



## Subject card

Subject name and code	Metrology and Measurement Systems, PG_00039316						
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			3.0		
Learning profile	general academic profile	Assessment form			assessment		
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	mgr inż. Karolina Miętka mgr inż. Anna Janeczek dr inż. Michał Dobrzyński					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 0.0						
	Miernictwo i systemy pomiarowe W/L, IMM, sem. 04, letni 21/22 (M:31677W0) - Moodle ID: 23646 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=23646">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=23646</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	30	5.0	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_W06	make analyses results			[SW1] Assessment of factual knowledge		
	K6_U04	make measurement, analyses results			[SU4] Assessment of ability to use methods and tools		
	K6_W10	determine error and uncertainty of measurements			[SW1] Assessment of factual knowledge		
Subject contents	Basic elements of metrology. Non-contact laser measurement and reverse engineering. 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		
	Lecture	50.0%			50.0%		
	Laboratory	100.0%			50.0%		
Recommended reading	Basic literature	1. W. Jakubiec, J. Malinowski: Metrologia wielkości geometrycznych. WNT, Warszawa 2004 2. E. Ratajczyk: Współrzędnościowa technika pomiarowa. OWPW, Warszawa 2005 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. W. Nawrocki: Sensory i systemy pomiarowe. Poznań, Wydawnictwo Politechniki Poznańskiej 2006. 2. P. Lesiak, D. Świsulski: Komputerowa technika pomiarowa. Warszawa, Agenda Wydawnicza PAK 2002. 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	Dimensional analysis of the mechanism. Types of hole and shaft fits. Methods and measuring instruments.	
Work placement	Not applicable	