



C. U. SHAH UNIVERSITY

With Effect from June 2014

Faculty: - Pharmaceutical Sciences

Department: Pharmaceutics & Pharmaceutical Technology

Discipline: 1) Pharmaceutics 2) Pharmaceutical Technology

Semester: III

Name of Subject: Advance Drug Delivery-II (Theory) (Specialization-IV)

Subject Code: 5PS03ADD4

Teaching & Evaluation Scheme:-

Sr. No	Branch Code	Subject Code	Subject Name	Teaching hours/ week				Credit	Evaluation Scheme/ Semester								Total
				Th	Tu	Pr	Total		Theory				Practical				
									Sessional Exam		University Exam		Internal		University		
									Marks	Hrs	Marks	Hrs	Pr	TW	Pr		
1	5	5PS03ADD4	Advance Drug Delivery-II	6	-	6	12	9	20	1	70	3	20	--	70	200	
									10 (CEC)	--			10 (CEC)				

OBJECTIVES:

- To get acquainted with Advancement in novel drug delivery systems, in terms of its formulation strategies, evaluation parameters and application.

PREREQUISITES:-

- Basic knowledge in Bio pharmaceutics, pharmacokinetics & basics of drug delivery in body.
- Fundamental understanding of biostatistics
- B. Pharm. degree from any AICTE approved institution or its equivalent.

COURSE OUTLINE:

Sr. No	COURSE CONTENTS	Hours
1	Nasopulmonary Drug delivery : Nasal administration, pulmonary drug Delivery Systems, dosage forms and drug Targeting to pulmonary drug Delivery Systems.	12
2	Proteins and peptides Delivery consideration: Structure of proteins and peptides, Protein formulation, Delivery techniques for proteins & peptides, Site specific delivery.	08
3	Nanotechnology: Preparation of Nano-suspensions, supramolecular and Nano-particle, Characterization and Pharmaceutical Applications of Nano-particle.	12
4	Supercritical fluids : Introduction to supercritical fluids, supercritical fluids technologies, Pharmaceutical applications of supercritical fluids, Equipments.	08
5	Extrusion and Pelletization : Pellet properties, Cold extrusion, Melt extrusion and other technologies, Applications of extrusion in pharmacy, selective equipments used for extrusion and Pelletization.	08



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6	PEGylation: Concept, PEGylation reagents & reaction, PEGylation process & chemistry, mechanism of drug release, factors affecting performance of PEGylated peptides, purification & analysis, applications of PEG-proteins	08
7	Liposomes Manufacturing of Liposomes, Method of Liposome Preparation and characterization.	08
8	Intelligent drug delivery: , Magnetically modulated system, Ultrasonically modulated systems, Thermo responsive delivery systems, Electrically controlled delivery systems and Self-regulated delivery systems.	08
9	Miscellaneous Drug Delivery Systems: Strips, diskettes and film, tailor made medicines, immunomodulated molecules. etc	10
10	Gene Therapy: Polymer based gene delivery, cardiovascular, pulmonary and Cancer gene therapy	08
Total		90



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Name of Subject: Advance Drug Delivery-II (Practical) (Specialization-IV)

Subject Code: 5PS03ADD4

Detailed Syllabus (Practical): To illustrate the topics included under theory

LEARNING OUTCOMES:

- With help of gained knowledge students can handle research project in novel drug delivery systems in his/her dissertation work & in pharmaceutical industry.
- Student can be able to optimize pharmaceutical formulation using Design of Experiments

TEACHING & LEARNING METHODOLOGY:

- Faculty member/s shall explain in a class room using black board and multimedia projector
- The course employs lectures and class discussions. It also includes presentation by students on a specific topic assigned to them by the faculty.
- Presentation on a case related to the course.

BOOKS RECOMMENDED:-

1. Encyclopedia of Pharmaceutical Technology, James Swarbrick and James C. Boylan, Marcel Dekker Inc., New York.
2. Theory and Practice of Industrial Pharmacy, L. Lachman, Varghese Publication, Bombay.
3. Modern Pharmaceutics, G.S. Banker and C.T. Rhodes, Marcel Dekker, Inc., New York.
4. Controlled Drug Delivery: J. R. Robinson and V. H. Lee, Marcel Dekker, Inc., New York.
5. Novel Drug Delivery Systems, Y.W. Chien, Marcel Dekker, Inc., New York.
6. Progress in Controlled and Novel Delivery Systems, edited by N.K. Jain, CBS Publishers & Distributors, New Delhi.
7. Targeted & Controlled Drug Delivery, S. P. Vyas and R. K. Khar, CBS Publishers & Distributors, New Delhi.
8. Advances in Controlled and Novel Drug Delivery, Edited by N.K. Jain, CBS Publishers & Distributors, New Delhi
9. Pharmaceutical Dosage Forms: Disperse system, Vol. I, II & III, Lieberman H. A. and Leon Lachman, Marcel Dekker, New York
10. Handbook of Pharmaceutical Controlled Release Technology, Donald L. Wise, Marcel Dekker, USA.

E-RESOURCES:

1. www.fda.gov.org
2. On line journals
3. <http://www.ich.org>



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4. www.usfda.gov
5. www.mhra.gov.uk
6. www.pubmedcentral.nih.gov
7. www.biomedcentral.com



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Semester: III

Name of Subject: Dissertation Phase-I

Subject Code: 5PS03DIP3

Teaching & Evaluation Scheme:-

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				Th	Tu	Pr	Total		Theory				Practical				
									Sessional Exam		University Exam		Internal		University		
									Marks	Hrs	Marks	Hrs	Pr	TW	Pr		
1	5	5PS03DIP3	Dissertation Phase-I	-	-	24	24	12	--	--	--	--	60	--	140	200	