GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00056099		
Field of study	Mechanical and Medical Engineering		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2024/2025
Education level	first-cycle studies	Subject group	
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	6	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Wiktoria Wojnicz	
	Teachers	dr hab. inż. Wiktoria Wojnicz dr inż. Wiktor Sieklicki mgr inż. Katarzyna Pytka	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	30.0	0.0	0.0	45

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	45	0.0	0.0	45

Subject objectives

The aim of the study is to acquire knowledge about methods and tools used in applied biomechanics

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U03] he/she is able to use information-communication skills to solve typical engineering tasks related to design, production and utilization	Student can solve problem related to mechanical-medical area by using engineering tools	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
[K6_U08] he/she is able to assess whether proposed methods and tools can be used in practice to solve simple engineering task related to machine design, manufacturing and utilization	Student can choose and apply measurement methods and engineering tools to solve a problem related to mechanical-medical area	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
[K6_U05] he/she is able to use analytic and modelling methods to formulate and solve engineering tasks related to the mechanical-medical area	Student can state problem related to mechanical-medical area by using analytical methods and define engineering tools than should be applied to solve a problem	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
[K6_W09] he/she has basic knowledge related to numerical methods and engineering software used to analyze, model and design a given mechanical system	Student can formulate steps of solution related to the given mechanical-medical problem by using engineering approach	[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Lecture (15h)

1. Biomechanical analysis in postural research (EMG, Motion Capture, Force Plates).

2. Biomechanical analysis in postural disease research (EMG, Motion Capture, Force Plates).

3. Gait analysis: gait parameters in normal gait (EMG, Motion Capture, Force Plates).

4. Gait analysis: gait parameters in disturbed gait (EMG, Motion Capture, Force Plates).

Labs (30h)

Health and safety regulations in Biomechanical Studies

1. Biomechanical analysis in postural research (EMG, Motion Capture, Force Plates).

2. Biomechanical analysis in postural disease research (EMG, Motion Capture, Force Plates).

3. Gait analysis: gait parameters in normal gait (EMG, Motion Capture, Force Plates).

4. Gait analysis: gait parameters in disturbed gait (EMG, Motion Capture, Force Plates).

5. Fundamental mechanical testing of biological tissues

Test</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Fundamentals of maths, mechanics, strength of materials and biomechanics</td></tr>
<tr><td>Assessment methods and criteria</td><td><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>lab passing</td><td>50.0%</td><td>50.0%</td></tr><tr><td>lecture passing</td><td>50.0%</td><td>50.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td>Basic literature</td><td>Wojnicz W., Wittbrodt E., Modele dyskretne w analizie dynamiki mięśni szkieletowych układu ramię-przedramię. Wydawnictwo Politechniki Gdańskiej, 2012, s. 1-212, ISBN 978-83-7348-424-5

Wojnicz W., Biomechaniczne modele układu mięśniowo-szkieletowego człowieka. Wydawnictwo Politechniki Gdańskiej, 2018, s.1-209, ISBN 978-83-7348-727-7

Mrozowski J., Awrejcewicz J: Podstawy biomechaniki. Wyd. Politechniki Łódzkiej, Łódź, 2004

Konrad P., ABC-EMG Praktyczne wprowadzenie do elektromiografii kinezjologicznej, Technomex, Gliwice 2007</td></tr>
</table>

	Supplementary literature	A.Chapman - Biomechanical analysis of fundamental human movements - Human Kinetics (2008) VM.Zatsiorsky - Kinetics of human motion - Human Kinetics (2002) A.Tozeren - Human body dynamics - Classical mechanics and human movement - Springer (2000)
	eResources addresses	Adresy na platformie eNauczanie: Biomechanika stosowana,Wykład/Lab,Lato,24-25(PG_00056099) - Moodle ID: 44361 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44361
Example issues/ example questions/ tasks being completed	Describe parameters of normal gait and disturbed gait	
Work placement	Not applicable	

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