

M. 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>
2.	Clinical Pharmacy Practice Core Course II	<p>Clinical Pharmacy Practice</p> <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>
3.	Hospital & Community Pharmacy Core Course III	<p>Hospital & Community Pharmacy</p> <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>

		MOLECULAR BIOLOGY
5	MOLECULAR BIOLOGY	<p>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.</p> <p>CO2: - Students will be able to know Transport of RNA within eukaryotic cell.</p> <p>Regulatory elements of genes-promoters</p>
6		ADVANCES IN PRECLINICAL EVALUATION – I
	ADVANCES IN PRECLINICAL EVALUATION – I	<p>CO1: - Students will be able to Understand the care and handling experimental animals</p> <p>CO2: - Students will be able to Understand drug rules and regulations for conducting animal studies</p> <p>CO3: - Students will be able to Know about preclinical & clinical studies of different ANS drugs and their models.</p>
		DRUG REGULATORY AFFAIRS
7	DRUG REGULATORY AFFAIRS	<p>CO1: - Students will be able to know the different competent regulatory authorities globally.</p> <p>CO2: - Students will be able to know technical aspects pertaining to the marketing authorization application</p> <p>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.</p>

		RESEARCH METHODOLOGY AND IPR
8	RESEARCH METHODOLOGY AND IPR	<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

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>

		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	<p>QUALITY USE OF MEDICINES</p> <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

		PRINCIPLES OF DRUG DISCOVERY
13	PRINCIPLES OF DRUG DISCOVERY	<p>Upon completion of the course, the student shall be able to,</p> <ul style="list-style-type: none"> · Explain the various stages of drug discovery. · Appreciate the importance of the role of genomics, proteomics and bioinformatics in drug discovery · Explain various targets for drug discovery. · Explain various lead seeking method and lead optimization · Appreciate the importance of the role of computer aided drug design in drug discovery
		CELLULAR AND MOLECULAR PHARMACOLOGY
14	CELLULAR AND MOLECULAR PHARMACOLOG Y	<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. 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>

16	Pharmacotherapeutics-II Lab Laboratory III	<p align="center">Pharmacotherapeutics-II Lab</p> <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>
		<p align="center">Clinical Pharmacokinetics and Therapeutic Drug Monitoring Lab</p>
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>

