COURSE OUTLINE "PHYSICAL CHEMISTRY AND ELEMENTS OF BIOPHYSICS"

1. GENERAL

SCHOOL	HEALTH SCIENCES		
DEPARTMENT	MOLECULAR BIOLOGY AND GENETICS		
LEVEL OF STUDIES	ISCED LEVEL 6		
COURSE CODE	**MBG114**	**SEMESTER**	2nd
COURSE TITLE	PHYSICAL CHEMISTRY AND ELEMENTS OF BIOPHYSICS		

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.*	**HOURS/WEEK**	**ECTS CREDITS**
	3	4

COURSE TYPE *Background, General Knowledge, Scientific Area, Skill Development*	GENERAL KNOWLEDGE
PREREQUISITES:	NO
TEACHING & EXAMINATION LANGUAGE:	GREEK
COURSE OFFERED TO ERASMUS STUDENTS:	NO
COURSE URL:	https://eclass.duth.gr/courses/ALEX01228/

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.

The objectives of the course are:

- Introduction of mass and energy balance
- Introduction to the Molecular motion in gases and liquids
- Understanding of thermodynamic Equilibrium
- Linking macroscopic properties with molecular forces
- Understanding the thermodynamic Lows
- Introduction to Thermochemistry
- Introduction of the State functions and exact differentials
- Work and heat
- Understanding and measuring Entropy
- Understanding Phase equilibrium
- Irreversibility

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
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
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

Search, analysis and synthesis of data and information, ICT Use
Production of new research ideas
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

1. Introductory Mathematical background

2. Mass and energy conservation
3. Molecular motion of gasses and Liquids
4. Equation of states
5. The First Law
6. Work and Heat
7. The Second Law
8. Entropy and irreversibility
9. Phase Equilibrium
10. Solutions
11. Open systems, Gibbs free energy
12. Chemical Equlibrium, Chemical Kinetics and Thermodynamics
13. Separation techniques and Structure of biomolecules

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD *Face to face, Distance learning, etc.*	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) *Use of ICT in Teaching, in Laboratory Education, in Communication with students*	Use of multimedia, interactive computational experiments
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.*	
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*	**Student evaluation languages** Greek **Method (Formative or Concluding)** Summative **Student evaluation methods** Written Exam with Short Answer Questions (100%)

Activity	***Workload/semester***
Lectures	39
Study at Home	81
Course Total	**120**

5. SUGGESTED BIBLIOGRAPHY

1) Τίτλος: Φυσικοχημεία
Κωδικός Βιβλίου στον Εύδοξο: 94643666
Έκδοση: 1/2021
Συγγραφείς: Chang Raymond, Thoman W. John
ISBN: 9789925576036
Τύπος: Σύγγραμμα
Διαθέτης (Εκδότης): BROKEN HILL PUBLISHERS LTD

2) Τίτλος: ΦΥΣΙΚΟΧΗΜΕΙΑ
Κωδικός Βιβλίου στον Εύδοξο: 94690187
Έκδοση: 1η/2020

Συγγραφείς: Peter Atkins, Julio de Paula, James Keeler
ISBN: 978-960-524-591-7
Τύπος: Σύγγραμμα
Διαθέτης (Εκδότης): ΙΔΡΥΜΑ ΤΕΧΝΟΛΟΓΙΑΣ & ΕΡΕΥΝΑΣ-ΠΑΝΕΠΙΣΤΗΜΙΑΚΕΣ ΕΚΔΟΣΕΙΣ ΚΡΗΤΗΣ

3) Τίτλος: Φυσικοχημεία Βιολογικών Συστημάτων
Κωδικός Βιβλίου στον Εύδοξο: 77119529
Έκδοση: Α/2018
Συγγραφείς: Αναστάσιος Τρογκάνης
ISBN: 978-960-563-192-5
Τύπος: Σύγγραμμα
Διαθέτης (Εκδότης): Δ.Β. ΕΛΛΗΝΟΕΚΔΟΤΙΚΗ Α.Ε.Ε.Ε

4) Τίτλος: Φυσικοχημεία για τις Βιολογικές Επιστήμες
Κωδικός Βιβλίου στον Εύδοξο: 77115195
Έκδοση: 1/2012
Συγγραφείς: Hammes
ISBN: 978-960-99858-3-3
Τύπος: Σύγγραμμα
Διαθέτης (Εκδότης): ΣΠΥΡΙΔΩΝ ΚΩΣΤΑΡΑΚΗΣ

5) Τίτλος: Φυσικοχημεία
Κωδικός Βιβλίου στον Εύδοξο: 94645324
Έκδοση: 1η έκδ./2020
Συγγραφείς: Kolasinski Kurt W. (Συγγρ.) - Γιαννακουδάκης Παναγιώτης, Σιμσερίδης Κωνσταντίνος (Επιμ.)
ISBN: 978-960-586-346-3
Τύπος: Σύγγραμμα
Διαθέτης (Εκδότης): ΕΚΔΟΣΕΙΣ ΚΡΙΤΙΚΗ ΑΕ

6) Τίτλος : ΒΙΟΦΥΣΙΚΗ
Κωδικός Βιβλίου στον Εύδοξο: 7755
Έκδοση: ΠΡΩΤΗ/2009
Συγγραφείς: Kensal Van Holde, W. Curtis Johnson, P. Shing Ho
ISBN: 978-960-8002-55-5
Τύπος: Σύγγραμμα
Διαθέτης (Εκδότης): ΣΤΥΛΙΑΝΟΣ ΒΑΣΙΛΕΙΑΔΗΣ