COURSE DESCRIPTION TEMPLATE FOR GRADUATE STUDIES

Faculty: Faculty of Graduate Studies

Department: Program of Pharmaceutical Sciences.

COURSE TITLE	Drug Delivery Systems and Formulation	COURSE CODE	1202721
LECTURERS	Ahmad Bani-Jaber and Hatim Al-Khattib	**Email:** abjaber@ju.edu.jo	
CREDITS	3	PRE-REQUISITES	None
DURATION OF COURSE	16 weeks, 3 h per week		

OBJECTIVES:
Upon completion of this course, the student should be able to
1. Know the ideal drug delivery system and its characteristics
2. Know the limitations to deliver drugs into the systemic circulation using various routes of administration
3. Know factors that affect drug delivery through various routes of drug administration
4. Know various formulation and technological strategies to enhance and optimize drug delivery through various routes.

INTENDED LEARNING OUTCOMES

Subject Specific Skills

1. To realize various limitations for the oral bioavailability of drugs and various chemical and formulation approaches to enhance the oral bioavailability of drugs.
2. To know various approaches to sustain and control drug delivery through the oral route.
3. To realize the inconvenience of administering drugs through the parenteral route and various sustained release parenteral formulation and strategies to achieve more patient convenience.
4. To realize the advantages, factors that affect and the limitations of drug delivery through the skin and mucusal membranes. To know how to optimize drug delivery through the skin and mucusal membranes.

Core Academic Skills: at the end of this course, the students should have knowledge and skills for performing research in the area of drug delivery.

Personal and Key Skills: at the end of the course, student are expected to be able to search the literature for papers on drug delivery systems, and be able to thoroughly read the paper and summarize and present its content. Also the student will have the ability to analyze data collected from a drug delivery systems, such as diffusion data through skin.

LEARNING/ TEACHING METHODS: Lectures, case studies, self reading (papers and handouts), and seminars by individual students to encourage developing skills of self expression.

ASSIGNMENTS:
1. Home works: Each students is given data on drug delivery systems and is required to analyze the data using spread sheets for certain parameters, and write a report of the results.

2. Presentation: each student is assigned for a topic on which he explores the literature and the internet, and then writes a report which he will talk about it and discuss it with his colleagues in the form of a seminar.

ASSESSMENT: Midterm exam (30%), Assignments (30%), and Final exam (40%).

SYLLABUS PLAN

Topic
Introduction: Ideal drug delivery system
Oral drug delivery: Advantages, limitation, formulation strategies to enhance drug delivery
Sustained release parenterals
Transdermal drug delivery
Colon Targeting
Drug targeting
Sustained and controlled drug delivery systems
Pharmaceutical Particulates: 1. Definition and introduction 2. Preparation of Pharmaceutical microparticles and microcapsules: ▪ Chemical Type "A" processes ▪ Physical Type "B" processes 3. Characterization of Pharmaceutical Particulate System ▪ Drug release from Pharmaceutical Particulate System ▪ Particle size and shape ▪ Physical form of the active ▪ Colloidal properties 4. Special applications: ▪ Nanocrystals ▪ Association type microparticles ▪ Respiratory (pulmonary) particles ▪ Solid lipid particles
Seminars
Final exam

INDICATIVE READING LIST

1. Yie W. Chien, 1992, Novel drug delivery systems, 2nd edition. Marcel Dekker, INC.

2. Simone Benita, 1996, Microencapsulation: Methods and Industrial Applications. Marcel Dekker, INC.

3. Selected reviews and research papers.