



## Subject card

Subject name and code	Fundamentals of Machine Design I, PG_00038858						
Field of study	Medical and Mechanical Engineering, Medical and Mechanical Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject				2021/2022	
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	2	Language of instruction				Polish	
Semester of study	4	ECTS credits				4.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Department of Machine Design and Vehicles -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Rafał Gawarkiewicz				
	Teachers		dr inż. Rafał Gawarkiewicz				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	15.0	0.0	0.0	45
	E-learning hours included: 0.0						
Podstawy konstrukcji maszyn I - L, IMM, I st., sem. V, zima 2021-22 (M:31639W0) - Moodle ID: 22604 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=22604">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=22604</a>							
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		3.0		52.0	100
Subject objectives	Presenting principles of designing basic elements used in the mechanical systems. Acquainting with computational models of typical joints utilised in the machine designing.						
Learning outcomes	Course outcome	Subject outcome				Method of verification	
	K6_W07	Student draws engineering drawings with the help of the CAD software.				[SW2] Assessment of knowledge contained in presentation	
	K6_U07	Student identifies phenomena in elements of machines. Student analyses and selects suitable computational models of separable and inseparable joints.				[SU1] Assessment of task fulfilment	
	K6_W09	Student draws engineering drawings with the help of the CAD software.				[SW2] Assessment of knowledge contained in presentation	
	K6_U05	Student identifies phenomena in elements of machines. Student creates computational models used in machine design. Student analyses and selects suitable computational models of separable and inseparable joints. Student identifies loadings and stress states at critical places of analysed machine elements and estimates their safety.				[SU1] Assessment of task fulfilment	
K6_U08	Student identifies phenomena in elements of machines. Student creates computational models used in machine design. Student analyses and selects suitable computational models of separable and inseparable joints. Student identifies loadings and stress states at critical places of analysed machine elements and estimates their safety.				[SU1] Assessment of task fulfilment		

Subject contents	Lecture and tutorials: elements of machine science and the theory of the design. Shaping machine elements using strength criteria - engineering methods. Safety coefficient and evaluation of permissible stress. Joints (welded, bolted) and hub-journal assembly. Laboratory: introduction to computer graphic. Familiarisation with CAD software in the range of creating 2D and 3D drawings.		
Prerequisites and co-requisites	Mathematics, Physics, Engineering graphics, Mechanics, Strength of materials, Materials science, Technology of the mechanical engineering, Metrology, Machine science		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	CAD laboratory	50.0%	10.0%
	Tests of the qualifying: classes and lecture	50.0%	90.0%
Recommended reading	Basic literature	<p>1. Siwek B.: Połączenia spawane, zgrzewane, lutowane i klejone - Wykład z Podstaw Konstrukcji Maszyn z ćwiczeniami rachunkowymi. Wyd. Politechniki Gdańskiej.</p> <p>2. Maciakowski R.: Połączenia śrubowe - Wykład z Podstaw Konstrukcji Maszyn z ćwiczeniami rachunkowymi. Wyd. Politechniki Gdańskiej.</p> <p>3. Maciakowski R., Majewski W.: Połączenia wału z piastą - Wykład z Podstaw Konstrukcji Maszyn z ćwiczeniami rachunkowymi. Wyd. Politechniki Gdańskiej.</p> <p>4. Kochanowski M.: Podstawy konstrukcji maszyn z rysunkiem technicznym. Wyd. Politechniki Gdańskiej, Gdańsk 1998.</p>	
	Supplementary literature	<p>1. Podstawy Konstrukcji Maszyn. The serie of monographs issued by PWN.</p> <p>2. Any studies dedicated to computer aided systems: AutoCAD, Inventor i SolidWorks for any software version.</p>	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<p>To check/assess the safety of the element/set of elements or/and connections used in it/them...</p> <p>To determine/estimate dimensions or max loading of the element/set of elements, or used joint/-s in it/them...</p> <p>Welded joints - to describe computational models for butt and fillet weld indicating differences between them.</p> <p>Motionless bolted joints - to describe computational models with indicating differences between them.</p> <p>Hub-journal couplings - to discuss characteristic features and the range of their applications. To describe computational models for three chosen couplings indicating differences between them.</p>		
Work placement	Not applicable		