



## Subject card

Subject name and code	Metrology and Measurement Systems, PG_00039871						
Field of study	Mechanical Engineering, Mechanical Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject				2020/2021	
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	1	Language of instruction				Polish	
Semester of study	2	ECTS credits				4.0	
Learning profile	general academic profile	Assessment form				exam	
Conducting unit	Department of Manufacturing and Production Engineering -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Adam Boryczko					
	Teachers	dr hab. inż. Adam Boryczko mgr inż. Karolina Miętka dr inż. Michał Dobrzyński					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	30.0	0.0	0.0	60
	E-learning hours included: 0.0						
	Metrologia i systemy pomiarowe -W/L/C,MiBM, sem.02 (M:31536W0) - Moodle ID: 13453 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13453">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13453</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	60	6.0		34.0		100
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	Studnet analyses results, determine error and uncertainty of measurements and evaluate measured workpiece.			[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment		
	[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 ucertainty 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 measurent systems. Automation of measurements.						
Prerequisites and co-requisites	No requirements						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Tutorial	50.0%	30.0%
	Lecture	50.0%	40.0%
	Laboratory	100.0%	30.0%
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. Makieta: 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. <a href="http://www.wbss.pg.gda.pl">http://www.wbss.pg.gda.pl</a> , podręczniki (format PDF)	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<p>Dimensional analysis of the mechanism.</p> <p>Types of hole and shaft fits.</p> <p>Methods and measuring instruments.</p>		
Work placement	Not applicable		