**Biomechanics of human movement**

## (1) GENERAL

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| **SCHOOL** | SCHOOL OF INFORMATION SCIENCES & TECHNOLOGY | | |
| **ACADEMIC UNIT** | DEPARTMENT OF STATISTICS | | |
| **LEVEL OF STUDIES** | POSTGRADUATE | | |
| **COURSE CODE** | | **TRIMESTER** | **3 OR 6** |
| **COURSE TITLE** | Biomechanics of human movement | | |
| **INDEPENDENT TEACHING ACTIVITIES** | | **WEEKLY TEACHING HOURS** | **CREDITS** |
| | | 1,5 | 2,5 |
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| | | 15 | 2,5 |
| **COURSE TYPE** | Specialization Elective | | |
| **PREREQUISITE COURSES:** | | | |
| **LANGUAGE OF INSTRUCTION and EXAMINATIONS:** | ENGLISH | | |
| **COURSE DELIVERY METHOD** | Distance | | |
| **IS THE COURSE OFFERED TO ERASMUS STUDENTS** | NO | | |
| **COURSE WEBSITE (URL)** | https://cloud.aueb.gr/index.php/s/6ojKMn9ewLQbXB4 | | |

## (2) LEARNING OUTCOMES

| **Learning outcomes** |
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| • Understanding the fundamental concepts of biomechanical modeling for the analysis of human movement.<br>• Familiarity with the mechanical modeling of sports skills in the context of athletic performance.<br>• Development of knowledge in human body kinematics and the related descriptive parameters.<br>• Understanding the basic principles of movement dynamics and the forces that influence human motion.<br>• Introduction to modeling the human musculoskeletal system for applications in performance analysis and enhancement.<br>• Development of applied skills in human movement analysis through biomechanical approaches. |
| **General Competences** |
| • Working in an interdisciplinary environment. |

## (3) SYLLABUS

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| The course focuses on the concepts of biomechanical modeling for the analysis of human movement. It addresses students' needs regarding mechanical modeling from the |

perspective of analyzing sports skills, the development of key concepts in human body kinematics and movement dynamics, as well as an introduction to modeling the human musculoskeletal system.

## (4) TEACHING and LEARNING METHODS - EVALUATION

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| **DELIVERY** *Face-to-face, Distance learning, etc.* | Distance |
| **METHOD AND FREQUENCY OF COMMUNICATING WITH THE STUDENTS** | Remotely via email and through weekly office hours (and whenever necessary) via teleconferencing or in-person office visits. |
| **ENSURING COMMUNICATION AMONG STUDENTS** | Teleconference, Chat via eclass and/ or TEAMS, and QA sessions |
| **USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY** | MS Teams, e-class, MS Outlook, R, Python, WayGround or Kahoot educational games and quizzes |
| **REQUIRED EQUIPMENT AND TECHNOLOGY KNOWLEDGE** | Camera, mic, PC, MS Office, and TEAMS |
| **COURSE POLICY ON PLAGIARISM AND PLAGIARISM DETECTION TOOLS** | Turnitin |
| **COURSE POLICY ON USE OF AI TOOLS** | The use of Artificial Intelligence is permitted with explicit reference to the bibliography (2) for the verbal correction of assignments and as long as students have understood the basic principles and methods of the course. |
| **TEACHING METHODS** | |

| ***Activity*** | ***Semester workload*** |
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| Lectures | 15 |
| Written Assignment | 20 |
| Lab Exercise | 10 |
| Self-Study hours | 20 |
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| Course total | ***65*** |

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| **STUDENT PERFORMANCE EVALUATION** | Evaluation language is English. Evaluation methods include lab exercises, written assignments, and/or written examinations. Oral examinations of the assignments may be conducted if clarifications are needed or if there are suspicions of plagiarism or unauthorized use of Artificial Intelligence tools. Assessment criteria are provided on the course eClass platform and in the course materials. |

## (5) RECOMMENDED BIBLIOGRAPHY


- McGinnis, P. M. (2013). Biomechanics of sport and exercise. Human Kinetics.