



NIRMALA COLLEGE OF PHARMACY MUVATTUPUZHA

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FIRST CYCLE NAAC ACCREDITATION 2023

CRITERION 2



TEACHING- LEARNING AND EVALUATION

2.6.1. Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered by the institution are stated and displayed on website and attainment of POs and COs are evaluated

Submitted to



THE NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL



2.6.1: Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered by the institution are stated and displayed on website and attainment of POs and COs are evaluated

INDEX

Course Outcomes (COs) for M Pharm Programmes offered by the institution

Sl no	Content	View Page
<i>M Pharm Pharmaceutics</i>		
1.	1 st semester Mpharm	view
2.	2 nd semester Mpharm	view
3.	3 rd semester Mpharm	view
<i>M Pharm Pharmacology</i>		
4.	1 st semester Mpharm	view
5.	2 nd semester Mpharm	view
6.	3 rd semester Mpharm	view



2.6.1.
QIM : Course Outcomes (COs) for
all Programmes
offered by the institution

M pharm

2.6.1:
Course Outcomes (COs)

Program: M Pharm (Pharmaceutics)
Batch: 1st semester





Nirmala College of Pharmacy, Muvattupuzha

Muvattupuzha P.O Ernakulam District Kerala, India, Pin:686661

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Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmaceutics
Batch	2021-2023
Semester	1
Subject	Modern Pharmaceutical Analytical Techniques

Sl.No	CO Code	Course Outcome	Description	Bloom Level	Created_by
1	MPT101T.1	Critically evaluate various analytical techniques in the context of qualitative and quantitative analysis of drugs in single and combination dosage forms		Understand	Manu Jose
2	MPT101T.2	Demonstrate an understanding of theory and application of the most common methods of pharmaceutical analysis in research, academia, and industry.		Understand	Manu Jose
3	MPT101T.3	Apply the principles of chromatography and spectroscopic tools in qualitative and quantitative analysis of pharmaceuticals in research and industrial perspective		Apply	Manu Jose

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CO-PO Mapping

Institute	Nirmala College of Pharmacy,Muvattupuzha							
Course	M Pharm Pharmaceutics							
Batch	2022-2024							
Semester	1							
Subject	Modern Pharmaceutical Analytical Techniques							
	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
MPT101T.1	Point : 3 Justification : Possess knowledge About analytical techniques in the context of qualitative and quantitative analysis of drugs	Point : 2 Justification : The analytical tools for the qualitative and quantitative analysis used for preformulation and post formulation studies make professionally competant candidates		Point : 1	Point : 2	Point : 3 Justification : Possess knowledge About analytical techniques in the context of qualitative and quantitative analysis of drugs	Point : 3 Justification : The analytical tools for the qualitative and quantitative analysis used for preformulation and post formulation studies make professionally competant candidates	Point : 2 Justification : The use of modern analytictxal techniques to determine the analysis of noval drug delivery system
MPT101T.2	Point : 3 Justification : Acquire knowledge about various research and industry aspect of analytical techniques	Point : 2 Justification : The use of modern analytictxal techniques to determine the analysis of noval drug delivery system			Point : 2	Point : 3 Justification : Acquire knowledge about various research and industry aspect of analytical techniques	Point : 2 Justification : The theoritical and practicals applications of analytical tools helps in formulation developement to make to fit as qulaified professional	
MPT101T.3	Point : 3 Justification : The quality assurance paramaters via various analytical techniques make expertise in formulation and production of conventional and novel drug delivery systems	Point : 2 Justification : The knowledge about spectroscopy in the elucidation of molecular structure and the interpretation of the result create a professional identity as an analyst		Point : 1	Point : 2 Justification : The quality assurance paramaters via various analytical techniques make expertise in formulation and production of conventional and novel drug delivery systems	Point : 3	Point : 3 Justification : The knowledge about spectroscopy in the elucidation of molecular structure and the interpretation of the result create a professional identity as an analyst	Point : 2 Justification : The quality assurance paramaters via various analytical techniques make expertise in formulation and production of conventional and novel drug delivery systems
Average Score	3	2		1	2	3	2.6666666666667	2



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Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmaceutics
Batch	2021-2023
Semester	1
Subject	Drug Delivery System

Sl.No	CO Code	Course Outcome	Description	Bloom Level	Created_by
1	MPH 102 T.1	Understand the various approaches for the development of novel drug delivery system.		Understand	Deepa M.K
2	MPH 102 T. 2	Apply the knowledge while selecting drugs and polymers for the designing of novel delivery system		Apply	Deepa M.K
3	MPH 102 T. 3	Apply their knowledge on advanced technology in formulation development and drug delivery		Apply	Deepa M.K
4	MPH 102 T. 4	Apply their knowledge on advanced technology in formulation development and drug delivery		Apply	Deepa M.K
5	MPH 102 T. 5	Understand various consideration of vaccine drug delivery through mucosal membrane and transdermal drug delivery system		Understand	Deepa M.K

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CO-PO Mapping

Institute	Nirmala College of Pharmacy,Muvattupuzha							
Course	M Pharm Pharmaceutics							
Batch	2021-2023							
Semester	1							
Subject	Drug Delivery System							
	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
MPH 102 T.1	Point : 3 Justification : students are able to apply their Pharmacy Knowledge on various approaches for the development of novel drug delivery system.	Point : 3 Justification : students are able to use modern technology and tools various approaches for the development of novel drug delivery system.		Point : 3 Justification : students are able to develop their communication skill taking seminar topic on arious approaches for the development of novel drug delivery system.	Point : 3 Justification : able to develop novel drug delivery system to ensure the safely and effectively patients in the community.	Point : 3 Justification : Possess extensive knowledge on various approaches for the development of novel drug delivery system.	Point : 3 Justification : Adhere the highest standards of professionalism while applying various approaches for the development of novel drug delivery system.	Point : 3 Justification : Be an expertise in formulation and production,students are able to apply their knowledge various approaches for the development of novel drug delivery system.
MPH 102 T. 2	Point : 3 Justification : students are able to apply their Pharmacy Knowledge while selecting drugs and polymers for the designing of novel delivery system	Point : 3 Justification : able to use modern tool the Advanced analytical instrumental techniques for identification, characterization and quantification of drug and polymer for the designing of novel delivery system.	Point : 1 Justification : students leadership skill aslo improved while selecting drugs and polymers for the designing of novel delivery system	Point : 3 Justification : communication skill of students will be improved while taking seminar on selection drugs and polymers for the designing of novel delivery system	Point : 1 Justification : able to apply the knowledge while selecting safe drugs and polymers for the designing of novel delivery system	Point : 3 Justification : Possess extensive knowledge in characterization of a drug and other excipients used in the development of delivery system	Point : 3 Justification : Adhere the highest standards of professionalism while considering criteria for selection of drugs and polymers for the development of delivering system	Point : 3 Justification : Be an expertise in formulation and production ,students are able to develop skills in selecting the suitable techniques for analysis of drugs ,polymersand pharmaceuticals.
MPH 102 T. 3	Point : 3 Justification : students are able to apply their Pharmacy Knowledge on advanced technology in formulation development and drug delivery	Point : 3 Justification : able to use modern tool while apply advanced technology in formulation development and drug delivery		Point : 3 Justification : communication skill of students will be improved while taking seminar on advanced technology in formulation development and drug delivery.		Point : 3 Justification : Possess extensive knowledge	Point : 2 Justification : Adhere the highest standards of professionalism while using advanced technology in formulation development and drug delivery	Point : 2 Justification : Be an expertise in formulation and production ,students are able to impart knowledge on the area of advances in novel drug delivery systems
MPH 102 T. 4	Point : 3 Justification : students are able to apply their Pharmacy Knowledge on various consideration of vaccine drug delivery through mucosal membrane and transdermal drug delivery system.	Point : 1 Justification : able to know about various modern tool usage for consideration of vaccine drug delivery through mucosal membrane and transdermal drug delivery system		Point : 3 Justification : communication skill of students will be improved while taking seminar on various consideration of vaccine drug delivery through mucosal membrane and transdermal drug delivery system	Point : 1 Justification : able to apply knowledge on various formulation consideration of vaccine drug delivery through mucosal membrane and transdermal drug delivery system for better patient convenience and safety.	Point : 3 Justification : Possess extensive knowledge various consideration of vaccine drug delivery through mucosal membrane and transdermal drug delivery system	Point : 2 Justification : Adhere the highest standards of professionalism while vaccine drug delivery through mucosal membrane and transdermal drug delivery system	Point : 2 Justification : Be an expertise in formulation and production ,students are able to apply their knowledge various consideration of vaccine drug delivery through mucosal membrane and transdermal drug delivery system
Average Score	3	2.5	1	3	1.6666666666667	3	2.5	2.5



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Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmaceutics
Batch	2021-2023
Semester	1
Subject	Modern Pharmaceutic

Sl.No	CO Code	Course Outcome	Description	Bloom Level	Created_by
1	MPH 103T.1	pharmaceutical formulation development and optimization of formulation		Apply	Gifty M Jojo
2	MPH 103T.3	Industrial Management and GMP Considerations		Understand	Gifty M Jojo
3	MPH 103T.5	Key parameters in formulation development		Apply	Gifty M Jojo
4	MPH 103T..2	Scope of process validation and guidelines for calibration and validation		Understand	Manju Maria Mathews
5	MPH 103T..4	physics of tablet compression		Understand	Manju Maria Mathews

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CO-PO Mapping

Institute	Nirmala College of Pharmacy,Muvattupuzha
Course	M Pharm Pharmaceutics
Batch	2021-2023
Semester	1
Subject	Modern Pharmaceutic

	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
MPH 103T.1	Point : 3 Justification : Acquire knowledge on Generic drug Product development and optimization of formulations	Point : 3 Justification : Study of optimization techniques enable the students to use modern computing tools	Point : 2 Justification : knowledge on modern tools in formulation development and optimization enable the students to lead roles in projects			Point : 3 Justification : knowledge in recent trends in formulation development improve the knowledge of students and helps them to meet the professional challenges in industrial, research and academic sectors	Point : 3 Justification : the present topic enable the students to achieve excellence in academic, industrial and research activities	Point : 2 Justification : detailed study on formulation of various dosage forms helps the students to be an expert in conventional drug delivery systems. Also knowledge on optimization techniques improve the skill of students in optimization of conventional as well as novel drug delivery systems
MPH 103T.3	Point : 3 Justification : Acquire	Point : 3				Point : 3 Justification : improve the	Point : 2 Justification : knowledge on industrial sector	Point : 2 Justification : knowledge on

	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
	knowledge on industrial level management and GMP considerations.					knowledge of students in industrial sector functioning and management which enable them to meet professional challenges in industrial sector	functioning and management helps the students to achieve excellence in industrial activities	GMP enable the students improve the understanding and work efficiency of students in QA and QC
MPH 103T.5	Point : 3 Justification : Acquire knowledge on key parameters in formulation development	Point : 3 Justification : Study of release kinetics enable the students to use modern computing tools in consolidated parameter estimation	Point : 2 Justification : knowledge on modern tools in formulation development and optimization enable the students to lead roles in projects			Point : 3 Justification : enable the students to gain knowledge in consolidated parameter estimation and their role in formulation development		Point : 2 Justification : the present topic improve the knowledge of students in consolidated parameters and which hepl them to use this parameters in conventional and novel drug delivery systems development
MPH 103T..2	Point : 3 Justification : Validation is a core area in the pharmaceutical industry	Point : 3 Justification : Modern tools are used in validation and calibration	Point : 2 Justification : Responsibilities of validation team in an industry is understood from the topic	Point : 2 Justification : For the preparation of validation report effective communication is required	Point : 3 Justification : validation assures the quality og formulations cosumed by people and a thorough knowledge on this enable the students to meet professional challenges with credibility, integrity, ethical	Point : 3 Justification : Validation is a responsible job undertaken by pharmacy professionals to make sure the products are of high quality Process validation must be done in a correct manner and conclusions are drawn and reports are	Point : 2 Justification : validation department is an integral part of industry which assure that that the products meet specified attributes. students gain knowledge about selecting critical process parameters and the methods to follow validation of different dosage forms	Point : 2 Justification : sudents getting knowledge in critical process parameters and validation of different dosage forms

	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
					standards and social responsibility	prepared by applying ethical principles		
MPH 103T..4	Point : 3 Justification : Acquire good knowledge in tablet manufacturing	Point : 3 Justification : Advanced instruments are involved in instrumentation for tablet puching			Point : 2 Justification : Theoretical aspects to ensure quality tablets are covered	Point : 2 Justification : extensive knowledge in tablet manufacturing is obtained which is the most widely used dosage form	Point : 2 Justification : learning about different equipments,enables the students to gain knowledge in tablet manufacturing in industiies	Point : 2 Justification : get expertise in tablet manufacturing
Average Score	3	3	2	2	2.5	2.8	2.25	2

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Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmaceutics
Batch	2021-2023
Semester	1
Subject	Regulatory Affairs

Sl.No	CO Code	Course Outcome	Description	Bloom Level	Created_by
1	CO1	Upon completion of the course the student will be able to describe the Concepts of innovator and generic drugs, the drug development process	Unit One and Two	Understand	Dhanish Joseph
2	CO2	Describe the guidelines for the filing and approval process Preparation of Dossiers and their submission to regulatory agencies in different countries	Unit two and three	Understand	Dhanish Joseph
3	CO3	Discuss the Post-approval regulatory requirements for activities and drug products	Unit Four	Understand	Dhanish Joseph
4	CO4	Able to describe the Submission procedure of global documents in CTD/ eCTD formats	Unit two and Three	Understand	Dhanish Joseph
5	CO5	Able to discuss the Clinical trials requirements for approvals for conducting clinical trials Pharmacovigilance and process of monitoring in clinical trials	Unit Five	Understand	Dhanish Joseph

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CO-PO Mapping

Institute	Nirmala College of Pharmacy,Muvattupuzha
Course	M Pharm Pharmaceutics
Batch	2021-2023
Semester	1
Subject	Regulatory Affair

	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
CO1	Point : 3 Justification : The topic discuss completely on the registration of drug product.		Point : 1 Justification : The debate and discussion as per the curriculam can act as a tool for better skill development	Point : 3 Justification : The Seminar and discussion group and peer learning process helps to improve the verbal and non verbal communicatioun skill of the student	Point : 3 Justification : The topic covers the need of developing a quality drug product to serve the society	Point : 3 Justification : The topic provide knowldge required in the filed of regulatory affairs	Point : 3 Justification : The role of a professional pharmacist as a regulatory authority is described here	Point : 1 Justification : The need of developing the standard formulation is only discussed here. More onproduct registration. But a registration need the hands of an expertise
CO2	Point : 3 Justification : The topic discuss completely on the registration of drug product.		Point : 1 Justification : The debate and discussion as per the curriculam can act as a tool for better skill development	Point : 3 Justification : The Seminar and discussion group and peer learning process helps to improve the verbal and non verbal communicatioun skill of the student	Point : 3 Justification : The topic covers the need of developing a quality drug product to serve the society	Point : 3 Justification : The topic provide knowldge required in the filed of regulatory affairs	Point : 3 Justification : The role of a professional pharmacist as a regulatory authority is described here	Point : 1 Justification : The need of developing the standard formulation is only discussed here. More onproduct registration. But a registration need the hands of an expertise

	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
CO3	Point : 3 Justification : The topic discuss completely on the registration of drug product.		Point : 1 Justification : The debate and discussion as per the curriculam can act as a tool for better skill development t	Point : 3 Justification : The Seminar and discussion group and peer learning process helps to improve the verbal and non verbal communicatiuon skill of the student	Point : 3 Justification : The topic covers the need of developing a quality drug product to serve the society	Point : 3 Justification : The topic provide knowldge required in the filed of regulatory affairs	Point : 3 Justification : The role of a professional pharmacist as a regulatory authority is described here	Point : 1 Justification : The need of developing the standard formulation is only discussed here. More onproduct registration. But a registration need the hands of an expertise
CO4	Point : 3 Justification : The topic discuss completely on the registration of drug product.		Point : 1 Justification : The debate and discussion as per the curriculam can act as a tool for better skill development	Point : 3 Justification : The Seminar and discussion group and peer learning process helps to improve the verbal and non verbal communicatiuon skill of the student	Point : 3 Justification : The topic covers the need of developing a quality drug product to serve the society	Point : 3 Justification : The topic provide knowldge required in the filed of regulatory affairs	Point : 3 Justification : The role of a professional pharmacist as a regulatory authority is described here	Point : 1 Justification : The need of developing the standard formulation is only discussed here. More onproduct registration. But a registration need the hands of an expertise
CO5	Point : 3 Justification : The topic discuss completely on the registration of drug product.		Point : 1 Justification : The debate and discussion as per the curriculam can act as a tool for better skill development	Point : 3 Justification : The Seminar and discussion group and peer learning process helps to improve the verbal and non verbal communicatiuon skill of the student	Point : 3 Justification : The topic covers the need of developing a quality drug product to serve the society	Point : 3 Justification : The topic provide knowldge required in the filed of regulatory affairs	Point : 3 Justification : The role of a professional pharmacist as a regulatory authority is described here	Point : 1 Justification : The need of developing the standard formulation is only discussed here. More onproduct registration. But a registration need the hands of an expertise
Average Score	3		1	3	3	3	3	1



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Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmaceutics
Batch	2021-2023
Semester	1
Subject	Pharmaceutics Practical

Sl.No	CO Code	Course Outcome	Description	Bloom Level	Created_by
1	CO1	Students will be able to select suitable ingredients for the granulation mixture		Apply	Vidya Peter
2	CO2	Students will be able to select suitable process parameters for tablet manufacturing		Apply	Vidya Peter
3	CO3	Demonstrate an understanding of theory and application of the most common methods of pharmaceutical analysis in research, academia, and industry.		Understand	Manju Maria Mathews
4	CO4	Apply the principles of chromatography and spectroscopic tools in qualitative and quantitative analysis of pharmaceuticals in research and industrial perspective		Apply	Manju Maria Mathews
5	CO5	Students are able to formulate and evaluate sustained release matrix tablets		Create	Deepa M.K

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CO-PO Mapping

Institute	Nirmala College of Pharmacy,Muvattupuzha							
Course	M Pharm Pharmaceutics							
Batch	2021-2023							
Semester	1							
Subject	Pharmaceutics Practical							
	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
CO1	Point : 3 Justification : apply the theory behing ingradient selection	Point : 2 Justification : operating tablet punching machine and bulk density apparatus for the evaluation process			Point : 3 Justification : right selection of ingredients will save the community from ADRs and also reduce the production cost	Point : 3 Justification : Deep knowldege in both formulation techniques and ingredient selection is required to produce ideal medication		Point : 3 Justification : able to perform various stages of formulation
CO2	Point : 3 Justification : Deep knowledge is required to select right process parameters	Point : 3 Justification : study to use modern tools to select crucial parameters			Point : 3 Justification : right selection of ingredients will save the community from ADRs and also reduce the production cost	Point : 3		
CO3	Point : 3	Point : 3	Point : 2	Point : 1	Point : 2	Point : 2	Point : 2	
CO4	Point : 3	Point : 3	Point : 1	Point : 1	Point : 2	Point : 3	Point : 1	
CO5	Point : 3 Justification : Students are able to apply their pharmacy Knowledge while formulating and evaluating sustained release matrix tablets	Point : 2 Justification : Students are able to use modern tool for the formulation and evaluation of sustained release matrix tablets	Point : 2 Justification : Leadership skills of students will be improved while formulating evaluating of sustained release matrix tablets in the lab in a group	Point : 3 Justification : Communication skill of students will be improved when they reporting and presenting their results and findings during practical session in the lab	Point : 1 Justification : Able to develop a SR drug delivery system to minimize patient non-compliance.	Point : 3 Justification : Possess extensive practical knowledge and skill in the formulation and evaluation of sustained release matrix tablets	Point : 3 Justification : Adhere the highest standards of professionalism while Formulating and evaluating sustained release matrix tablets	Point : 3 Justification : e an expertise in formulation and production,students are able to formulate and evaluate sustained release matrix tablets
Average Score	3	2.6	1.6666666666667	1.6666666666667	2.2	2.8	2	3

2.6.1:
Course Outcomes (COs)

Program: M Pharm (Pharmaceutics)
Batch: 2nd Semester





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Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmaceutics
Batch	2021-2023
Semester	2
Subject	Molecular Pharmaceutics (Nano Tech and Targeted DDS)

Sl.No	CO Code	Course Outcome	Description	Bloom Level	Created_by
1	MPH 201T1	Design drug delivery systems for targeting drugs to tumours and to the brain		Create	Deepa M.K
2	MPH 201T2	Prepare and evaluate nanoparticles and liposomes as carriers for drug targeting		Apply	Deepa M.K
3	MPH 201T3	Select drugs and polymers in the design of microspheres and microcapsules for various applications and to understand various develop strategies for improving nasal absorption in the design of nasal drug delivery systems		Evaluate	Deepa M.K
4	MPH 201T4	Optimize pulmonary delivery by the design of suitable aerosols, nebulizers and dry powder inhalers		Analyze	Deepa M.K
5	5	To understand the role of antisense molecules and aptamers in the design of novel drug delivery systems and apply gene therapy in the treatment of cancer and inherited diseases		Understand	Deepa M.K
6	5	To understand the role of antisense molecules and aptamers in the design of novel drug delivery systems and apply gene therapy in the treatment of cancer and inherited diseases		Understand	Deepa M.K

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CO-PO Mapping

Institute	Nirmala College of Pharmacy,Muvattupuzha
Course	M Pharm Pharmaceutics
Batch	2021-2023
Semester	2
Subject	Molecular Pharmaceutics (Nano Tech and Targeted DDS)

	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
MPH 201T1	Point : 3 Justification : The students will gain good pharmacy knowledge by understanding how to develop drug delivery systems for targeting drugs to tumours and the brain.	Point : 3 Justification : The students will able to use modern tool to develop drug delivery systems for targeting drugs to tumours and the brain.	Point : 1 Justification : While developing the delivery system for targeting drugs to tumours the knowledge on the topic improves the researches in their leadership skills	Point : 3 Justification : Presenting seminars on the topic design drug delivery systems for targeting drugs to tumours and to the brain help students develop good communication skills.	Point : 3 Justification : For the benefit of society, the delivery system was developed to safely target drugs to tumours	Point : 3 Justification : Possess extensive knowledge on design drug delivery systems for targeting drugs to tumours and to the brain	Point : 2 Justification : Adhere the highest standards of professionalism in design drug delivery systems for targeting drugs to tumours and to the brain	Point : 3 Justification : Knowledge on design and develop drug delivery systems that target drugs to tumours and the brain enables them an expert in the formulation and production of targeted delivery systems.
MPH 201T2	Point : 3 Justification : The students will gain good pharmacy knowledge by understanding how to prepare and evaluate nanoparticles and liposomes as carriers for drug targeting	Point : 3 Justification : The students will able to use modern tool to Prepare and evaluate nanoparticles and liposomes as carriers for drug targeting.	Point : 1 Justification : While developing the delivery system for targeting drugs to tumours the knowledge on the topic improves the researches in their leadership skills	Point : 3 Justification : Presenting seminar on the topic help students develop good communication skills	Point : 3 Justification : For the benefit of society, the delivery system was developed to safely to the target site in the form of liposomes and nanoparticles..	Point : 3 Justification : Possess extensive knowledge on design of nanoparticulate drug delivery systems.	Point : 2 Justification : Adhere the highest standards of professionalism in design drug delivery systems for targeting drugs as liposomes and nanoparticles	Point : 3 Justification : Be an expertise ldesign and development of nanoparticulate delivery systems tha them an expert in the formulation and production of targeted delivery systems.
MPH 201T3	Point : 3 Justification : The students will gain pharmacy knowledge while selecting drugs and polymers in the design of microspheres and microcapsules for various applications and to understand various develop strategies for improving nasal absorption in the design of nasal drug delivery systems.	Point : 2 Justification : design of microspheres and microcapsules for various applications and to understand various develop strategies for improving nasal absorption in the design of nasal drug delivery systems.	Point : 1 Justification : While developing the delivery system for targeting drugs to tumours the knowledge on the topic improves the researches in their leadership skills	Point : 3 Justification : Presenting seminar on the topic help students develop good communication skills	Point : 1 Justification : able to follow safeformulation development strategies for improving nasal absorption in the design of nasal drug delivery systems.	Point : 3 Justification : possess extensive knowledge in selection drugs and polymers in the design of microspheres and microcapsules for various applications and to understand various develop strategies for improving nasal absorption in the design of nasal drug delivery systems.		Point : 3 Justification : become expert in the selection of sedrugs and polymers in the design of microspheres and microcapsules for various applications and to understand various develop strategies for improving nasal absorption in the design of nasal drug delivery systems.

	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5:The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
MPH 201T4	Point : 3 Justification : The students will gain good pharmacy knowled in the Optimize pulmonary delivery by the design of suitable aerosols, nebulizers and dry powder inhalers.		Point : 1 Justification : While developing the delivery system for targeting drugs to tumours the knowledge on the topic improves the researches in their leadership skills	Point : 3 Justification : Presenting seminar on the topic help students develop good communication skills		Point : 3 Justification : possess extensive knowledge in the design of suitable aerosols, nebulizers and dry powder inhalers.		Point : 3 Justification : students become expert in Optimize pulmonary delivery by the design of suitable aerosols, nebulizers and dry powder inhalers.
MPH 201T5	Point : 3 Justification : The students will gain good pharmacy knowledge by understanding how to prepare anTo understand the role of antisense molecules and aptamers in the design of novel drug delivery systems and apply gene therapy in the treatment of cancer and inherited diseases	Point : 3 Justification : able to use modern tools during optimize pulmonary delivery by the design of suitable aerosols, nebulizers and dry powder inhalers	Point : 1 Justification : While developing the delivery system for targeting drugs to tumours the knowledge on the topic improves the researches in their leadership skills	Point : 3 Justification : Presenting seminar on the topic help students develop good communication skills	Point : 3 Justification : able to develop safety drdelivery of drug for the treatment of cancer and other deseases	Point : 2 Justification : possess extensive knowledge in the preparation and,to understand the role of antisense molecules and aptamers in the design of novel drug delivery systems and apply gene therapy in the treatment of cancer and inherited diseases		Point : 3 Justification : become expert in the preparation of novel drug delivery systems and apply gene therapy in the treatment of cancer and inherited diseases
Average Score	3	2.75	1	3	2.5	2.8	2	3

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Nirmala College of Pharmacy, Muvattupuzha

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Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmaceutics
Batch	2021-2023
Semester	2
Subject	Advanced Biopharmaceutics & Pharmacokinetics

Sl.No	CO Code	Course Outcome	Description	Bloom Level	Created_by
1	CO1	Describe the concept behind the biopharmaceutics, pharmacokinetics and design of dose and dosage regimen	Basic ADME	Understand	Dhanish Joseph
2	CO2	Use plasma data and derive the pharmacokinetic parameters to describe the process of drug absorption, distribution, metabolism and elimination.	Pharmacokinetics	Apply	Dhanish Joseph
3	CO3	Design and evaluate dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.	Pharmacokinetic principles	Evaluate	Dhanish Joseph
4	CO4	Critically evaluate biopharmaceutic studies involving drug product equivalency and Assess the reason for poor bioavailability of drug and methods to overcome the poor bioavailability	Bioavailability and bioequivalence	Evaluate	Dhanish Joseph
5	CO5	Detect potential clinical pharmacokinetic problems and apply basic pharmacokinetic principles to solve them	Pharmacokinetics	Evaluate	Dhanish Joseph

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CO-PO Mapping

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmaceutics
Batch	2021-2023
Semester	2
Subject	Advanced Biopharmaceutics & Pharmacokinetics

	PO1: Pharmacy Knowledge:	PO2: Modern tool usage	PO3: Leadership skills	PO4: Communication	PO5: The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
CO1	Point : 3 Justification : The student will be able to design of dose and dosage regimen			Point : 3 Justification : The verbal and written communication is only through, English. This gives a better understanding on language more over confidence in public communication	Point : 3 Justification : The knowledge gained under this CO can be utilised for the welfare of society and to educate them	Point : 3 Justification : The student will be able to perform the pharmacokinetic studies	Point : 3 Justification : The technical knowledge gained is highly professional, since they develop the procedure, perform it, analyse it and optimise it	
CO2	Point : 3 Justification : The student will be able to derive the pharmacokinetic parameters to describe the process of drug absorption, distribution, metabolism and elimination.			Point : 3 Justification : The verbal and written communication is only through, English. This gives a better understanding on language more over confidence in public communication	Point : 3 Justification : The knowledge gained under this CO can be utilised for the welfare of society and to educate them	Point : 3 Justification : The student will be able to perform the pharmacokinetic studies	Point : 3 Justification : The technical knowledge gained is highly professional, since they develop the procedure, perform it, analyse it and optimise it	

	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
CO3	Point : 3 Justification : The student will be able to Design and evaluate dosage regimens of the drugs			Point : 3 Justification : The verbal and written communication is only through, English. This gives a better understanding on language more over confidence in public communication	Point : 3 Justification : The knowledge gained under this CO can be utilised for the welfare of society and to educate them	Point : 3 Justification : The student will be able to perform the pharmacokinetic studies	Point : 3 Justification : The technical knowledge gained is highly professional, since they develop the procedure, perform it, analyse it and optimise it	
CO4	Point : 3 Justification : The student will be able to Design and evaluate dosage regimens of the drugs			Point : 3 Justification : The verbal and written communication is only through, English. This gives a better understanding on language more over confidence in public communication	Point : 3 Justification : The knowledge gained under this CO can be utilised for the welfare of society and to educate them	Point : 3 Justification : The student will be able to perform the pharmacokinetic studies	Point : 3 Justification : The technical knowledge gained is highly professional, since they develop the procedure, perform it, analyse it and optimise it	
CO5	Point : 3 Justification : The student will Detect potential clinical pharmacokinetic problems and apply basic pharmacokinetic principles to solve them			Point : 3 Justification : The verbal and written communication is only through, English. This gives a better understanding on language more over confidence in public communication	Point : 3 Justification : The knowledge gained under this CO can be utilised for the welfare of society and to educate them	Point : 3 Justification : The student will be able to perform the pharmacokinetic studies	Point : 3 Justification : The technical knowledge gained is highly professional, since they develop the procedure, perform it, analyse it and optimise it	
Average Score	3			3	3	3	3	



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Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmaceutics
Batch	2021-2023
Semester	2
Subject	Cosmetics and Cosmeceuticals

Sl.No	CO Code	Course Outcome	Description	Bloom Level	Created_by
1	MPH 204 T	To study the biological and Formulation aspects in the design of skin cosmetics		Understand	Melody Grace Baby
2	MPH 204 T	To design and Develop various cosmetics and cosmeceuticals addressing various skin and oral health problems.		Apply	Melody Grace Baby
3	MPH 204 T	Understand regulatory provisions relating to manufacture of cosmetics.		Understand	Manju Maria Mathews
4	MPH 204 T	Gain knowledge about building blocks to develop cosmetics and cosmeceuticals with desired safety, stability, and efficacy.		Apply	Manju Maria Mathews
5	MPH 204 T	Learn the guidelines for herbal cosmetics and analyse challenges in formulating herbal cosmetics		Understand	Manju Maria Mathews

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CO-PO Mapping

Institute	Nirmala College of Pharmacy,Muvattupuzha
Course	M Pharm Pharmaceutics
Batch	2021-2023
Semester	2
Subject	Cosmetics and Cosmeceuticals

	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
MPH 204 T	Point : 3 Justification : Get a intelligible knowledge reagarding the biological aspects of skin and thereby provide the formulation aspects for cosmetics				Point : 3 Justification : Inelligible knowlege about the various skin problems helps to design and formulate varios cosmetics to society	Point : 3 Justification : about the various skin problems is required for proper formulation of cosmetics	Point : 2 Justification : about the various skin problems will help the manufacture to formulate cosmetics with great standard anf safety	Point : 2 Justification : about the various skin problems makes the manufacture a expert in cosmetics production with great safety
MPH 204 T	Point : 3 Justification : Crystal clear knowlege of each skin and mouth related problems for develop a cosmetics				Point : 3 Justification : Crystal clear knowlege of each skin and mouth related problems for develop a cosmetics which is helpful for the society	Point : 3 Justification : Crystal clear knowlege of each skin and mouth related problems for develop a cosmetics is required for right and accurate	Point : 2 Justification : Crystal clear knowlege of each skin and mouth related problems for develop a cosmeceuticals of high safety .	Point : 2 Justification : Crystal clear knowlege of each skin and mouth related problems helps the manufacture to develop the exact design of cosmeceuticals for

	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
						cosmetics for each conditions		various health issues
MPH 204 T	Point : 3 Justification : .Get a clear knowledge about different regulations put forward by different agencies related to the manufacture, import and export different cosmetics				Point : 3 Justification : Get a clear knowledge about different regulations put forward by different agencies related to the manufacture, import and export different cosmetics make the manufacturer a responsible pharmacist	Point : 2 Justification : .Get a clear knowledge about different regulations put forward by different agencies related to the manufacture, import and export different cosmetics	Point : 2 Justification : gaining thorough knowledge about different regulations put forward by different agencies related to the manufacture, import and export different cosmetics makes them professionals	Point : 1 Justification : after getting thorough knowledge about different regulations put forward by different agencies related to the manufacture, import and export different cosmetics helps the manufacturer to become an expert in manufacturing.
MPH 204 T	Point : 3 Justification : A thorough knowledge about the formulation components is required for the manufacture of cosmetics with desired safety, stability, and efficacy.			Point : 2 Justification : understanding the regulations helps the manufacturer to effectively draft for manufacture, import etc	Point : 3 Justification : A thorough knowledge about the formulation components is required for the manufacture of cosmetics with desired safety, stability, and efficacy helps the manufacturer a responsible pharmacist	Point : 2 Justification : A thorough knowledge about the formulation components is required for the manufacture of cosmetics with desired safety, stability, and efficacy.	Point : 2 Justification : achieving a thorough knowledge about the formulation components is required for the manufacture of cosmetics with desired safety, stability, and efficacy.	Point : 2 Justification : achieving a thorough knowledge about the formulation components is required for the manufacture of cosmetics with desired safety, stability, and efficacy.
MPH 204 T	Point : 3 Justification : understand about the guidelines for manufacturing herbal cosmetics and the challenges in formulating herbal cosmetics				Point : 3 Justification : formulation and stability of herbal cosmetics are very challenging. understanding and analysing challenges	Point : 2 Justification : understand about the guidelines for manufacturing herbal cosmetics and the challenges in	Point : 2 Justification : expert knowledge about the guidelines for manufacturing herbal cosmetics and the challenges in formulating herbal cosmetics helps the	Point : 1 Justification : knowledge about the guidelines for manufacturing herbal cosmetics and the challenges in formulating herbal cosmetics

	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
					enables manufacturer to provide best cosmetics for the society	formulating herbal cosmetics	manufacurer to adhere to highest standards of professionalism	helps the manufacturer to be an expert tin that field
Average Score	3			2	3	2.4	2	1.6

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CO-PO Mapping

Institute	Nirmala College of Pharmacy, Muvattupuzha							
Course	M Pharm Pharmaceutics							
Batch	2021-2023							
Semester	2							
Subject	Computer Aided Drug Delivery System							
	PO1: Pharmacy Knowledge:	PO2: Modern tool usage	PO3: Leadership skills	PO4: Communication	PO5: The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
MPH 203T.1	Point : 5 Justification : gain knowledge on Computers in Pharmaceutical Research and Development and QbD	Point : 5				Point : 5 Justification : gain knowledge on Computers in Pharmaceutical Research and Development and QbD		Point : 5 Justification : since QbD based approach is implemented in formulation development the knowledge on the same enhance the ability of student in formulation development
MPH 203T.4	Point : 5 Justification : Gain knowledge on Computer-aided biopharmaceutical characterization	Point : 5 Justification : gain knowledge on modern tools in Computer-aided biopharmaceutical characterization:				Point : 5 Justification : Gain knowledge on Computer-aided biopharmaceutical characterization		Point : 5 Justification : understanding on the applicability of modern tools in biopharmaceutical characterization can be employed in product parameter optimization and there by improve the quality and safety of product
MPH 203T.5	Point : 5 Justification : gain knowledge on Artificial Intelligence(AI), Robotics and Computational fluid dynamics					Point : 5 Justification : gain knowledge on Artificial Intelligence(AI), Robotics and Computational fluid dynamics		
Average Score	5	5				5		5

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Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmaceutics
Batch	2021-2023
Semester	2
Subject	Computer Aided Drug Delivery System

Sl.No	CO Code	Course Outcome	Description	Bloom Level	Created_by
1	MPH 203T.1	Computers in Pharmaceutical Research and Development		Apply	Gifty M Jojo
2	MPH 203T.4	Computer-aided biopharmaceutical characterization		Apply	Gifty M Jojo
3	MPH 203T.5	Artificial Intelligence(AI), Robotics and Computational fluid dynamics		Understand	Gifty M Jojo

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CO-PO Mapping

Institute	Nirmala College of Pharmacy,Muvattupuzha
Course	M Pharm Pharmaceutics
Batch	2021-2023
Semester	2
Subject	Pharmaceutics Practical II

	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
MPH 205.1 P	Point : 3 Justification : ACQUIRING THE KNOWLEDGE ABOUT FORMULATION OF COSMETICS HELPS THE PHARMACIST TO BE AN EFFICIENT FORMULATOR	Point : 2 Justification : EVALUATION OF COSMETICS MAKE USE OF MODERN TOOLS		Point : 2 Justification : WORKING TOGETHER IN A GROUP ENHANCES THE COMMUNICATION SKILL OF STUDENTS	Point : 2 Justification : KNOWLEDGE IN FORMULATION OF COSMETICS WITH SAFETY AND EFFICACY IS VERY MUCH IMPORTANT SINCE COSMETICS ARE WIDELY USED BY THE SOCIETY WITHOUT ANYONES GUIDANCE	Point : 2 Justification : EXTENSIVE KNOWLEDGE IN FORMULATION AND EVALUATION IS ACHIEVED	Point : 2 Justification : EXTENSIVE KNOWLEDGE IN FORMULATION AND EVALUATION IS ACHIEVED	Point : 2 Justification : THE KNOWLEDGE STUDENTS ACHIEVE HELPS THEM TO BECOME AN EXPERT IN FORMULATION AND PRODUCTION
MPH 205.2 P	Point : 3 Justification : UNDERSTANDING THE CONCEPT OF OPTIMISATION TECHNIQUES CONTRIBUTE TO THE KNOWLEDGE OF THE PHARMACIST	Point : 3 Justification : MAKES USE OF DESIGN EXPERT SOFTWARE				Point : 3 Justification : EXTENSIVE KNOWLEDGE IN STATISTICS AND SOFTWARE ARE ACHIEVED BY STUDENTS		Point : 3 Justification : UNDERSTANDING SIGNIFICANT FACTORS THAT INFLUENCES THE FORMULATION CHARACTERISTICS AND HOW TO OPTIMISE THE FORMULATION MAKE THE STUDENT AN EXPERT IN FORMULATION AND PRODUCTION
MPH205.3P	Point : 3 Justification : The studen will able to derive the pharmacokinetic parameters to describe the process of drug absorption, distribution, metabolism and elimination.			Point : 3 Justification : The verbal and written communication is only through, english. this gives a beter understanding on language more over confidence in public communication		Point : 3 Justification : The technical knowldge gained is highly professional , since they develop the procedure, performm it, analyse it and optimise it		
MP205.4 P	Point : 3 Justification : study to identify various factors influencing a formulation and optimize the formualtion based on that	Point : 3 Justification : will be able to handle optimization softwares			Point : 3 Justification : can reduce cost of drugs by optimization of formula	Point : 3 Justification : continuouse study in statistics and other computer tools is required		Point : 3 Justification : will be able to optimize formulation
MPH205.5P	Point : 3 Justification : Able to gain knowledge in the design, formulation develop and evaluation of microspheres and liposomes	Point : 3 Justification : Able to make use of modern tool in the design and formulation develop microspheres and liposomes.	Point : 2 Justification : working in group able to enhance their leadership skill	Point : 1 Justification : discussion and suggestion while formulation development enhance their communication skill	Point : 3 Justification : Able to design and develop safe and effective novel drug delivery system for the society	Point : 3 Justification : Possess extensive knowledge while selecting suitable polymer and designing drug delivery system like microspheres and liposomes	Point : 2 Justification : Able to adheres the height standard of professionalism while designing evaluating microspheres and liposomes	Point : 3 Justification : become expert in the design, formulation develop and evaluation of microspheres and liposomes
Average	3	2.75	2	2	2.66666666666667	2.8	2	2.75

	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
Score								

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Course Outcome

Institute	Nirmala College of Pharmacy,Muvattupuzha
Course	M Pharm Pharmaceutics
Batch	2021-2023
Semester	2
Subject	Pharmaceutics Practical II

Sl.No	CO Code	Corse Outcome	Description	Bloom Level	Created_by
1	MPH 205.1 P	TO APPLY THEIR KNOWLEDGE TO DEVELOP COSMETICS WITH DESIRED SAFETY, STABILITY AND EFFICACY		Apply	Manju Maria Mathews
2	MPH 205.2 P	TO SCREEN SIGNIFICANT FACTORS THAT INFLUENCES THE FORMULATION CHARACTERISTICS AND OPTIMISE THE FORMULATION ACCORDINGLY		Apply	Manju Maria Mathews
3	MPH205.3P	Use plasma data and derive the pharmacokinetic parameters to describe the process of drugabsorption, distribution, metabolism and elimination.		Apply	Vidya Peter
4	MP205.4 P	To optimize the formulation by design expert software		Apply	Fels Saju
5	MPH205.5P	Students are able to Prepare and evaluate microspheres and liposomes as carriers for drug targeting		Apply	Vidya Peter

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2.6.1:
Course Outcomes (COs)

Program: M Pharm
(Pharmaceutics)
Batch: 3rd Semester





Nirmala College of Pharmacy,Muvattupuzha

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Course Outcome

Institute	Nirmala College of Pharmacy,Muvattupuzha
Course	M Pharm Pharmaceutics
Batch	2020-2022
Semester	3
Subject	Research Methodology and Biostatistics*

Sl.No	CO Code	Corse Outcome	Description	Bloom Level	Created_by
1	MRM 301T.1	After completion of this course students gain knowledge in General Research Methodology		Understand	Gifty M Jojo
2	MRM 301T.2	After completion of this course students gain knowledge in Collection and analysis of data		Understand	Gifty M Jojo
3	MRM 301T.3	After completion of this course students gain knowledge in Medical Research:		Understand	Gifty M Jojo
4	MRM301.4	After completion of this course students gain knowledge in CPCSEA guidelines for laboratory animal facility:		Understand	Gifty M Jojo
5	MRM301T.5	After completion of this course students gain knowledge in Technical writing, thesis/research report writing		Apply	Gifty M Jojo
6	MRM301T.6	After completion of this course students gain knowledge in Research reporting		Apply	Gifty M Jojo

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CO-PO Mapping

Institute	Nirmala College of Pharmacy,Muvattupuzha
Course	M Pharm Pharmaceutics
Batch	2020-2022
Semester	3
Subject	Research Methodology and Biostatistics*

	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
MRM 301T.1	Point : 3 Justification : students gain knowledge on General Research Methodology: Research, objective, requirements, practical difficulties, types of research, scientific methods of research, types of studies, study design and review of literature	Point : 3 Justification : students learn Searching of library documents and databases online and offline		Point : 3 Justification : knowledge on Searching of library documents and databases online and offline enhance the research communication ability of students		Point : 3 Justification : students gain knowledge on General Research Methodology: Research, objective, requirements, practical difficulties, types of research, scientific methods of research, types of studies, study design and review of literature		Point : 3 Justification : Knowledge of general research methodology and literature surveys enhances the knowledge of students in the design and optimisation of various dosage forms.
MRM 301T.2	Point : 3 Justification : students gain knowledge on Collection and analysis of research data	Point : 3 Justification : students gain knowledge on various tools used for analysis of data		Point : 3 Justification : Knowledge of Research data Analysis helps students to express research findings in a scientific manner.		Point : 3 Justification : students gain knowledge on Collection and analysis of research data		Point : 3 Justification : Knowledge of Research data Analysis helps students to express research findings in a scientific manner.
MRM 301T.3	Point : 3 Justification : students gain knowledge on Medical Research					Point : 3 Justification : students gain knowledge on Medical Research		
MRM301.4	Point : 3 Justification : students gain knowledge on CPCSEA guidelines for laboratory animal facility:					Point : 3 Justification : students gain knowledge on CPCSEA guidelines for laboratory animal facility:		
MRM301T.5	Point : 3 Justification : students gain knowledge on Technical writing, thesis/research report writing,			Point : 3 Justification : This chapter helps students to express research in a scientific manner		Point : 3 Justification : students gain knowledge on Technical writing, thesis/research report writing,		

	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
	structure of thesis, editing and formatting, reference citations, abstracting, plagiarism and paraphrasing, tools for writing good research report.					structure of thesis, editing and formatting, reference citations, abstracting, plagiarism and paraphrasing, tools for writing good research report.		
MRM301T,6	Point : 3 Justification : students gain knowledge on Research reporting			Point : 3 Justification : This chapter helps students to express research in a scientific manner		Point : 3 Justification : students gain knowledge on Research reporting		
Average Score	3	3		3		3		3

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2.6.1:
Course Outcomes (COs)

Program: M Pharm(pharmacology)
Batch: 1st semester





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Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmacology
Batch	2021-2023
Semester	1
Subject	Modern Pharmaceutical Analytical Techniques

Sl.No	CO Code	Course Outcome	Description	Bloom Level	Created_by
1	MPT101T.1	Critically evaluate various analytical techniques in the context of qualitative and quantitative analysis of drugs in single and combination dosage forms		Understand	Manu Jose
2	MPT101T.2	Demonstrate an understanding of theory and application of the most common methods of pharmaceutical analysis in research, academia, and industry.		Understand	Manu Jose
3	MPT101T.3	Apply the principles of chromatography and spectroscopic tools in qualitative and quantitative analysis of pharmaceuticals in research and industrial perspective		Apply	Manu Jose

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CO-PO Mapping

Institute	Nirmala College of Pharmacy,Muvattupuzha							
Course	M Pharm Pharmaceutics							
Batch	2022-2024							
Semester	1							
Subject	Modern Pharmaceutical Analytical Techniques							
	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
MPT101T.1	Point : 3 Justification : Possess knowledge About analytical techniques in the context of qualitative and quantitative analysis of drugs	Point : 2 Justification : The analytical tools for the qualitative and quantitative analysis used for preformulation and post formulation studies make professionally competent candidates		Point : 1	Point : 2	Point : 3 Justification : Possess knowledge About analytical techniques in the context of qualitative and quantitative analysis of drugs	Point : 3 Justification : The analytical tools for the qualitative and quantitative analysis used for preformulation and post formulation studies make professionally competent candidates	Point : 2 Justification : The use of modern analytical techniques to determine the analysis of novel drug delivery system
MPT101T.2	Point : 3 Justification : Acquire knowledge about various research and industry aspect of analytical techniques	Point : 2 Justification : The use of modern analytical techniques to determine the analysis of novel drug delivery system			Point : 2	Point : 3 Justification : Acquire knowledge about various research and industry aspect of analytical techniques	Point : 2 Justification : The theoretical and practical applications of analytical tools helps in formulation development to make to fit as qualified professional	
MPT101T.3	Point : 3 Justification : The quality assurance parameters via various analytical techniques make expertise in formulation and production of conventional and novel drug delivery systems	Point : 2 Justification : The knowledge about spectroscopy in the elucidation of molecular structure and the interpretation of the result create a professional identity as an analyst		Point : 1	Point : 2 Justification : The quality assurance parameters via various analytical techniques make expertise in formulation and production of conventional and novel drug delivery systems	Point : 3	Point : 3 Justification : The knowledge about spectroscopy in the elucidation of molecular structure and the interpretation of the result create a professional identity as an analyst	Point : 2 Justification : The quality assurance parameters via various analytical techniques make expertise in formulation and production of conventional and novel drug delivery systems
Average Score	3	2		1	2	3	2.6666666666667	2

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Nirmala College of Pharmacy, Muvattupuzha

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Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmacology
Batch	2021-2023
Semester	1
Subject	Advanced Pharmacology-I

Sl.No	CO Code	Course Outcome	Description	Bloom Level	Created_by
1	CO1	The students would have an indepth knowledge in the field of pharmacology pertaining to the drugs and its therapeutic applications, the recent advances in the drugs used for the treatment of various diseases. They would have understood the concepts of drug action and mechanisms involved. They would have discussed the pathophysiology and pharmacotherapy of certain diseases? They would have understood the underlying mechanism of drug actions at cellular and molecular level.		Understand	Emily James
2	CO2	They would have knowledge on the recent advances in the drugs used for the treatment of various diseases.		Remember	Emily James
3	CO3	They would have discussed the pathophysiology and pharmacotherapy of certain diseases		Understand	Emily James

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CO-PO Mapping

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmacology
Batch	2021-2023
Semester	1
Subject	Advanced Pharmacology-I

	PO1.Pharmacy Knowledge	PO2.Modern tool usage	PO3.Leadership skills	PO4:Communication	PO5:The Pharmacist and society	PSO.01	PSO.02	PSO.03	PSO.04
CO1	Point : 3	Point : 2	Point : 2	Point : 1	Point : 1				
CO2	Point : 3	Point : 2	Point : 2	Point : 1	Point : 1				
CO3	Point : 3	Point : 2	Point : 2	Point : 1	Point : 1				
Average Score	3	2	2	1	1				

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Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmacology
Batch	2021-2023
Semester	1
Subject	Pharmacology and Toxicology Screening Methods-I

Sl.No	CO Code	Course Outcome	Description	Bloom Level	Created_by
1	MPL103T.1	Appraise the regulations and ethical requirement for the usage of various animals used in the drug discovery process and good laboratory practices in maintenance and handling of experimental animals	Describe the regulations and ethical requirement for the usage of various species and strains of experimental animals and explain CPCSEA guidelines, GLP. Classify Bioassay, Explain the principle, scope, limitations and methods of bioassay	Understand	Maneesha Peter
2	MPL103T.2	Describe the various newer screening methods involved in the drug discovery process	Classify and explain various preclinical invitro, invivo and other possible animal alternative models for the screening of following classes of drugs: a) CNS Pharmacology b) Respiratory Pharmacology c) Reproductive Pharmacology d) Analgesics, antiinflammatory and antipyretic agents e) Gastrointestinal drugs f) Cardiovascular Pharmacology g) metabolic disorders h) Anti cancer agents i) Hepatoprotective screening methods j) Immunomodulators, Immunosuppressants and immunostimulants	Evaluate	Maneesha Peter
3	MPL103T.3	Describe general principles of Immunoassay and explain Immunoassay methods of evaluation	Explain optimization of immunoassay, classify immunoassay systems and study various Immunoassay methods	Understand	Maneesha Peter
4	MPL103T.4	Appreciate and correlate the preclinical data to clinical data	Describe limitations of animal experimentation, alternate animal experiments and explain Extrapolation of in vitro data to preclinical and preclinical to humans	Understand	Maneesha Peter



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CO-PO Mapping

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmacology
Batch	2021-2023
Semester	1
Subject	Pharmacology and Toxicology Screening Methods-I

	PO1. Pharmacy Knowledge	PO2. Modern tool usage	PO3. Leadership skills	PO4: Communication	PO5: The Pharmacist and society	PSO.01	PSO.02	PSO.03	PSO.04
MPL103T.1	Point : 3				Point : 1				
MPL103T.2	Point : 3	Point : 2			Point : 3				
MPL103T.3	Point : 3	Point : 2			Point : 3				
MPL103T.4	Point : 3	Point : 3			Point : 3				
Average Score	3	2.33333333333333			2.5				

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Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmacology
Batch	2021-2023
Semester	1
Subject	Pharmacology-I Practical

Sl.No	CO Code	Course Outcome	Description	Bloom Level	Created_by
1	MPL 105P.1	Students were able to design & analyze the given sample of drugs using spectroscopic, chromatographic, fluorimetry, and flame photometry		Evaluate	Nancy Jose
2	MPL 105P.2	Students were able to perform experiments with rodents for CNS-related activities, diuretics, and GI effects.		Analyze	Nancy Jose
3	MPL 105P.3	Students were able to perform experiments with rodents for CNS-related activities, diuretics, and GI effects.		Analyze	Nancy Jose
4	MPL 105P.4	Students were able to perform experiments with rodents for CNS-related activities, diuretics, and GI effects.		Analyze	Nancy Jose
5	MPL 105P.5	Students were able to perform experiments with rodents for CNS-related activities, diuretics, and GI effects.		Analyze	Nancy Jose

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CO-PO Mapping

Institute	Nirmala College of Pharmacy,Muvattupuzha
Course	M Pharm Pharmacology
Batch	2022-2024
Semester	1
Subject	Pharmacology-I Practical

	PO1.Pharmacy Knowledge	PO2.Modern tool usage	PO3.Leadership skills	PO4:Communication	PO5:The Pharmacist and society	PSO.01 Knowledge in drug development	PSO.02 Application to pharmacotherapeutics	PSO.03 Knowledge on CPCSEA guidelines	PSO.04 Application to pharmacovigilance and drug discovery
MPL 105P.1	Point : 3 Justification : Gives idea about various instruments used in analysis of drugs	Point : 2 Justification : Newer instruments and models provide better analysis	Point : 1 Justification : provide leadership skills to students	Point : 1 Justification : Documentation of recordings is important for success of the study	Point : 1 Justification : Drug development through bioassays & animal studies helps in developing new drugs	Point : 2 Justification : Drug development through bioassays & animal studies helps in developing new drugs	Point : 2 Justification : helps in therapy		Point : 1 Justification : helps in determining ADR and new drug discovery
MPL 105P.2	Point : 3 Justification : Laboratory animal studies are an important part of preclinical testing	Point : 1 Justification : Study through modern screening techniques and new equipments is essential to decrease animal use	Point : 1 Justification : provide leadership skills to students	Point : 1 Justification : Documentation and tabulation is essential during recording raw data for analysis later	Point : 1 Justification : Modern screening techniques decreases repetition and wastage of animals	Point : 2 Justification : provide immense scope in new drug development	Point : 2 Justification : conducive to better therapeutics regimen	Point : 2 Justification : provide thorough knowledge on CPCSEA guidelines	Point : 2 Justification : helps in determining ADR and new drug discovery
MPL 105P.3	Point : 2 Justification : give pharmacists an idea on drugs used in CNS, diuretics and GI	Point : 1 Justification : new tools can be used for research	Point : 1 Justification : provide leadership skills to students	Point : 1 Justification : better at communication	Point : 2 Justification : Modern screening techniques decreases repetition and wastage of animals	Point : 1 Justification : Drug development through bioassays & animal studies helps in developing new drugs	Point : 2 Justification : helps in therapy	Point : 1 Justification : provide thorough knowledge on CPCSEA guidelines	Point : 2 Justification : helps in determining ADR and new drug discovery
MPL 105P.4	Point : 2 Justification : Gives idea about various instruments used in analysis of drugs	Point : 1 Justification : Study through modern screening techniques and new equipments is essential to decrease animal use	Point : 1 Justification : provide leadership skills to students	Point : 2 Justification : Documentation and tabulation is essential during recording raw data for analysis later	Point : 2 Justification : Modern screening techniques decreases repetition and wastage of animals	Point : 2 Justification : provide immense scope in new drug development	Point : 1 Justification : conducive to better therapeutics regimen	Point : 2 Justification : provide thorough knowledge on CPCSEA guidelines	Point : 1 Justification : helps in determining ADR and new drug discovery
MPL 105P.5	Point : 1 Justification : Laboratory animal studies are an important part of preclinical testing	Point : 2 Justification : Newer instruments and models provide better analysis	Point : 1 Justification : provide leadership skills to students	Point : 2 Justification : better at communication	Point : 1 Justification : Modern screening techniques decreases repetition and wastage of animals	Point : 3 Justification : Drug development through bioassays & animal studies helps in developing new drugs	Point : 1 Justification : helps in therapy	Point : 1 Justification : provide thorough knowledge on CPCSEA guidelines	Point : 2 Justification : helps in determining ADR and new drug discovery
Average Score	2.2	1.4	1	1.4	1.4	2	1.6	1.5	1.6

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Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmacology
Batch	2021-2023
Semester	1
Subject	Cell and Molecular Pharmacology

Sl.No	CO Code	Course Outcome	Description	Bloom Level	Created_by
1	C01	To acquire the fundamental knowledge on the cellular structures and the interaction of these components with drugs		Understand	Fousia R
2	C02	To learn the receptor signal transduction processes.		Understand	Fousia R
3	C03	To learn the molecular pathways affected by drugs.		Remember	Fousia R
4	C04	To learn the applicability of molecular pharmacology and biomarkers in drug discovery process		Remember	Fousia R
5	C05	To learn and to demonstrate molecular biology techniques as applicable for pharmacology		Understand	Fousia R

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CO-PO Mapping

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmacology
Batch	2021-2023
Semester	1
Subject	Cell and Molecular Pharmacology

	PO1. Pharmacy Knowledge	PO2. Modern tool usage	PO3. Leadership skills	PO4: Communication	PO5: The Pharmacist and society	PSO.01	PSO.02	PSO.03	PSO.04
C01	Point : 3								
C02	Point : 2								
C03	Point : 2								
C04					Point : 3				
C05			Point : 3						
Average Score	2.33333333333333		3		3				

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2.6.1:
Course Outcomes (COs)

Program: M Pharm(pharmacology)
Batch: 2nd semester



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Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmacology
Batch	2021-2023
Semester	2
Subject	Advanced Pharmacology II

Sl.No	CO Code	Course Outcome	Description	Bloom Level	Created_by
1	CO1	The students would have an indepth knowledge in the field of pharmacology pertaining to the drugs and its therapeutic applications, the recent advances in the drugs used for the treatment of various diseases. They would have understood the concepts of drug action and mechanisms involved.		Understand	Emily James
2	CO2	Students would have understood the pharmacotherapy and adverse effects, contraindications and clinical uses of drugs used in treatment of various diseases		Apply	Emily James
3	CO3	They would have gained sufficient understanding of the mechanism of drug actions at cellular and molecular level under various pharmacological classes.		Understand	Emily James
4	CO4	Understand the mechanisms in generation of free radicals, role of free radicals disease etiology and use of antioxidants.		Apply	Emily James
5	CO5	They would have understood the concepts of drug action and mechanisms involved. They would have discussed the pathophysiology and pharmacotherapy of certain diseases.		Understand	Emily James

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CO-PO Mapping

Institute	Nirmala College of Pharmacy, Muvattupuzha								
Course	M Pharm Pharmacology								
Batch	2021-2023								
Semester	2								
Subject	Advanced Pharmacology II								
	PO1: Pharmacy Knowledge	PO2: Modern tool usage	PO3: Leadership skills	PO4: Communication	PO5: The Pharmacist and society	PSO.01 Knowledge in drug development	PSO.02 Application to pharmacotherapeutics	PSO.03 Knowledge on CPSCEA guidelines	PSO.04 Application to pharmacovigilance and drug discovery
CO1	Point : 3 Justification : A thorough knowledge of drugs and their therapeutic applications	Point : 1 Justification : Use of various modern teaching aids in presentations etc	Point : 1	Point : 2 Justification : Medium of communication is only through, english. this gives a better understanding on language more over confidence in public communication	Point : 1 Justification : Student can use his knowledge of drugs to benefit society in various ways like awareness programmes, counselling etc	Point : 1 Justification : A thorough knowledge of drugs acting on various systems including endocrine and chemotherapy and cancer.	Point : 2 Justification : A detailed study of various molecular mechanisms of drug action pathophysiology to the pharmacotherapy of certain diseases and mechanism of drug actions.		
CO2	Point : 3 Justification : A deep insight into various pathophysiological mechanisms underlying various diseases and their pharmacotherapy.	Point : 1 Justification : Use of modern ICT based tools in learning.	Point : 1	Point : 2 Justification : communication skills gained through seminar presentations and group discussions	Point : 1 Justification : Student can use his knowledge of drugs to benefit society in various ways like awareness programmes, counselling etc	Point : 2 Justification : A thorough knowledge of drugs acting on various systems including endocrine and chemotherapy and cancer.	Point : 2 Justification : A detailed study of various molecular mechanisms of drug action pathophysiology to the pharmacotherapy of certain diseases and mechanism of drug actions.		
CO3	Point : 3 Justification : A sound insight into the molecular mechanism of drug action.	Point : 1 Justification : Use of various modern teaching aids in presentations etc	Point : 1	Point : 2 Justification : communication skills gained through seminar presentations and group discussions	Point : 1 Justification : Student can use his knowledge of drugs to benefit society in various ways like awareness programmes, counselling etc	Point : 1 Justification : A thorough knowledge of drugs acting on various systems including endocrine and chemotherapy and cancer.	Point : 2 Justification : A detailed study of various molecular mechanisms of drug action pathophysiology to the pharmacotherapy of certain diseases and mechanism of drug actions.		
CO4	Point : 3 Justification : A proper understanding of free radical generation and their role in etiology of various disease as well as role of antioxidants.	Point : 1 Justification : Use of various modern teaching aids in presentations etc	Point : 1	Point : 2 Justification : communication skills gained through seminar presentations and group discussions	Point : 1 Justification : Student can use his knowledge of drugs to benefit society in various ways like awareness programmes, counselling etc	Point : 1 Justification : A thorough knowledge of drugs acting on various systems including endocrine and chemotherapy and cancer.	Point : 2 Justification : A detailed study of various molecular mechanisms of drug action pathophysiology to the pharmacotherapy of certain diseases and mechanism of drug actions.		
CO5	Point : 3 Justification : A proper knowledge on pathophysiological and pharmacotherapy of selected conditions.	Point : 1 Justification : Use of various modern teaching aids in presentations etc	Point : 1	Point : 2 Justification : communication skills gained through seminar presentations and group discussions	Point : 1 Justification : Student can use his knowledge of drugs to benefit society in various ways like awareness programmes, counselling etc	Point : 1 Justification : A thorough knowledge of drugs acting on various systems including endocrine and chemotherapy and cancer.	Point : 2 Justification : A detailed study of various molecular mechanisms of drug action pathophysiology to the pharmacotherapy of certain diseases and mechanism of drug actions.		
Average Score	3	1	1	2	1	1.2	2		



Nirmala College of Pharmacy, Muvattupuzha

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Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmacology
Batch	2021-2023
Semester	2
Subject	Pharmacological and Toxicological Screening Methods –II

Sl.No	CO Code	Course Outcome	Description	Bloom Level	Created_by
1	CO 1	Evaluate and estimate different types of toxicity studies in regulatory toxicology and its importance in drug development.		Understand	Hema S
2	CO 2	Interpret and justify ethical and safety aspects of regulatory requirements for toxicity studies in association with investigational new drug application.		Analyze	Hema S
3	CO 3	Interpret the importance of toxicokinetic and alternative methods to animal toxicity testing in association with drug discovery and assessment		Understand	Hema S
4	CO 4	Interpret the importance of toxicokinetic and alternative methods to animal toxicity testing in association with drug discovery and assessment		Understand	Hema S
5	CO 5	Describe in detail about various methods employed in drug discovery and development		Understand	Hema S

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CO-PO Mapping

Institute	Nirmala College of Pharmacy,Muvattupuzha
Course	M Pharm Pharmacology
Batch	2021-2023
Semester	2
Subject	Pharmacological and Toxicological Screening Methods –II

	PO1.Pharmacy Knowledge	PO2.Modern tool usage	PO3.Leadership skills	PO4:Communication	PO5:The Pharmacist and society	PSO.01 Knowledge in drug development	PSO.02 Application to pharmacotherapeutics	PSO.03 Knowledge on CPSCEA guidelines	PSO.04 Application to pharmacovigilance and drug discovery
CO 1	Point : 2	Point : 1							
CO 2	Point : 3	Point : 2							
CO 3	Point : 3								
CO 4	Point : 3	Point : 3							
CO 5	Point : 3	Point : 3							
Average Score	2.8	2.25							

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Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmacology
Batch	2021-2023
Semester	2
Subject	Principles of Drug Discovery

Sl.No	CO Code	Course Outcome	Description	Bloom Level	Created_by
1	MPL 203 T.1	Explain about various stages involved in modern drug discovery process	An overview of modern drug discovery process: Target identification, target validation, lead identification and lead Optimization. Economics of drug discovery.	Understand	Elayath Parvathy Murali
2	MPL 203 T.2	Explain the role of genomics, proteomics and bioinformatics in drug discovery	Target Discovery and validation-Role of genomics, proteomics and bioinformatics. Role of nucleic acid microarrays, protein microarrays, antisense technologies, siRNAs, antisense oligonucleotides, Zinc finger proteins. Role of transgenic animals in target validation.	Understand	Elayath Parvathy Murali
3	MPL 203 T.3	Explain various lead seeking method and lead optimization	Lead Identification- combinatorial chemistry & high throughput screening, insilico lead discovery techniques, assay development for hit identification. Protein structure Levels of protein structure, domains, motifs, and folds in protein structure. Computational prediction of protein structure: Threading and homology modeling methods. Application of NMR and X-ray crystallography in protein structure prediction .	Remember	Elayath Parvathy Murali
4	MPL 203 T.4	Describe in detail about the concept of Rational Drug Design	Rational Drug Design Traditional vs rational drug design, methods followed in traditional drug design, high throughput screening, concepts of rational drug design, rational drug Design Methods: Structure and pharmacophore based approaches virtual screening techniques: drug likeness screening, concept of pharmacophore mapping and pharmacophore based screening.	Understand	Elayath Parvathy Murali
5	MPL 203 T.5	Explain the concept of molecular docking and its applications	Molecular docking: rigid docking, flexible docking, manual docking; docking based screening. De novo drug design. Quantitative analysis of structure activity relationship	Remember	Elayath Parvathy Murali
6	MPL 203 T.6	Explain the concept of QSAR and QSAR statistical methods	History and development of QSAR, SAR vs QSAR, physicochemical parameters, Hansch analysis, Fee Wilson analysis and relationship between them. 5. QSAR Statistical methods – regression	Apply	Elayath Parvathy Murali

Sl.No	CO Code	Corse Outcome	Description	Bloom Level	Created_by
			analysis, partial least square analysis (PLS) and other multivariate statistical methods. 3D-QSAR approaches like COMFA and COMSIA		
7	MPL 203 T.7	Explain Rationale of prodrug design and practical consideration of prodrug design	Prodrug design-basic concept, prodrugs to improve patient acceptability, drug solubility, drug absorption and distribution, site specific drug delivery and sustained drug action. Rationale of prodrug design and practical consideration of prodrug design	Apply	Elayath Parvathy Murali

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CO-PO Mapping

Institute	Nirmala College of Pharmacy, Muvattupuzha								
Course	M Pharm Pharmacology								
Batch	2021-2023								
Semester	2								
Subject	Principles of Drug Discovery								
	PO1: Pharmacy Knowledge	PO2: Modern tool usage	PO3: Leadership skills	PO4: Communication	PO5: The Pharmacist and society	PSO.01 Knowledge in drug development	PSO.02 Application to pharmacotherapeutics	PSO.03 Knowledge on CPSCEA guidelines	PSO.04 Application to pharmacovigilance and drug discovery
MPL 203 T.1	Point : 2 Justification : Students will gain an in-depth knowledge regarding different stages of drug discovery	Point : 2 Justification : Modern methods of high throughput screening and drug discovery processes can be learnt			Point : 1 Justification : Novel techniques will help in contributing to improving health of society as a whole	Point : 3	Point : 1		Point : 3
MPL 203 T.2	Point : 2	Point : 2			Point : 2	Point : 2	Point : 2		Point : 2
MPL 203 T.3	Point : 2	Point : 2			Point : 2	Point : 3	Point : 3		Point : 3
MPL 203 T.4	Point : 2	Point : 3			Point : 2	Point : 2	Point : 2		Point : 2
MPL 203 T.5	Point : 2	Point : 2			Point : 2	Point : 2	Point : 2		Point : 2
MPL 203 T.6	Point : 2	Point : 3			Point : 3	Point : 3	Point : 3		Point : 3
MPL 203 T.7	Point : 2	Point : 2			Point : 2	Point : 2	Point : 2		Point : 2
Average Score	2	2.2857142857143			2	2.4285714285714	2.1428571428571		2.4285714285714

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Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmacology
Batch	2021-2023
Semester	2
Subject	Clinical research and Pharmacovigilance

Sl.No	CO Code	Course Outcome	Description	Bloom Level	Created_by
1	MPL 204T.1	Explain the regulatory requirements for conducting clinical trial	ICH-GCP, Institutional Review Board, Schedule Y, ICMR & Informed Consent Process	Understand	Maneesha Peter
2	MPL 204T.2	Demonstrate the types of clinical trial designs	Experimental Study & Observation Study	Apply	Maneesha Peter
3	MPL 204T.3	Explain the responsibilities of key players involved in clinical trials	Roles and responsibilities of Investigator, Study Coordinator, Sponsor & Contract Research Organization	Remember	Maneesha Peter
4	MPL 204T.4	Execute safety monitoring, reporting and close-out activities	Clinical Trial Documentation & Predictability, preventability, assessment & Management of adverse drug reactions	Apply	Maneesha Peter
5	MPL 204T.5	Explain the principles of Pharmacovigilance	History and progress of pharmacovigilance, Significance of safety monitoring, Pharmacovigilance in India and international aspects, WHO international drug monitoring programme, WHO and Regulatory terminologies of ADR, evaluation of medication safety, Establishing pharmacovigilance centres in Hospitals, Industry and National programmes related to pharmacovigilance. Roles and responsibilities in Pharmacovigilance	Remember	Maneesha Peter
6	MPL204T.6	Detect new adverse drug reactions and their assessment	International classification of diseases, International Non-proprietary names for drugs, Passive and Active surveillance, Comparative observational studies, Targeted clinical investigations and Vaccine safety surveillance.	Analyze	Maneesha Peter
7	MPL 204T.7	Perform the adverse drug reaction reporting systems and communication in Pharmacovigilance	Spontaneous reporting system and Reporting to regulatory authorities, Guidelines for ADRs reporting.	Apply	Maneesha Peter



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CO-PO Mapping

Institute	Nirmala College of Pharmacy,Muvattupuzha
Course	M Pharm Pharmacology
Batch	2021-2023
Semester	2
Subject	Clinical research and Pharmacovigilance

	PO1.Pharmacy Knowledge	PO2.Modern tool usage	PO3.Leadership skills	PO4:Communication	PO5:The Pharmacist and society	PSO.01 Knowledge in drug development	PSO.02 Application to pharmacotherapeutics	PSO.03 Knowledge on CPSCEA guidelines	PSO.04 Application to pharmacovigilar and drug discovery
MPL 204T.1	Point : 3			Point : 3	Point : 2				Point : 3
MPL 204T.2	Point : 3			Point : 3	Point : 3				Point : 3
MPL 204T.3	Point : 3			Point : 3	Point : 3				Point : 3
MPL 204T.4	Point : 3	Point : 3		Point : 3	Point : 3				Point : 3
MPL 204T.5	Point : 3			Point : 3	Point : 3				Point : 3
MPL204T.6	Point : 3	Point : 3		Point : 3	Point : 3				Point : 3
MPL 204T.7	Point : 3	Point : 3		Point : 3	Point : 3				Point : 3
Average Score	3	3		3	2.8571428571429				3

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Nirmala College of Pharmacy, Muvattupuzha

Muvattupuzha P.O Ernakulam District Kerala, India, Pin:686661

Email : info@nirmalacp.org, Phone : 04852836888

Course Outcome

Institute	Nirmala College of Pharmacy, Muvattupuzha
Course	M Pharm Pharmacology
Batch	2021-2023
Semester	2
Subject	Pharmacology Practical -II

Sl.No	CO Code	Corse Outcome	Description	Bloom Level	Created_by
1	CO1	test 1	students could perform experiments on effects of agonist, antagonist/potentiating effects on DRC using isolated chicken ileum	Evaluate	Elizabeth Abraham P
2	CO2	test2	Students were able to determine strength of unknown sample by matching, interpolation, bracketing and multiple point bioassays	Evaluate	Elizabeth Abraham P
3	CO3	test3	Students could design ADR monitoring protocol and do ADR reporting	Create	Elizabeth Abraham P
4	CO4	test4	Students could perform in-silico docking studies, pharmacophore based screening and QSAR studies	Apply	Elizabeth Abraham P

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CO-PO Mapping

Institute	Nirmala College of Pharmacy,Muvattupuzha
Course	M Pharm Pharmacology
Batch	2021-2023
Semester	2
Subject	Pharmacology Practical -II

	PO1.Pharmacy Knowledge	PO2.Modern tool usage	PO3.Leadership skills	PO4:Communication	PO5:The Pharmacist and society	PSO.01 Knowledge in drug development	PSO.02 Application to pharmacotherapeutics	PSO.03 Knowledge on CPSCEA guidelines	PSO.04 Application to pharmacovigilance and drug discovery
CO1	Point : 3 Justification : students are able to increase their pharmacy knowledge by testing these actions of a drug		Point : 2 Justification : able to develop leadership skills	Point : 2 Justification : they learn to communicate	Point : 2 Justification : they can contribute to the society regarding effects of drugs on target organs				
CO2	Point : 3 Justification : unknown concentration of a drug can be calculated		Point : 2 Justification : able to develop leadership skills	Point : 2 Justification : they learn to communicate	Point : 2 Justification : they can contribute to the society				
CO3	Point : 3 Justification : Students are able to increase pharmacy knowledge by knowing adverse effects		Point : 2 Justification : able to develop leadership skills	Point : 2 Justification : they learn to communicate with doctors ,nurses and patients	Point : 3 Justification : contribute to society by finding out the ADR				
CO4	Point : 3 Justification : Students are able to increase pharmacy knowledge by developing new drugs	Point : 3 Justification : Modern tools are used	Point : 2 Justification : able to develop leadership skills	Point : 2 Justification : they learn to communicate	Point : 3 Justification : contribute to the society by invention of new drugs				
Average Score	3	3	2	2	2.5				

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2.6.1:
Course Outcomes (COs)

Program: M Pharm
(Pharmacology)
3rd Semester





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Course Outcome

Institute	Nirmala College of Pharmacy,Muvattupuzha
Course	M Pharm Pharmacology
Batch	2020-2022
Semester	3
Subject	Research Methodology and Biostatistics*

Sl.No	CO Code	Corse Outcome	Description	Bloom Level	Created_by
1	MRM 301T.1	After completion of this course students gain knowledge in General Research Methodology		Understand	Gifty M Jojo
2	MRM 301T.2	After completion of this course students gain knowledge in Collection and analysis of data		Understand	Gifty M Jojo
3	MRM 301T.3	After completion of this course students gain knowledge in Medical Research:		Understand	Gifty M Jojo
4	MRM301.4	After completion of this course students gain knowledge in CPCSEA guidelines for laboratory animal facility:		Understand	Gifty M Jojo
5	MRM301T.5	After completion of this course students gain knowledge in Technical writing, thesis/research report writing		Apply	Gifty M Jojo
6	MRM301T.6	After completion of this course students gain knowledge in Research reporting		Apply	Gifty M Jojo

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CO-PO Mapping

Institute	Nirmala College of Pharmacy,Muvattupuzha
Course	M Pharm Pharmacology
Batch	2020-2022
Semester	3
Subject	Research Methodology and Biostatistics*

	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
MRM 301T.1	Point : 3 Justification : students gain knowledge on General Research Methodology: Research, objective, requirements, practical difficulties, types of research, scientific methods of research, types of studies, study design and review of literature	Point : 3 Justification : students learn Searching of library documents and databases online and offline		Point : 3 Justification : knowledge on Searching of library documents and databases online and offline enhance the research communication ability of students		Point : 3 Justification : students gain knowledge on General Research Methodology: Research, objective, requirements, practical difficulties, types of research, scientific methods of research, types of studies, study design and review of literature		Point : 3 Justification : Knowledge of general research methodology and literature surveys enhances the knowledge of students in the design and optimisation of various dosage forms.
MRM 301T.2	Point : 3 Justification : students gain knowledge on Collection and analysis of research data	Point : 3 Justification : students gain knowledge on various tools used for analysis of data		Point : 3 Justification : Knowledge of Research data Analysis helps students to express research findings in a scientific manner.		Point : 3 Justification : students gain knowledge on Collection and analysis of research data		Point : 3 Justification : Knowledge of Research data Analysis helps students to express research findings in a scientific manner.
MRM 301T.3	Point : 3 Justification : students gain knowledge on Medical Research					Point : 3 Justification : students gain knowledge on Medical Research		
MRM301.4	Point : 3 Justification : students gain knowledge on CPCSEA guidelines for laboratory animal facility:					Point : 3 Justification : students gain knowledge on CPCSEA guidelines for laboratory animal facility:		
MRM301T.5	Point : 3 Justification : students gain knowledge on Technical writing, thesis/research report writing,			Point : 3 Justification : This chapter helps students to express research in a scientific manner		Point : 3 Justification : students gain knowledge on Technical writing, thesis/research report writing,		

	PO1:Pharmacy Knowledge:	PO2:Modern tool usage	PO3:Leadership skills	PO4:Communication	PO5.The Pharmacist and society	PSO.01. Possess extensive knowledge	PSO.02. Adhere the highest standards of professionalism	PSO.03. Be an expertise in formulation and production
	structure of thesis, editing and formatting, reference citations, abstracting, plagiarism and paraphrasing, tools for writing good research report.					structure of thesis, editing and formatting, reference citations, abstracting, plagiarism and paraphrasing, tools for writing good research report.		
MRM301T,6	Point : 3 Justification : students gain knowledge on Research reporting			Point : 3 Justification : This chapter helps students to express research in a scientific manner		Point : 3 Justification : students gain knowledge on Research reporting		
Average Score	3	3		3		3		3

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