



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: <u>1st</u>
Credit: <u>4</u>	L T P <u>4 0 0</u>	Duration: <u>60 Hrs.</u>

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6
CO1	Chemicals and Excipients	1			1		1
CO2	The analysis of various drugs in single and combination dosage forms		1	1			1
CO3	Theoretical and practical skills of the instruments	1		1			1

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%



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**

Subject: <u>Drug Delivery System</u>	Subject Code: <u>MPH102T</u>	Semester: <u>1st</u>
Credit: <u>4</u>	L T P <u>4 0 0</u>	Duration: <u>60 Hrs.</u>

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6
CO1	The various approaches for development of novel drug delivery systems.		2	1			1
CO2	The criteria for selection of drugs and polymers for the development of delivering system	1	2	1			1
CO3	The formulation and evaluation of Novel drug delivery systems..		2	1			1

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%



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**

Subject: Modern Pharmaceutics	Subject Code: <u>MPH103T</u>	Semester: <u>1st</u>
Credit: <u>4</u>	L T P <u>4 0 0</u>	Duration: <u>60 Hrs.</u>

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6
CO1	The elements of preformulation studies			1			1
CO2	The Active Pharmaceutical Ingredients and Generic drug Product Development	1		1			1
CO3	Industrial Management and GMP Considerations.	1	1				
CO4	Optimization Techniques & Pilot Plant Scale Up Techniques	2	1				
CO5	Stability Testing, sterilization process & packaging of dosage forms.	1		1			1

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%



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**

Subject: Regulatory Affairs	Subject Code: <u>MPH104T</u>	Semester: <u>1st</u>
Credit: <u>4</u>	L T P <u>4 0 0</u>	Duration: <u>60 Hrs.</u>

Cos	Statement	PO1	PO2	PO3	PO4	PO5	PO6
CO1	The Concepts of innovator and generic drugs, drug development Process	1	1				
CO2	The Regulatory guidance's and guidelines for filing and approval Process	1	1				
CO3	Preparation of Dossiers and their submission to regulatory agencies in different countries	1	1				
CO4	Post approval regulatory requirements for actives and drug products	1	1				
CO5	Submission of global documents in CTD/ eCTD formats	1	1				
CO6	Clinical trials requirements for approvals for conducting clinical trials	1	1				
CO7	Pharmacovigilance and process of monitoring in clinical trials.	1	1				

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%



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**

Subject: <u>Pharmaceutics Practical I</u>	Subject Code: <u>MHP105P</u>	Semester: <u>1st</u>
Credit: <u>6</u>	L T P <u>0 0 6</u>	Duration: <u>180 Hrs.</u>

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6
CO1	The elements of formulation studies	1		1			1
CO2	Optimization Techniques & Pilot plant scale up techniques		1		1		1
CO3	The various approaches for development of novel drug delivery systems	1	1				1
CO4	The criteria for selection of drugs and polymers for the development of delivering system	1				1	1
CO5	The analysis of various drugs in single and combination dosage forms	2	1				1

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%



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**

Subject: <u>Molecular Pharmaceutics (Nano Tech and Targeted DDS)</u>	Subject Code: <u>MPH201T</u>	Semester: <u>2nd</u>
Credit: <u>4</u>	L T P <u>4 0 0</u>	Duration: <u>60 Hrs.</u>

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6
CO1	The various approaches for development of novel drug delivery Systems		1		1		
CO2	The understanding of critical variables (material and process) for the development of novel drug/ gene delivery systems.		1		1		
CO3	The formulation, evaluation & application of novel drug/ gene delivery systems.		1		1		

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%



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**

Subject: Advanced Biopharmaceutics and Pharmacokinetics	Subject Code: MPH202T	Semester: 2nd
Credit: 4	L T P 4 0 0	Duration: 60 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6
CO1	The basic concepts in biopharmaceutics and pharmacokinetics	1	1				1
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	1				1
CO3	The critical evaluation of biopharmaceutic studies involving drug product equivalency	1	1				1
CO4	The design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters	1	1				1
CO5	The potential clinical pharmacokinetic problems and application of basics of pharmacokinetic	1	1				1

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%



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**

Subject: Computer Aided Drug Development	Subject Code: <u>MPL203T</u>	Semester: <u>2ND</u>
Credit: <u>4</u>	L T P <u>4 0 0</u>	Duration: <u>60 Hrs.</u>

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6
CO1	History of Computers in Pharmaceutical Research and Development		1				
CO2	Computational Modeling of Drug Disposition		1				
CO3	Computers in Preclinical Development		1				
CO4	Optimization Techniques in Pharmaceutical Formulation		1				
CO5	Computers in Market Analysis		1				
CO6	Computers in Clinical Development		1				
CO7	Artificial Intelligence (AI) and Robotics		1				
CO8	Computational fluid dynamics(CFD)		1				

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%



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**

Subject: Cosmetics and Cosmeceuticals	Subject Code: <u>MPH204T</u>	Semester: <u>2nd</u>
Credit: <u>4</u>	L T P <u>4 0 0</u>	Duration: <u>60 Hrs.</u>

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6
CO1	Key ingredients used in cosmetics and cosmeceuticals	1	1				1
CO2	Key building blocks for various formulations	1	1				1
CO3	Current technologies in the market	1	1				1
CO4	Various key ingredients and basic science to develop cosmetics and cosmeceuticals	1	1				1
CO5	Scientific knowledge to develop cosmetics and cosmeceuticals with desired Safety, stability, and efficacy.						

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%



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**

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

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6
CO1	Various key ingredients and basic science to develop Novel drug delivery system.	1		1			1
CO2	Optimization Techniques in pharmaceutical formulation using factorial design		1		1		1
CO3	The use raw data and derive the pharmacokinetic models and parameters the best describe the process of during absorption, distribution, metabolism	1	1				1
CO4	The formulation and evaluation of novel drug delivery systems	1				1	1
CO5	Drafting of various pharmaceutical Process related documentation	2	1				1

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%