

**COURSE SPECIFICATION**

Course code	full-time programme:	M#2-S1-ME-206
	part-time programme:	
Course title in Polish	Podstawy metrologii	
Course title in English	Fundamentals of Metrology	
Valid from (academic year)	2024/2025	

GENERAL INFORMATION

Programme of study	MECHANICAL ENGINEERING
Level of qualification	first-cycle
Type of education	academic
Mode of study	full-time programme
Specialism	all
Department responsible	Department of Metrology and Modern Manufacturing
Course leader	dr hab. inż. Krzysztof Stępień, prof. PŚk dr hab. inż. Paweł Zmarzły, prof. PŚk
Approved by	dr hab. Jakub Takosoglu, prof. PŚk, Dean of the Faculty of Mechatronics and Mechanical Engineering

COURSE OVERVIEW

Course type		programme-specific
Course status		compulsory
Language of instruction		English
Semester of delivery	full-time programme	Semester II
	part-time programme	
Pre-requisites		None
Examination required (YES/NO)		NO
ECTS value		1

Mode of instruction		lecture	class	laboratory	project	seminar
No. of hours per semester	full-time programme	15				
	part-time programme					

LEARNING OUTCOMES

Category of outcome	Outcome code	Course learning outcomes	Corresponding programme outcome code
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Knowledge	W01	Students have advanced knowledge in the field of physical principles used in various types of measuring instruments and measurement methods. They know the components of measuring instruments and systems. Students are acquainted with standards and gauges.	MiBM1_W02 MiBM1_W16
	W02	Students have advanced knowledge of the fundamental problems of metrology, including units of measurement and methods of estimating measurement uncertainty. They know what factors influence the measurement uncertainty.	MiBM1_W02 MiBM1_W16
Competence	K01	Students are ready to critically evaluate their knowledge in the field of metrology and measurement technique used in mechanical engineering and the need to obtain new information from both literature and experts.	MiBM1_K01

COURSE CONTENT

Type of instruction lecture	Topics covered
lecture	The classification and history of metrology. Basic concepts related to metrology. Characteristics of the basic units of the SI system. Estimating measurement uncertainty. Factors that affect the accuracy of the measurement. Evaluation and interpretation of measurement results. Classification, construction and characteristics of workshop measuring instruments. Standards and gauges used in length and angle metrology. Overview of modern systems for measuring geometric quantities.

ASSESSMENT METHODS

Outcome code	Methods of assessment (Mark with an X where applicable)					
	Oral examination	Written examination	Test	Project	Report	Other
W01			X			
W02			X			
K01						X

ASSESSMENT TYPE AND CRITERIA

Mode of instruction	Assessment type	Assessment criteria
lecture	non-examination assessment	Passing the final test. Scoring at least 50% of the points.

OVERALL STUDENT WORKLOAD

ECTS weighting												
No.	Activity type	Student workload										Unit
		full-time programme					part-time programme					
1.	Scheduled contact hours	L	C	Lb	P	S	L	C	Lb	P	S	h
		15										





2.	Other contact hours (office hours, examination)	2										h
3.	Total number of contact hours	17										h
4.	Number of ECTS credits for contact hours	0,7										ECTS
5.	Number of independent study hours	8										h
6.	Number of ECTS credits for independent study hours	0,3										ECTS
7.	Number of practical hours	0										h
8.	Number of ECTS credits for practical hours	0										ECTS
9.	Total study time	25										h
10.	ECTS credits for the course <i>1 ECTS credit = 25-30 hours of study time</i>	1										ECTS

READING LIST

1. Adamczak S., Metrologia geometryczna powierzchni technologicznych, Wydawnictwo Naukowe PWN, Warszawa, 2023.
2. Adamczak S., „Pomiary geometryczne powierzchni”, WNT, 2009.
3. Adamczak S., Makiela W., Podstawy metrologii i inżynierii jakości dla mechaników – ćwiczenia praktyczne, PWN, Warszawa, 2010.
4. Arendarski J., Niepewność pomiarów, Oficyna Wydawnicza Politechniki Warszawskiej, 2013.
5. Cieplucha J. Podstawy metrologii, Wydawnictwo Politechniki Łódzkiej, 2008.
6. Paczyński P. „Metrologia Techniczna. Przewodnik do wykładów, ćwiczeń i laboratoriów”, Politechnika Poznańska, 2003.
7. Barzykowski, J., A. Domańska, M. Kujawińska, Współczesna metrologia – wybrane zagadnienia, WNT, Warszawa, 2016
8. Jakubiec W., Malinowski J., Metrologia Wielkości Geometrycznych, WNT, Warszawa, 2007.
9. Tumański S.: Technika pomiarowa. WNT, Warszawa, 2007
10. Zator S., Majda P., Jakubiec W., Metrologia, PWE Polskie Wydawnictwo Ekonomiczne, 2014.
11. Praca zbiorowa pod redakcją Z. Humiennego „Geometrical Product Specifications - Course for Technical Universities” – Oficyna Wydawnicza Politechniki Warszawskiej, 2001.
12. Katalog przyrządów pomiarowych 2019-2021 Mitutoyo - PL-20004.

