COURSE OUTLINE

"LABORATORY COURSE IV: PHYSIOLOGY & STRUCTURAL BIOLOGY"

1. GENERAL

SCHOOL	HEALTH SCIENCES			
DEPARTMENT	MOLECULAR BIOLOGY AND GENETICS			
LEVEL OF STUDIES	ISCED LEVEL 6			
COURSE CODE	**MBG226**	**SEMESTER**	4th	
COURSE TITLE	LABORATORY COURSE IV: PHYSIOLOGY & STRUCTURAL BIOLOGY			
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**
			4	5
COURSE TYPE *Background, General Knowledge, Scientific Area, Skill Development*	SKILL DEVELOPMENT			
PREREQUISITES:	NO			
TEACHING & EXAMINATION LANGUAGE:	GREEK ENGLISH FOR ERASMUS STUDENTS			
COURSE OFFERED TO ERASMUS STUDENTS:	YES			
COURSE URL:	https://eclass.duth.gr/courses/ALEX01229/			

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 for the students are:

- To understand the basic principles of selected technologies and methodologies in the fields of Physiology and Structural Biology
- To become familiar with anatomy equipment and perform micro manipulations for microscopic observation
- To recognize the basic elements of structure and function of experimental models and develop experimental design skills
- To get familiar with key operating systems of organisms
- To understand the basic principles of cellular physiology and the molecular mechanisms underlying them and the basic principles of biological control systems
- To become familiar with 3D structure representation graphical programs for biomolecules
- To understand the basic principles of organisation and stability of proteins and their complexes with other chemical compounds.

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

- Know the basic principles of selected technologies of Physiology and Structural Biology
- Process, analyse and evaluate experimental results in the subjects of Physiology and Structural Biology
- Reinforce the basic knowledge of Organismal Physiology and Structural Biology with the help of interactive surveillance tools and experimental training
- Compose and comparatively analyze the functional systems of humans

- Analyse and interpret experimental results and propose solutions to problems/questions, formulating hypotheses and designing appropriate methodological approaches
- Know and understand the basic principles of organisation and stability of protein molecules in 3D space, and the basic principles governing the structure-function relationship of proteins

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,	*Project design and management*
ICT Use	*Equity and Inclusion*
Adaptation to new situations	*Respect for the natural environment*
Decision making	*Sustainability*
Autonomous work	*Demonstration of social, professional and moral responsibility and*
Teamwork	*sensitivity to gender issues*
Working in an international environment	*Critical thinking*
Working in an interdisciplinary environment	*Promoting free, creative and inductive reasoning*
Production of new research ideas	

- Research, analysis and synthesis of data and information, using the necessary technologies
- Production of new research ideas
- Promotion of free, creative and inductive thinking
- Decision making
- Autonomous and team work
- Adaptation to new situations
- Project design and management

3. COURSE CONTENT

- Neurophysiology
- Skeletal muscle physiology
- Energetics of muscle contraction
- Blood Cells: Hematocrit Determination, Erythrocyte Count, Hemostasis, Blood Coagulation, Leukocyte Count and Leukocyte Type Determination
- Frog Cardiac System
- Physiology of kidney function
- Mammalian digestive enzymes
- Molecular graphics (C)
- Introduction to protein chemistry and structure (C)
- Secondary structure of proteins (C)
- Tertiary and quaternary structure of proteins and structural domains (C)
- DNA and nucleoprotein complexes (C)

All practicals consist of a theory part and a practical part

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD *Face to face, Distance learning, etc.*	Face to face, practical education in small groups
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) *Use of ICT in Teaching, in Laboratory Education, in Communication with students*	Use of ICT in Teaching Use of ICT in Communication with students Use of e-class and new technologies in the lab practicals (wet / dry lab)
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.*	In order to support the development of the student's scientific thinking, instructional teaching in conjunction with collaborative teaching strategies and integrating technology are used in the course. In this way, the student not only acquires knowledge but also develops skills in experimental design and result interpretation. In addition, the student collaborates with both peers and the instructor.

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

Activity	*Workload/semester*
Laboratory Exercise	50
Bibliographic reseach & analysis	50
Laboratory reports	50
Course Total	**150**

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, English **Method (Formative or Concluding)** Formative **Student evaluation methods** Presentation of Lab course results - Written Lab course reports (20%) Written test exams with multiple-choice questionnaires and/or short-answer questions (80%) The assessment criteria are presented in the course syllabus available on the course website.

5. SUGGESTED BIBLIOGRAPHY

Suggested Textbooks

• Introduction to Human Physiology (Greek translation). Author(s): Lauralee Sherwood. Publishing Company: Academic Publications J. Basdra & Co., 2014 (ISBN: 9786185135027). EUDOXOS code: 41959951.

• Human Physiology – The mechanisms of body function (Greek translation). Author(s): Vander A., Sherman J., Luciano D. Publishing Company: BROKEN HILL PUBLISHERS LTD (ISBN: 97899963274031). EUDOXOS code: 50662972

• Physiology – Laboratory manual (in Greek). Author(s): A. Pappa. Publishing Company: Department of Molecular Biology & Genetics, Democritus University of Thrace Place & Year of Publishing: Alexandroupolis, 2018

• Introduction to Protein Structure, Carl Branden and John Tooze, Academic publications, 2019, ISBN: 978-618-5135-16-4, *Eudoxus code: 86054640*

• Laboratory practicals (in Greek; English for Erasmus students). Author(s): V. Fadouloglou