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

COURSE TITLE: BIOMOLECULES

CODE:HG4_NM7

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_NM7**	**SEMESTER**	**B'**
COURSE TITLE	**BIOMOLECULES**		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Courses	4	6

COURSE TYPE	Specialized general knowledge (Biotechnology, Pharmaceutical bio-technology, Immunology, Biological Drugs) , 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_NM07.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 structure and properties of biological and biotech drugs (peptides, proteins, nucleid acids) 2. understand the structure and properties of antibodies, their production methods and how they are used in Pharmaceutics 3. have been introduced to basic concepts of immunology and vaccines. 4. have understood the basic approaches to consider for preparation of a vaccine 5. have understood the basic approaches to consider for formulation of biological drugs

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

1. Intro Biomolecules
2. General aspects of the immune system
3. Chemistry of biological molecules
4. Innate immunity
5. Chemistry of biological molecules
6. T-cell antigen recognition
7. Analytical methods for biological products
8. B-cell antigen recognition
9. Anticancerous immunity
10. Formulation for gene therapy
11. Peptide and peptidomimetics
12. Developpment and optimisation of non viral carriers for gene therapy
13. Reconbinant proteins
14. Administration of siRNA by non-viral carriers
15. Monoclonal Antibodies
16. Therapeutic applications of siRNA and ODN
17. Conjugated Antibodies
18. Vaccines and Semisynthetic glyco-vaccines
19. Conjugated Antibodies
20. Development and validation of vaccine product against tuberculosis
21. Analytical methods for biological products
22. Formulation and characterization to optimize biotherapeutics and vaccine stability
23. Formulation and characterization to optimize biotherapeutics and vaccine stability

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 85 Presentations 15 non-directed Study 50 ***Course Total*** **(25 hours of work-load per ECTS credit) 150**
STUDENT PERFORMANCE EVALUATION	Language of Evaluation: English Oral Examination (70% of final grade) Written exams • Multiple choice questionnaires, Short answer questions, Open ended questions (20% of final grade) Public Presentation • Presentation of a Case study (English) (10% of final grade)

5. RECOMMENDED BIBLIOGRAPHY

Suggested Bibliography:

1. Pharmaceutical Biotechnology: Drug Discovery and Clinical Applications. (2012). Γερμανία: Wiley.
2. **Pharmaceutical Biotechnology: Fundamentals and Applications. (2013). Γερμανία: Springer New York.**
3. **Immunopotentiators in Modern Vaccines. (2016). Ολλανδία: Elsevier Science.**
4. **Encyclopedia of Medical Immunology: Vaccines. (n.d.). Ηνωμένες Πολιτείες: Springer US.**
5. **Nanomedicine and Nanobiotechnology. (2012). Γερμανία: Springer Berlin Heidelberg.Βασίλειο: Cambridge University Press.**
6. **Formulation and Process Development Strategies for Manufacturing Biopharmaceuticals. (2010). Γερμανία: Wiley.**

Related Academic Journals:

Nature Nanotechnology
Immunology
J. Immunol. Methods
J, Controlled Release
ACS Nano
Inter. J. Pharmaceutics
J. Pharm. Sciences
J. Liposome Research
Nanomedicine