UNIVERSITY OF PATRAS
SCHOOL OF HEALTH SCIENCES
DEPARTMENT OF PHARMACY
POSTGRADUATE PROGRAM: **NANOMEDICINES FOR DRUG DELIVERY- NANOMED (EMJMD)**

COURSE TITLE: **3RD SEMESTER I (ANGERS COURSES)**
CODE:**HG4_NM10**

NANOMEDICINES FOR DRUG DELIVERY- NANOMED (EMJMD)

COURSE OUTLINE

1. GENERAL

SCHOOL	HEALTH SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF PHARMACY		
PARTICIPATING INSTITUTIONS	-		
TITLE of POSTGRADUATE PROGRAM	NANOMEDICINES FOR DRUG DELIVERY- NANOMED (EMJMD)		
LEVEL	POSTGRADUATE		
COURSE CODE	**HG4_NM10**	**SEMESTER**	**C'**
COURSE TITLE	**3RD SEMESTER I (ANGERS COURSES)**		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Courses (6 cources)	20	30

COURSE TYPE	Cycle of Specialized knowledge courses for Specialization semester (selections 1) (CMC Regulatory and QbD Approach, Innovation and Application, Drug Product Design, Characterization strategy, Non Clinical Strategy, Innovation Project and Personal development Seminars), Skills Development.
PREREQUISITE COURSES	None
LANGUAGE of INSTRUCTION and EXAMINATIONS	ENGLISH
COURSE OFFERED to ERASMUS STUDENTS	THIS IS ALREADY AN EMJMD PROGRAM COURSE
COUSRSE (URL)	https://www.pharmacy.upatras.gr/images/DS/NanoMed/HG4_NM10.pdf

2. LEARNING OUTCOMES

Learning Outcomes

Upon successful course completion, students will acquire knowledge, skills and abilities related to level 7 of the European Qualifications Framework for Lifelong Learning.

In particular, students will:

1. understand the strategies available for different application of nanomedicines for drug delivery
2. have been familiarized to the applications of nanomedicines for therapeutic and/or diagnostic applications .
3. Have understood the basic approaches for design and development of nanomedicines depending on the specific application.
4. Have familiarized themselves with the techniques of optimizing nanomedicines depending on therapeutic or diagnostic requirements, route of administration etc.
5. Learn how a nanomedicine can go from the lab to the clinic and finally to the market, what to consider and how to organize each step.
6. learn about personal development methods that will help them in their future carriers

General Competences

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Working independently
- Team Work
- Decision-making
- Working in an international environment
- Working in an interdisciplinary environment
- Production of free, creative and inductive thinking
- Adapting to new situations

3. SYLLABUS

LECTURES

This semester consists of 6 courses (that are carried of @ Universite d' Angers), the following:

CMC Regulatory and QbD Approach:

Applied studies in Chemistry

Manufacturing and Control (CMC) Regulatory,

Quality by Design (QbD),

Design of Experiments (DoE),

Statistics

Special Seminars

Innovation and Application:

Applied study of Innovation engineering

Intellectual property,

Applications in complex Drug Products.

Personal Development Seminars

Occupational Integration.

Drug product Design:

Raw material properties,

Formulation and Process development.

Characterization strategy:

Analytical consideration

method development,

Physicochemical consideration,

Microbiological consideration.

Non clinical strategy:

Non clinical methodology,

Kinetics and Efficacy,

Safety and Toxicology.

Innovation project:

Project management,

PUBLIC PRESENTATIONS

Selected case studies in modern Nanomedicine subjects

Individual Assignment & Presentation

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Face to face	
USE of INFORMATION and COMMUNICATIONS TECHNOLOGY	• Use of ICT - e-class platform • Communication with students	
TEACHING METHODS	***Activity***	***Semester Workload***
	Lectures	280
	Practical's	50
	Presentations of Case Studies	100
	Seminars	60
	Case Studies' Preparation & non-directed Study	260
	Course Total **(25 hours of work-load per ECTS credit)**	**750**

STUDENT PERFORMANCE EVALUATION	Language of Evaluation: English Written exams • Multiple choice questionnaires, Short answer questions, Open ended questions (60% of final grade) Public Presentation • Presentation of a Case study (English) (25% of final grade) • Presentation of Practicals courses results • (15% of final grade)

5. RECOMMENDED BIBLIOGRAPHY

Suggested Bibliography:

1. Nanomedicine for the Treatment of Disease: From Concept to Application. (2019). United States: Apple Academic Press.
2. Advances and Challenges in Nanomedicine. (2019). (n.p.): Frontiers Media SA.
3. Nanomedicine for Bioactives: Healthcare Applications. (2020). Singapore: Springer Nature Singapore.
4. Igarashi, E. (2018). Nanomedicines and Nanoproducts: Applications, Disposition, and Toxicology in the Human Body. United States: CRC Press.
5. Gregoriadis, G. (2018). Liposome Technology: Volume III: Targeted Drug Delivery and Biological Interaction. United Kingdom: CRC Press.
6. Liposomes: Methods and Protocols. (2023). Germany: SPRINGER-VERLAG NEW YORK.
7. Liposomes in Drug Delivery: What, Where, How and When to Deliver. (2024). United Kingdom: Elsevier Science.
8. Grumezescu, A. M. (2019). Nanomaterials for Drug Delivery and Therapy. Netherlands: Elsevier Science.

Related Academic Journals:

Nature Nanotechnology
J, Controlled Release
ACS Nano
Inter. J. Pharmaceutics
J. Pharm. Sciences
J. Liposome Research
Nanomedicine
Int. J. Nanomedicines
Pharmaceutics