



**LESSON PLAN**

**Faculty Name: Palika Sehgal**

**Class: B. Pharmacy-7<sup>th</sup> Semester**

**Subject: Noval Drug Delivery System**

**Subject Code: BP-704T**

**Scope:** This subject is designed to impart basic knowledge on the area of Novel Drug Delivery.

**Aim:**

1. To understand various approaches for development of Novel Drug Delivery Systems.
2. To understand the criteria for selection of drugs and polymers for the development of Novel Drug Delivery Systems, their formulation and evaluation.

**Course Objective:**

1. To provide basic knowledge about development of novel drug delivery systems.
2. To provide knowledge about the criteria for selection of drugs and polymers for the development of novel drug delivery systems.
3. To provide knowledge about the formulation and evaluation of novel drug delivery systems.

**Course Outcome:** After completion of course, student should be able to:

1. Understand the rationale for developing various novel drug delivery systems.
2. Understand the various approaches and problem involve in designing novel drug delivery systems.
3. Understand the applications of novel drug delivery systems in improvement of treatment.
4. Understand the concepts involved in preparation and analyzing various evaluation parameters for oral, parenteral, topical, nasal, intrauterine etc. drug delivery systems.
5. Understand the nanotechnology and its application in the area of targeted drug delivery system.

**Number of Lectures: 45**

**Each lecture: 01 hour (3 lectures per week)**

Chapter	Lecture No.	Particular	Remark/Date
<b>Unit 1: (10 hrs)</b>	1.	<b>Controlled Drug Delivery Systems:</b> Introduction	
	2.	Terminology/Definitions and Rationale,	
	3.	Advantages, Disadvantages, selection of drug candidates.	
	4.	Approaches to design controlled release formulations based on diffusion,	
	5.	Dissolution and ion exchange principles.	
	6.	Physicochemical properties of drugs relevant to	

		controlled release formulations.	
	7.	Biological properties of drugs relevant to controlled release formulations.	
	8.	<b>Polymers:</b> Introduction, Classification	
	9.	Advantages and Disadvantages, properties, advantages	
	10.	application of polymers in formulation of controlled release drug delivery systems	
<b>Unit- II (10 hrs)</b>	11.	<b>Microencapsulation:</b> Definition, advantages and disadvantages,	
	12.	Microspheres /microcapsules, micro-particles,	
	13.	Methods of microencapsulation, applications.	
	14.	<b>Mucosal Drug Delivery system:</b> Introduction,	
	15.	Principles of bioadhesion / mucoadhesion,	
	16.	Concepts, advantages and disadvantages,	
	17.	Transmucosal permeability and formulation considerations of buccal delivery.	
	18.	Transmucosal permeability and formulation considerations of buccal delivery.	
	19.	<b>Implantable Drug Delivery Systems:</b> Introduction, advantages and disadvantages,	
	20.	Concept of implants and osmotic pump	
<b>Unit- III (10 hrs)</b>	21.	<b>Transdermal Drug Delivery Systems:</b> Introduction, Permeation through skin,	
	22.	Factors affecting permeation, permeation enhancers,	
	23.	Basic components of TDDS, formulation approaches	
	24.	<b>Gastroretentive Drug Delivery Systems:</b> Introduction, advantages, disadvantages,	
	25.	Approaches for GRDDS – Floating, high density systems,	
	26.	Inflatable and gastroadhesive systems and their applications	
	27.	<b>Nasopulmonary drug delivery system:</b> Introduction	
	28.	Nasal and Pulmonary routes of drug delivery,	
	29.	Formulation of Inhalers (dry powder and metered dose), nasal sprays, nebulizers	
	30.	Formulation of Inhalers (dry powder and metered dose), nasal sprays, nebulizers	
<b>Unit IV (08 hrs)</b>	31.	<b>Targeted drug Delivery:</b> Introductions	
	32.	Concepts and approaches	
	33.	Advantages and disadvantages,	
	34.	Introduction to liposomes,	
	35.	Introduction to niosomes,	
	36.	Introduction to nanoparticles,	
	37.	Monoclonal antibodies and their applications	
	38.	Monoclonal antibodies and their applications	

<b>Unit- V (07 hrs)</b>	39.	<b>Ocular Drug Delivery Systems:</b> Introduction,	
	40.	Intra ocular barriers and	
	41.	Methods to overcome –Preliminary study,	
	42.	Ocular formulations and ocuserts	
	43.	<b>Intrauterine Drug Delivery Systems:</b> Introduction,	
	44.	Advantages and disadvantages,	
	45.	Development of intra uterine devices (IUDs) and applications	

**Teacher in-charge**

**Academic Incharge**

**Principal**