INSTITUTE	**FACULTY OF PHARMACY**
PROGRAM	**MASTER OF PHARMACY (PHARMACEUTICS)**
SEMESTER	**2**
COURSE TITLE	**MOLECULAR PHARMACEUTICS (NANO TECHNOLOGY & TARGETED DDS)**
COURSE CODE	**13MC0201**
COURSE CREDITS	**4**

Objective:

1 This course is designed to impart knowledge in the area of advances in novel drug delivery systems.

Course Outcomes: After completion of this course, student will be able to:

1 The various approaches for the development of novel drug delivery systems.

2 The criteria for the selection of drugs and polymers for the development of NTDS

3 The formulation and evaluation of novel drug delivery systems.

Pre-requisite of course: Nil

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
4	0	0	75	15	10	0	0

Contents : Unit	Topics	Contact Hours
1	**Unit-1** Targeted Drug Delivery Systems: Concepts, Events, and biological process involved in drug targeting. Tumor targeting and Brain-specific delivery.	12
2	**Unit-2** Targeting Methods: introduction preparation and evaluation., Nano Particles & Liposomes: Types, preparation, and evaluation.	12
3	**Unit-3** Micro Capsules / Micro Spheres: Types, preparation, and evaluation, Monoclonal Antibodies; preparation and application, preparation and application of Niosomes, Aquasomes, Phytosomes, and Electrosomes.	12
4	**Unit-4** Pulmonary Drug Delivery Systems: Aerosols, propellents, ContainersTypes, preparation, and evaluation, , Intra Nasal Route Delivery systems; Types, preparation, and evaluation.	12

DR. RAMESH BHANAJIBHAI PARMAR
Digitally signed by (Name of HOD)

DR. LALJI HAKUBHAI BALDANIYA
Digitally signed by (Name of Dean/ Principal)

Contents : Unit	Topics	Contact Hours
5	**Unit-5** Nucleic acid-based therapeutic delivery system: Gene therapy, introduction (ex-vivo & 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 the future.	12
Total Hours		**60**

Textbook :

1 Novel Drug Delivery Systems, Y W. Chien, Marcel Dekker, Inc., 1992

2 Controlled Drug Delivery - concepts and advances, S. P. Vyas and R.K.Khar, Vallabh Prakashan, 2002

3 Controlled and Novel Drug Delivery, , N.K. Jain, CBS Publishers & Distributors, 1997

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
20.00	25.00	25.00	15.00	15.00	5.00

Instructional Method:

1 The course delivery method will depend upon the requirement of content and the need of students. The teacher in addition to the conventional teaching method by the blackboard may also use any tools such as demonstration, role play, quiz, brainstorming, MOOCs etc.

2 The internal evaluation will be done based on continuous evaluation of students in the laboratory and classroom.

3 Students will use supplementary resources such as online videos, NPTEL videos, MOOCs/ e-courses, virtual laboratories.

DR. RAMESH BHANAJIBHAI PARMAR
Digitally signed by (Name of HOD)

DR. LALJI HAKUBHAI BALDANIYA
Digitally signed by (Name of Dean/ Principal)