

COURSE OUTLINE “GENOMICS”

1. GENERAL

SCHOOL	HEALTH SCIENCES		
DEPARTMENT	MOLECULAR BIOLOGY AND GENETICS		
LEVEL OF STUDIES	ISCED LEVEL 6		
COURSE CODE	MBG318	SEMESTER	6 th
COURSE TITLE	GENOMICS		
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>	BACKGROUND		
PREREQUISITES:	NO		
TEACHING & EXAMINATION LANGUAGE:	GREEK		
COURSE OFFERED TO ERASMUS STUDENTS:	NO		
COURSE URL:	https://eclass.duth.gr/courses/ALEX01155/		

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 introduces students to Genomics, a cutting-edge discipline with major impact on human health, biotechnology, ecology and environmental management, evolutionary biology, etc. Students learn how to access and use genomic databases, and to discuss the ethical, legal and social implications of genomics.</p> <p>Upon successful completion of the course, participants:</p> <ul style="list-style-type: none"> -will be familiar with the history of Genomics and its roots in Genetics and other branches of Biology -will know the basic and advanced approaches to genome mapping -will know the sequencing technologies, from the historically important ones to the most modern NGS technologies -will be able to design and participate in genomics projects as a member of a large and international scientific team -will be familiar with genomics databases and have practiced their use -will know which ones to select and apply in order to answer different research questions in health, biotechnology, evolution, etc -will be able to apply genomics tools to the study of physiological and pathological conditions -will know the ethical, legal and social aspects of genomics and be aware of the risks of misuse of genomic data 												
<p>General Skills <i>Name the desirable general skills upon successful completion of the module</i></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"><i>Search, analysis and synthesis of data and information,</i></td> <td style="width: 50%; border: none;"><i>Project design and management</i></td> </tr> <tr> <td style="border: none;"><i>ICT Use</i></td> <td style="border: none;"><i>Equity and Inclusion</i></td> </tr> <tr> <td style="border: none;"><i>Adaptation to new situations</i></td> <td style="border: none;"><i>Respect for the natural environment</i></td> </tr> <tr> <td style="border: none;"><i>Decision making</i></td> <td style="border: none;"><i>Sustainability</i></td> </tr> <tr> <td style="border: none;"><i>Autonomous work</i></td> <td style="border: none;"><i>Demonstration of social, professional and moral responsibility and sensitivity to gender issues</i></td> </tr> <tr> <td style="border: none;"><i>Teamwork</i></td> <td style="border: none;"></td> </tr> </table>	<i>Search, analysis and synthesis of data and information,</i>	<i>Project design and management</i>	<i>ICT Use</i>	<i>Equity and Inclusion</i>	<i>Adaptation to new situations</i>	<i>Respect for the natural environment</i>	<i>Decision making</i>	<i>Sustainability</i>	<i>Autonomous work</i>	<i>Demonstration of social, professional and moral responsibility and sensitivity to gender issues</i>	<i>Teamwork</i>	
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<i>Teamwork</i>												

<i>Working in an international environment</i>	<i>Critical thinking</i>
<i>Working in an interdisciplinary environment</i>	<i>Promoting free, creative and inductive reasoning</i>
<i>Production of new research ideas</i>	

Search, analysis and synthesis of data and information, ICT Use
Autonomous work
Working in an interdisciplinary environment
Production of new research ideas
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

<p>The course content includes the following lecture topics:</p> <ol style="list-style-type: none"> 1) The history of genomics - Major advancements and applications - The Human Genome Project (S. Boukouvala, 3 hours) 2) Genome Mapping I - Genetic mapping (S. Boukouvala, 3 hours) 3) Genome Mapping II - Physical mapping (S. Boukouvala, 3 hours) 4) Genome Sequencing I - Classical approaches (S. Boukouvala, 3 hours) 5) Genome Sequencing II - Next (second, third) generation technologies (S. Boukouvala, 3 hours) 6) Genotyping technologies for genome-wide analysis (S. Boukouvala, 3 hours) 7) Transcriptomics (S. Boukouvala, 3 hours) 8) Comparative genomics, pathogenomics and metagenomics (S. Boukouvala, 3 hours) 9) Pharmacogenomics-Toxicogenomics (S. Boukouvala, 3 hours) 10) Genomic data mining from electronic databases (S. Boukouvala, 3 hours) 11) Oncogenomics and the Cancer Genome Project (I. Maroulakou, 3 hours) 12) Functional genomics and epigenomics (I. Maroulakou, 3 hours) 13) Ethical, legal and social implications of genomics (I. Maroulakou, 3 hours)

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 (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> <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	39
	Study of lecture material	54
	Bibliographic research and analysis	27
	Course Total	120
STUDENT EVALUATION <i>Description of the evaluation process</i> <i>Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test,</i>	Student evaluation languages: Greek	

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

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

Method (Formative or Concluding):

Summative

Student evaluation methods	Rate
Written exam with multiple choice test	15
Written Exam with Short Answer Questions	30
Written Exam with Essay Development Questions	30
Written Exam with Problem Solving	25

5. SUGGESTED BIBLIOGRAPHY

- A) «Γονιδιώματα-Σύγχρονες Ερευνητικές Προσεγγίσεις» 5η αγγλική/ 3η ελληνική έκδοση» του T.A. Brown από τις Εκδόσεις BROKEN HILL PUBLISHERS LTD
- B) «Εισαγωγή στη Γονιδιωματική» του A.M. Lesk από τις Εκδόσεις UTOPIA ΕΚΔΟΣΕΙΣ Μ. ΕΠΕ
- Γ) «Φαρμακογονιδιωματική και Πρωτεϊνωματική» των S.H.Y. Wong, M.W. Linder και R. Valdes από τις Εκδόσεις Παρισιάνου
- Δ) «Η Επιγενετική Επανάσταση» της Νέσα Κάρεϊ από τις Εκδόσεις ΧΑΡΙΤΟΣ ΧΡ. ΠΑΝΑΓΙΩΤΗΣ

Eudoxus

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- B) «Εισαγωγή στη Γονιδιωματική» του A.M. Lesk από τις Εκδόσεις UTOPIA ΕΚΔΟΣΕΙΣ Μ. ΕΠΕ (Κωδικός Βιβλίου στον Εύδοξο: 102124945).
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