

Teerthanker Mahaveer University
College of Pharmacy

Pharm.D. (Doctorate in Pharmacy)

Programme Outcome

PO-1	:	Acquiring and retrieve sound knowledge on fundamental principles and their applications in the area of Pharmaceutical Sciences.
PO-2	:	Understanding and communicate the value of pharmacist's professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
PO-3	:	Developing ability for in-depth analytical and critical thinking in order to identify, formulate and solve the issues related to Pharmaceutical Industry, Regulatory Agencies, Hospital and Community Pharmacy Services.
PO-4	:	Developing ability for in-depth analytical and critical thinking in order to identify, formulate and solve the issues related to Pharmaceutical Industry, Regulatory Agencies, Hospital and Community Pharmacy Services.
PO-5	:	Developing written and oral communication skills.
PO-6	:	Developing creativity to solve need based problems in pharmaceutical Industry as well as in healthcare systems for raising quality use of medicine.
PO-7	:	Developing professional ethics, entrepreneurship, leadership and team spirit.

Programme Specific Outcome

PSO-1	:	Understanding the basic concepts of homeostasis, disease etiology and therapeutic management with their principles and applications.
PSO-2	:	Understanding the various concepts of development of drug and pharmaceuticals
PSO-3	:	Describing various requirements and methodology used for manufacturing and quality control of various pharmaceutical and cosmetic products.
PSO-4	:	Demonstrating use of various instruments and equipment with their standard operating procedures (SOPs) for the analysis of drugs and pharmaceuticals.
PSO-5	:	Demonstrating the ability to compound extemporaneous and commercially available dosage forms, dispense, and administer medications in a variety of healthcare settings.
PSO-6	:	Applying standards, guidelines, best practices, and established processes related to safe and effective medication use.
PSO-7	:	Conducting various pharmaceutical research studies such as identify and report drug related problems, ADRs, drug-drug interactions, drug toxicities, DUR etc. during pharmacy practice in clinics/hospitals.
PSO-8	:	Developing and providing an evidence-based approach to care that considers the cost, care, access, and satisfaction needs of a targeted patient population.
PSO-9	:	Developing research instinct in the area of community, hospital and clinical pharmacy.

Course Outcomes

PDR101	CO-1	Understanding the structure and functions of various organs of the human body.
	CO-2	Describing various homeostatic mechanisms and their imbalances in various Systems.
	CO-3	Applying the hematological tests and vital signs and symptoms.
	CO-4	Analyzing the interlinked mechanisms of homeostasis in human body.
PDR102	CO-1	Understanding the formulation aspects of different dosage forms
	CO-2	Applying different pharmaceutical calculation involved in formulation.
	CO-3	Formulating different types of dosage forms.
	CO-4	Evaluating the formulations for effectiveness.
PDR103	CO-1	Understanding the role and importance of enzymes in the diagnosis of diseases.
	CO-2	Defining the genetics, mutation and repair mechanism of human body.
	CO-3	Explaining the metabolic process of biomolecules in health and illness.
	CO-4	Demonstrating the biochemical principles in organ function and their biochemical tests in body fluids.
PDR104	CO-1	Understanding important physical & chemical properties of organic compounds
	CO-2	Explaining various nomenclature systems of organic compounds.
	CO-3	Applying the mechanism of organic chemical reactions.
	CO-4	Analyzing methods of preparation, tests for purity, assay, medicinal uses of important organic compounds.
PDR105	CO-1	Understanding the principles and procedures of analysis of drugs and the application of inorganic pharmaceuticals
	CO-2	Demonstrating the importance of inorganic pharmaceuticals in preventing and curing the disease
	CO-3	Analyzing the inorganic pharmaceuticals and their application
PDR1036	CO-1	Understanding the basic concepts of mathematical theory, formulas and their applications in Pharmacy.
	CO-2	Demonstrating the important application of Mathematics in Pharmacy.
	CO-3	Applying formulas to solve the different types of pharmaceutical calculations.
PDR107	CO-1	Understanding classification and salient features of plant and animal kingdoms.
	CO-2	Demonstrating about naturally occurring drugs its sources and use.
	CO-3	Analyzing tools and techniques used in herbal drug and cell biology study
PDR151	CO-1	Understanding the anatomy and physiology of different systems of our body.
	CO-2	Describing various homeostatic mechanisms and their imbalances of various systems.
	CO-3	Demonstrating various hematological tests and record vital signs.
	CO-4	Applying the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body.
PDR152	CO-1	Understanding formulation aspects of different dosage forms.
	CO-2	Explaining physical, chemical and therapeutic incompatibilities in

		formulations.
	CO-3	Demonstrating the manufacturing of various dosage forms by understanding the use of equipment.
PDR153	CO-1	Understanding the qualitative and quantitative estimation of biochemical Parameters.
	CO-2	Analyzing the biochemical tests for blood and urine.
PDR154	CO-1	Understanding various stereo models of organic molecules.
	CO-2	Explaining various laboratory techniques involved in synthesis of organic Compounds.
	CO-3	Illustrating schematic qualitative organic analysis for identification of organic functional groups.
PDR155	CO-1	Understanding the principle and procedures involved in limit tests and volumetric analysis.
	CO-2	Identifying the presence and the purity of inorganic compounds based on official monograph.
	CO-3	Preparing inorganic pharmaceutical compounds
PDR156	CO-1	Understanding the basic morphology of animals and plants.
	CO-2	Defining the plant physiology.
	CO-3	Preparing the transvers sections and permanent slides of given plant samples.
PDR201	CO-1	Understanding the etiology, pathogenesis and clinical features of the selected disease conditions and immunogenic reactions.
	CO-2	Explaining the pathophysiologic conditions of some common and infectious diseases.
	CO-3	Analyzing laboratory values of clinical significance for disease identification.
PDR202	CO-1	Understanding the structure, classification, identification of microorganisms and disinfection & sterilization techniques.
	CO-2	Demonstrating the mode of transmission, sign and symptoms of disease caused by microorganisms.
	CO-3	Experimenting various identification and diagnostic tests for microorganisms.
PDR203	CO-1	Understanding the basic principles of cultivation, collection, storage and sources of adulteration of crude drugs.
	CO-2	Identifying the sources, its active constituents and use of crude drugs.
	CO-3	Demonstrating the application of primary and secondary metabolites of plants.
	CO-4	Estimating different values for standardization of crude drugs.
PDR204	CO-1	Understanding the pharmacology of different classes of drugs acting on different systems of human body.
	CO-2	Classifying the drugs on the basis of their pharmacological action and therapeutic uses.
	CO-3	Illustrating the associated side effect and toxicities of drugs and its interaction in between them.
	CO-4	Explaining the mechanism of drug's action.
PDR205	CO-1	Understanding professional practice management and pharmaceutical care services in community pharmacy.

	CO-2	Demonstrating patient counseling and practicing health screening services in community pharmacy.
	CO-3	Practicing community services and responding to minor ailments providing appropriate medications with professional code of ethics.
	CO-4	Supporting health education services to the community.
PDR206	CO-1	Understanding the pathophysiology of selected disease states and rationale behind drug therapy.
	CO-2	Identifying patient specific parameters in initiating and monitoring drug therapy.
	CO-3	Demonstrating different therapeutic approaches in management of selected disease conditions.
	CO-4	Devising individualized drug therapy based on diagnosis of selected disease conditions.
PDR207	CO-1	Understanding the principles and process of communication.
	CO-2	Recognizing the barriers of communication.
	CO-3	Analyzing the verbal and non-verbal communication.
	CO-4	Developing interpersonal skills, oral and written communication skills.
PDR208	CO-1	Understanding application of computers in pharmacy.
	CO-2	Recognizing concept of information system, software and bioinformatics.
	CO-3	Applying computers for data analysis in preclinical development.
PDR251	CO-1	Understanding the basics of experimental microbiology.
	CO-2	Identifying the presence of microorganism in some infectious diseases & pharmaceutical preparation.
	CO-3	Demonstrating the microbiological assay of antibiotics and vitamins.
PDR252	CO-1	Understanding the microscopic evaluations of crude/herbal drugs including internal structure (T.S.), powder analysis, leaf surface microscopy to confirm plant species and variety.
	CO-2	Identifying crude drugs with morphology, chemical tests for active chemical constituents as compared with official standards.
	CO-3	Analyzing the fixed & volatile oils by saponification, acid value, ester values, physico-chemical evaluations for purity.
	CO-4	Developing plant monographs, herbarium and authentication for official comparison.
PDR253	CO-1	Understanding the principles and practices involved in selection of drug therapy including clinical discussions for selected diseases.
	CO-2	Interpreting the follow up, progress and changes made in drug therapy.
	CO-3	Analyzing the pharmaceutical care issues and their solutions.
	CO-4	Developing the evidence based pharmaceutical care plans for allotted patients.
PDR254	CO-1	Understanding the basics of communication skills.
	CO-2	Applying oral and written communication skills with proper pronunciation and presentation.
PDR208	CO-1	Understanding basic concepts of HTML and its use in creating websites.
	CO-2	Demonstrating the information of any drug and its adverse effects using online tools.
	CO-3	Deploying MS Office tools to store and retrieve patient information from the Database.

	CO-4	Generating and printing report from patient database.
PDR301	CO-1	Understanding the pharmacological aspects of selected drugs.
	CO-2	Applying the pharmacology of drugs and correlate therapeutics.
	CO-3	Evaluating and interpreting the drugs action through animal toxicology.
PDR302	CO-1	Understanding the concept of quality assurance, principles of instrumental techniques such as and electro chemical techniques in drug analysis. chromatography, spectroscopy, thermal
	CO-2	Analyzing drugs and pharmaceuticals using different analytical techniques.
	CO-3	Estimating the drug content in various formulations
PDR303	CO-1	Relating the pathophysiology of selected disease states and the rationale for drug therapy.
	CO-2	Demonstrating different therapeutic approaches in management of selected disease conditions.
	CO-3	Assessing the needs for monitoring the drug therapy for selected diseases Conditions.
	CO-4	Devising individualized drug therapy plans based on diagnosis for selected disease.
PDR304	CO-1	Recognizing the role of regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals.
	CO-2	Illustrating various concepts of the pharmaceutical legislation in India including drug and cosmetic act and rules, drug policies, DPCO, Patent and design act.
	CO-3	Practicing professional ethics during handling of drugs, pharmaceuticals and cosmetics.
	CO-4	Employing the concepts of different acts and related laws as prescribed by the Pharmacy Council of India and International drug regulatory authorities.
PDR305	CO-1	Understanding various modern approaches in drug design, QSAR and CADD.
	CO-2	Demonstrating the chemistry & SAR of various categories of drugs with respect to their biological activities.
	CO-3	Explaining the metabolism, adverse effects and therapeutic activities of various categories of drugs.
	CO-4	Estimating drugs qualitatively and quantitatively in formulations through assays.
	CO-5	Synthesizing drugs using different chemical reaction approach.
PDR306	CO-1	Understanding the principles involved in formulation of various pharmaceutical forms.
	CO-2	Demonstrating the concept of bioavailability and bioequivalence and their role in clinical situations.
	CO-3	Formulating various dosage forms.
	CO-4	Evaluating various dosage forms.
PDR307	CO-1	Understanding concepts & sources of environment and its associated problems and measures to control.
	CO-2	Describing the ecosystems.
	CO-3	Analyzing human impacts on the environment.

PDR351	CO-1	Understanding the animal handling and route of drug administration of several types of dosage forms.
	CO-2	Recognizing the different types of experimental instruments dealing with pharmacological research.
	CO-3	Demonstrating the several molecular level target in in-vitro and in-vivo technology.
	CO-4	Evaluating currently accepted experimental methods, instrumental techniques and procedure.
PDR352	CO-1	Understanding the principles and procedures involved in estimation of drugs and pharmaceuticals.
	CO-2	Demonstrating different analytical techniques and instruments.
	CO-3	Interpreting the data and spectra for analysis.
PDR353	CO-1	Understanding the principles and practices involved in selection of drug therapy including clinical discussions for selected diseases.
	CO-2	Interpreting the follow up, progress and changes made in drug therapy.
	CO-3	Analyzing pharmaceutical care issues and their solutions.
	CO-4	Developing the evidence based pharmaceutical care plans for allotted patients
PDR354	CO-1	Recognizing various mechanisms for synthesis of drugs or their intermediates.
	CO-2	Illustrating different physico-chemical properties of various classes of drug.
	CO-3	Applying the principles involved in assay of drugs in dosage forms
PDR355	CO-1	Understanding the principle involved in formulation of various pharmaceutical dosage forms.
	CO-2	Recalling the concept of bioavailability and bioequivalence.
	CO-3	Evaluating pharmaceutical dosage forms.
	CO-4	Preparing various pharmaceutical formulations.
PDR401	CO-1	Understanding the pathophysiology of selected disease states and the rational drug therapy.
	CO-2	Demonstrating different therapeutic approaches in management of selected disease conditions.
	CO-3	Developing individualized therapeutic plans based on diagnosis.
PDR402	CO-1	Understanding drug distribution and professional practice management skills in hospital pharmacies.
	CO-2	Demonstrating unbiased drug information to the patients and physicians.
	CO-3	Formulating extemporaneous drug preparations in the hospital pharmacies.
	CO-4	Practicing drug dispensing, store management and inventory control in hospitals.
	CO-5	Developing practice-based research methods.
PDR403	CO-1	Identifying and resolving drug related problems.
	CO-2	Assessing adverse drug reactions.
	CO-3	Interpreting selected laboratory results (as monitoring parameters in therapeutics) for specific diseased conditions and providing medicine information.
	CO-4	Practicing medication history interviews and patients counseling.

PDR404	CO-1	Understanding research methodology.
	CO-2	Applying biostatistical tools and techniques to test hypothesis, optimize and correlate different types of data and its analysis.
	CO-3	Employing computer application in hospital pharmacy, community pharmacy, drug information retrieval and managing stores.
PDR405	CO-1	Understanding the basic concepts of Biopharmaceutics and Pharmacokinetics.
	CO-2	Experimenting in-vitro dissolution studies and in-vivo bioavailability studies for various drugs and its formulations.
	CO-3	Analyzing plasma drug availability data and pharmacokinetic parameters of a drug to fix its dosage regimen.
	CO-4	Developing bioavailability and bio-equivalence study for new drug formulations.
PDR406	CO-1	Understanding the concept of poisoning, drug toxicities, its general management and Supportive care.
	CO-2	Analyzing various toxicities, poisonings, bites and stings with their clinical features, diagnosis and management.
	CO-3	Managing acute & chronic poisoning due heavy metals, plants and food.
PDR451	CO-1	Understanding the rational drug use in selection of drug therapy including clinical discussions for selected diseases.
	CO-2	Interpreting the follow up, progress and changes made in drug therapy.
	CO-3	Analyzing the pharmaceutical care issues and their solutions.
	CO-4	Developing the evidence based pharmaceutical care plans including pharmacological, nonpharmacological counselling for allotted patients.
PDR452	CO-1	Understanding inventory control for hospitals.
	CO-2	Assessing drug interactions in the given prescriptions.
	CO-3	Analyzing drug information queries in the given prescription.
	CO-4	Formulating parenteral and powder preparations.
PDR453	CO-1	Understanding the concept and procedures involved in patient medication history interviews and counseling.
	CO-2	Analyzing laboratory investigations in case studies.
	CO-3	Evaluating drug information queries.
PDR454	CO-1	Understanding the concepts of bioavailability and pharmacokinetics in clinical context.
	CO-2	Interpreting the various pharmacokinetic parameters from blood profile and urine excretion data.
	CO-3	Analyzing in-vitro dissolution studies for different drugs as per the standards.
PDR501	CO-1	Understanding various approaches to drug discovery, developments and requirements of drug regulatory bodies at national and international level.
	CO-2	Demonstrating various phases of clinical trials and various methods of post marketing surveillance.
	CO-3	Applying good clinical practice as per ICH guidelines.
	CO-4	Designing clinical study documents and safety monitoring in clinical trials.
PDR502	CO-1	Understanding the concept of pharmacoepidemiology and pharmacoconomics.

	CO-2	Identifying risk factors related to the occurrence of disease.
	CO-3	Comparing the costs and outcomes of pharmaceutical products and services to reduce monetary burden on the consumers.
	CO-4	Evaluating out comes based case study reports to minimize cost of drug therapy.
PDR503	CO-1	Understanding the concept of clinical pharmacokinetics.
	CO-2	Computing dosage regimen using pharmacokinetic data.
	CO-3	Interpreting drug interactions and monitoring individual drug therapy.
	CO-4	Practicing different approaches for dosage adjustment in patients with different pathophysiologic conditions.
PDR551	CO-1	Familiarizing with various clinical aspects by interacting with patients and healthcare professionals.
	CO-2	Developing pharmaceutical care skills during clerkship.
PDR552	CO-3	Developing research questions and methodology.
	CO-4	Developing data collection, analysis, reporting skills in the area of community, hospital and clinical pharmacy.