a broad idea on the drug discovery mechanisms. CO1: - The students will be able to know broad idea on the drug discovery mechanisms, its related terms and concepts of designing of drugs
7	PHARMACEUTICAL FOOD ANALYSIS	CO1: student will be able to understand various analytical techniques in the determination of ☐ Food constituents ☐ Food additives



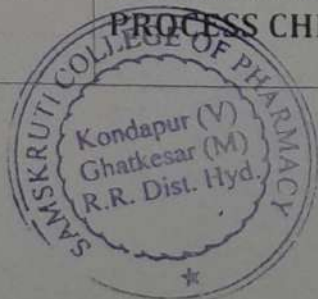
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		<ul style="list-style-type: none"> ☐ Finished food products regulations and legislations CO2: - student will be able to understand various analytical techniques in the ☐ Pesticides in food ☐ Pharmaceuticals (API & Dosage forms) ☐ And also student shall have the knowledge on food regulations and legislations
8	SPECTRAL ANALYSIS	<p>CO1: the students will be able To know spectral aspects of X-Ray, IR, SEM, ORD etc which help them in further projects works and also industrial opportunities</p>
9	RESEARCH METHODOLOGY AND IPR	<p>CO1: - students will be able to Understand research problem formulation. Analyze research related information, Follow research ethics</p> <p>CO2: - students will be able to Understand that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in</p> <p>CO3:- students will be able to Understand that IPR protection provides an incentive to inventors for further research work</p>



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		and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.
10	ADVANCED ORGANIC CHEMISTRY - I LAB (The student would be able to design of new chemical entities (NCE) for the treatment of different diseases in new drug discovery Program.
11	ADVANCED MEDICINAL CHEMISTRY - I LAB	The student would be able to which is useful to involve in new drug discovery Program by the utilization of natural leads and also with the help of structure-based drug design.
12	ADVANCED ORGANIC CHEMISTRY-II	CO1: The student would be in a position to have advanced knowledge of different Synthetic reagents and reaction processes, synthetic routes by involving green chemistry principles. CO2: - The student would be able to know techniques to utilize the chemical library of combinatorial chemistry
13	ADVANCED MEDICINAL CHEMISTRY - II	CO1: - The student would be in a position to involve in the development of different enzyme inhibitors, prodrugs and also equipped with different biotechnological techniques of Recombinant DNA products.
14	PHARMACEUTICAL PROCESS CHEMISTRY	CO1: - students will be able to understand the strategies of scale up process of apes and



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		intermediates CO2: - students will be able to know various unit operations and various reactions in process chemistry.
15	QUALITY CONTROL AND QUALITY ASSURANCE	CO1: - student should be able to Understand the cGMP aspects in a pharmaceutical industry CO2: - student should be able to appreciate the importance of documentation CO3: - student should be able to understand the responsibilities of QA & QC departments.
16	CLINICAL RESEARCH AND PHARMACOVIGILANCE	CO1: - student shall be able to explain the regulatory requirements for conducting clinical trial Demonstrate the types of clinical trial designs CO2: student shall be able to Execute safety monitoring, reporting and close-out activities. Explain the principles of Pharmacovigilance Detect new adverse drug reactions and their assessment Perform the adverse drug reaction reporting systems and communication in pharmacovigilance
17	SCREENING METHODS IN PHARMACOLOGY	CO1: - student will be able to know how to handle animals and know about various techniques for screening of drugs for different pharmacological activities, guidelines and regulations for screening new drug molecules on animals.



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18	ADVANCED INSTRUMENTAL ANALYSIS	CO1: - By the completion of topics, the students will come out with the thorough knowledge of various spectral aspects of X-Ray, IR, SEM, ORD etc
19	HERBAL DRUG TECHNOLOGY	CO1: - student will be able to the understand the organization and research of natural products in herbal drugs industries
20	ADVANCED ORGANIC CHEMISTRY - II LAB	CO1: The student would be in a position to have advanced knowledge of different Synthetic reagents and reaction processes, synthetic routes by involving green chemistry principles.
21	ADVANCED MEDICINAL CHEMISTRY - II LAB	CO1: - The student would be in a position to involve in the development of different enzyme inhibitors, prodrugs and also equipped with different biotechnological techniques of Recombinant DNA products.
22	BIostatISTICS	CO1: - The student will be known the Biostatistics arrangement, presentation and Formation of tables and charts. They also know the correlation and regression & application of different methods, analysis of data
23	PHARMACEUTICAL PRODUCTION AND PACKAGING TECHNOLOGY	CO1: - student will be able to know about Industrial area design and packaging of different formulations and its stability



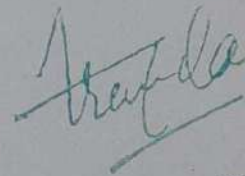
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		conditions.
24	SCALE UP AND TECHNOLOGY TRANSFER	<p>Manage the scale up process in pharmaceutical industry.</p> <ul style="list-style-type: none"> ☐ Assist in technology transfer. ☐ To establish safety guidelines, which prevent industrial hazards
25	ENGLISH FOR RESEARCH PAPER WRITING	<p>CO1: - Students will be able to: Understand that how to improve your writing skills and level of readability</p> <p>CO2: - Students will be able to Learn about what to write in each section</p> <p>CO3: - Students will be able to Understand the skills needed when writing a Title Ensure the good quality of paper at very first-time submission</p>
26	PEDAGOGY STUDIES	<p>CO1: - Students will be able to understand: What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?</p> <p>CO2: - Students will be able to What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?</p>
27	STRESS MANAGEMENT BY YOGA	<p>CO1: - Students will be able to Develop healthy mind in a healthy body thus improving social health also Improve efficiency</p>



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28	PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS	CO1: - Students will be able to Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life CO2: - Students will be able to the person who has studied Geeta will lead the nation and mankind to peace and prosperity
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M.PHARMACY

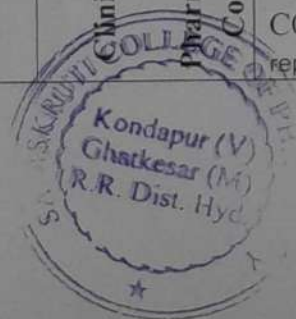
COURSE OUTCOMES

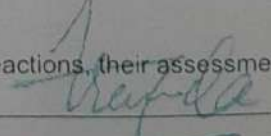


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Pharmacy 1st Year 1st Semester (Pharmacy Practice): University Regulation –R22

S.No	Course	Course Outcomes MPharm (HCP) I Year /I Sem
Pharmacotherapeutics-I		
1	Pharmacotherapeutics-I Core Course I	<p>CO1: Students will be able to describe and explain the rationale of drug therapy.</p> <p>CO2: Students will be able to summarize the therapeutic approach for management of various disease conditions including reference to the latest available evidence.</p> <p>CO3: Students will be able to find the clinical controversies in drug therapy and evidence based medicine</p> <p>CO4: Students will learn to prepare individualized therapeutic plans based on diagnosis and identify the patient specific parameters relevant in initiating drug therapy, and monitoring therapy.</p>
Clinical Pharmacy Practice		
2.	Clinical Pharmacy Practice Core Course II	<p>CO1: Students will understand the elements of pharmaceutical care and provide comprehensive patient care services.</p> <p>CO2: Students will be able to interpret the laboratory results to aid the clinical diagnosis of various diseases.</p> <p>CO3: Students will be able to provide integrated, critically analyzed medicine and poison information.</p> <p>CO4: Students will be able to manage healthcare professionals in the efficient patient management.</p>
Hospital & Community Pharmacy		
3.	Hospital & Community Pharmacy Core Course III	<p>CO1: Students will understand drug policy and drug committees.</p> <p>CO2: Students will be able to handle about procurement & drug distribution practices.</p> <p>CO3: Students will be able to understand the community pharmacy management</p> <p>CO4: Students will be able to know about value added services in community pharmacies.</p>
Clinical Research and Pharmacovigilance		
4.	Clinical Research and Pharmacovigilance Core Elective I	<p>CO1: Student will be able to know good clinical practices for conducting clinical trial.</p> <p>CO2: Student will be able to understand the clinical trial designs and the responsibilities of key players involved in clinical trials.</p> <p>CO3: Student will be knowing principles of Pharmacovigilance and execute safety monitoring, reporting and close-out activities</p> <p>CO4: Student will be able to detect new adverse drug reactions, their assessment and reporting.</p>




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		MOLECULAR BIOLOGY
5	MOLECULAR BIOLOGY	CO1: - Students will be able to know about total molecular biology with structures, chromosomes arrangement, the processes occur in cell, synthesis and processing of prokaryotic and eukaryotic transcripts. CO2: - Students will be able to know Transport of RNA within eukaryotic cell. Regulatory elements of genes-promoters
6		ADVANCES IN PRECLINICAL EVALUATION – I
	ADVANCES IN PRECLINICAL EVALUATION – I	CO1: - Students will be able to Understand the care and handling experimental animals CO2: - Students will be able to Understand drug rules and regulations for conducting animal studies CO3: - Students will be able to Know about preclinical & clinical studies of different ANS drugs and their models.
		DRUG REGULATORY AFFAIRS
7	DRUG REGULATORY AFFAIRS	CO1: - Students will be able to know the different competent regulatory authorities globally. CO2: - Students will be able to know technical aspects pertaining to the marketing authorization application CO3: - Students will be able to know the regulatory guidelines and directions framed by the regulatory authorities will be helpful to place the drug products in market for marketing approvals.
		RESEARCH METHODOLOGY AND IPR



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		<p>CO1: - Students will be able to know to understand the research problem To know the literature studies, plagiarism and ethics</p> <p>CO2: - Students will be able to know to get the knowledge about technical writing to analyze the nature of intellectual property rights and new developments</p>
Pharmacotherapeutics-I Lab		
9	Pharmacotherapeutics-I Lab Laboratory I	<p>CO1: Students will be able to study and practice on clinical cases.</p> <p>CO2: Students will be able to analyze rational use of medicines in special population admitted in above wards.</p> <p>CO3: Students will be demonstrating on calculation of bioavailability and bioequivalence from the given data.</p> <p>CO4: Students will be able to Interpret of Therapeutic Drug Monitoring reports of a given patient.</p>
Clinical Pharmacy Practice Lab		



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10.	Clinical Pharmacy Practice Lab	<p>CO1: Students will be demonstrating on treatment Chart Review, Medication History Interview, and Poison Information Query.</p> <p>CO2: Students will be trained on Patient Medication Counseling, Drug Information Query and Lab Data Interpretation.</p> <p>CO3: Students will be demonstrate on preparing of a patient information leaflet and Study Protocol.</p> <p>CO4: Students will be demonstrate on Formulation and dispensing of a given IV admixtures</p>
I st year 2nd Sem		
Clinical Pharmacokinetics and Therapeutic Drug Monitoring		
11.	Clinical Pharmacokinetics and Therapeutic Drug Monitoring Core Course IV	<p>CO1: Students will be able to Design the drug dosage regimen for individual patients-renal/ hepatic impairment, and for paediatrics and geriatrics.</p> <p>CO2: Students will be able to Manage pharmacokinetic drug interactions and Apply pharmacokinetic parameters in clinical settings.</p> <p>CO3: Students will be able to Interpret the impact of genetic polymorphisms of individuals on pharmacokinetics and or pharmacodynamics of drugs.</p> <p>CO4: Students will be able to Interpret and correlate the plasma drug concentrations with patients' therapeutic outcomes.</p>
Pharmacotherapeutics-II		
12	Pharmacotherapeutics-II Core Course V	<p>CO1: Students will be able to Describe and explain the rationale for drug therapy.</p> <p>CO2: Students will know the therapeutic approach for management of various disease conditions including reference to the latest available evidence.</p> <p>CO3: Students will understand the clinical controversies in drug therapy and evidence based medicine.</p> <p>CO4: Students will be able to Identify the patient specific parameters relevant in initiating drug therapy, and monitoring therapy.</p>

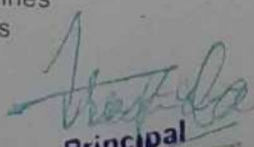


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		BIOPHARMACEUTICS AND PHARMACOKINETICS
13	BIOPHARMACEUTICS AND PHARMACOKINETICS	<p>CO1: - Students will be able to Understand the organizational structure of hospital pharmacy CO2: - Students will be able to Understand drug policy and drug committees, about procurement & drug distribution practices.</p> <p>CO3: - Students will be able to Know the admixtures of Radiopharmaceuticals, Understand the community pharmacy management, know about value added services in community pharmacies</p>
		CLINICAL RESEARCH
11.	CLINICAL RESEARCH	<p>CO1: - Student will be able to, know approaches for drug discovery, Explain the regulatory requirements for conducting clinical trial Demonstrate the types of clinical trial designs</p> <p>CO2: - - Student will be able to Explain the responsibilities of key players involved in clinical trials know the regulations of GCP, ICH and different protocols.</p>
12.	QUALITY USE OF MEDICINES	QUALITY USE OF MEDICINES
		<p>Upon completion of this course it is expected that students shall be able to:</p> <ul style="list-style-type: none"> Understand the principles of quality use of medicines Know the benefits and risks associated with use of medicines Understand regulatory aspects of quality use of medicines Identify and resolve medication related problems Promote quality use of medicines Practice evidence-based medicines




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		PRINCIPLES OF DRUG DISCOVERY
13	PRINCIPLES OF DRUG DISCOVERY	<p>Upon completion of the course, the student shall be able to,</p> <p>Explain the various stages of drug discovery.</p> <p>Appreciate the importance of the role of genomics, proteomics and bioinformatics in drug discovery</p> <p>Explain various targets for drug discovery.</p> <p>Explain various lead seeking method and lead optimization</p> <p>Appreciate the importance of the role of computer aided drug design in drug discovery</p>
		CELLULAR AND MOLECULAR PHARMACOLOGY
14	CELLULAR AND MOLECULAR PHARMACOLOGY	<p>Upon completion of the course, the student shall be able to, Explain the receptor signal transduction processes. Explain the molecular pathways affected by drugs. Appreciate the applicability of molecular pharmacology and biomarkers in drug discovery process.</p> <p>Demonstrate molecular biology techniques as applicable for pharmacology</p>
		NUTRACEUTICALS
15	NUTRACEUTICALS	<p>CO1: - students will be able to understand the importance of Nutraceuticals in various common problems with the concept of free radicals.</p>



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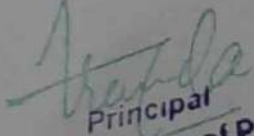
Pharmacotherapeutics-II Lab

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		<p>CO1: Students will study the cases after visiting the ward of oncology, dermatology, neurology and infection department.</p> <p>CO2: Students will be demonstrating about rational use of medicines in special population admitted in above wards.</p> <p>CO3: They will be able to calculating the Bioavailability and Bioequivalence from the given data.</p> <p>CO4: Students will be able to Interpreting of Therapeutic Drug Monitoring reports of a given patient of any of the above wards.</p> <p>CO5: Students will be able to calculate Pharmacoeconomic outcome analysis for the given data from the above</p>
		Clinical Pharmacokinetics and Therapeutic Drug Monitoring Lab
17	Clinical Pharmacokinetics and Therapeutic Drug Monitoring Lab Laboratory IV	<p>CO1: Students will be demonstrated Causality assessment of adverse drug reactions.</p> <p>CO2: Students will be able to detect and managing of medication errors.</p> <p>CO3: Students will be learning Manufacture of parenteral formulations, powders.</p> <p>CO4: Students will be able to apply knowledge for critical evaluation of drug information queries.</p> <p>CO5: Students will be knowing the process of development of a hospital formulary for a teaching hospital and</p> <p>CO6: Evaluation of prescriptions generated in hospital for drug interactions and find out the suitable management.</p>




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M.Pharmacy 1st Year 1st Semester (Pharmaceutics): University Regulation R22

S.N	Name of the subject	Course outcomes
1	MODERN PHARMACEUTICS	<p>CO1:-The students will. Be explain the preformulation parameters, apply ICH Guidelines and evaluate drug, drug excipients compatibility.</p> <p>CO2: -The students will. Be able to explain about formulation and development, use of excipients in tablets, powders, capsules, micro encapsulation and coating techniques.</p>
2	APPLIED BIOPHARMACEUTICS AND PHARMACOKINETICS	<p>CO1-students will be able to express factors affecting the bioavailability and stability of dosage form.</p> <p>CO2- They also learn the bioequivalence studies and protocols for bioequivalent studies.</p> <p>CO3- They also evaluate the parameters for the disposition, absorption and Michaelis-Menton constants for nonlinear kinetics.</p>
3	ADVANCED PHYSICAL PHARMACEUTICS (Core course - I)	<p>CO1-The students will learn particle size analysis method, solid dispersion, physics of tablets, polymer classification and its applications.</p> <p>CO2- student will also practice the stability calculations, shelf-life calculations and accelerated stability studies.</p> <p>CO3-They also understand the rheology, absorption related to liquids and semisolid dosage forms with advances.</p>



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		CO4-They also know the factors affecting the dissolution and solubility in related to In-vitro/In-vivo correlations.
4	DRUG REGULATORY AFFAIRS (Open Elective - I)	CO1- Students will come to know the different competent regulatory authorities globally. and be aware of technical aspects pertaining to the marketing authorization application. CO2 - The regulatory guidelines and directions framed by the regulatory authorities will be helpful to place the drug products in market for marketing approvals.
5	TOTAL QUALITY MANAGEMENT	CO1: - Students will be able to learn the established regulatory guidelines in GMP, GCP, GLP, USFDA, WHO, ISO.. CO2: - Students will be able to acquire knowledge regarding the quality control aspects of different regulatory bodies as per their requirements throughout the world.
6	PHARMACEUTICAL VALIDATION (Core Elective - I)	Upon completion of the subject student shall be able to CO1 -Explain the aspect of validation. CO2 - Carryout validation of manufacturing processes. CO3 - Apply the knowledge of validation to instruments and equipment's. CO4 -Validate the manufacturing facilities.
7	STABILITY OF DRUGS AND DOSAGE FORMS (Open	CO1 - The students should describe the evaluation of stability of

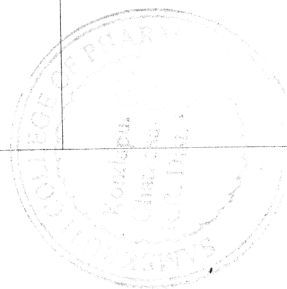
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	Elective - II)	solutions, solids, and formulations against adverse conditions. CO2- The students should be able to suggest the measures to retain stability and storage conditions for retaining the efficacy of the products.
8	RESEARCH METHODOLOGY AND IPR	CO1: - Upon completion of the subject student shall be able to Understand the research problem. CO2: - Upon completion of the subject student shall be able to know the literature studies, Plagiarism and ethics. CO3: - Upon completion of the subject student shall be able to get the knowledge about technical writing. CO4: - Upon completion of the subject student shall be able to know the Patient rights.
9	MODERN PHARMACEUTICS - I (Core course - II)	CO1-Students shall explain the preformulation parameters, apply ICH guidelines and evaluate drug, drug excipients compatibility. CO2- Students also explain about formulation and development, use of excipients in tablets, powders, capsules, micro capsules and coating techniques. CO3- They also learn and apply the statistical design in different formulations
10	ADVANCED DRUG DELIVERY SYSTEMS	CO1: - Students will be able to design CDDS design of the formulation, fabrication of systems of drug delivery systems.



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11	INDUSTRIAL PHARMACY	<p>C01: -Students should be able to explain the machinery involved in milling, mixing, filtration, drying and packing material constructions used in the production of pharmaceutical materials.</p> <p>C02 :- Students should be able salient features of GMP, TQM applicable in industry .</p> <p>C03:- Students should be able to understand effluent treatments and prevent pollution.</p> <p>C04 :-Student should be able to evaluate the validation of analytical methods and process.</p>
12	HERBAL COSMETICS	<p>CO1 -Students will learn about the raw materials used in herbal cosmetics and get exposed to various preparations herbal cosmetics.</p>
13	NANO BASED DRUG DELIVERY SYSTEMS (Open Elective - II)	<p>CO1-The students should be DELIVERY SYSTEMS (Open Elective - II) able to select the right kind of materials, able to develop nano-formulations with appropriate technologies, evaluate the product related test and for identified diseases.</p>
14	NUTRACEUTICALS	<p>CO1-The students should be able to understand the importance of Nutraceuticals in various common problems with the concept of free radicals.</p>
15	CLINICAL RESEARCH AND PHARMACOVIGILANCE	<p>CO1: - Students will be able to explain the regulatory requirements for conducting clinical trial.</p> <p>CO2: - Students will be able to demonstrate the types of clinical trial designs.</p>



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		<p>CO3: - Students will be able to explain the responsibilities of key players involved in clinical trials.</p> <p>CO4:- Students will be able to explain the principles the Pharmacovigilance.</p>
16	BIOSTATISTICS	<p>CO1: - Students will be able to know the Biostatistics arrangement, presentation and formation of tables and charts</p> <p>CO2: - Students will be able to know the correlation and regression and application of different methods, analysis of data.</p>
17	MODERN PHARMACEUTICS - II LAB	<p>CO1-Students shall explain the preformulation parameters, apply ICH guidelines and evaluate drug, drug excipients compatibility.</p> <p>CO2- Students also explain about formulation and development, use of excipients in tablets, powders, capsules.</p>
18	ADVANCED DRUG DELIVERY SYSTEMS LAB	<p>CO1: - Students will be able to design CDDS design of the formulation, fabrication of systems of drug delivery systems.</p>
19	SCALE UP AND TECHNOLOGY TRANSFER	<p>CO1: - - Students will be able to Manage the scale up process in pharmaceutical industry.</p> <p>CO2: - Students will be able to Assist in technology transfer.</p> <p>CO3: - To establish safety guidelines, which prevent industrial hazards.</p>




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COURSE OUTCOMES

PHARM.D




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Course	Course Outcomes
	I Year
	1.1 HUMAN ANATOMY & PHYSIOLOGY (THEORY)
1	<p>HUMAN ANATOMY & PHYSIOLOGY (THEORY)</p> <p>CO1: Students will be able to describe the structure and functions of various organs of the human body and mechanisms in the maintenance of normal functioning of diseased state.</p> <p>CO2: Students will be able to describe the various homeostatic mechanisms and their imbalances of various systems</p> <p>CO3: Students will be able to analyze the similarities and difference between various anatomical structures and functions.</p> <p>CO4: Students will be able to apply the knowledge gained for individual system to understand interlink between various anatomical structures and functions.</p>
2	<p>HUMAN ANATOMY & PHYSIOLOGY (PRACTICAL)</p> <p style="text-align: center;">1.1 HUMAN ANATOMY & PHYSIOLOGY (PRACTICAL)</p> <p>CO1: Students will be able to remember anatomy of various organs through specimens and models.</p> <p>CO2: Students will demonstrate various blood tests experiments including blood group determination, RBC count, WBC count, Differential count etc.</p> <p>CO3: Students will be able to analyze various blood test results whether they fall in normal or abnormal limits.</p> <p>CO4: Students will be able to correlate abnormal blood test results to pathological conditions.</p>
	1.2 PHARMACEUTICS (THEORY)
3	<p>PHARMACEUTICS (THEORY)</p> <p>CO1: Students will be able to know the formulation aspects of different dosage forms</p> <p>CO2: Students will be able to do different pharmaceutical calculation involved in formulation</p> <p>CO3: Students will be able to formulate different types of dosage forms</p> <p>CO4: Students will be able to appreciate the importance of good formulation for effectiveness.</p>
	1.2 PHARMACEUTICS (PRACTICAL)
4	<p>PHARMACEUTICS (PRACTICAL)</p> <p>CO1: Students will be able to demonstrate experiments related to preparation of various formulations such as syrups, elixirs, suppositories, etc.</p> <p>CO2: Students will be able to compare different physicochemical properties determination.</p> <p>CO3: Students will be able to describe different incompatibilities.</p> <p>CO4: Students will be able to apply physicochemical properties analysis to pharmaceutical formulations.</p>
	1.3 MEDICINAL BIOCHEMISTRY (THEORY)




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5.	MEDICINAL BIOCHEMISTRY (THEORY)	<p>CO1: Students will be able to understand understand the catalytic activity of enzymes and importance of isoenzymes in diagnosis of diseases</p> <p>CO2: Students will be able to know the metabolic process of biomolecules in health and illness (metabolic disorders)</p> <p>CO3: Students will be able to understand the genetic organization of mammalian genome: protein synthesis: replication: mutation and repair mechanism.</p> <p>CO4: Students will be able to know the biochemical principles of organ function tests of kidney, liver and endocrine gland.</p>
1.3 MEDICINAL BIOCHEMISTRY (PRACTICAL)		
6.	MEDICINAL BIOCHEMISTRY (PRACTICAL)	<p>CO1: Students will be able to write about estimation of various biomolecules in various biological fluids.</p> <p>CO2: Students will be able to understand various biochemical diagnostic tests.</p> <p>CO3: Students will be able to analyze electrolytes in biological fluids like serum, urine, etc</p> <p>CO4: Students will be able to understand various qualitative and quantitative tests.</p>
1.4 PHARMACEUTICAL ORGANIC CHEMISTRY (THEORY)		
7.	PHARMACEUTICAL ORGANIC CHEMISTRY (THEORY)	<p>CO1: Students will be able to understand IUPAC/Common system of nomenclature of simple organic compounds belonging to different classes of organic compounds.</p> <p>CO2: Students will be able to understand some important physical properties of organic compounds.</p> <p>CO3: Students will be able to understand the concepts of 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</p> <p>CO4: Students will be able to understand the methods of preparation, test for purity, principle involved in the assay</p> <p>CO5: Students will be able to understand naming reactions and pharmaceutical applications.</p>
1.4 PHARMACEUTICAL ORGANIC CHEMISTRY (PRACTICAL)		




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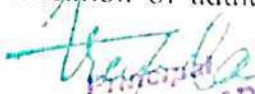
8.	PHARMACEUTICAL ORGANIC CHEMISTRY (PRACTICAL)	<p>CO1: Students will demonstrate the preparation of organic compounds that could involve with design, reaction setup, extraction, purification and qualitative analysis.</p> <p>CO2: Students will be able to compare the similarities and differences among practical procedures, reaction set up, extraction and purification organic compounds along with qualitative analysis.</p> <p>CO3: Students will be able to analyze the similarities and differences among practical procedures, reaction set up, extraction and purification organic compounds along with the qualitative analysis.</p> <p>CO4: Students will be able apply practical procedures, reaction set up, extraction and purification organic compounds along with qualitative analysis for the analogues reaction.</p>
1.5 PHARMACEUTICAL INORGANIC CHEMISTRY (THEORY)		
9.	PHARMACEUTICAL INORGANIC CHEMISTRY (THEORY)	<p>CO1: Students will be able to understand the principles and procedures of analysis of drugs and also regarding the application of inorganic pharmaceuticals</p> <p>CO2: Students will be able to know the analysis of the inorganic pharmaceuticals their applications.</p> <p>CO3: Students will be able to identify and recognize different sources of impurities present in a pharmaceutical substance.</p> <p>CO4: Students will be able to write about haemodialysis fluids and can differentiate different haemodialysis fluids.</p>
1.6 REMEDIAL MATHEMATICS (THEORY)		
10.	REMEDIAL MATHEMATICS (THEORY)	<p>CO1: Students will be able to find solutions of Algebraic problems.</p> <p>CO2: Students will be able to find solutions of Trigonometric functions.</p> <p>CO3: Students will be able to find solutions of Differential and Integral calculus problems.</p> <p>CO4: Students will learn the basics of mathematics which will be helpful in pharmaceutical calculation in the higher classes.</p>
REMEDIAL BIOLOGY (THEORY)		
11	REMEDIAL BIOLOGY (THEORY)	<p>CO1: Students will attain knowledge and to explain on structure and functions of plant and animal cells, tissues, root and stem modifications and taxonomy.</p> <p>CO2: Students will be able to understand and compare basic physiology of frog. Structure and life history of parasites.</p> <p>CO3: Students will be able to apply basic concepts to human physiology.</p> <p>CO4: Students will be able to analyze physiological and anatomical differences among different animal/plant species.</p>



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		II YEAR
		2.1 PATHOPHYSIOLOGY
PATHOPHYSIOLOGY		<p>CO1: Describe the etiology and pathogenesis of the selected disease states.</p> <p>CO2: Knowledge of signs and symptoms of the diseases.</p> <p>CO3: Identify the complications of the diseases.</p> <p>CO4: Know most commonly encountered pathophysiological state(s) and/or disease mechanism(s), as well as any clinical testing requirements</p>
		2.2 PHARMACEUTICAL MICROBIOLOGY
PHARMACEUTICAL MICROBIOLOGY		<p>CO1: Students will know the anatomy, identification, growth factors and sterilization of microorganisms; know the mode of transmission of disease causing microorganism, symptoms of disease, and treatment aspect; do estimation of RNA and DNA and there by identifying the source:</p> <p>CO2: Students will do cultivation and identification of the microorganisms in the laboratory</p> <p>CO3: Students will do identification of diseases by performing the diagnostic tests</p> <p>CO4: Students will appreciate the behavior of motility and behavioral characteristics of microorganisms.</p>
		2.2 PHARMACEUTICAL MICROBIOLOGY LAB
PHARMACEUTICAL MICROBIOLOGY LAB		<p>CO1: Students will acquire and demonstrate competency in laboratory safety and in routine and specialized microbiological laboratory skills applicable to microbiological research or clinical methods, including accurately reporting observations and analysis.</p> <p>CO2: Students will demonstrate isolation of and identification of microbes</p> <p>CO3: Students can able to design microbiology laboratory considering all the aspects of safety</p> <p>CO4: Students will acquire knowledge about validating the microbiological equipment and reporting the observations</p>
		2.3 PHARMACOGNOSY & PHYTOPHARMACEUTICALS
PHARMACOGNOSY & PHYTOPHARMACEUTICALS		<p>CO1: Students will understand the basic principles of cultivation, collection and storage of crude drugs.</p> <p>CO2: Classification of Medicinal Plants, Phytochemistry, Carbohydrates, Lipids, Terpenes, Polyphenols, Alkaloids, Pharmacology, Toxicity, Formulations and Preparations.</p> <p>CO3: Student will know the source, active constituents and uses of crude drugs appreciate the applications of primary and secondary metabolites of the plant.</p> <p>CO4: Students will recognition of medicinal plants, identification of adulteration and Contamination.</p>
		2.3 PHARMACOGNOSY & PHYTOPHARMACEUTICALS LAB




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PHARMACOGNOSY &
PHYTOPHARMACEUTI
CAL'S LAB

CO1: Student will be able to explain various powdered characteristics of crude drugs and can distinguish various cell contents.
CO2: Student will be able to define micrometer & its application on measurement of dimensions of various powdered drugs.
CO3: Student will be able to identify various plant constituents and can differentiate different constituents by chemical tests.
CO4: Student will be able to explain various morphological evaluations of crude drugs.

2.4 PHARMACOLOGY - I

PHARMACOLOGY - I

CO1: Students would have understood the pharmacological actions of different categories of drugs
CO2: They would have studied in detailed about mechanism of drug action at organ system sub cellular macromolecular levels. They would have understood the application of basic pharmacological knowledge in the prevention and treatment of various diseases.
CO3: They would got an idea about correlation of pharmacology with other bio medical sciences.
CO4: They would have understood the signal transduction mechanism of various receptors

2.5 COMMUNITY PHARMACY

COMMUNITY PHARMACY

CO1: Students will provide patient centered care to diverse patients using the best available evidence and in consideration of patients' circumstances to devise, modify, implement, document and monitor pharmacotherapy care plans, either independently or as part of healthcare team.
CO2: Students will demonstrate knowledge of the business and professional practice management skills in community pharmacies.
CO3: Students will educate patients through counseling & provide health screening services to public
CO4: Students will identify symptoms of minor ailments and provide appropriate medication
CO5: Students will participate in prevention programs of communicable diseases
CO6: Students will exhibit professional ethics by promoting safe and appropriate medication use throughout society

2.6 PHARMACOTHERAPEUTICS - I



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<p style="writing-mode: vertical-rl; transform: rotate(180deg);">PHARMACOTHERAPEUTICS - I</p>	<p>CO1: Students will be able to describe the pathophysiology and management of cardiovascular, respiratory and endocrine diseases</p> <p>CO2: Students will be developing Patient case based Assessment Skills</p> <p>CO3: Students will be able to describe the quality use of medicines issues surrounding the therapeutic agents in the treatment of these diseases</p> <p>CO4: Students will provide patient – centred care to diverse patients using the evidence based medicine.</p>
<p>2.6 PHARMACOTHERAPEUTICS – I LAB</p>	
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">PHARMACOTHERAPEUTICS – I LAB</p>	<p>CO1: Students will 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)</p> <p>CO2: Students will have developed clinical skills in the therapeutic management of conditions Continue to develop communication skills.</p> <p>CO3: Students will discuss the controversies in drug therapy; discuss the importance of preparation of individualised therapeutic plans based on diagnosis.</p> <p>CO4: Students will summarise the therapeutic approach to management of these diseases including reference to the latest available evidence.</p>



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		III YEAR
		3.1 PHARMACOLOGY
	3.1 PHARMACOLOGY	<p>CO1: Students would have understood the pharmacological actions of different categories of drugs</p> <p>CO2: They would have studied in detailed about mechanism of drug action at organ system/sub cellular/ macromolecular levels. They would have understood the application of basic pharmacological knowledge in the prevention and treatment of various diseases.</p> <p>CO3: They would got an idea about correlation of pharmacology with other bio medical sciences.</p> <p>CO4: They would have understood the signal transduction mechanism of various receptors</p>
		3.1 PHARMACOLOGY LAB
	3.1 PHARMACOLOGY LAB	<p>CO1: Students will learn about the techniques of handling common laboratory animals and about different routes of administration and different drug dilutions.</p> <p>CO2: Students will be able to describe the common laboratory animals and anesthetics used in animal pharmacology.</p> <p>CO3: Students will be able to construct the concentration response curves of various drugs on isolated muscle preparations and interpret the potency of drugs.</p> <p>CO4: Students will be able to design new models in experimentation on animals.</p>
		3.2 PHARMACEUTICAL ANALYSIS
	3.2 PHARMACEUTICAL ANALYSIS	<p>CO1: Students will be able to separate and analyzes drugs by Column chromatography, Thin layer chromatography and paper chromatography.</p> <p>CO2: Students will be able to analyze drugs by using nephlo-turbidity meter, flame photometer and flourimeter.</p>
		3.2 PHARMACEUTICAL ANALYSIS LAB



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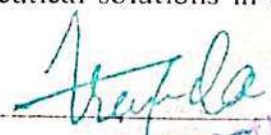
		III YEAR
		3.1 PHARMACOLOGY
3.1 PHARMACOLOGY		<p>CO1: Students would have understood the pharmacological actions of different categories of drugs</p> <p>CO2: They would have studied in detailed about mechanism of drug action at organ system/sub cellular/ macromolecular levels. They would have understood the application of basic pharmacological knowledge in the prevention and treatment of various diseases.</p> <p>CO3: They would got an idea about correlation of pharmacology with other bio medical sciences.</p> <p>CO4: They would have understood the signal transduction mechanism of various receptors</p>
		3.1 PHARMACOLOGY LAB
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3.2 PHARMACEUTICAL ANALYSIS		<p>CO1: Students will be able to separate and analyzes drugs by Column chromatography, Thin layer chromatography and paper chromatography.</p> <p>CO2: Students will be able to analyze drugs by using nephlo-turbidity meter, flame photometer and flourimeter.</p>
		3.2 PHARMACEUTICAL ANALYSIS LAB




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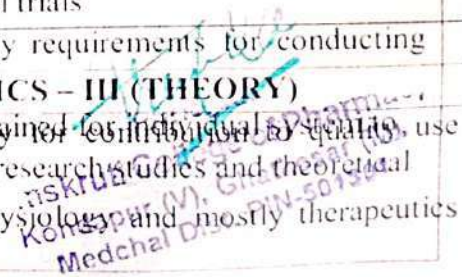
3.2 PHARMACEUTICAL ANALYSIS LAB	<p>CO1: Students will be able to analyze drugs by using nephlo-turbidity meter, flame photometer and flourimeter.</p> <p>CO2: Students will be able to determine p^H and conductivity of different solutions.</p> <p>CO3: Students will be able to analyze the drug by using instruments like uv-visible spectrophotometer,hple.</p>
3.3 PHARMACOTHERAPEUTICS-11	
3.3 PHARMACOTHERAPEUTICS-11	<p>CO1: Students will be able to describe the pathophysiology and management of cardiovascular, respiratory and endocrine diseases</p> <p>CO2: Students will be developing Patient case based Assessment Skills</p> <p>CO3: Students will be able to describe the quality use of medicines issues surrounding the therapeutic agents in the treatment of these diseases</p> <p>CO4: Students will provide patient – centred care to diverse patients using the evidence based medicine</p>
3.3 PHARMACOTHERAPEUTICS-11 LAB	
3.3 PHARMACOTHERAPEUTICS-11 LAB	<p>CO1: Students will 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)</p> <p>CO2: Students will have developed clinical skills in the therapeutic management of conditions Continue to develop communication skills.</p> <p>CO3: Students will discuss the controversies in drug therapy; discuss the importance of preparation of individualized therapeutic plans based on diagnosis.</p> <p>CO4: Students will summaries the therapeutic approach to management of these diseases including reference to the latest available evidence.</p>
3.4 PHARMACEUTICAL JURISPRUDENCE	
3.4 PHARMACEUTICAL JURISPRUDENCE	<p>CO1: student will be able to practice pharmacy profession as per the Pharmaceutical Act and different laws related to drugs.</p> <p>CO2: student will be able to apply knowledge in the area of pharmaceutical legislation, rules, laws, ethics, acts and amendments related to drugs</p> <p>CO3: student will be able to apply the broad pharmaceutical solutions in a global and economical context</p>




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	BIOPHARMACEUTICS AND PHARMACOKINETICS (THEORY)	<p>CO1: Students will be able to describe the pharmacokinetic models & differentiate between compartmental & non-compartmental analysis.</p> <p>CO2: Students will be able to identify the different study designs applied in bioequivalence studies.</p> <p>CO3: Students will be able to explain the disease related factors that can cause pharmacokinetic variability.</p> <p>CO4: Students will be able to design new pharmacokinetic models for clinical trial for the benefit of patient.</p>
		4.5 BIOPHARMACEUTICS AND PHARMACOKINETICS (PRACTICAL)
11.	BIOPHARMACEUTICS AND PHARMACOKINETICS (PRACTICAL)	<p>CO1: Students will be able to estimate various Pharmacokinetic & Pharmacodynamics parameters.</p> <p>CO2: Students will be able to perform the in vitro evaluation of different dosages form for drug release.</p> <p>CO3: Students will be able to apply the Biostatistics to pharmaceutical data.</p> <p>CO4: Students will be able to design the Bioequivalence protocol.</p>
		4.6 CLINICAL TOXICOLOGY (THEORY)
13		<p>CO1: Student should know the General principles involved in the management of poisoning</p> <p>CO2: Students should know the Antidotes and the clinical applications.</p> <p>CO3: Students should know Supportive care in clinical Toxicology.</p>

S. No	Course	Course Outcomes
		V Year
		5.1 CLINICAL RESEARCH (THEORY)
		<p>CO1: Students will be able to describe the various clinical trial and understand the responsibilities of key players involved in clinical trials.</p> <p>CO2: Students will be able to design different clinical trials</p> <p>CO3: Students will be able to know the regulatory requirements for conducting clinical trial and the documentation.</p> <p>CO4: Students will be able to apply the knowledge gained for individual to quality, use and understand the link between evidence from various research studies and theoretical aspects.</p>
		PHARMACO THERAPEUTICS – III (THEORY)
		<p>CO1: Students will be able to apply the knowledge gained for individual to quality, use and understand the link between evidence from various research studies and theoretical aspects.</p> <p>CO2: Chapters dealt cover briefly pathophysiology and mostly therapeutics various diseases.</p>



		3.5 MEDICINAL CHEMISTRY
-3.5 MEDICINAL CHEMISTRY		<p>CO1: Students will be able to understand the structure, nomenclature, synthesis metabolism, uses of Antibiotics.</p> <p>CO2: Students will be able to differentiate different classes of drug, synthetic methods.</p> <p>CO3: Students will be able to evaluate different synthetic and S A R methods.</p> <p>CO4: Students will be able to apply S A R & Synthetic methods for Drug Design.</p>
		3.5 MEDICINAL CHEMISTRY LAB
3.5 MEDICINAL CHEMISTRY LAB		<p>CO1: Students will be able to perform the analysis of various medicinal compounds that could help the students to understand structure of Medicinal compounds.</p> <p>CO2: Students will be able to acquire knowledge about Medicinal compounds, with emphasis on their analytical process, physical and chemical properties and compare them with each other.</p> <p>CO3: Students will be able to analyze various Medicinal compounds.</p> <p>CO4: Students will be able to apply various reactions for the synthesis of Medicinal compounds.</p>
		3.6 PHARMACEUTICAL FORMULATIONS
3.6 PHARMACEUTICAL FORMULATIONS		<p>CO1: Student will understand the principle involved in formulation of various pharmaceutical dosage forms</p> <p>CO2: student will understand and appreciate concept of bioavailability and bioequivalence and their role in clinical situations</p>
		3.6 PHARMACEUTICAL FORMULATIONS LAB
3.6 PHARMACEUTICAL FORMULATIONS LAB		<p>CO1: Students will prepare various pharmaceutical formulations</p> <p>CO2: Students will perform evaluation of pharmaceutical dosage form</p>




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		4.1 PHARMACOTHERAPEUTICS – III (THEORY)
	PHARMACOTHERAPEUTICS – III (THEORY)	<p>impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.</p> <p>know the therapeutic approach to management of these diseases;</p> <p>know the controversies in drug therapy;</p> <p>know the importance of preparation of individualised therapeutic plans based on diagnosis; and</p> <p>appreciate the needs to identify the patient-specific parameters relevant in initiating</p>
2	PHARMACOTHERAPEUTICS – III (PRACTICAL)	<p style="text-align: center;">4.1 PHARMACOTHERAPEUTICS – III (PRACTICAL)</p> <p>Hospital postings in various departments designed to complement the lectures by providing practical clinical discussion; attending ward rounds; follow up the progress and changes made in drug therapy in allotted patients; case presentation upon discharge.</p> <p>Students are required to maintain a record of cases presented and the same should be submitted at the end of the course for evaluation.</p>
		4.2 HOSPITAL PHARMACY (THEORY)
3	HOSPITAL PHARMACY (THEORY)	<p>CO1: Students will be able to know various drug distribution methods.</p> <p>CO2: Students will be able to know the professional practice management skills in hospital pharmacies.</p> <p>CO3: Students will be able to provide unbiased drug information to the doctors.</p> <p>CO4: Students will be able to provide unbiased drug information to the doctors.</p> <p>CO5: Students will be able to appreciate the practice based research methods; stores management and inventory control.</p>
		4.2 HOSPITAL PHARMACY (PRACTICAL)
4	HOSPITAL PHARMACY (PRACTICAL)	<ol style="list-style-type: none"> 1. Students should do Assessment of drug interactions in the given prescriptions 2. Students should Manufacture of parenteral formulations, powders. 3. Students should participate in Drug information queries. 4. Inventory control
		4.3 CLINICAL PHARMACY (THEORY)




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6.	CLINICAL PHARMACY (THEORY)	<p>CO1: Students will be able to explain the principles of clinical pharmacy and therapeutics</p> <p>CO2: Students will be able to appraise the appropriate drug treatment for diseases considering various factors like age, medication history, drug-interactions, side effects, socio-economic factors etc.</p> <p>CO3: Students will be able to interpret or analyze the outcomes of drug treatment when two or more drugs co-administered (Polypharmacy)</p> <p>CO4: Students will be able to apply the knowledge to invent new therapeutic agent for existing diseases or newly developed diseases.</p>
4.3 CLINICAL PHARMACY (PRACTICAL)		
7.	CLINICAL PHARMACY (PRACTICAL)	<p>Hospital postings in various departments designed to complement the lectures by providing practical clinical discussion; attending ward rounds; follow up the progress and changes made in drug therapy in allotted patients; case presentation upon discharge.</p> <p>Students are required to maintain a record of cases presented and the same should be submitted at the end of the course for evaluation.</p>
4.4 BIOSTATISTICS AND RESEARCH METHODOLOGY (THEORY)		
8.	BIOSTATISTICS AND RESEARCH METHODOLOGY (THEORY)	<p>a) students should get an idea of clinical study designs: Case studies, observational studies, interventional studies, Students should be able to Designing the methodology</p> <p>Students should be able to take Sample size determination and Power of a study Determination of sample size for simple comparative experiments, determination of sample size to obtain a confidence interval of specified width, power of a study Report writing and presentation of data</p>
9		4.5 BIOPHARMACEUTICS AND PHARMACOKINETICS (THEORY)



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2	PHARMACOEPIDEMIOLOGY AND PHARMACOECONOMICS (THEORY)	<p align="center">5.2 PHARMACOEPIDEMIOLOGY AND PHARMACOECONOMICS (THEORY)</p> <p>CO1: Students will be able to understand various terms associated with Pharmacoepidemiology and methods of conducting pharmacoepidemiological studies.</p> <p>CO2: Students will be able to understand the practical applications of Pharmacoepidemiology.</p> <p>CO3: Students will be able to understand the needs of Pharmacoeconomic evaluation.</p> <p>CO4: Students will be able to describe the various applications of pharmacoeconomics.</p>
5.3 Clinical Pharmacokinetics and Therapeutic Drug Monitoring		
3	CLINICAL PHARMACOKINETICS AND THERAPEUTIC DRUG MONITORING (THEORY)	<p>CO1: Students will be able to Design the drug dosage regimen for individual patients- renal/ hepatic impairment, and for paediatrics and geriatrics.</p> <p>CO2: Students will be able to Manage pharmacokinetic drug interactions and Apply pharmacokinetic parameters in clinical settings.</p> <p>CO3: Students will be able to Interpret the impact of genetic polymorphisms of individuals on pharmacokinetics and or pharmacodynamics of drugs.</p> <p>CO4: Students will be able to Interpret and correlate the plasma drug concentrations with patients' therapeutic outcomes.</p>




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M.Pharmacy 1st Year 1st Semester (Regulatory Affairs): University Regulation R22

S.NO	Course	Course outcomes
1	Good Regulatory Practices	CO1: - Students will be able to understand the key regulatory and compliance elements with respect to Good Manufacturing Practices, Good Laboratory Practices, Good Automated Laboratory Practices and Good Documentation Practices. CO2: - Students will be able to Prepare and implement the check lists and SOPs for various Good Regulatory Practices. CO3: - Students will be able to Implement Good Regulatory Practices in the Healthcare and related Industries. Prepare for the readiness and conduct of audits and inspections.
2	DRUG REGULATORY AFFAIRS	CO1: - Students will be able to know the different competent regulatory authorities globally. CO2: - Students will be aware of technical aspects pertaining to the marketing authorization application. CO3: - Students will be able to the regulatory guidelines and directions framed by the regulatory authorities will be helpful to place the drug products in market for marketing approvals.
3	INTELLECTUAL PROPERTY RIGHTS	CO1: - Students will be able to know the clear information



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		about the patent laws, intellectual property rights and drug regulation in India and abroad is gained by the students.
4	TOTAL QUALITY MANAGEMENT	CO1: - Students will be able to know Total quality management helps the students to learn the established regulatory guidelines in GMP, GCP, GLP, USFDA, WHO, ISO etc CO2: - Students will be able to acquire vast knowledge regarding the quality control aspects of different regulatory bodies as per their requirements throughout the world.
5	PHARMACEUTICAL VALIDATION	CO1: - Student will be able to explain the aspect of validation, Carryout validation of manufacturing processes CO2: - Student will be able to Apply the knowledge of validation to instruments and equipment's
6	STABILITY OF DRUGS AND DOSAGE FORMS	CO1: - The students will be able to evaluation of stability of solutions, solids and formulations against adverse conditions. CO2: - The students should be able to suggest the measures to retain stability and storage conditions for retaining the efficacy of the products.
7	PHARMACEUTICAL FORMULATION TECHNOLOGY	Students shall explain the pre-formulation parameters, apply ICH guidelines and



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		evaluate drug, drug excipients compatibility. Students also explain about formulation and development, use of excipients in tablets, powders, capsules, micro-encapsules and coating techniques. They also learn and apply the statistical design in different formulations.
8	DOCUMENTATION AND REGULATORY WRITING	CO1: - Student will be able to, Know the various documents pertaining to drugs in pharmaceutical industry And understand the basics of regulatory compilation CO2: - Student will be able to Create and assemble the regulation submission as per the requirements of agencies and Follow up the submissions and post approval document requirements
9	RESEARCH METHODOLOGY AND IPR	CO1: - Students will be able to Understand research problem formulation, literature studies, plagiarism and ethics. CO2: - Students will be able to knowledge about technical writing CO3: - Students will be able to analyze the nature of intellectual property rights and new developments. CO4: - Students will be able to know the patent rights
10	REGULATORY PRACTICE AND DOCUMENTATION LAB	CO1: - Student will be able to, Know the various documents pertaining to drugs in pharmaceutical industry



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		And understand the basics of regulatory compilation
11	DRUG REGULATION & REGISTRATION LAB	CO1: - Students will able to know the different competent regulatory authorities globally. CO2: - Students will be aware of technical aspects pertaining to the marketing authorization application
12	REGULATORY ASPECTS OF HERBALS AND BIOLOGICALS	CO1: - Students will able to Understand the regulation for newly developed biologics and biosimilars CO2: - Students will able to Know the pre-clinical and clinical development considerations of biologics CO3: - Students will able to Understand the Regulatory Requirements of Blood and/or Its Components Including Blood Products and label requirements
13	REGULATORY ASPECTS OF MEDICAL DEVICES	CO1: - Students will able to know the Basics of medical devices and IVDs, process of development, ethical and quality considerations. CO2: - Students will able to know Harmonization initiatives for approval and marketing of medical devices and IVDs. Regulatory approval process for medical devices and IVDs in India, US, Canada, EU, Japan and ASEAN. CO3: - Students will able to know Clinical evaluation and



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		investigation of medical devices and IVDs.
14	REGULATORY ASPECTS OF FOOD AND NUTRACEUTICALS	CO1: - Students will able to know the regulatory Requirements for nutraceuticals CO2: - Students will able to know Understand the regulation for registration and labeling of nutraceuticals and food supplements in India, USA and Europe
15	PHARMACEUTICAL QUALITY CONTROL AND QUALITY ASSURANCE	CO1: - Students will able to know the study of this subject builds the confidence in the minds on the students to develop and formulate high quality pharmaceutical products.
16	NANO BASED DRUG DELIVERY SYSTEMS	CO1: - Students will able to select the right kind of materials, able to develop nano formulations with appropriate technologies, evaluate the product related test and for identified diseases
17	CLINICAL RESEARCH AND PHARMACOVIGILANCE	CO1: - Students will able to explain the regulatory requirements for conducting clinical trial Demonstrate the types of clinical trial designs explain the responsibilities of key players involved in clinical trials CO2: - Students will able to Execute safety monitoring, reporting and close-out activities Explain the principles of Pharmacovigilance



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		Detect new adverse drug reactions and their assessment
18	NUTRACEUTICALS	CO1: - Students will be able to Helps the student to understand the importance of Nutraceuticals in various common problems with the concept of free radicals.
19	ADVANCED DRUG DELIVERY SYSTEMS	CO1: - Students will be able to know for CDDS design of the formulation fabrication of systems of above drug delivery systems with relevant applications.
20	REGULATORY ASPECTS OF HERBALS AND BIOLOGICAL LAB	
21	REGULATORY ASPECTS OF MEDICAL DEVICES LAB	CO1: - Students will be able to know the Basics of medical devices and IVDs, process of development, ethical and quality considerations. CO2: - Students will be able to know Harmonization initiatives for approval and marketing of medical devices and IVDs. Regulatory approval process for medical devices and IVDs in India, US, Canada, EU, Japan and ASEAN.
22	BIOSTATISTICS	CO1: - The student will be known the Biostatistics arrangement, presentation and formation of tables and charts. They also know the correlation and regression & application of



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		different methods, analysis of data
23	PHARMACEUTICAL PRODUCTION AND PACKAGING TECHNOLOGY	CO1: - student will be able to know about Industrial area design and packaging of different formulations and its stability conditions.
24	SCALE UP AND TECHNOLOGY TRANSFER	CO1: - student will be able to Manage the scale up process in pharmaceutical industry. Assist in technology transfer. CO2: - student will be able to establish safety guidelines, which prevent industrial hazards.
25	ENGLISH FOR RESEARCH PAPER WRITING	CO1: - Students will be able to: Understand that how to improve your writing skills and level of readability CO2: - Students will be able to Learn about what to write in each section CO3: - Students will be able to Understand the skills needed when writing a Title Ensure the good quality of paper at very first-time submission
26	PEDAGOGY STUDIES	CO1: - Students will be able to understand: What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries? CO2: - Students will be able to What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what



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		population of learners?
27	STRESS MANAGEMENT BY YOGA	CO1: - Students will be able to Develop healthy mind in a healthy body thus improving social health also Improve efficiency
28	PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS	CO1: - Students will be able to Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life CO2: - Students will be able to the person who has studied Geeta will lead the nation and mankind to peace and prosperity

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