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	**AB102**	**SEMESTER**	**1st**
COURSE TITLE	PRINCIPLES OF BIOINFORMATICS		

TEACHING ACTIVITIES *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.*	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
	5	20
Please, add lines if necessary. Teaching methods and organization of the course are described in section 4.		

COURSE TYPE *Background, General Knowledge, Scientific Area, Skill Development*	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

Learning Outcomes

Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of the course, participants will be able to:

- Understand the theory behind the generation and utilization of biological data, the theory and tools available in Bioinformatics and Computational Biology,
- have the skills needed to support the analysis of biological data using state-of-the-art techniques,
- work in interdisciplinary teams to address computational problems in biology,
- know and understand the basic concepts of Machine Learning and Deep Learning and Neural Networks
- design appropriate algorithms to address computational problems in Biology,
- have familiarity with the main molecular biology techniques that generate data for bioinformatics analysis.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use
Adaptation to new situations
Decision making
Autonomous work
Teamwork
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

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

- Search, analysis, and synthesis of data and information, using the necessary technologies
- Generation of new research ideas
- Project planning and management
- Respect for the natural environment
- Promotion of free, creative, and deductive thinking

3. COURSE CONTENT

The fundamental concepts related to Bioinformatics and Computational Biology, Machine Learning, Neural Networks, Deep Learning, Transcriptomics, Genomics, Epigenetics, Algorithms, and their applications in the biological sciences are explained.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD
Face to face, Distance learning, etc.

From an amphitheater, by working, distance learning

USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT)
Use of ICT in Teaching, in Laboratory Education, in Communication with students

Use of ICT in teaching and communication with students:

- Digital slides and exercises
- Computer room
- Video
- MsTeams/e-class, webmail

TEACHING ORGANIZATION
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.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards.

Activity	***Workload/semester***
Lectures	62
Exercises	150
Final project	140
Bibliographic research & analysis	240
Exams	8
Total	600

STUDENT EVALUATION
Description of the evaluation process

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

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

5. SUGGESTED BIBLIOGRAPHY

1. ΑΝΑΛΥΣΗ ΔΕΔΟΜΕΝΩΝ ΜΕ ΤΗΝ R. Έκδοση: 2/2023. Συγγραφείς: ΝΙΚΟΛΑΟΥ ΧΡΙΣΤΟΦΟΡΟΣ. ISBN: 978-618-202-154-5. Διαθέτης (Εκδότης): ΕΚΔΟΣΕΙΣ ΔΙΣΙΓΜΑ ΙΚΕ
2. Βιοπληροφορική και Λειτουργική Γονιδιωματική (2018). Jonathan Pevsner
3. Βιοπληροφορική (2015), Παντελής Μπάγκος
4. Ανασυνδυασμένο DNA, Watson D.A. κα ISBN: 978-960-88412-5-3

ANNEX OF THE COURSE OUTLINE

Alternative ways of examining a course in emergency situations

Teacher (full name):	Maria Grigoriou, Antonis Giannakakis
Contact details:	Email: mgrigor@mbg.duth.gr, antgian@mbg.duth.gr
Supervisors: (1)	Yes
Evaluation methods: (2)	Homework (35%). Written Assignment (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.