



Subject card

Subject name and code	Metrology and Measurement Systems, PG_00040053						
Field of study	Mechanical Engineering, 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	Part-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	4	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Michał Dobrzyński					
	Teachers	dr inż. Michał Dobrzyński					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	8.0	8.0	15.0	0.0	0.0	31
	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	31		4.0		40.0	75
Subject objectives	Introduction to basic principles of metrology and measurement preparation to components mechanical analysis of the results.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K6_U05] is able to plant an experiment within the range of measuring the basic operating parameters of mechanical devices using a specialized equipment, interpret the results and reach the correct conclusions		Student analyses results, determine error and uncertainty of measurements and evaluate measured workpiece.			[SU1] Assessment of task fulfillment [SU4] Assessment of ability to use methods and tools	
	[K6_W11] possesses knowledge on design, technology and manufacturing of machine parts, metrology, and quality control; knows and understands methods of measuring and calculating basic values describing the operation of mechanical systems, knows basic calculating methods applied to analyse the results of experiments		Students introduce measurement methods, determine instruments and measurement systems, make measurement,			[SW1] Assessment of factual knowledge	
Subject contents	Basic elements of metrology. Methods, errors and uncertainty of measurements. Tolerance and fit of lengths and angles. Methods of geometrical chains analysis. Principles of interchangeability of machine parts. Accuracy of workpiece in machining. Elements of geometrical product specifications, tolerances of form, directions and position. Characteristic of surface geometrical workpiece structure. Principles of geometrical fit. Measure standards and instruments of measurement. Coordinate measuring machine and measurement systems. Automation of measurements.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold			Percentage of the final grade	
	Laboratory		100.0%			30.0%	
	Tutorial		50.0%			30.0%	
	Lecture		50.0%			40.0%	

Recommended reading	Basic literature	1. W. Jakubiec, J. Malinowski: Metrologia wielkości geometrycznych. WNT, Warszawa 2004 2. S. Białas: Metrologia techniczna z podstawami tolerowania wielkości geometrycznych dla mechaników. Oficyna wydawnicza PW, Warszawa 2006 3. Pr. zb. pod red. Z. Humienny: Specyfikacje geometryczne wyrobów. WNT, Warszawa 2004 4. S. Adamczak, W. Makiela: Metrologia w budowie maszyn. WNT, Warszawa 2004 5. P. Paczyński: Metrologia techniczna. Przewodnik do wykładów, ćwiczeń i laboratoriów. Wyd. PP, Poznań 2003
	Supplementary literature	1. E. Ratajczyk: Współrzędnościowa technika pomiarowa. OWPW, Warszawa 2005 2. J. Jezierski: Analiza tolerancji i niedokładności pomiarów w budowie maszyn. WNT Warszawa 2003 3. A. Boryczko: Podstawy pomiarów wielkości mechanicznych. Wydawnictwo PG, Gdańsk 2010 4. A. Meller, P. Grudowski: Laboratorium metrologii warsztatowej i inżynierii jakości. http://www.wbss.pg.gda.pl , podręczniki (format PDF)
	eResources addresses	
Example issues/ example questions/ tasks being completed	Dimensional analysis of the mechanism. Types of hole and shaft fits. Methods and measuring instruments	
Work placement	Not applicable	