

COURSE OUTLINE

“LABORATORY COURSE VI: IMMUNOBIOLOGY AND BIOTECHNOLOGY”

1. GENERAL

SCHOOL	HEALTH SCIENCES		
DEPARTMENT	MOLECULAR BIOLOGY AND GENETICS		
LEVEL OF STUDIES	ISCED LEVEL 6		
COURSE CODE	MBG319	SEMESTER	6 th
COURSE TITLE	LABORATORY COURSE VI: IMMUNOBIOLOGY AND BIOTECHNOLOGY		
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
		4	6
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/ALEX01255/		

2. LEARNING OUTCOMES

<p>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>
<p>The objectives of the course are:</p> <ul style="list-style-type: none"> • To understand the basic principles of selected technologies and methodologies in the fields of Immunobiology, Protein Structure and Applied Biotechnology • To gain knowledge about the cells of the immune system (examination, isolation, identification, culture) and to understand the basic principles of experimental immunoassays • To acquire knowledge about the immobilization of microbial cells, the bioreactor kinetics and the technology of aerobic and anaerobic fermentations. <p>LEARNING OUTCOMES: After successfully completing the course, students will acquire the following knowledge, skills and competencies:</p> <ul style="list-style-type: none"> • They should know the basic principles of selected technologies in Immunobiology and Applied Biotechnology • They should know the experimental procedures for examination, isolation, identification and culture of immune cells and understand the basic principles of selected immunoassays (ELISA, immunofluorescence, flow cytometry) in the field of Molecular Immunobiology. • They should know and understand the basic principles of microbial cell immobilization, the basic principles of enzyme kinetics and bioreactor kinetics, and know the basic principles of aerobic and anaerobic fermentations. • They should be able to analyze and interpret experimental results in the fields of Immunobiology and Biotechnology and to suggest solutions in problem-based questions, designing appropriate methodologies
<p>General Skills <i>Name the desirable general skills upon successful completion of the module</i></p>

<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 Decision making Production of new research ideas Promoting free, creative and inductive reasoning	

3. COURSE CONTENT

1. Morphological examination of blood leukocytes - immune cells (L)
2. Isolation of mononuclear cells (lymphocytes and monocytes) from peripheral blood (L)
3. Introduction into flow cytometry – Analysis of data with computational software (C)
4. Immunoassay: ELISA (L)
5. Immunoassay: Immunofluorescence (L)
6. Immunoassay data analysis (C)
7. Single cell protein production: Aerobic fermentation of Molasses (L)
8. Yeast immobilization on natural supports (L)
9. Fermentation technology with immobilized yeast (L)
10. Analysis of fermentation products using HPLC (L)
11. Analysis of fermentation kinetics parameters & HPLC data (C)
12. Visits to industrial units

L=Laboratory exercise, C=Computational analysis

All practicals consist of a theory part and a practical part.

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 Laboratory Education 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	30
	Laboratory exercise	110
	Study visits	20
	Bibliographic research & analysis	20
	Course Total	180
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,</i>	Student evaluation languages Greek, English Method (Formative or Concluding) Formative Student evaluation methods	

Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Essay / Report (50%)

Laboratory Report (50%)

5. SUGGESTED BIBLIOGRAPHY

Προτεινόμενα Συγγράμματα

- ΤΙΤΛΟΣ: «Kuby ΑΝΟΣΟΛΟΓΙΑ»

ΣΥΓΓΡΑΦΕΙΣ: Pund J, Stranford A.S., Jones PP, Owen AJ, μεταφρασμένο στα ελληνικά

ΕΚΔΟΣΕΙΣ: Broken Hill Publishers

ΕΤΟΣ ΕΚΔΟΣΗΣ: 2021 (3η έκδοση)

Κωδικός βιβλίου στον Εύδοξο: 94645033

- ΤΙΤΛΟΣ: «Κυτταρική και Μοριακή Ανοσολογία»

ΣΥΓΓΡΑΦΕΙΣ: Abbas AK, Lichtman AH, Pillai, SV, μεταφρασμένο στα ελληνικά

ΕΚΔΟΣΕΙΣ: Utopia Εκδόσεις Μ. ΕΠΕ.

ΕΤΟΣ ΕΚΔΟΣΗΣ: 2019 (1η ελλ έκδοση/9η αμερικ. Έκδοση)

Κωδικός βιβλίου στον Εύδοξο: 86197140

- ΤΙΤΛΟΣ: «Μικροβιολογία & Μικροβιακή Τεχνολογία»

ΣΥΓΓΡΑΦΕΑΣ: Γ. Αγγελής

ΕΚΔΟΣΕΙΣ: Unibooks IKE

ΕΤΟΣ ΕΚΔΟΣΗΣ: 2017 (1η έκδοση)

Κωδικός Βιβλίου στον Εύδοξο: 68407499

Σημειώσεις Μαθήματος

Όλες οι σημειώσεις του μαθήματος είναι διαθέσιμες στους φοιτητές μέσω της πλατφόρμας e-class (<https://eclass.duth.gr/courses/ALEX01255/>)

1. «Σημειώσεις Εργαστηριακών Ασκήσεων Μοριακής Ανοσοβιολογίας και Εφαρμοσμένης Βιοτεχνολογίας». Συγγραφείς: Καθ. Αικατερίνη Χλίχλια & Καθ. Ιωάννης Κουρκουτάς. Χρόνος & Τόπος Έκδοσης: Τμήμα Μοριακής Βιολογίας & Γενετικής-ΔΠΘ, Αλεξανδρούπολη, 2022.