M.Pharm Pharmaceutics Program outcome (MPH)	
PO1(MPH)	PO1(MPH): To Understand the principles of novel drug delivery system and apply the same for the fabrication of cost effective, efficacious, and patient compliant dosage form.
PO2(MPH)	PO2(MPH): To Understand the concepts of pre-formulation and its importance in developing a quality, efficacious, safe and stable dosage form and gain knowledge in performing various analytical techniques using different equipments and instruments.
PO3(MPH)	PO3(MPH): To Gain knowledge of drug and cosmetics regulatory process in India and other countries. To comprehend the computer aided drug development process using various PK-PD soft wares and understand the basic concepts of bio pharmaceutics & pharmacokinetics and its Problem solving techniques.
PO4(MPH)	PO4(MPH): To Attain hands-on training in handling various analytical equipment; perform pre-formulation studies, and formulation of cosmetics and novel drug delivery system,usage of pharmacokinetics softwares and hands-on training in the formulation of cosmetics and cosmoceuticals. Ability to understand research methodology and conduct research work and its presentation

M.Pharm Pharmaceutics Course outcome

M.Pharm Pharmaceutics Course outcome	
ID	**OUTCOME**
CO1(MPH)	To understand theoretical and practical skills of handling various instruments
CO2(MPH)	To gain knowledge in formulation and evaluation of novel drug delivery systems. To get hands-on training in formulating, systemic and targeted novel drug delivery system.

CO3(MPH)	Able to understand the elements of pre-formulation studies, optimisation of formulations, GMP and pilot plant techniques. To study the compression & compaction of tablets and consolidation parameters using various statistical tests.
CO4(MPH)	Gain knowledge in documentation and drug approval process in India and abroad. Understand dossiers and protocols related to Clinical and non-clinical drug development
CO5(MPH)	Ability to analyse drugs and formulations using various instruments. Ability to perform various pre-formulation studies. Gain knowledge in formulation and evaluation of novel dosage forms.
CO6(MPH)	To gain knowledge in understanding basics of bio pharmaceutics & pharmacokinetics, its calculations and applications. To understand the concept of in vitro, in vivo drug product performances.
CO7(MPH)	To understand the basics of computers in drug development. To understand the principles of QBD, optimisation of formulations, computer simulations, biopharmaceutical characterisation and artificial intelligence in drug design.
CO8(MPH)	To understand the formulation and evaluation of synthetic & herbal cosmetics and cosmeceuticals. Gain knowledge in the cosmetics regulatory process, biological aspects of skin & skin care products. Able to understand various pharmaceutical automation
CO9(MPH)	ability to understand research methodologies, biostatistical tools that can be employed in research, various medical care protocols, CPCSEA guidelines for laboratory animals.
CO10(MPH)	Ability to understand the details of a journal and its importance along with protocols of writing a journal.
CO11(MPH)	Ability to acquire freedom to express their ideas and thoughts of their perspective in choosing a project of their own interest under the supervision of respective guides.
CO12(MPH)	Ability to explain their research projects through seminars, along with their thesis, in partial fulfillment for the award of their post-graduation degree

M.Pharm Pharmaceutics - Program outcome and course outcome Map

I- SEMESTER			
Code:MPC:101T - Sub: MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES (MPAT)MPAT			
	PO1(MPH)	**PO2(MPH)**	**PO3(MPH)**	**PO4(MPH)**

	PO1(MPH)	**PO2(MPH)**	**PO3(MPH)**	**PO4(MPH)**
CO1(MPH)		X	X	
CO2(MPH)				
CO3(MPH)				
CO4(MPH)				
CO5(MPH)		X	X	
CO6(MPH)				
CO7(MPH)				
CO8(MPH)				
CO9(MPH)				
CO10(MPH)				
CO11(MPH)				
CO12(MPH)				
Code:MPH:102T - Sub: Drug delivery System (DDS)				
	PO1(MPH)	**PO2(MPH)**	**PO3(MPH)**	**PO4(MPH)**
CO1(MPH)				
CO2(MPH)	X			
CO3(MPH)				
CO4(MPH)				
CO5(MPH)	X			

	PO1(MPH)	PO2(MPH)	PO3(MPH)	PO4(MPH)
CO6(MPH)				
CO7(MPH)				
CO8(MPH)				
CO9(MPH)				
CO10(MPH)				
CO11(MPH)				
CO12(MPH)				

	Code:MPH:103T- Sub: Modern Pharmaceutics (MP)			
	PO1(MPH)	**PO2(MPH)**	**PO3(MPH)**	**PO4(MPH)**
CO1(MPH)				
CO2(MPH)				
CO3(MPH)	X	X	X	
CO4(MPH)				
CO5(MPH)	X	X	X	
CO6(MPH)				
CO7(MPH)				
CO8(MPH)				
CO9(MPH)				
CO10(MPH)				
CO11(MPH)				
CO12(MPH)				
Code:MPH:104T- Sub: Regulatory affairs (RA)				

![G. Pulla Reddy College of Pharmacy logo]
G. Pulla Reddy College of Pharmacy
ISO 9001 - 2000 Certified College
(Affiliated to Osmania University and Approved by AICTE & PCI)
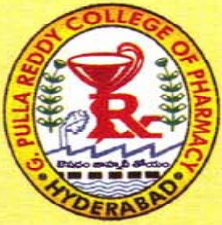
	PO1(MPH)	PO2(MPH)	PO3(MPH)	PO4(MPH)
CO1(MPH)				
CO2(MPH)				
CO3(MPH)				X
CO4(MPH)				
CO5(MPH)				X
CO6(MPH)				
CO7(MPH)				X
CO8(MPH)				
CO9(MPH)				
CO10(MPH)				
CO11(MPH)				
CO12(MPH)				

Code:MPA:105TP- Sub: PHARMACEUTICS PRACTICAL I

	PO1(MPH)	PO2(MPH)	PO3(MPH)	PO4(MPH)
CO1(MPH)	X	X		X
CO2(MPH)	X	X		X
CO3(MPH)		X		X
CO4(MPH)				
CO5(MPH)		X		X
CO6(MPH)				
CO7(MPH)				
CO8(MPH)				

CO9(MPH)			
CO10(MPH)			
CO11(MPH)			
CO12(MPH)			

II- SEMESTER			
Code:MPH: 201T - Sub: MOLECULAR PHARMACEUTICS (NANO TECHNOLOGY & TARGETED DDS) (NTDS)			
	PO1(MPH)	**PO2(MPH)**	**PO3(MPH)**	**PO4(MPH)**
CO1(MPH)				
CO2(MPH)	X			X
CO3(MPH)				
CO4(MPH)				
CO5(MPH)				
CO6(MPH)				
CO7(MPH)				
CO8(MPH)				
CO9(MPH)				
CO10(MPH)				
CO11(MPH)				
CO12(MPH)				
Code:MPH:202T - Sub: Advanced Biopharmaceutics and pharmacokinetics (ABBK)				
	PO1(MPH)	**PO2(MPH)**	**PO3(MPH)**	**PO4(MPH)**
CO1(MPH)				

CO2(MPH)				
CO3(MPH)				
CO4(MPH)				
CO5(MPH)				
CO6(MPH)			X	
CO7(MPH)			X	
CO8(MPH)				
CO9(MPH)				
CO10(MPH)				
CO11(MPH)				
CO12(MPH)				
Code:MPH:203T- Sub: Computer aided drug design (CADD)				
	PO1(MPH)	PO2(MPH)	PO3(MPH)	PO4(MPH)
CO1(MPH)				
CO2(MPH)				
CO3(MPH)				
CO4(MPH)				
CO5(MPH)				
CO6(MPH)				
CO7(MPH)				X
CO8(MPH)				X
CO9(MPH)				
CO10(MPH)				

	PO1(MPH)	PO2(MPH)	PO3(MPH)	PO4(MPH)
CO11(MPH)				
CO12(MPH)				
Code:MPH:204T- Sub: cosmetics and cosmeceuticals (CC)				
	PO1(MPH)	PO2(MPH)	PO3(MPH)	PO4(MPH)
CO1(MPH)				
CO2(MPH)				
CO3(MPH)				
CO4(MPH)				
CO5(MPH)				
CO6(MPH)				
CO7(MPH)				
CO8(MPH)			X	X
CO9(MPH)				
CO10(MPH)				
CO11(MPH)				
CO12(MPH)				
Code:MPA:205TP- Sub: PHARMACEUTICS PRACTICAL II				
	PO1(MPH)	PO2(MPH)	PO3(MPH)	PO4(MPH)
CO1(MPH)				
CO2(MPH)	X	X		X
CO3(MPH)				
CO4(MPH)				
CO5(MPH)	X	X		X

CO6(MPH)	X	X		X
CO7(MPH)	X	X		X
CO8(MPH)	X	X		**X**
CO9(MPH)				
CO10(MPH)				
CO11(MPH)				
CO12(MPH)				
III- SEMESTER				
Code:MPH:301T - Sub: Research methodology and Biostatistics (RMB)				
	PO1(MPH)	**PO2(MPH)**	**PO3(MPH)**	**PO4(MPH)**
CO1(MPH)				
CO2(MPH)				
CO3(MPH)				
CO4(MPH)				
CO5(MPH)				
CO6(MPH)				
CO7(MPH)				
CO8(MPH)				
CO9(MPH)				X
CO10(MPH)				X
CO11(MPH)				
CO12(MPH)				
Discussion/Presentation (Proposal Presentation)				

	PO1(MPH)	PO2(MPH)	PO3(MPH)	PO4(MPH)
CO1(MPH)				
CO2(MPH)				
CO3(MPH)				
CO4(MPH)				
CO5(MPH)				
CO6(MPH)				
CO7(MPH)				
CO8(MPH)				
CO9(MPH)				
CO10(MPH)				X
CO11(MPH)				X
CO12(MPH)				X

Research Work

	PO1(MPH)	PO2(MPH)	PO3(MPH)	PO4(MPH)
CO1(MPH)				
CO2(MPH)				
CO3(MPH)				
CO4(MPH)				
CO5(MPH)				
CO6(MPH)				
CO7(MPH)				
CO8(MPH)				

CO9(MPH)				
CO10(MPH)				X
CO11(MPH)				X
CO12(MPH)				

SPECIFIC LEARNING OUTCOMES (SLO)- M.PHARM-PHARMACEUTICS– I Semester

ID	Unit / Topic	Outcome statement
M.PHARM-PHARMACEUTICS (MPH)	
Code:101T - MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES (MPAT)	
SLO1(MPH)	Spectroscopy	Ability to understand principles and instrumentation of UV-Vis, IR, Flame emission spectroscopy along withspectro fluorometry and their applications
SLO2(MPH)	NMR spectroscopy	To understand Principles, Instrumentation, Solvent requirements, chemical shifts of NMR; briefly about FT-NMR and 13CNMR
SLO3(MPH)	Mass spectroscopy	To understande Mass Spectroscopy, Ionization techniques, Fragmentation Rules, Mass Analysers, Applications
SLO4(MPH)	Chromatography	Ability to understand Detailed study of various types of Chromatographies (TLC, HPLC, HPTLC, GC, UPLC, etc), Electrophoresis, X-ray Crystallography
SLO5(MPH)	Immunological assays	To know about methods of advanced Instrumentation of Potentiometry and Thermal techniques (DSC, DTA, TGA)
CODE:102T- DRUG DELIVERY SYSTEM (DDS)	
SLO1(DDS)	Sustained Release(SR) and Controlled Release (CR) formulations	Understand basic concepts of novel drug delivery system
SLO2(DDS)	Sustained Release(SR) and Controlled Release (CR) formulations	Understand the principles of personalised medicines
SLO3(DDS)	Rate Controlled Drug Delivery Systems	Ability to understand theoritical principles of activation modulated system

SLO4(DDS)	Rate Controlled Drug Delivery Systems	Gain knowledge of mathematical models of activation modulated system
SLO5(DDS)	Gastro-Retentive Drug Delivery Systems	Understand basic prinicples of formulation and evaluation of gastrotetentive drug delivery system
SLO6(DDS)	Occular Drug Delivery System	understand Basic concepts of ocular drug delivery system
SLO7(DDS)	Transdermal Drug Delivery System	able to develop various approaches for the formulation and evaluation of transdermal drug delivery system
SLO8(DDS)	Protein and Peptide Delivery	able to develop formulations of macromolecules
SLO9(DDS)	Vaccine delivery system	Understand the principles of vaccine drug delivery system
CODE:103T- MODERN PHARMACEUTICS (MP)		
SLO1(MP)	Preformulation concepts	Ability to understand elements of preformulation studies
SLO2(MP)	Optimization techniques in preformualtion studies	To understand the concepts and parameters of optimisation
SLO3(MP)	Validation	Ability to understand the principles of pharmaceutical validation
SLO4(MP)	cGMP and industrial management	To understand industrial business management and cGMP considerations
SLO5(MP)	Compression and compaction	Ability understand the physics of tablet compression
SLO6(MP)	Study of consolidation parameters	To understand the concept of dissolution and pharmacokintic parameters
CODE:104T- REGULATORY AFFAIRS(RA)		

SLO1(RA)	Documentation in	Able to Documents of various records in industry
SLO2(RA)	pharmaceutical industry	Able to understand Drug approval process
SLO3(RA)	Regulatory requirement	to understand the approval process for generic and new molecules
SLO4(RA)	for product approval	to understand the various regulatory filings in various countries
SLO5(RA)	Non clinical drug development	able understand submission of IND,NDA and ANDA
SLO6(RA)	Clinical trials	To understand clinical trial protocols
CODE:105T- PHARMACEUTICS PRACTICAL-I (PP-I)		
SLO1(PP)	Able to perform analysis of drugs using various analytical techniques	
SLO2(PP)	Able to formulate and evaluate novel drug delivery system	
SLO3(PP)	Able to perform preformulation studies for API	
SLO4(PP)	Able to understand different types of drug kinetics and its calculations	

SPECIFIC LEARNING OUTCOMES (SLO)- M.PHARM-PHARMACEUTICS– II Semester

M.PHARM-PHARMACEUTICS (MPH)		
Code:201T - MOLECULAR PHARMACEUTICS (NANO TECHNOLOGY & TARGETED DDS) (NTDS)		
ID	**Unit / Topic**	**Outcome statement**
SLO1(NTDS)	Targeted drug delivery system &Targeting methods	To understand the principles and concepts of targeted drug delivery systems
SLO2(NTDS)	Microcapsules and microspheres	To prepare and evaluate novel vesicular drug delivery system and microshperes

SLO3(NTDS)	Pulmonary drug delivery system	To understand the concepts of pulmonary drug delivery system
SLO4(NTDS)	Nucleic acid based drug delivery system	To understand the principles of nuclear drug delivery sytem
SLO5(NTDS)	Biodistribution and pharmacokinetics	To understand the theory of biodistribution and pharmacokinetics of antisense molecules
CODE:202T- ADVANCED BIOPHARMACEUTICS AND PHARMACOKINETICS (ABPPK)		
SLO1(ABPPK)	Drug absorption from GI tract	To understand the basic concepts in biopharmaceutics and pharmacokinetics.
SLO2(ABPPK)	Biopharmaceutical consideration I drug product design	ability touse raw data and derive the pharmacokinetic models and parameters the best describe the process of drug absorption, distribution, metabolism and elimination.
SLO3(ABPPK)	Drug product performance invivo	To critically evaluate of biopharmaceutic studies involving drug product equivalency.
SLO4(ABPPK)	Pharmacokinetics	Ability to design and evaluate of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.
SLO5(ABPPK)	Application of Pharmacokinetics	Ability to derive potential clinical pharmacokinetic problems and understand the application of pharmacokinetics of different dosage forms
CODE:203T- COMPUTER AIDED DRUG DESIGN (CADD)		
SLO1(CADD)	Computers in pharmaceutical research in development	To understand the usage of computers in pharmaceutical research and QBD principles in industry

SLO2(CADD)	Computationl modelling of drug disposition	to understand the use of computers in drug disposition modeling and and preclinical development
SLO3(CADD)	Computer aided formulation development	formulations using various softwares and techniques
SLO4(CADD)	Computer aided biopharmaceutical charaterization	ability to understand the use of Computers in clinical development
SLO5(CADD)	Artifical intellingence, Robotics and CFD	able to know pharmaceutical automation
CODE:204T- COSMETICS AND COSMECEUTICALS		
SLO1(CADD)	Computers in pharmaceutical research in development	To understand the usage of computers in pharmaceutical research and QBD principles in industry
SLO2(CADD)	Computationl modelling of drug disposition	To understand the use of computers in drug disposition modeling and and preclinical development
SLO3(CADD)	Computer aided formulation development	Formulations using various softwares and techniques
SLO4(CADD)	Computer aided biopharmaceutical	Ability to understand the use of Computers in clinical development

	charaterization	
SLO5(CADD)	Artifical intellingence, Robotics and CFD	Able to know pharmaceutical automation

CODE:205T- PHARMACEUTICS PRACTICAL-I (PP-II)	
SLO1(PPII)	Able to prepare and evaluate various novel drug delivery system
SLO2(PPII)	Able to perform various biopharmaceutical and pharmacokinetic experiments and calculations
SLO3(PPII)	Able to use various statistical and DoE softwares for optimisation of formulations
SLO4(PPII)	To design, formulate and evaluate cosmetics and cosmeceutical preparations

M.PHARM PHARMACEUTICS (MPH) - III SEMESTER		
Code:301T - RESEARCH METHODOLOGY AND BIO STATISTICS		
ID	Unit/Topic	Outcome statement
SLO1(RMB)	Unit I	To Understand General research methodology
SLO2(RMB)	Unit II	Ability to acquire knowledge in Biostatistics
SLO3(RMB)	Unit III	Ability to Detail protocols of Medical research
SLO4(RMB)	Unit IV	To have Clear perspective of CPCSEA guidelines for laboratory animal facilities
SLO5(RMB)	Unit V	To understand the declaration of Helsinki rule, additional principles combined with medical care

M.PHARM-PHARMACEUTICS- I-SEMESTER						
	CO1	CO2	CO3	CO4	CO5	CO6
SLO1(MPAT)	x					
SLO2(MPAT)						
SLO3(MPAT)						

SLO4(MPAT)					
SLO5(MPAT)					
SLO1(DDS)		X			X	
SLO2(DDS)		X			X	
SLO3(DDS)		X			X	
SLO4(DDS)		X			X	
SLO5(DDS)		X			X	
SLO6(DDS)		X			X	
SLO7(DDS)		X			X	
SLO8(DDS)		X			X	
SLO9(DDS)		X			X	
SLO1(MP)			X		X	
SLO2(MP)			X			
SLO3(MP)			X			
SLO4(MP)			X			
SLO5(MP)			X			
SLO6(MP)			X			
SLO7(MP)			X			
SLO8(MP)			X			
SLO9(MP)			X			
SLO1(RA)				X		
SLO2(RA)				X		
SLO3(RA)				X		

	CO1	CO2	CO3	CO4	CO5	CO6	CO7	CO8	CO9
SLO4(RA)						X		X	
SLO5(RA)						X			
SLO6(RA)						X			
SLO1(PP-I)	X								
SLO2(PP-I)		X							
SLO3(PP-I)			X						
SLO4(PP-I)								X	

II-SEMESTER									
	CO1	CO2	CO3	CO4	CO5	CO6	CO7	CO8	CO9
SLO1(NTDS)		X							
SLO2(NTDS)		X							
SLO3(NTDS)		X							
SLO4(NTDS)		X							
SLO5(NTDS)		X				X			
SLO1(ABPPK)						X	X		
SLO2(ABPPK)						X	X		
SLO3(ABPPK)						X	X		
SLO4(ABPPK)						X	X		
SLO5(ABPPK)						X	X		
SLO1(CADD)						X			
SLO2(CADD)						X			
SLO3(CADD)						X			

SLO4(CADD)					X			
SLO5(CADD)						X		
SLO1(CC)							X	
SLO2(CC)							X	
SLO3(CC)							X	
SLO4(CC)							X	
SLO5(CC)							X	
SLO1(PP-II)	X							
SLO2(PP-II)					X			
SLO3(PP-II)						X		
SLO4(PP-II)							X	
III SEMESTER								
SLO1(RMB)								X
SLO2(RMB)								X
SLO3(RMB)								X
SLO4(RMB)								X
SLO5(RMB)								X