MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **Pharmaceutical Sciences & Technology**

Program: M. Pharmacy

COs, POs, PSOs Mapping

Subject: Modern Pharmaceutical Analytical Techniques	**Subject Code: MPH101T**	**Semester: 1st**
Credit: 4	**L T P 4 0 0**	**Duration: 45 Hrs.**

COs	Statement	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	Chemicals and Excipients	2	2	3		2			2
CO2	The analysis of various drugs in single and combination dosage forms	2	2	2		2			2
CO3	Theoretical and practical skills of the instruments	2	2	3	1	2		1	3

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low)- upto 30% 2. Moderate (Medium) – above 30% and upto70% 3. Substantial (High) – above 70%

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Department: **Pharmaceutical Sciences & Technology**

Program: M. Pharmacy

Subject: Drug Delivery System	**Subject Code: MPH102T**	**Semester: 1st**
Credit: 4	**L T P 4 0 0**	**Duration: 45 Hrs.**

COs	Statement	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	The various approaches for development of novel drug delivery systems	2	2	2		1			2
CO2	The criteria for selection of drugs and polymers for the development of delivering system	2	2	1		1			2
CO3	The formulation and evaluation of Novel drug delivery systems	3	2	2		2		1	2

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Department: **Pharmaceutical Sciences & Technology**

Program: M. Pharmacy

Subject: Modern Pharmaceutics	**Subject Code: MPH103T**	**Semester: 1st**
Credit: 4	**L T P 4 0 0**	**Duration: 45 Hrs.**

COs	Statement	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	The elements of preformulation studies	2	2	2		2			2
CO2	The Active Pharmaceutical Ingredients and Generic drug Product development	2	1		2			1	2
CO3	Industrial Management and GMP Considerations.	2	2	2	1	2			2
CO4	Optimization Techniques & Pilot Plant Scale Up Techniques	2	2	2		2			2
CO5	Stability Testing, sterilization process & packaging of dosage forms.	1	2	2		2			2

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Department: **Pharmaceutical Sciences & Technology**

Program: M. Pharmacy

Subject: Regulatory Affair	**Subject Code: MPH104T**	**Semester: 1st**
Credit: 4	**L T P 4 0 0**	**Duration: 45 Hrs.**

Cos	Statement	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	The Concepts of innovator and generic drugs, drug development process	2	2	2		2		1	2
CO2	The Regulatory guidance's and guidelines for filing and approval process		1	2		2		2	2
CO3	Preparation of Dossiers and their submission to regulatory agencies in different countries		2	2		2			2
CO4	Post approval regulatory requirements for actives and drug products		2	2		2			2
CO5	Submission of global documents in CTD/ eCTD formats		2	2		2			2
CO6	Clinical trials requirements for approvals for conducting clinical trials		2	2		2			2
CO7	Pharmacovigilence and process of monitoring in clinical trials.					1			

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Department: **Pharmaceutical Sciences & Technology**

Program: M. Pharmacy

Subject: Pharmaceutics Practical I	**Subject Code: MPH105P**	**Semester: 1st**
Credit: 6	**L T P 0 0 6**	**Duration: 180 Hrs.**

COs	Statement	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	The elements of performulation studies	2		2		2	2		2
CO2	Optimization Techniques & Pilot plant scale up techniques	2		2		1	2		1
CO3	The various approaches for development of novel drug delivery systems	1	1	2		1	2	1	
CO4	The criteria for selection of drugs and polymers for the development of delivering system	1		2		2	1		
CO5	The analysis of various drugs in single and combination dosage forms	1		2		2	2		2

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Department: **Pharmaceutical Sciences & Technology**

Program: M. Pharmacy

Subject: Molecular Pharmaceutics (Nano Tech and Targeted DDS)	**Subject Code: MPH201T**	**Semester: 2nd**
Credit: 4	**L T P 4 0 0**	**Duration: 45 Hrs.**

COs	Statement	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	The various approaches for development of novel drug delivery systems	2	1	2		1	1		
CO2	The understanding of critical variables (material and process) for the development of novel drug / gene delivery systems. .	1		1			1		
CO3	The formulation, evaluation & application of novel drug/ gene delivery systems.	1			1		1		

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Department: **Pharmaceutical Sciences & Technology**

Program: M. Pharmacy

Subject: Advanced Biopharmaceutics & Pharmacokinetics	**Subject Code: MPH202T**	**Semester: 2nd**
Credit: 4	**L T P 4 0 0**	**Duration: 45 Hrs.**

COs	Statement	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	The basic concepts in biopharmaceutics and pharmacokinetics	1		1			2	2	
CO2	The use raw data and derive the pharmacokinetic models and parameters the best describe the process of drug absorption, distribution, metabolism and elimination	1					2	2	
CO3	The critical evaluation of biopharmaceutic studies involving drug product equivalency	2		2				1	
CO4	The design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters	1		2		1		2	
CO5	The potential clinical pharmacokinetic problems and application of basics of pharmacokinetic	1		2				2	

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Department: **Pharmaceutical Sciences & Technology**

Program: M. Pharmacy

Subject: Computer Aided Drug Delivery System	**Subject Code: MPH203T**	**Semester: 2nd**
Credit: 4	**L T P 4 0 0**	**Duration: 45 Hrs.**

COs	**Statement**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**	**PSO7**	**PSO8**
CO1	History of Computers in Pharmaceutical Research and Development						1	2	
CO2	Computational Modeling of Drug Disposition	1				2		2	1
CO3	Computers in Preclinical Development	1	1			2	1	2	
CO4	Optimization Techniques in Pharmaceutical Formulation	2		2				2	1
CO5	Computers in Market Analysis			2					
CO6	Computers in Clinical Development	1	2	2				2	1
CO7	Artificial Intelligence (AI) and Robotics		1	2		1	3		
CO8	Computational fluid dynamics(CFD)	1		2				1	

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Department: **Pharmaceutical Sciences & Technology**

Program: M. Pharmacy

Subject: Cosmetics And Cosmeceuticals	**Subject Code: MPH 204T**	**Semester: 2nd**
Credit: 4	**L T P 4 0 0**	**Duration: 45 Hrs.**

COs	**Statement**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**	**PSO7**	**PSO8**
CO1	Key ingredients used in cosmetics and cosmeceuticals	2		1		1		2	2
CO2	Key building blocks for various formulations	1		2		2			2
CO3	Current technologies in the market		2						1
CO4	Various key ingredients and basic science to develop cosmetics and cosmeceuticals	1	1	2		2		2	2
CO5	Scientific knowledge to develop cosmetics and cosmeceuticals with desired Safety, stability, and efficacy.	2		2		2		2	1

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Program: M. Pharmacy

Subject: Pharmaceutics Practicals - II	**Subject Code: MPH 205P**	**Semester: 2nd**
Credit: 6	**L T P 0 0 6**	**Duration: 180 Hrs.**

COs	Statement	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	Various key ingredients and basic science to develop Novel drug delivery system.	2		2			1	2	1
CO2	Optimization Techniques in pharmaceutical formulation using factorial design	1		2		1		2	1
CO3	The use raw data and derive the pharmacokinetic models and parameters the best describe the process of during absorption, distribution, metabolism	1		2		1	1	2	
CO4	The formulation and evaluation of novel drug delivery systems	1	1	2		1	1	2	1
CO5	Drafting of various pharmaceutical Process related documentation			2		2	1	2	

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