

COURSE OUTLINE

1. GENERAL

SCHOOL	SCHOOL OF HEALTH SCIENCES		
DEPARTMENT	MBG / APPLIED BIOINFORMATICS - BIOLOGICAL DATA ANALYSIS		
LEVEL OF STUDIES	ISCED 7 - Masters degree or equivalent tertiary education level		
COURSE CODE	AB101	SEMESTER	1st
COURSE TITLE	FUNDAMENTAL KNOWLEDGE		
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>		TEACHING HOURS PER WEEK	ECTS CREDITS
		4	10
<i>Please, add lines if necessary. Teaching methods and organization of the course are described in section 4.</i>			
COURSE TYPE <i>Background, General Knowledge, Scientific Area, Skill Development</i>	Background, Scientific Area, Skill Development		
PREREQUISITES:	None		
TEACHING & EXAMINATION LANGUAGE:	Greek		
COURSE OFFERED TO ERASMUS STUDENTS:	No		
COURSE URL:	https://eclass.duth.gr/courses/ALEX01338/		

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>Upon successful completion of the course, participants will be able to:</p> <ul style="list-style-type: none"> ● Understand the foundations and basic principles of programming and of the programming tools available, ● Solve computational problems using programming tools such as R, Python and the UNIX shell environment, ● Design the appropriate programming methodology to address computational problems in biology, ● To work in interdisciplinary teams aiming to address and solve computational problems in biology, ● To be familiar with biological data from experiments and measurements and the ways of searching for primary data on the Internet and in databases, ● To know and understand the basic concepts of molecular biology and genetics required for the interdisciplinary subject of the MSc. 										
<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</i></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</i>
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<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>and sensitivity to gender issues</i> <i>Critical thinking</i> <i>Promoting free, creative and inductive reasoning</i>
<ul style="list-style-type: none"> ● Searching, analyzing and synthesizing data and information using the necessary technologies ● Generation of new research ideas ● Project design, planning and management ● Promotion of free, creative and deductive thinking ● Teamwork ● Independent work ● Self evaluation and constructive review/criticism 	

3. COURSE CONTENT

Basic concepts related to UNIX programming and the shell, the C programming language, R and R-studio (basic commands, data frames, functions and diagrams), Python (data and variable types, functions and modules). Examples of programming, statistical analysis with R and Python and troubleshooting using these tools. Introductory tutorials on basic concepts of molecular biology and genetics for students without a biology background.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD <i>Face to face, Distance learning, etc.</i>	Face to face, Distance learning																			
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, Laboratory Education and communication with students including : <ul style="list-style-type: none"> ● Digital content, videos, and exercises ● Computer terminal classroom ● Virtual reality classroom ● All standard applications including e-class, MsTeams, webmail, etc. 																			
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>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #f2f2f2;">Activity</th> <th style="background-color: #f2f2f2;">Workload/semester</th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td style="text-align: center;">52</td> </tr> <tr> <td>Laboratory Exercise</td> <td style="text-align: center;">80</td> </tr> <tr> <td>Final project</td> <td style="text-align: center;">74</td> </tr> <tr> <td>Bibliographic research & analysis</td> <td style="text-align: center;">90</td> </tr> <tr> <td>Exams</td> <td style="text-align: center;">4</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td>TOTAL</td> <td style="text-align: center;">300</td> </tr> </tbody> </table>		Activity	Workload/semester	Lectures	52	Laboratory Exercise	80	Final project	74	Bibliographic research & analysis	90	Exams	4					TOTAL	300
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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 Method : Formative Student evaluation methods : <ul style="list-style-type: none"> ● Written Exam with Short Answer Questions & written exam with multiple choice test : 65% ● Laboratory Report : 35% 																			

5. SUGGESTED BIBLIOGRAPHY

1. Βασικές Αρχές Γενετικής, W. S. Klug, M. R. Cummings, C. A. Spencer και M. A. Palla (11η Έκδοση), Έτος Έκδοσης: 2015, Ακαδημαϊκές Εκδόσεις Ι. Μπάσδρα & Σια, Ο.Ε. ISBN: 978-618-5135-03-4
2. Εισαγωγή στην Πληθυσμιακή Βιολογία. Συγγραφείς: BOSSERT W.H., WILSON E.O., ΙΤΕ-ΠΑΝΕΠΙΣΤΗΜΙΑΚΕΣ ΕΚΔΟΣΕΙΣ ΚΡΗΤΗΣ.
3. Εξέλιξη. Έκδοση: 4η αμερικανική-1η ελληνική/2019. Συγγραφείς: Douglas Futuyma, Mark Kirkpatrick. Διαθέτης (Εκδότης): ΥΤΟΡΙΑ ΕΚΔΟΣΕΙΣ Μ. ΕΠΕ.
4. ΑΝΑΛΥΣΗ ΔΕΔΟΜΕΝΩΝ ΜΕ ΤΗΝ R. Έκδοση: 2/2023. Συγγραφείς: ΝΙΚΟΛΑΟΥ ΧΡΙΣΤΟΦΟΡΟΣ. ISBN: 978-618-202-154-5. Διαθέτης (Εκδότης): ΕΚΔΟΣΕΙΣ ΔΙΣΙΓΜΑ ΙΚΕ
5. LINUX ΓΙΑ ΠΡΩΤΑΡΗΔΕΣ, DEE-ANN LEBLANC, RICHARD K. BLUM

ANNEX OF THE COURSE OUTLINE

Alternative ways of examining a course in emergency situations

Teacher (full name):	Nicholas M. Glykos
Contact details:	glykos@mbg.duth.gr
Supervisors: (1)	Yes
Evaluation methods: (2)	<ul style="list-style-type: none">• Written assignment or/and exercises : 35%• Written and/or oral examination with distance learning methods : 65%
Implementation Instructions: (3)	As described in Article 12 of Annex 7 ("Examination Regulations") of the Rules of Procedure of Democritus University of Thrace.

(1) Please write YES or NO

(2) Note down the evaluation methods used by the teacher, e.g.

written assignment or/and exercises

written or oral examination with distance learning methods, provided that the integrity and reliability of the examination are ensured.

(3) In the **Implementation Instructions** section, the teacher notes down clear instructions to the students:

a) in case of **written assignment and / or exercises**: the deadline (e.g. the last week of the semester), the means of submission, the grading system, the grade percentage of the assignment in the final grade and any other necessary information.

b) in case of **oral examination with distance learning methods**: the instructions for conducting the examination (e.g. in groups of X people), the way of administration of the questions to be answered, the distance learning platforms to be used, the technical means for the implementation of the examination (microphone, camera, word processor, internet connection, communication platform), the hyperlinks for the examination, the duration of the exam, the grading system, the percentage of the oral exam in the final grade, the ways in which the inviolability and reliability of the exam are ensured and any other necessary information.

c) in case of **written examination with distance learning methods**: the way of administration of the questions to be answered, the way of submitting the answers, the duration of the exam, the grading system, the percentage of the written exam of the exam in the final grade, the ways in which the integrity and reliability of the exam are ensured and any other necessary information.

There should be an attached list with the Student Registration Numbers only of students eligible to participate in the examination.