



**Faculty of Pharmacy**  
**Master of Pharmacy (M. Pharm.)**  
**(W. E. F.: 2023-24)**  
**Document ID: SUTEPHIM-01**

<b>Name of Faculty</b>	:	Faculty of Pharmacy
<b>Name of Program</b>	:	Master of Pharmacy (M. Pharm)
<b>Course Code</b>	:	2MPH01
<b>Course Title</b>	:	Molecular Pharmaceutics (Nanotechnology & Targeted DDS) (NTDS)
<b>Type of Course</b>	:	Pharmaceutics
<b>Year of Introduction</b>	:	2023-24

<b>Prerequisite</b>	:	To have sufficient knowledge about basics of pharmaceutical dosage forms
<b>Course Objective</b>	:	This course will discuss the following aspects of <ol style="list-style-type: none"> <li>1. The various approaches for development of novel drug delivery.</li> <li>2. The criteria for selection of drugs and polymers for the development of systems.</li> <li>3. The formulation and evaluation of novel drug delivery systems.</li> </ol>
<b>Course Outcomes</b>	:	Upon successful completion of this course, the students will be able to
	CO1	To understand fundamental concepts of NDDS.
	CO2	To remember preparation and evaluation of NDDS.
	CO3	To learn (remember) models and methods for bio disturbance of drugs and its pharmacokinetics studies.

**Teaching and Examination Scheme**

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	SEE	CIA	SEE	CIA	
04	00	00	04	75	25	00	00	100

*Legends: L-Lecture; T-Tutorial/Teacher Guided Theory Practice; P - Practical, C - Credit, SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

**Course Content**

Unit No.	Topics	Teaching Hours	Weightage	Mapping With COs
1	<ul style="list-style-type: none"> <li>Targeted Drug Delivery Systems: Concepts, Events and biological process involved in drug targeting.</li> <li>Tumor targeting and Brain specific delivery.</li> </ul>	12	20%	CO1
2	<ul style="list-style-type: none"> <li>Targeting Methods: introduction preparation and evaluation. Nano Particles &amp; Liposomes: Types, preparation and evaluation.</li> </ul>	12	20%	CO2
3	<ul style="list-style-type: none"> <li>Micro Capsules / Micro Spheres: Types, preparation &amp; evaluation, Monoclonal Antibodies;</li> <li>preparation &amp; application: preparation and application of Niosomes, Aquasomes, Phytosomes, Electrosomes.</li> </ul>	12	20%	CO2
4	<ul style="list-style-type: none"> <li>Pulmonary Drug Delivery Systems: Aerosols, propellents, ContainersTypes, preparation and evaluation, Intra Nasal Route Delivery systems; Types, preparation and evaluation.</li> </ul>	12	20%	CO2
5	<ul style="list-style-type: none"> <li>Nucleic acid based therapeutic delivery system: Gene therapy, introduction (ex-vivo &amp; in-vivo gene therapy). Potential target diseases for gene therapy (inherited disorder and cancer). Gene expression systems (viral and nonviral gene transfer). Liposomal gene delivery systems. Biodistribution and Pharmacokinetics. knowledge of therapeutic antisense molecules and aptamers as drugs of future.</li> </ul>	12	20%	CO3

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	33.33	66.67	-	-	-	-

*NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.*



### Suggested Learning Websites

Sr. No.	Name of Website
1	<a href="https://pci.nic.in/pdf/Syllabus_B_Pharm.pdf">https://pci.nic.in/pdf/Syllabus_B_Pharm.pdf</a>
2	<a href="https://www.aicte-india.org/downloads/bpharma.pdf">https://www.aicte-india.org/downloads/bpharma.pdf</a>
3	<a href="https://www.ipc.gov.in/">https://www.ipc.gov.in/</a>
4	<a href="https://www.ayush.gov.in/">https://www.ayush.gov.in/</a>
5	<a href="https://ayudmla.gujarat.gov.in/home.php">https://ayudmla.gujarat.gov.in/home.php</a>
6	<a href="https://www.fda.gov/">https://www.fda.gov/</a>
7	<a href="https://www.pharmacopoeia.com/">https://www.pharmacopoeia.com/</a>
8	<a href="https://ipapharma.org/">https://ipapharma.org/</a>
9	<a href="https://gpat.nta.nic.in/">https://gpat.nta.nic.in/</a>
10	<a href="https://drnaitiktrivedi.com/">https://drnaitiktrivedi.com/</a>
11	<a href="https://gdc4gpat.com/course/gpat/">https://gdc4gpat.com/course/gpat/</a>
12	<a href="https://niscpr.res.in/">https://niscpr.res.in/</a>
13	<a href="https://delnet.in/">https://delnet.in/</a>
14	<a href="https://ihubgujarat.in/">https://ihubgujarat.in/</a>
15	<a href="https://www.ssipgujarat.in/">https://www.ssipgujarat.in/</a>

### Reference Books

Sr. No.	Name of Reference Books
1	Y W. Chien, Novel Drug Delivery Systems, 2nd edition, revised and expanded, Marcel Dekker, Inc., New York, 1992.
2	S.P.Vyas and R.K.Khar, Controlled Drug Delivery - concepts and advances, Vallabh Prakashan, New Delhi, First edition 2002.
3	N.K. Jain, Controlled and Novel Drug Delivery, CBS Publishers & Distributors, NewDelhi, First edition 1997 (reprint in 2001).