



Subject card

Subject name and code	Biomechanics, PG_00047815						
Field of study	Biomedical Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2025/2026		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	3	Language of instruction			Polish		
Semester of study	5	ECTS credits			1.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Mechanics and Mechatronics -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Wiktor Sieklicki					
	Teachers	dr inż. Wiktor Sieklicki					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours		Self-study		SUM
	Number of study hours	15	5.0		5.0		25
Subject objectives	basic knowledge in biomechanics, motoric functions, walking, and tissue biomechanics.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U05] can plan and conduct experiments related to the field of study, including computer simulations and measurements; interpret obtained results and draw conclusions		student understands physical phenomenons which determine functioning of the human body and it's motoric function		[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
	[K6_U07] can apply methods of process and function support, specific to the field of study		student is able to analyze physical phenomenons crucial for biomechanics		[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
	[K6_W51] Knows and understands, to an advanced extent, selected aspects of human anatomy and physiology, constituting general knowledge related to the field of study		Student is able to analyze and understand sub-systems that are combined in a human mobility		[SW2] Assessment of knowledge contained in presentation		
Subject contents	<ul style="list-style-type: none"> • basic information about biomechanics, mass-geometrical identification of human body segments • defining the center point of mass of body segments • body dynamics in the translational and rotational movement, body inertion • kinematic pairs, manipulator mobility, levers in biomechanics • muscle biomechnics • mechanical characterisation of human body tissues, spring-elastic behavior, cyclic movement • bone structures, bones adaptation scheme • tissues loading schemes, anisotropy of tissues, • bones biomechanics, • modelling in biomechanics, • arm biomechanical model, • nerve system biomechanics. 						

Prerequisites and co-requisites	<p>strength of the materials basics</p> <p>material science</p> <p>basics of mechanics</p> <p>human anatomy</p>		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	lecture - tests	56.0%	70.0%
	lecture - presence	85.0%	30.0%
Recommended reading	Basic literature	<p>Bober T., Zawadzki Z. Biomechanika układu ruchu człowieka, Wyd. BK, Wrocław 2001</p> <p>Świtońskiego, Marka Gzika. Wydawnictwo Politechniki Śląskiej, 2011, Gliwice</p> <p>Błaszczyk J. W. Biomechanika kliniczna. Wyd. Lek. PZWL, Warszawa 2004</p> <p>Dega W., Milanowska K. red. Rehabilitacja medyczna. PZWL Warszawa 1983</p> <p>Erdmann W. S. Biomechanika ogólna. Wyd. May, Gdańsk 2010</p> <p>Mrozowski J., Awrejcewicz J.: Podstawy biomechaniki. Politechnika Łódzka, 2004, Łódź</p>	
	Supplementary literature	<p>Erdmann W. S. Metody obrazowe. Akademia Wych. Fiz. i Sportu Gdańsk 2007.</p> <p>Będziński R. Biomechanika inżynierska. Zagadnienia wybrane. Politechnika Wrocławska, Wrocław 1997</p> <p>Biomechanika narządu ruchu. Pod redakcją Dagmary Tejszerskiej, Eugeniusza</p>	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	define what are planes of the body, directions of movements, center point of mass and pressure, position of the center point of mass, anatomical position, inertia, rotational inertia, central inertia momentum, Steiner's theorem, Hooks law, Young modulus		
Work placement	Not applicable		