



Subject card

Subject name and code	Metrology and Measurement Systems, PG_00039316													
Field of study	Medical and Mechanical Engineering, Mechanical and Medical 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													
	Adresy na platformie eNauczanie: Miernictwo i systemy pomiarowe W/L, IMM, sem. 04, letni 21/22 (M:31677W0) - Moodle ID: 23646 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=23646													
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: Współrzędnoścowa technika pomiarowa. OWPW, Warszawa 2005 3. Pr. zb. pod red. Z. Humienny: Specyfikacje geometryczne wyrobów. WNT, Warszawa 2004 4. S. Adamczak, W. Makieła: 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. Świsłuski: 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. http://www.wbss.pg.gda.pl , podręczniki (format PDF)
	eResources addresses	Miernictwo i systemy pomiarowe W/L, IMM, sem. 04, letni 21/22 (M: 31677W0) - Moodle ID: 23646 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=23646
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	