UNIVERSITY OF PATRAS

SCHOOL OF HEALTH SCIENCES

DEPARTMENT OF PHARMACY

POSTGRADUATE PROGRAM: DRUG DESIGN AND DEVELOPMENT

COURSE TITLE: **NANOMEDICINES AND SPECIAL SYSTEMS FOR ADMINISTRATION AND/OR TARGETING OF DRUGS/IMAGING AGENTS**

CODE: **DPHA_B01**

NATURAL PRODUCTS IN DRUG DISCOVERY
COURSE OUTLINE

1. GENERAL

SCHOOL	HEALTH SCIENCES
ACADEMIC UNIT	DEPARTMENT OF PHARMACY
PARTICIPATING INSTITUTIONS	-
TITLE of POSTGRADUATE PROGRAM	DRUG DESIGN AND DEVELOPMENT
LEVEL	POSTGRADUATE
COURSE CODE	DPHA_B01 **SEMESTER** B'
COURSE TITLE	**NANOMEDICINES AND SPECIAL SYSTEMS FOR ADMINISTRATION AND/OR TARGETING OF DRUGS/IMAGING AGENTS**

INDEPENDENT TEACHING ACTIVITIES	WEEKLY TEACHING HOURS	CREDITS
Courses	3	5

COURSE TYPE	Scientific Area (Pharmaceutical Technology), Skills Development
PREREQUISITE COURSES	None
LANGUAGE of INSTRUCTION and EXAMINATIONS	GREEK or ENGLISH (if required)
COURSE OFFERED to ERASMUS STUDENTS	YES
COUSRSE (URL)	http://www.pharmacy.upatras.gr/images/DS/DPHA_B01_EN.pdf

2. LEARNING OUTCOMES

Learning Outcomes
This course aims to acquire knowledge, skills and competences related to level 7 of the European Qualifications Framework for Lifelong Learning Upon successful completion of the course, students: 1. They will have understood the strategy and rationale of nanotechnology applications in the design and development of advanced drug delivery systems 2. They will have become familiar with the techniques and methodology governing the development of nanomedicines and diagnostics 3. Development of the skills required for oral and written presentation and argumentation, based on experimental data.

General Competences
• Search, analysis and synthesis of data and information, using the necessary technologies • Self-study • Team work • Working in interdisciplinary environment • Working in the international environment • Search, analyze and combine data towards making useful conclusions • Understand basic concepts of formulation development

3. SYLLABUS

LECTURES

• Introduction - Basics.

• Design of Systems for Controlled Drug Delivery - Pharmacokinetic/Pharmacodynamic basis of controlled delivery - Mechanisms of Controlled Release.

• Detection/Targeting Methodologies - Absorption - barrier penetration - Biodegradation - bio-compatibility - hematocompatibility of nanoforms (Limitations and control methods).

• Systems for diagnosis and for simultaneous treatment or monitoring of the therapeutic effect - monitoring - Systems for gene therapy (Structure, Ingredients, Preparation, Characterization, in vitro/in vivo evaluation).

• Other special administration systems: Solid forms for per os administration - Transdermal Administration Systems - Emulsions-microemulsions, gels (in situ formed) - Osmotically regulated systems (Ingredients, Preparation, Characterization, in vitro/in vivo evaluation).

• Liposomes and hybrid liposomes (Ingredients-Structure, Preparation, in vitro/in vivo evaluation - Applications).

• Nanoparticles - Nanocapsules (Ingredients-Structure, Preparation, Physicochemical characterization, Applications).

• The Role of polymers in innovative forms of drug administration.

• Cyclodextrins (Structure, Preparation of complexes, Physicochemical characterization, Applications).

• Lipid Nanocarriers and Nanogels.

• Nano cosmetics.

• Physicochemical Characterization of nanocarriers.

• Methods of studying the interaction of nanocarriers with tissues.

GUIDED WORK

• Analysis and presentation of a relevant scientific paper of recent literature

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Face-to-Face, Essays, Exercises Self-study
USE of INFORMATION and COMMUNICATIONS TECHNOLOGY	Use of E-class platform to share archives and lectures, to communicate with students and to organize the lecture schedule.

TEACHING METHODS	*Activity*	*Semester Workload*
	Lectures	39
	Directed Exercises	13
	Self Study	73
	Course Total	
	(25 hours of work-load per ECTS credit)	**125**
STUDENT PERFORMANCE EVALUATION	Language of Evaluation: Greek / English	
	Written exams; MCQ; Essays and exercises	
	Final Grade: performance in written exam on the theoretical courses (70%), performance in case study essay: 30%.	

5. RECOMMENDED BIBLIOGRAPHY

Related Academic Journals:

Pharmaceutical Manufacturing Handbook : Production and Processes Shayne Cox Gad

Methods in Molecular Biology: Liposomes

Related Scientific Journals

- Nano Letters
- ACS Nano
- Nature Nanotechnology
- Nanomedicine
- Biomaterials
- Journal of Pharmaceutical Sciences
- International Journal of Pharmaceutics
- Pharmaceutical Research
- Small
- European journal of Pharmaceutics and Biopharmaceutics
- Journal of Pharmaceutical Sciences
- J. Contr. Release
- Pharmaceutics