



# G. Pulla Reddy College of Pharmacy

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<b>2.6.1. The Institution has stated the learning outcomes (generic and programme-specific) and graduate attributes as per the provisions of the Regulatory bodies and the University; which are communicated to the students and teachers through the website and other documents</b>	
Provide details of the stated learning outcomes for each programme / course as stipulated by the appropriate Regulatory bodies and the University and the methods followed by the Institution for assessment of the same within 500 words.	
<b>Provide Weblink to:</b> Relevant documents pertaining to learning outcomes and graduate attributes <ul style="list-style-type: none"><li>· Methods of the assessment of learning outcomes and graduate attributes</li><li>· Upload Course Outcomes for all courses (exemplars from Glossary)</li></ul> Any other relevant information	
<b>M.Pharm - PHARMACOLOGY Program outcome (MPL)</b>	
<b>PO1(MPL)</b>	To understand the basic concepts and perform the experiments on analytical techniques, molecular pharmacology, pharmacology of various drugs and their screening techniques.
<b>PO2(MPL)</b>	To understand the basic concepts and perform the experiments on Insilco drug design, clinical research, ADR monitoring, pharmacology of various drugs and toxicological screening techniques..
<b>PO3(MPL)</b>	To gain knowledge the on research methodology. ethics in research, biostatistics and able to design the experimental methods
<b>PO4(MPL)</b>	To gain the knowledge in various experimental techniques in pharmacology and able to understand the presentation and interpretation data



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## M.Pharm Pharmacology Course outcome

M.Pharm Pharmacology Course outcome	
ID	OUTCOME
CO1(MPL):	Able to know the basic concepts of analytical techniques and theoretical skills of the analytical instruments
CO2(MPL):	Able to understand the basic pharmacology and gain the knowledge on pharmacology of drugs used in various diseases.
CO3(MPL):	Gain the knowledge on various screening techniques used drug discovery process and regulatory guidelines on usage of experimental animals.
CO4(MPL):	Able to understand the basic concepts in cellular and molecular pharmacology and their importance in drug discovery process.
CO5(MPL):	Able to perform various experiments on analysis of drugs in formulation, screening of drug activity by using suitable in vivo and in vitro techniques.
CO6(MPL):	Able to improve the compilation, interpretation and presentation skills.
CO7(MPL)	Able to understand the mechanism of action, adverse effects, contraindications, clinical uses of drugs used in treatment of various diseases.
CO8(MPL)	Appreciate the importance of ethical and regulatory requirements for toxicity studies.
CO9(MPL)	Gain the knowledge on various novel techniques for target identification and lead optimisation
CO10(MPL)	Able to understand the clinical trial process and principles of pharmacovigilance
CO11(MPL)	Able to perform various qualitative and quantitative techniques to measure drug activity by using suitable in vivo and in vitro techniques.
CO12(MPL)	Gain the knowledge in various experimental techniques in pharmacology and able to understand the presentation and interpretation data
CO13(MPL)	Gain the idea about research methodologies, biostatistical tools that can be employed in research, various medical care



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	protocols, CPCSEA guidelines for laboratory animals.
<b>CO14(MPL)</b>	Able to understand the details of a journal and its importance along with protocols of writing a journal.
<b>CO15(MPL)</b>	Able to express their ideas and thoughts of their perspective in choosing a project of their own interest under the supervision of respective guides.
<b>CO16(MPL)</b>	Able to gain the knowledge from all concerned faculty and the principal, students finalized their area of research and proceeded with the work.
<b>CO17(MPL)</b>	Able to publish papers in various national and international journals approved by UGC.
<b>CO18(MPL)</b>	Able to work rigorously to conclude their respective research projects and engaged themselves in drafting thesis
<b>CO19(MPL)</b>	Able to explain their research projects through seminars, along with their thesis, in partial fulfillment for the award of their post-graduation degree
<b>CO20(MPL)</b>	Able to compete in various national and international seminars/conferences with innovative research ideas. They also took up trainings and workshops to enhance their practical skills.

## M.Pharm Pharmacology - Program outcome and course outcome Map

I- SEMESTER				
Code:MPC:101T - Sub: MPAT				
	PO1(MPL)	PO2(MPL)	PO3(MPL)	PO4(MPL)
<b>CO1(MPL)</b>	X			
<b>CO2(MPL)</b>				
<b>CO3(MPL)</b>				
<b>CO4(MPL)</b>				
<b>CO5(MPL)</b>				
<b>CO6(MPL)</b>				



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Code:MPL:102T - Sub: AP-I				
	PO1(MPL)	PO2(MPL)	PO3(MPL)	PO4(MPL)
CO1(MPL)				
CO2(MPL)	X			
CO3(MPL)				
CO4(MPL)				
CO5(MPL)				
CO6(MPL)				
Code:MPL:103T- Sub: PTSM				
	PO1(MPL)	PO2(MPL)	PO3(MPL)	PO4(MPL)
CO1(MPL)				
CO2(MPL)				
CO3(MPL)	X			
CO4(MPL)				
CO5(MPL)				
CO6(MPL)				
Code:MPL:104T- Sub: CAMP				
	PO1(MPL)	PO2(MPL)	PO3(MPL)	PO4(MPL)
CO1(MPL)				
CO2(MPL)				
CO3(MPL)				
CO4(MPL)	X			
CO5(MPL)				





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CO6(MPL)				
<b>Code:MPL:105TP- Sub: PHARMACOLOGY PRACTICAL I (PP-I)</b>				
	PO1(MPL)	PO2(MPL)	PO3(MPL)	PO4(MPL)
CO1(MPL)				
CO2(MPL)				
CO3(MPL)				
CO4(MPL)				
CO5(MPL)	X			
CO6(MPL)				
<b>SEMINAR/ASSIGNMENT</b>				
	PO1(MPL)	PO2(MPL)	PO3(MPL)	PO4(MPL)
CO1(MPL)				
CO2(MPL)				
CO3(MPL)				
CO4(MPL)				
CO5(MPL)				
CO6(MPL)	X			

<b>II- SEMESTER</b>				
<b>Code:MPL: 201T - Sub: AP-II</b>				
	PO1(MPL)	PO2(MPL)	PO3(MPL)	PO4(MPL)
CO7(MPL)		X		



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CO8(MPL)				
CO9(MPL)				
CO10(MPL)				
CO11(MPL)				
CO12(MPL)				
<b>Code:MPL:202T - Sub: PTSM-II</b>				
	<b>PO1(MPL)</b>	<b>PO2(MPL)</b>	<b>PO3(MPL)</b>	<b>PO4(MPL)</b>
CO7(MPL)		X		
CO8(MPL)				
CO9(MPL)				
CO10(MPL)				
CO11(MPL)				
CO12(MPL)				
<b>Code:MPL:203T- Sub: PDD</b>				
	<b>PO1(MPL)</b>	<b>PO2(MPL)</b>	<b>PO3(MPL)</b>	<b>PO4(MPL)</b>
CO7(MPL)				
CO8(MPL)		X		
CO9(MPL)				
CO10(MPL)				
CO11(MPL)				
CO12(MPL)				
<b>Code:MPL:204T- Sub: CRPV</b>				
	<b>PO1(MPL)</b>	<b>PO2(MPL)</b>	<b>PO3(MPL)</b>	<b>PO4(MPL)</b>



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CO7(MPL)				
CO8(MPL)				
CO9(MPL)				
CO10(MPL)		X		
CO11(MPL)				
CO12(MPL)				
<b>Code:MPA:205TP- Sub: PHARMACEUTICS PRACTICAL II (PP-II)</b>				
	<b>PO1(MPL)</b>	<b>PO2(MPL)</b>	<b>PO3(MPL)</b>	<b>PO4(MPL)</b>
CO7(MPL)				
CO8(MPL)				
CO9(MPL)				
CO10(MPL)	X			
CO11(MPL)				
CO12(MPL)				
<b>III- SEMESTER</b>				
<b>Code:MPL:301T - Sub: RMB</b>				
	<b>PO1(MPL)</b>	<b>PO2(MPL)</b>	<b>PO3(MPL)</b>	<b>PO4(MPL)</b>
CO13(MPL)	X			
CO14(MPL)		X		
CO15(MPL)			X	
CO16(MPL)				X
<b>Discussion/Presentation (Proposal Presentation)</b>				
	<b>PO1(MPL)</b>	<b>PO2(MPL)</b>	<b>PO3(MPL)</b>	<b>PO4(MPL)</b>



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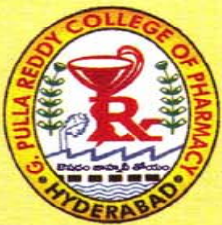
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CO13(MPL)				
CO14(MPL)				
CO15(MPL)			X	
CO16(MPL)			X	
<b>Research Work</b>				
	<b>PO1(MPL)</b>	<b>PO2(MPL)</b>	<b>PO3(MPL)</b>	<b>PO4(MPL)</b>
CO17(MPL)				X
CO18(MPL)				X
CO19(MPL)				X
CO20(MPL)				X





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

<b>M.PHARM-PHARMACOLOGY (MPL)</b>		
<b>Code:101T - MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES (MPAT)</b>		
<b>ID</b>	<b>Unit / Topic</b>	<b>Outcome statement</b>
<b>SLO1(MPAT)</b>	<b>Unit I</b>	Principles and instrumentation of UV-Vis, IR, Flame emission spectroscopy along with spectrofluorometry and their applications
<b>SLO2(MPAT)</b>	<b>Unit II</b>	Principles, Instrumentation, Solvent requirements, chemical shifts of NMR; briefly about FT-NMR and <sup>13</sup> CNMR
<b>SLO3(MPAT)</b>	<b>Unit III</b>	Understanding Mass Spectroscopy, Ionization techniques, Fragmentation Rules, Mass Analysers, Applications
<b>SLO4(MPAT)</b>	<b>Unit IV</b>	Detailed study of various types of Chromatographies (TLC, HPLC, HPTLC, GC, UPLC, etc), Electrophoresis, X-ray Crystallography
<b>SLO5(MPAT)</b>	<b>Unit V</b>	Advanced Instrumentation of Potentiometry and Thermal techniques (DSC, DTA, TGA)
<b>CODE:102T- ADVANCED PHARMACOLOGY-I (AP-I)</b>		
<b>SLO6(AP-I)</b>	<b>Unit I</b>	Able to understand the basic concepts of pharmacokinetics and pharmacodynamics
<b>SLO7(AP-I)</b>	<b>Unit II</b>	Able to gain the knowledge on neurotransmission process in ANS, CNS and NANC
<b>SLO8(AP-I)</b>	<b>Unit III</b>	Able gain the knowledge on drugs modulating ANS and neuromuscular junction
<b>SLO9(AP-I)</b>	<b>Unit IV</b>	Able understand the drugs acting on CNS and the significance
<b>SLO10(AP-I)</b>	<b>Unit V</b>	Able to understand the pharmacology of autocooids and their modulators



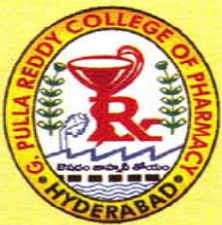
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<b>CODE:103T- PHARMACOLOGICAL AND TOXICOLOGICAL SCREENING METHODS-I(PTSM-I)</b>		
<b>SLO11(PTSM-I)</b>	<b>Unit I</b>	Able to understand the CPCSEA guidelines for laboratory animal maintenance, transgenic animals and bioassay techniques.
<b>SLO12(PTSM-I)</b>	<b>Unit II</b>	Able to gain the knowledge on preclinical screening of drugs acting on CNS and ANS system
<b>SLO13(PTSM-I)</b>	<b>Unit III</b>	Able to gain the knowledge on preclinical screening of drugs acting on respiratory system, reproductive system, GI system and inflammation.
<b>SLO14(PTSM-I)</b>	<b>Unit IV</b>	Able to gain the knowledge on preclinical screening of drugs acting on CVS system, metabolic disorders, cancer and hepatic diseases
<b>SLO15(PTSM-I)</b>	<b>Unit V</b>	Able to understand preclinical evaluation of immunomodulators, general principles of immunoassay, alternative to animal experiments and methods of dose calculations.
<b>CODE:104T- CELLULAR AND MOLECULAR PHARMACOLOGY(CAMP)</b>		
<b>SLO16(CAMP)</b>	<b>Unit I</b>	Able to gain basic knowledge in cell biology
<b>SLO17(CAMP)</b>	<b>Unit II</b>	Able to understand the intercellular and intracellular signalling pathways.
<b>SLO18(CAMP)</b>	<b>Unit III</b>	Able to gain the basic knowledge in genomics and proteomic tools, recombinant DNA technology and gene therapy
<b>SLO19(CAMP)</b>	<b>Unit IV</b>	Able to understand the concept of pharmacogenomics and immunotherapeutics
<b>SLO20(CAMP)</b>	<b>Unit V</b>	Able to gain the knowledge on cell culture techniques, cell based assays and concept of biosimilars.
<b>CODE:105TP- PHARMACOLOGICAL PRACTICAL-I(PP-I)</b>		
<b>SLO1(PP)</b>	Able to perform analysis of drugs using various analytical techniques	
<b>SLO2(PP)</b>	Able to formulate and evaluate novel drug delivery system	
<b>SLO3(PP)</b>	Able to perform preformulation studies for API	
<b>SLO4(PP)</b>	Able to understand different types of drug kinetics and its calculations	



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

<b>M.PHARM-PHARMACOLOGY (MPL)</b>		
<b>Code:201T - ADVANCED PHARMACOLOGY-II(AP-II)</b>		
<b>ID</b>	<b>Unit / Topic</b>	<b>Outcome statement</b>
<b>SLO26(AP-II)</b>	<b>Unit I</b>	Able to gain the knoweldge on pharmacology of drugs acting on endocrine system and their therapeutc significance
<b>SLO27(AP-II)</b>	<b>Unit II</b>	Able to gain the knowelgedge on pharmacology of chemotherapeutic agents
<b>SLO28(AP-II)</b>	<b>Unit III</b>	Able to understand the pharmacology of drugs used in protozoal infections,helminthiasis,cancer,asthama,COPD,immunomodulators and hypersensitivity reactions
<b>SLO29(AP-II)</b>	<b>Unit IV</b>	Able to understand the pharnacology of drugs used in GI diseases and applications of chronotherapy for treatment of CVS disease,diabetes,asthama and peptic ulcer.
<b>SLO30(AP-II)</b>	<b>Unit V</b>	To undestand the role of free radicals in diabetes,cancer and neurological diseases.
<b>CODE:202T- PHARMACOLOGICAL AND TOXICOLOGICAL SCREENING METHODS-II(PTSM-II)</b>		
<b>SLO31(PTSM-II)</b>	<b>Unit I</b>	Able to understand the importance of OECD,ICH,EPA and Schedule-Y guidelines in toxxicology
<b>SLO32(PTSM-II)</b>	<b>Unit II</b>	Able to gain the knowelgedge on evaluation of various toxicity tests as per reulatory norms
<b>SLO33(PTSM-II)</b>	<b>Unit III</b>	Able to understand the test procedure for reproductive toxicity and genotoxicity studies.
<b>SLO34(PTSM-II)</b>	<b>Unit IV</b>	Able to understand the concept of IND and safety pharmacology studies.
<b>SLO35(PTSM-II)</b>	<b>Unit V</b>	Able to undestand the importance and applications of toxicokinetic studies and alternative methods to animal toxicity testing.
<b>CODE:203T- PRINCIPLES OF DRUG DISCOVERY(PDD)</b>		
<b>SLO36(PDD)</b>	<b>Unit I</b>	Able to understand the basic concept of target identification and validation,lead identification and optimisation,various molecular techniwwes used in drug discovery process.





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SLO37(PDD)	Unit II	Able to understand the basic concept of combinatorial chemistry, HTS and computational techniques for prediction of protein structure.
SLO38(PDD)	Unit III	Able to understand the basic concept of rational drug design techniques in drug discovery process
SLO39(PDD)	Unit IV	Able to understand the basic concept of molecular docking techniques and QSAR studies in drug discovery process
SLO40(PDD)	Unit V	Able to understand the basic concept QSAR statistical techniques, 3D QSAR and prodrug design in drug discovery process
<b>CODE:204T- CLINICAL RESEARCH AND PHARMACOVIGILANCE(CRPV)</b>		
SLO41(CRPV)	Unit I	Able to understand the concept of GCP, schedule-Y, ICMR guideline and informed consent process
SLO42(CRPV)	Unit II	Able to gain the knowledge on types and design of clinical trails
SLO43(CRPV)	Unit III	Able to gain the knowledge on necessary documents required for clinical trails and ADRs
SLO44(CRPV)	Unit IV	Able to gain the knowledge on basic concept and establishment of pharmacovigilance
SLO45(CRPV)	Unit V	Able to gain the knowledge on methods and tools used in pharmacovigilance and concept of pharmacoepidemiology and pharmacoconomics
<b>CODE:205P- PHARMACOLOGICAL PRACTICAL-II (PP-II)</b>		
SLO46(PP-II)	Able to perform the bioassay of given sample by using suitable tissue preparations	
SLO47(PP-II)	Able to record the BP, Heart rate and ECG in rats	
SLO48(PP-II)	Able to perform toxicity studies, drug absorption studies and mutagenicity study	
SLO49(PP-II)	Able to design clinical trial protocols and ADR monitoring protocols	
SLO50(PP-II)	Able to perform insilico docking and QSAR studies	





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<b>M.PHARM PHARMACOLOGY (MPL) - III SEMESTER</b>		
<b>Code:301T - RESEARCH METHODOLOGY AND BIO STATISTICS</b>		
<b>ID</b>	<b>Unit/Topic</b>	<b>Outcome statement</b>
SLO51(RMB)	Unit I	Able to understand the conceptl research methodology
SLO52(RMB)	Unit II	Able to gain the knowedge on types of biostastical test and their significance
SLO53(RMB)	Unit III	Able to understand the ethics in medical research
SLO54(RMB)	Unit IV	Able understand imortance of CPCSEA guidelines for laboratory animal facilities
SLO55(RMB)	Unit V	Able to gain the knowledge on concept of decleration of helsinki

<b>M.Pharm Pharmacology Course outcome and Specific Learning Outcome Map</b>						
<b>M.PHARM-PHARMACOLOGY</b>						
<b>I-SEMESTER</b>						
	<b>CO1(MPL)</b>	<b>CO2(MPL)</b>	<b>CO3(MPL)</b>	<b>CO4(MPL)</b>	<b>CO5(MPL)</b>	<b>CO6(MPL)</b>
SLO1(MPAT)	X					
SLO2(MPAT)	X					
SLO3(MPAT)	X					
SLO4(MPAT)	X					
SLO5(MPAT)	X					
SLO6(AP-I)		X				
SLO7(MPAAP-I)		X				
SLO8(AP-I)		X				
SLO9(AP-I)		X				
SLO10(AP-I)		X				



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SLO11(PTSM-I)			X			
SLO12(PTSM-I)			X			
SLO13(PTSM-I)			X			
SLO14(PTSM-I)			X			
SLO15(PTSM-I)			X			
SLO16(CAMP)				X		
SLO17(CAMP)				X		
SLO18(CAMP)				X		
SLO19(CAMP)				X		
SLO20(CAMP)				X		
SLO21(PP-I)					X	
SLO22(PP-I)					X	
SLO23(PP-I)					X	
SLO24(PP-I)					X	
SLO25(PP-I)					X	



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## M.Pharm Pharmacology Course outcome and Specific Learning Outcome Map

### M.PHARM-PHARMACOLOGY

#### II-SEMESTER

	CO7(MPL)	CO8(MPL)	CO9(MPL)	CO10(MPL)	CO11(MPL)	CO12(MPL)
SLO26(AP-II)	X					
SLO27(AP-II)	X					
SLO28(AP-II)	X					
SLO29(AP-II)	X					
SLO30(AP-II)	X					
SLO31(PTSM-II)		X				
SLO32(PTSM-II)		X				
SLO33(PTSM-II)		X				
SLO34(PTSM-II)		X				
SLO35(PTSM-II)		X				
SLO36(PDD)			X			
SLO37(PDD)			X			
SLO38(PDD)			X			
SLO39(PDD)			X			
SLO40(PDD)			X			
SLO41(CRPV)				X		
SLO42(CRPV)				X		
SLO43(CRPV)				X		
SLO44(CRPV)				X		



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SLO45(CRPV)				X		
SLO46(PP-II)					X	
SLO47(PP-II)					X	
SLO48(PP-II)					X	
SLO49(PP-II)					X	
SLO50(PP-II)					X	

III SEMESTER				
	C013(MPL)	CO14(MPL)	CO15(MPL)	CO16(MPL)
SLO51(RMB)	X			
SLO52(RMB)	X			
SLO53(RMB)	X			
SLO54(RMB)	X			
SLO55(RMB)	X			