GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Biomechanics, PG_00047815		
Field of study	Biomechanika		
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 -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Wiktor Sieklicki	
	Teachers	dr inż. Wiktor Sieklicki	

Lesson types

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] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu [SU2] Ocena umiejętności analizy informacji
[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] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu [SU2] Ocena umiejętności analizy informacji
[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] Ocena wiedzy zawartej w prezentacji

Subject contents

- 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.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="2">strength of the materials basics

material science

basics of mechanics

human anatomy</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>lecture - tests</td><td>56.0%</td><td>70.0%</td></tr><tr><td>lecture - presence</td><td>85.0%</td><td>30.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>Bober T., Zawadzki Z. Biomechanika układu ruchu człowieka, Wyd. BK, Wrocław 2001

Świtońskiego, Marka Gzika. Wydawnictwo Politechniki Śląskiej, 2011, Gliwice

Błaszczyk J. W. Biomechanika kliniczna. Wyd. Lek. PZWL, Warszawa 2004

Dega W., Milanowska K. red. Rehabilitacja medyczna. PZWL Warszawa 1983

Erdmann W. S. Biomechanika ogólna. Wyd. May, Gdańsk 2010

Mrozowski J., Awrejcewicz J.: Podstawy biomechaniki. Politechnika Łódzka, 2004, Łódź</td></tr>
<tr><td>Supplementary literature</td><td>Erdmann W. S. Metody obrazowe. Akademia Wych. Fiz. i Sportu Gdańsk 2007.

Będziński R. Biomechanika inżynierska. Zagadnienia wybrane. Politechnika
Wrocławska, Wrocław 1997

Biomechanika narządu ruchu. Pod redakcją Dagmary Tejszerskiej, Eugeniusza</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">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 interia momentum, Steiner's theorem, Hooks law, Young modulus</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="2">Not applicable</td></tr>
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