

Course Title	KINESIOLOGY - BIOMECHANICS			
Course Code	SSKIN302-1			
Course Type	MANDATORY			
Level	BSc (Level 1)			
Year / Semester	3rd / Spring			
Teacher's Name	Dr. Anthi Xenofontos & Dr Dimitris Patikas			
ECTS	6	Lectures / week	2	Laboratories / week / 1
Course Purpose	The aim of the course is to provide students with the skills required to apply the laws of mechanics to motion analysis, to design measurements for the analysis of basic techniques in various sports, to understand the collaborations of the skeletal muscular and nervous systems in motion production and the possible interventions they can apply.			
Learning Outcomes	<p>Upon completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Understand what biomechanics is and its importance in the study of human movement. • Acquire knowledge of basic kinematic concepts in the analysis of human movement. • Understand the concepts of kinetics applied in the analysis of human movement. • Examine biomechanics involving the growth and development of human bone. • To study the biomechanics of the structures of the human skeleton. • Understand the biomechanics applied to human skeletal muscle. • Become familiar with the neuromechanics of human movement. • Analyze linear kinematics in human motion. • Examine angular kinematics in human motion. • To deepen the study of linear kinematics with applications in human movement. • Understand the importance of balance in human movement. • Analyze angular kinetics in human motion. 			
Prerequisites	No	Corequisites	No	
Course Content	<ol style="list-style-type: none"> 1. What is biomechanics? 2. Kinematic concepts for the analysis of human movement 3. Concepts of kinetics for the analysis of human movement 4. Biomechanics of human bone growth and development 			

	<ol style="list-style-type: none"> 5. Biomechanics of the structures of the human skeleton 6. The biomechanics of human skeletal muscle 7. Neuromechanics of human movement 8. The linear kinematics of human movement 9. The angular kinematics of human motion 10. The linear kinematics of human motion 2 11. Balance and human movement 12. The angular kinetics of human movement
Teaching Methodology	<p>Monological, dialogical and exploratory-active methods. Presentations, individual study, dialogue / questions and answers, brainstorming, experiential learning, exploratory method and critical reflection will be used. During laboratory courses, students develop laboratory skills in biomechanical assessment so that they can successfully analyze measurements and data analysis in a real environment.</p>
Bibliography	<ul style="list-style-type: none"> • Hall, S. J. (2001). Βασική εμβιομηχανική. Αθήνα: Παρισιάνος. <p><u>Additional bibliography:</u></p> <ul style="list-style-type: none"> • Hamilton, N., & Luttgens, K. (2003). Κινησιολογία. Αθήνα: Παρισιάνος. • Κέλλης, Ε. (2008). Νευρομηχανικές αρχές αξιολόγησης της μυϊκής δύναμης. Αθήνα: Πιπέρης & Σια. • McGinnis, P. M. (2013). Biomechanics of sport and exercise (3rd ed.). Human Kinetics • Enoka, R. M. (2002). Neuromechanics of human movement. Champaign, IL: Human Kinetics.
Assessment	<ul style="list-style-type: none"> • Workshops – 30%: Laboratory reports will examine the student's performance in the reported learning practical outcomes of the current lecture. • Pop-up exit tickets - 30%: Pop-up exit tickets consist of short quizzes. The questions will examine the student's performance in the reported learning outcomes of the current lecture. Each exit ticket will contribute up to 5% of the grade of the final course. Students are encouraged to complete 5 exit tickets during the course. • Final Project – 40%: Students will use open-source motion recording technology to conduct an industrial study on movement efficiency. They will collect and analyze motion data to understand how various movements affect athletic performance or injury risk. This practical experience aims to bridge theoretical knowledge with practical application, encouraging students to explore kinematics and kinetics through data interpretation and suggest evidence-based improvements for sports education, rehabilitation or ergonomics.
Language	Greek / English