



VIGNAN

INSTITUTE OF PHARMACEUTICAL TECHNOLOGY

(Approved By AICTE, PCI New Delhi & Affiliated to JNTUK - Kakinada)

An ISO 9001:2015, ISO 14001:2015 & OHSAS 18001:2007 Certified Institution

Program Outcomes:

Program outcomes are statements conveying the intent of a program of study. Specifically, program outcomes refer to what a student should know or be able to do at the end of a program. They are often seen as the knowledge and skills students will have obtained by the time they have received their intended degree.

Program Outcomes for M.Pharmacy (Pharmacology) Program

- PO1 Pharmacy knowledge:** Apply fundamental understanding of pharmaceutical sciences and exhibit proficiency in gathering, organizing, and utilizing up-to-date data to effectively address and resolve challenges.
- PO2 Professional Identity:** Demonstrate dedication and accountability by actively engaging in community initiatives and fostering social empowerment.
- PO3 Drug Expertise:** Analyze different categories of medications and their mechanisms of action in order to discover solutions for multiple illnesses.
- PO4 Usage of modern tools:** Utilize, choose, and employ suitable methods, materials, and contemporary devices and technology, such as forecasting and simulation, for intricate pharmaceutical tasks while acknowledging their constraints.
- PO5 Research Skill:** Acquire technological knowledge in one or more domains of pharmaceutical sciences.
- PO6 Collaborative and Multidisciplinary work:** Apply critical thinking skills, including investigation, application, analysis, creativity, evaluation of information, data and documents related to research investigation.
- PO7 Entrepreneurship:** Acquire the ability to publicize the research outcomes useful to government, pharmaceutical industries, health care providers and the community. Possess the ability to identify business Opportunities and initiate entrepreneurship.
- PO8 Ethical Practices and Social Responsibility:** Acquire knowledge of ethics of research, consideration of the impact of research outcomes on professional practices and an understanding of responsibility to contribute to the community for sustainable development of society.
- PO9 Statistical Skills:** Apply and analyze quantitative metrics to gain safety data on dosage, also to compare the effectiveness among experimental groups.
- PO10 Life-long Learning:** Understand and apply the concepts in day-to-day life activities for the benefit of self and for the welfare of society and its concerns.

Course Outcomes:

Course Outcomes are narrower statements that describe what students are expected to know, and be able to do at the end of each course. These relate to the skills, knowledge, and behaviour that students acquire in their enrolment through the course.

Name of the Course	Course Code	Course Outcome Code	Course Outcome Statements
Modern Pharmaceutical Analytical Techniques	MPL101T	MPL101T.1	Explain general principles and theory of spectroscopy
		MPL101T.2	Recognise the basic instrumentation of HPTLC, HPLC, GC for identification, and characterization of compounds
		MPL101T.3	Understand the basic concept, instrumentation and separation of Chromatographic techniques
		MPL101T.4	Know about the basic principles and instrumentation of fluorimeter and atomic absorption spectrometer
		MPL101T.5	Learn the principle, instrumentation and applications of electrophoresis and X ray crystallography
		MPL101T.6	Perceive the fundamentals of immunological assays
Advanced Pharmacology-I	MPL102T	MPL102T.1	Explain the Pharmacokinetic and Pharmacodynamic aspects of drugs including quantization of drug receptor interaction.
		MPL102T.2	Illustrate the Neurohumoral transmission in Autonomic nervous system and central nervous system.
		MPL102T.3	Discuss the Pharmacology of drugs at cellular and molecular level
		MPL102T.4	Describe the Pathophysiology and Pharmacotherapy of certain diseases
		MPL102T.5	Understand the Physiological and Pathophysiological role of Autocoids
		MPL102T.6	Understand the Advanced treatment for Neurodegenerative disorders
Pharmacological and Toxicological Screening Methods-I	MPL103T	MPL103T.1	Appraise the regulation and guideline regarding animal handling and usage
		MPL103T.2	Demonstrate the use of various animals in screening methods
		MPL103T.3	Identify the new and novel screening methods for drug discovery process
		MPL103T.4	Corelate and extrapolate the preclinical data to human regimen
		MPL103T.5	Explain various good clinical practices useful in drug discovery process
		MPL103T.6	Demonstrate the maintenance and handling of experimental animals as per guidelines

Cellular and Molecular Pharmacology	MPL104T	MPL104T.1	Understood the fundamental knowledge on the structure and functions of cellular components.
		MPL104T.2	Appreciate and apply the interaction of these components with drugs in drug discovery process
		MPL104T.3	Explain the receptor signal transduction processes and molecular pathway affected by drugs
		MPL104T.4	Appreciate the applicability of molecular pharmacology and biomarkers in drug discovery process.
		MPL104T.5	Explain the types and applications of Immunotherapeutics.
		MPL104T.6	Demonstrate molecular biology techniques as applicable for pharmacology.
Pharmacology Practical-I	MPL105PA	MPL105PA.1	Analyse different compounds and their formulations using UV Visible spectrophotometer
		MPL105PA.2	Explain animal restraining, routes of drug administration, anaesthesia and euthanasia blood and tissue sampling techniques
		MPL105PA.3	Evaluate CNS stimulant, depressant, anti-anxiety and anticonvulsant activities
		MPL105PA.4	Evaluate different antiulcer, analgesic, anti-inflammatory, analgesic and local anaesthetic studies.
		MPL105PA.5	Evaluate diuretic activity.
		MPL105PA.6	Estimate oral glucose tolerance test.
Pharmacology Practical-II	MPL105PB	MPL105PB.1	To isolate & identify the DNA & RNA from various sources like bacteria, cauliflower and onion
		MPL105PB.2	Estimate RNA /DNA by UV spectroscopy & proteins by Bradford/lowry's in biological samples
		MPL105PB.3	Understand the Cell viability tests, enzyme based invitro assays, enzyme inhibition and enzyme induction activity
		MPL105PB.4	Understand the gene amplification by PCR and protein quantification western blotting
		MPL105PB.5	Extraction and estimation of drugs from various biological samples and biological fluids by using different analytical techniques like UV and HPLC
		MPL105PB.6	Pharmacokinetic studies and data analysis of drugs given by different routes administration using different software's
Seminar/ Assignment	MPL106S	MPL106S.1	Demonstrate proficiency in gathering, organizing, and utilizing up-to-date data for problem-solving in the field of Pharmacy.
		MPL106S.2	Contribute to social empowerment and exhibit qualities of a responsible pharmacy professional.
		MPL106S.3	Analyze different categories of medications and their mechanisms of action and apply this knowledge to discover solutions for various illnesses.
		MPL106S.4	Choose and employ suitable methods, materials, and contemporary devices and technology for pharmaceutical tasks
		MPL106S.5	Acquire Pharmacy knowledge demonstrate proficiency in research methodologies and techniques relevant to their field of study.
		MPL106S.6	Apply critical thinking skills, including investigation, analysis, creativity, and evaluation of research-related information and data.

Advanced Pharmacology-II	MPL201T	MPL201T.1	Apply the cellular and molecular mechanism in drug discovery process
		MPL201T.2	Understand the importance of microbial agents' mechanism in regimen design
		MPL201T.3	Demonstrate the endocrinal hormone applicability in replacement therapy
		MPL201T.4	Estimate the role of radicals in progression of various metabolic disease
		MPL201T.5	Explain the pathogenesis of neurodegenerative disease due to radical generations
		MPL201T.6	Identify the possible cause and prognosis in gastrointestinal diseases
Pharmacological and Toxicological Screening Methods-II	MPL202T	MPL202T.1	Explain the basics and the types of toxicology
		MPL202T.2	Enumerate the regulatory guidelines (ICH, OECD, EPA and Schedule-Y) required to perform preclinical toxicity studies in laboratories
		MPL202T.3	Describe in detail about various methods employed in drug discovery and development
		MPL202T.4	Enumerate reproductive toxicology studies and genotoxicity studies
		MPL202T.5	Identify the role and importance of IND submission in drug discovery
		MPL202T.6	Explain the importance of toxicokinetic and alternative methods to animal toxicity testing
Principals of Drug Discovery	MPL203T	MPL203T.1	Describe in detail about various stages involved in modern drug discovery process
		MPL203T.2	Explain the role of various elements in target discovery and validation
		MPL203T.3	Explain Lead Identification methods and computational protein structure prediction
		MPL203T.4	Describe in detail about the concept of Rational Drug Design
		MPL203T.5	Explain the concept of molecular docking and its applications
		MPL203T.6	Explain the concept of QSAR, its statistical methods and prodrug design
Clinical Research and Pharmacovigilance	MPL204T	MPL204T.1	Explain the Principles of ICH-GCP, ICMR Schedule Y guidelines and the Ethical Principles governing Informed consent Process
		MPL204T.2	Discuss the roles and responsibilities of various Clinical Trail Personnel involved in Clinical trails
		MPL204T.3	Enumerate various guidelines for the Preparation of Essential Documents in Clinical Trail.
		MPL204T.4	Interpret various methods for ADR reporting and tools used in Pharmacovigilance
		MPL204T.5	Understand the types of adverse drug reactions, Management and terminologies of ADR
		MPL204T.6	Understand the Principles of Pharmacovigilance, Pharmacoeconomics and safety Pharmacology.

Pharmacology Practical-III	MPL205PA	MPL205PA.1	To record the DRC of agonist using suitable isolated tissue preparations
		MPL205PA.2	To study the effects of antagonist / potentiating agents on DRC of agonist using suitable isolated tissue preparations
		MPL205PA.3	To determine strength of unknown sample by matching bioassay by using suitable isolated tissue preparations
		MPL205PA.4	To determine strength of unknown sample by bracketing bioassay by using suitable isolated tissue preparations
		MPL205PA.5	To determine strength of unknown sample by interpolation, multiple point bioassay by using suitable isolated tissue preparations
		MPL205PA.6	Recording BP, ECG, HR of rat
Pharmacology Practical-IV	MPL205PB	MPL205PB.1	Demonstrate the Drug absorption studies by averted ileum Preparation
		MPL205PB.2	Experiment the acute oral toxicity, acute dermal toxicity and Repeated dose toxicity studies as per OECD guidelines
		MPL205PB.3	Understand the designing of Clinical trial protocol and ADR monitoring Protocol.
		MPL205PB.4	Evaluate Drug mutagenicity study using mice bone-marrow chromosomal aberration
		MPL205PB.5	Using In-silico docking studies/pharmacophore-based screening/QSAR studies
Seminar/ Assignment	MPL206S	MPL206S.1	Demonstrate proficiency in gathering, organizing, and utilizing up-to-date data for problem-solving in the field of Pharmacy.
		MPL206S.2	Contribute to social empowerment and exhibit qualities of a responsible pharmacy professional.
		MPL206S.3	Analyze different categories of medications, their mechanisms of action and apply this knowledge to discover solutions for various illnesses.
		MPL206S.4	Choose and employ suitable methods, materials, and contemporary devices and technology for pharmaceutical tasks
		MPL206S.5	Acquire Pharmacy knowledge demonstrate proficiency in research methodologies and techniques relevant to their field of study.
		MPL206S.6	Apply critical thinking skills, including investigation, analysis, creativity, and evaluation of research-related information and data.
Research Methodology and Biostatistics*	MRM301T	MRM301T.1	Explain qualitative and quantitative aspects of clinical study design
		MRM301T.2	Interpret Various Biostatistical methods in Experimental Pharmacological studies
		MRM301T.3	Describe various ethical guidelines for biomedical research.
		MRM301T.4	Enumerate various CPCSEA guidelines for laboratory animal facility.
		MRM301T.5	Discuss the principals of Declaration of Helsinki for Medical Research.
		MRM301T.6	Understand Research writing and Review of Literature

Journal Club	MRM302S	MRM302S.1	Understanding and debating current topics of active interest in their field
		MRM302S.2	Apply skills to use search engines for selection of scientific articles of their interest
		MRM302S.3	Analyze the critical thinking skills in appraisal of the scientific literature
		MRM302S.4	Create a scientific report on the critically appraised article
		MRM302S.5	Evaluate detailed knowledge of a specific area of research including the literature published in that area, its underlying concepts, theories and assumptions.
		MRM302S.6	Apply ability to write various types of manuscripts
Discussion and Presentation	MRM303S	MRM303S.1	Identify relevant information, defining and explaining topics under discussion
		MRM303S.2	Demonstrate complexity, insight, cogency, independent thought, relevance and persuasiveness
		MRM303S.3	Demonstrate Command of voice modulation, voice projection, and pacing to support their presentation
		MRM303S.4	Evaluate information and use and apply relevant theories.
		MRM303S.5	Demonstrate breadth of reading, use sources, show independence and flexibility of thought
		MRM303S.6	Analyze and Demonstrate problem solving skills and apply theoretical knowledge
Research Work and Colloquium	MRM304S	MRM304S.1	Identify and discuss the role, importance and concepts to the research process in pharmacology
		MRM304S.2	Discuss the complex issues in selecting a research problem, selecting an appropriate research design, and implementing a research project.
		MRM304S.3	Identify and discuss the concepts and procedures of sampling, data collection, analysis and reporting.
		MRM304S.4	Establish motivation for any topic of interest and develop a thought process for technical presentation.
		MRM304S.5	Organize a detailed literature survey and build a document with respect to technical publications. Analysis and comprehension of proof-of-concept and related data.
		MRM304S.6	Analysis and comprehension of proof-of-concept and related data and Make use of new and recent technology for creating technical reports
Journal Club	MRM401P	MRM401P.1	Understanding and debating current topics of active interest in their field.
		MRM401P.2	Apply skills to use search engines for selection of scientific articles of their interest.
		MRM401P.3	Analyze the critical thinking skills in appraisal of the scientific literature.
		MRM401P.4	Create a scientific report on the critically appraised article.
		MRM401P.5	Evaluate detailed knowledge of a specific area of research including the literature published in that area, its underlying concepts, theories and assumptions.
		MRM401P.6	Apply ability to write various types of manuscripts

Discussion and Presentation	MRM403P	MRM403P.1	Identify relevant information, defining and explaining topics under discussion
		MRM403P.2	Demonstrate complexity, insight, cogency, independent thought, relevance and persuasiveness
		MRM403P.3	Demonstrate Command of voice modulation, voice projection, and pacing to support their presentation
		MRM403P.4	Evaluate information and use and apply relevant theories.
		MRM403P.5	Demonstrate breadth of reading, use sources, show independence and flexibility of thought
		MRM403P.6	Analyze and Demonstrate problem solving skills and apply theoretical knowledge
Research Work and Colloquium	MRM404P	MRM404P.1	Identify and discuss the role, importance and concepts to the research process in pharmacology
		MRM404P.2	Discuss the complex issues in selecting a research problem, selecting an appropriate research design, and implementing a research project.
		MRM404P.3	Identify and discuss the concepts and procedures of sampling, data collection, analysis and reporting.
		MRM404P.4	Establish motivation for any topic of interest and develop a thought process for technical presentation.
		MRM404P.5	Organize a detailed literature survey and build a document with respect to technical publications. Analysis and comprehension of proof-of-concept and related data.
		MRM404P.6	Analysis and comprehension of proof-of-concept and related data and Make use of new and recent technology for creating technical reports