COURSE OUTLINE BIOMECHANICS

1. GENERAL

SCHOOL	**PHYSICAL EDUCATION, SPORT SCIENCE AND OCCUPATIONAL THERAPY**		
DEPARTMENT	PHYSICAL EDUCATION AND SPORT SCIENCE		
LEVEL OF STUDIES	ISCED level 6 – Bachelor's or equivalent level		
COURSE CODE	C121	**SEMESTER**	2nd
COURSE TITLE	BIOMECHANICS		
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**
		3	6
COURSE TYPE *Background, General Knowledge, Scientific Area, Skill Development*	Background		
PREREQUISITES:	None		
TEACHING & EXAMINATION LANGUAGE:	Greek English for Erasmus+ students		
COURSE OFFERED TO ERASMUS STUDENTS:	YES		
COURSE URL:			

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

- *understand the effect of the basic laws and principles of mechanics on human movement, as well as on the structure and function of the human body.*
- *explain the relationship between the laws and principles of mechanics with the technique of specific movements, to improve the efficiency and effectiveness of movements*
- *analyze the mechanical interaction of the human-user with the various types of equipment and aids, in order to improve the efficiency of the movements and their safety*
- *apply the laws and principles of mechanics to the design of training / exercise programs to improve performance and prevent injuries*

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

The general skills that are supported involve:

- *Search, analysis and synthesis of data and information, using appropriate ICT*

- *Decision making*
- *Autonomous work*
- *Teamwork*
- *Working in an international environment*
- *Working in an interdisciplinary environment*
- *Production of new research ideas*
- *Project design and management*
- *Respect for the natural environment*
- *Promoting free, creative and inductive reasoning*

3. COURSE CONTENT

1. *Introduction to Biomechanics*
2. *Description of the system (human body) and its movement*
3. *The movements of the body and its segments*
4. *Methods of studying the movements of the body and its segments*
5. *Basic elements of vectors*
6. *Linear movements (translations) - first part*
7. *Linear movements (translations) - second part*
8. *Linear movements (translations) - third part*
9. *Angular movements (rotations) - first part*
10. *Angular movements (rotations) - second part*
11. *Center of mass, balance and stability of the body*
12. *The human body as a machine*
13. *Movement in a fluid environment*

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD *Face to face, Distance learning, etc.*	Face to face Theoretical lectures Laboratory courses 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 • videos • 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.*	
STUDENT EVALUATION	

Activity	***Workload/semester***
Lectures	39
Lab exercises	30
Study and analysis of the literature	78
Examinations	3
Total Course	**150**

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*	Interim evaluations (20%) Written exams including: multiple choice tests, short answer questions and development questions designed to solve problems (80%) The assessment languages are Greek and English for Erasmus students

5. SUGGESTED BIBLIOGRAPHY

1. *MCLESTER J., ST. PIERE P. (2019) APPLIED BIOMECHANICS. CONCEPTS AND CONNECTIONS, 2nd ed. Jones & Bartlett Learning*
2. *MCGINNIS P. (2020). BIOMECHANICS OF EXERCISE. ATHENS: IOANNIS KONSTANTARAS*

ANNEX OF THE COURSE OUTLINE

Alternative ways of examining a course in emergency situations

Teacher (full name):	Nikolaos Aggelousis
Contact details:	nagelous@phyed.duth.gr
Supervisors:	Yes
Evaluation methods:	Written or oral examination with distance learning methods, via eClass. Identification and monitoring of examinees through Microsoft Teams
Implementation Instructions:	The examination in the course will be done in randomly created groups of users (examinees). The compositions of the user groups will be announced in time. The total examination duration of each group will be 1 hour. In the first twenty minutes of each examination period, the examinees will be identified through the MS Teams app. For this purpose, there must be a camera, microphone and headphones connected to their terminal device (PC or smartphone). The relevant link will be sent via eClass, exclusively to the institutional accounts of those who have registered for the course and have accepted the terms of distance examination. For identification, students will display their student ID on camera when requested. The main examination will be carried out through the "Exercises" application of eClass. In particular, at the beginning of the second twenty minutes of each examination period, an exercise entitled "Examination - Group X (where X = 1 to n)" will be activated in the eClass, which will include 20 questions. The time limit for answering the 20 questions will be 30 minutes. During this period, all questions should be answered and finalized. Each of the questions will be graded with 0.5 points. Students should log in to the eClass platform through their institutional

	account. Also during the exam the camera and microphone of the examinees have to be continuously activated and the MS Teams application should be open.