

COURSE OUTLINE

“APPLICATIONS OF MOLECULAR BIOLOGY IN MEDICAL SCIENCES”

1. GENERAL

SCHOOL	HEALTH SCIENCES		
DEPARTMENT	MOLECULAR BIOLOGY AND GENETICS		
LEVEL OF STUDIES	ISCED LEVEL 6		
COURSE CODE	MBG402	SEMESTER	7 th
COURSE TITLE	APPLICATIONS OF MOLECULAR BIOLOGY IN MEDICAL SCIENCES		
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
		3	4
COURSE TYPE <i>Background, General Knowledge, Scientific Area, Skill Development</i>	SCIENTIFIC AREA		
PREREQUISITES:	NO		
TEACHING & EXAMINATION LANGUAGE:	GREEK		
COURSE OFFERED TO ERASMUS STUDENTS:	NO		
COURSE URL:	https://eclass.duth.gr/courses/ALEX01159/		

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 course aims:</p> <p>a) To introduce students to the principles and methodologies of applied research in biotechnological fields associated with human health.</p> <p>b) To describe the link between basic research, industrial R&D and clinical application.</p> <p>c) To introduce concepts like innovation, protection of intellectual property, resource management and quality management in applied research.</p> <p>d) To present the current regulatory framework encompassing the development of drugs and IVD devices.</p> <p>e) To describe major technological breakthroughs and current career prospects in the field.</p> <p>Upon successful completion of the course, participants:</p> <ul style="list-style-type: none"> -will be to comprehend the connection between basic research in life sciences and applications of this research in industry and the clinic -will have a thorough knowledge of the regulatory framework governing the development of biotechnology applications in health -will understand the significant role of innovation, intellectual property, quality control and quality assurance in the life sciences -will be able to design biological applications and innovations in health <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</i> <i>Adaptation to new situations</i> <i>Decision making</i> <i>Autonomous work</i> <i>Teamwork</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Production of new research ideas</i>	<i>Project design and management</i> <i>Equity and Inclusion</i> <i>Respect for the natural environment</i> <i>Sustainability</i> <i>Demonstration of social, professional and moral responsibility and sensitivity to gender issues</i> <i>Critical thinking</i> <i>Promoting free, creative and inductive reasoning</i>
Search, analysis and synthesis of data and information, ICT Use Decision making Autonomous work Working in an interdisciplinary environment Project design and management Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning	

3. COURSE CONTENT

<p>Part I: From basic to applied research</p> <p>The history and progress of applied biomedical research (3 hours).</p> <p>Innovation and intellectual property (3 hours).</p> <p>Funding and managing of start-up businesses in biotechnology (3 hours).</p> <p>Part II: Applications of modern biosciences in molecular diagnostics</p> <p>The regulatory framework for in vitro diagnostic devices in the EU and the USA (3 hours).</p> <p>Quality management in the industrial setting – Laboratory safety principles (3 hours).</p> <p>Modern technologies for nucleic acid detection and their diagnostic applications in clinical microbiology, preventive and predictive population genetic screening, preimplantation and prenatal genetic diagnosis, etc. (9 hours).</p> <p>Part III: Applications of modern biosciences in therapeutics</p> <p>The regulatory framework for drug development in the USA and the EU (3 hours).</p> <p>From drug discovery to drug development – Clinical trials (3 hours).</p> <p>The contribution of modern biosciences to the development and clinical evaluation of new therapies: Target identification and validation, lead discovery and optimization, pre-clinical and clinical development; pharmacogenetics and pharmacogenomics; targeted cancer therapies; recombinant proteins and monoclonal antibodies as therapeutic agents; therapeutic applications of antisense nucleic acids, ribozymes and RNA interference; recombinant vaccines and DNA vaccines; gene therapy; targeted drug delivery (9-12 hours).</p>
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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 (examples of ICT: eClass, MS Teams)	
TEACHING ORGANIZATION <i>The ways and methods of teaching are described in detail.</i> <i>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>	Activity	Workload/semester
	Lectures	39
	Study of lecture material	60
	Bibliographic research and analysis	21
	Course Total	120

<p><i>The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards.</i></p>											
<p align="center">STUDENT EVALUATION</p> <p><i>Description of the evaluation process</i></p> <p><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></p> <p><i>Please indicate all relevant information about the course assessment and how students are informed</i></p>	<p>Student evaluation languages:</p> <p>Greek</p> <p>Method (Formative or Concluding):</p> <p>Summative</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Student evaluation methods</th> <th>Rate</th> </tr> </thead> <tbody> <tr> <td>Written exam with multiple choice test</td> <td align="center">15</td> </tr> <tr> <td>Written Exam with Short Answer Questions</td> <td align="center">25</td> </tr> <tr> <td>Written Exam with Essay Development Questions</td> <td align="center">35</td> </tr> <tr> <td>Written Exam with Problem Solving</td> <td align="center">25</td> </tr> </tbody> </table>	Student evaluation methods	Rate	Written exam with multiple choice test	15	Written Exam with Short Answer Questions	25	Written Exam with Essay Development Questions	35	Written Exam with Problem Solving	25
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Written Exam with Short Answer Questions	25										
Written Exam with Essay Development Questions	35										
Written Exam with Problem Solving	25										

5. SUGGESTED BIBLIOGRAPHY

- A) "Μοριακή Διαγνωστική" των Γ.Π. Πατρινού και W. Ansorge από τις Εκδόσεις Παρισιάνου
- B) "Εφαρμογές Μοριακής Διαγνωστικής" των Π. Πλαγερά, Α. Γεροβασίλη και Α. Παπαϊωάννου από τις Εκδόσεις BROKEN HILL PUBLISHERS LTD
- Γ) "Φαρμακογονιδιωματική και πρωτεϊνωματική" των S.H.Y. Wong, M.W. Linder και R. Valdes από τις Εκδόσεις Παρισιάνου
- Δ) "Φαρμακευτική Βιοτεχνολογία" του D.J.A. Crommelin, από τις Εκδόσεις Παρισιάνου
- Ε) "Οικονομία-Δίκαιο στη Βιολογία" του Κ. Τριανταφυλλίδη από τις εκδόσεις ΕΚΔΟΣΕΙΣ ΚΥΡΙΑΚΙΔΗ ΜΟΝΟΠΡΟΣΩΠΗ ΙΚΕ

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- A) "Μοριακή Διαγνωστική" των Γ.Π. Πατρινού και W. Ansorge από τις Εκδόσεις Παρισιάνου (Κωδικός Βιβλίου στον Εύδοξο: 41544).
- B) "Εφαρμογές Μοριακής Διαγνωστικής" των Π. Πλαγερά, Α. Γεροβασίλη και Α. Παπαϊωάννου από τις Εκδόσεις BROKEN HILL PUBLISHERS LTD (Κωδικός Βιβλίου στον Εύδοξο: 13256969).
- Γ) "Φαρμακογονιδιωματική και πρωτεϊνωματική" των S.H.Y. Wong, M.W. Linder και R. Valdes από τις Εκδόσεις Παρισιάνου (Κωδικός Βιβλίου στον Εύδοξο: 89223).
- Δ) "Φαρμακευτική Βιοτεχνολογία" του D.J.A. Crommelin, από τις Εκδόσεις Παρισιάνου (Κωδικός Βιβλίου στον Εύδοξο: 12828234).
- Ε) "Οικονομία-Δίκαιο στη Βιολογία" του Κ. Τριανταφυλλίδη από τις εκδόσεις ΕΚΔΟΣΕΙΣ ΚΥΡΙΑΚΙΔΗ ΜΟΝΟΠΡΟΣΩΠΗ ΙΚΕ (Κωδικός Βιβλίου στον Εύδοξο: 50662950).