

COURSE OUTLINE “NANOTECHNOLOGY AND BIOMEDICAL APPLICATIONS”

1. GENERAL

SCHOOL	HEALTH SCIENCES		
DEPARTMENT	MOLECULAR BIOLOGY AND GENETICS		
LEVEL OF STUDIES	ISCED LEVEL 6		
COURSE CODE	MBG617	SEMESTER	6 th and 8 th
COURSE TITLE	NANOTECHNOLOGY AND BIOMEDICAL APPLICATIONS		
TEACHING ACTIVITIES <i>If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.</i>		HOURS/WEEK	ECTS CREDITS
		2	3
COURSE TYPE <i>Background, General Knowledge, Scientific Area, Skill Development</i>	SCIENTIFIC AREA		
PREREQUISITES:	NO		
TEACHING & EXAMINATION LANGUAGE:	GREEK ENGLISH FOR ERASMUS STUDENTS		
COURSE OFFERED TO ERASMUS STUDENTS:	YES		
COURSE URL:	https://eclass.duth.gr/courses/ALEX01281/		

2. LEARNING OUTCOMES

Learning Outcomes <i>Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.</i>	
<p>The objectives of the course are:</p> <p>a) the acquisition of knowledge and basic principles and familiarization with the interdisciplinary field of Nanotechnology</p> <p>b) the understanding of the properties and behavior of nanoparticles/nanomaterials with the aim of exploiting them in biomedical applications</p> <p>c) to learn important biomedical applications based on the use of nanoparticles</p> <p>d) to get familiar with the strategies for developing innovative nanotechnological applications in diagnosis and treatment</p> <p>Learning results</p> <p>After successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • know the basic principles of Nanotechnology, • know the properties and behavior of nanoparticles/nanomaterials, • know biomedical applications in various fields that rely on the use of nanoparticles, • know new strategies for the development of innovative nanotechnological applications in diagnosis and treatment, • utilize knowledge in a combinatorial way, in order to be able to design innovative approaches using nanoparticles. 	
General Skills <i>Name the desirable general skills upon successful completion of the module</i>	
<i>Search, analysis and synthesis of data and information, ICT Use Adaptation to new situations Decision making Autonomous work Teamwork Working in an international environment Working in an interdisciplinary environment Production of new research ideas</i>	<i>Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning</i>

Search, analysis and synthesis of data and information, ICT Use
 Autonomous work
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3. COURSE CONTENT

1. Introduction to Nanotechnology: nanoscale, basic definitions, historical overview, major achievements
2. Why 'Nano': natural phenomena at the nanoscale, characteristic properties
3. Nanotechnological tools: nanodevices and nanomaterials, nanoparticles, types of nanoparticles
4. Nanotechnology and applications in Molecular Biology and Immunology – Nanobiotechnology of vaccines
5. Nanomolecular Diagnostics and Imaging
6. Nanotechnology and applications in Pharmacy
7. Nanosystems for transport and delivery of bioactive molecules
8. Toxicity, Safety and Ethical issues related to Nanotechnology applications
9. Specialized topics – Paper presentations: Nanotechnology applications in Molecular Diagnostics
10. Specialized topics – Paper presentations: Nanotechnology applications in Microbiology
11. Specialized topics – Paper presentations: Nanotechnology applications in Pharmacy
12. Specialized topics – Paper presentations: Nanotechnology applications in Immunology
13. Specialized topics – Paper presentations: Applications of magnetic nanoparticles in Biomedicine

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD <i>Face to face, Distance learning, etc.</i>	Face to face	
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) <i>Use of ICT in Teaching, in Laboratory Education, in Communication with students</i>	Use of ICT in Teaching Use of ICT in Communication with students	
TEACHING ORGANIZATION <i>The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research & analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.</i> <i>The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards.</i>	Activity	Workload/semester
	Lectures	20
	Seminars	10
	Study and analysis of bibliography	20
	Essay writing	40
	Course Total	90
STUDENT EVALUATION <i>Description of the evaluation process</i> <i>Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others</i> <i>Please indicate all relevant information about the course assessment and how students are informed</i>	Student evaluation languages Greek, English Method (Formative or Concluding) Formative Student evaluation methods Oral Exams (20%) Written Assignment (60%) Presentation in audience (20%)	

5. SUGGESTED BIBLIOGRAPHY

ΣΥΓΧΡΟΝΗ ΦΑΡΜΑΚΕΥΤΙΚΗ ΝΑΝΟΤΕΧΝΟΛΟΓΙΑ
 Κωδικός Βιβλίου στον Εύδοξο: 112745798

Έκδοση: 2η/2022

Συγγραφείς: ΚΩΝΣΤΑΝΤΙΝΟΣ Ν. ΔΕΜΕΤΖΟΣ

ISBN: 9789605836627

Τύπος: Σύγγραμμα

Διαθέτης (Εκδότης): ΠΑΡΙΣΙΑΝΟΥ ΜΟΝΟΠΡΟΣΩΠΗ ΑΝΩΝΥΜΗ ΕΚΔΟΤΙΚΗ ΕΙΣΑΓΩΓΙΚΗ ΕΜΠΟΡΙΚΗ ΕΤΑΙΡΕΙΑ ΕΠΙΣΤΗΜΟΝΙΚΩΝ ΒΙΒΛΙΩΝ

ΙΑΤΡΙΚΗ ΝΑΝΟΤΕΧΝΟΛΟΓΙΑ ΚΑΙ ΝΑΝΟΪΑΤΡΙΚΗ

Κωδικός Βιβλίου στον Εύδοξο: 102074476

Έκδοση: 1η έκδ./2021

Συγγραφείς: Tibbals H.

ISBN: 9789600237511

Τύπος: Σύγγραμμα

Διαθέτης (Εκδότης): ΕΚΔΟΣΕΙΣ Α.ΠΑΠΑΖΗΣΗΣ ΜΟΝΟΠΡΟΣΩΠΗ ΙΔΙΩΤΙΚΗ ΚΕΦΑΛΑΙΟΥΧΙΚΗ ΕΤΑΙΡΕΙΑ