

DEMOCRITUS UNIVERSITY OF THRACE
DEPARTMENT OF PHYSICAL EDUCATION & SPORT SCIENCE

UNDERGRADUATE PROGRAM OF STUDY

COURSE TITLE:

Biomechanics

COURSE CODE:

N127

ECTS CREDITS

5

RESPONSIBLE FOR THE COURSE:

NAME	Nickos Aggeloussis	
POSITION	Associate Professor	
SECTOR	Sports Training Theory and Application	
OFFICE	B3-8	
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CO-INSTRUCTORS	-	

SEMESTER:

1ST 2ND 3RD 4TH
5TH 6TH 7TH 8TH

COURSE TYPE:

OBLIGATORY
DIRECTION
SPECIALIZATION
PREREQUIZITE FOR SPECIALIZATION
ELECTIVE (*OPEN*)

HOURS (per week):

2

DIRECTION

(only for 3rd & 4th year courses)

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SPECIALIZATION *(only for 3rd & 4th year courses)*

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LANGUAGE OF TEACHING:

GREEK

ENGLISH

AIM OF THE COURSE (*content and acquired skills*)

To provide students with basic scientific knowledge regarding the application of mechanical laws and principles in human locomotion and sport performance.

By the completion of this course, students should be able to understand:

1. the impact of basic mechanical laws and principles on human motion and on the structure and function of the human body
2. the relationships between mechanical laws and principles and movement techniques, in order to improve the outcomes or effectiveness of a performance
3. the mechanical interaction between the human user and the equipment in order to improve performance effectiveness and safety
4. how to prevent injuries caused by the forces acting onto the human body

COURSE CONTENTS (*outline – titles of lectures*)

1. Introduction to Biomechanics
2. Linear kinematics – Part I
3. Linear kinematics – Part II
4. Angular kinematics
5. Linear kinetics – Part I
6. Linear kinetics – Part II
7. Linear kinetics – Part III
8. Angular kinetics – Part I
9. Angular kinetics – Part II
10. Angular kinetics – Part III
11. Angular kinetics – Part IV
12. Fluid mechanics
13. Course resume – Discussion

TEACHING METHOD (*lectures – labs – practice etc*)

This course includes lectures, workshops and distance learning through the asynchronous distance learning platform e-Class, in the Academic Internet GUNet, at the URL: <http://eclass.duth.gr/eclass/>

ASSESSMENT METHOD(-S)

1. Project: 20%
2. Mid-term examination: 20%
3. Final examination: 60%

LEARNING OUTCOMES

Upon the completion of this course the student will be able to understand:

1. how the basic mechanical laws and principles of motion affect human motion and the structure and function of the human body,
2. the relations of biomechanical laws and principles with the technique of specific movements to improve movement performance and efficiency
3. the mechanical interaction of the human-user with various types of equipment and assistive devices for the improvement of movement efficiency and safety
4. how to prevent injuries that forces acting on the human body can cause.

LEARNING OUTCOMES - CONTINUED

<i>Learning Outcomes</i>	<i>Educational Activities</i>	<i>Assessment</i>	<i>Students Work Load (hours)</i>
Knowledge and understanding of mechanical laws and principles and their applications on human movements	Lectures, problem solving, individual project, home study	Mid-term, individual project, final exam	30
Knowledge and understanding of the applications of biomechanical laws and principles on sport movements	Lectures, problem solving, individual project, home study	Mid-term, individual project, final exam	40
Knowledge and understanding of the mechanical interaction of the human-user with various types of equipment and assistive devices for the improvement of movement efficiency and safety	Lectures, problem solving, class project, home study	Mid-term, class project, final exam	40
Knowledge and understanding of injury and prevention biomechanics	Lectures, problem solving, home study	Mid-term, final exam	40
		TOTAL	150

OBLIGATORY & SUGGESTED BIBLIOGRAPHY:

1. HALL, S.J. (2003) *BASIC BIOMECHANICS, 4TH EDITION*. BOSTON, MA: MCGRAW HILL
2. HAMILL, J., & KNUTZEN, K. (1995) *BIOMECHANICAL BASIS OF HUMAN MOVEMENT*. LONDON: WILLIAMS & WILKINS
3. MAVROMATIS, G., AGGELOUSSIS, N., GOURGOULIS, V. (2006) *BIOMECHANICS – COURSE CONTENT MANUAL*. KOMOTINI: DEMOCRITUS UNIVERSITY OF THRACE PRESS