



COURSE SPECIFICATION

Course code	M#1-S1-ME-405
Course title in Polish	Metrologia II
Course title in English	Metrology II
Valid from (academic year)	2019/2020

GENERAL INFORMATION

Programme of study	MECHANICAL ENGINEERING
Level of qualification	first-cycle
Type of education	academic
Mode of study	full-time
Specialism	all
Department responsible	Department of Manufacturing Engineering and Metrology
Course leader	Prof. dr hab. inż. Stanisław Adamczak, dr h. c. multi
Approved by	

COURSE OVERVIEW

Course type	basic
Course status	compulsory
Language of instruction	English
Semester of delivery	semester 4
Pre-requisites	Metrology I
Examination required (YES/NO)	YES
ECTS value	4

Mode of instruction	lecture	class	laboratory	project	seminar
No. of hours per semester	15		30		

LEARNING OUTCOMES

Category of outcome	Out-come code	Course learning outcomes	Corresponding programme outcome code
Knowledge	W01	On completion of the course students will have a knowledge of physical principles applied in various types of measuring instruments. They will know fundamental components of measuring instruments. Students will have knowledge of basic parameters relating to the dimensional accuracy of machine parts.	MiBM1_W01
	W02	On completion of the course students will have knowledge of principles of measurement planning and the principles of conducting measurements of basic physical quantities. Students will know how to use selected mathematical methods to analyze and interpret measurement data.	MiBM1_W16
Skills	U01	On completion of the course, students will have skills to use basic instruments for measurements of geometrical quantities. They will be able to choose the instrument to the relevant measurement task.	MiBM1_W01
	U02	On completion of the course students will be able to calculate measurement uncertainty for experimental measurement data. They will have skills to correctly interpret measurement results.	MiBM1_W16
Competence	K01	On completion of the course students will be aware of the importance of the team work	MiBM1_K04

COURSE CONTENT

Type of instruction*	Topics covered
lecture	Manual instruments for measurements of length and angle. Computer-aided instruments for measurements of length and angle. Fundamentals of surface metrology. Measurements of form deviations. Fundamentals of geometrical dimensioning and tolerancing.
laboratory	Components of measuring instruments. Measurements of inner, outer and complex dimensions. An analysis of errors in direct measurements. An analysis of errors in indirect measurements. An analysis of errors in contact measurements. Measurements of go-not go gauges. Measurements of threads. Measurements of gears. Surface roughness measurements. Pneumatic measurements. Measurements of roundness. Optical measurements.

*) Please delete rows in the table above that are not applicable.

ASSESSMENT METHODS

Outcome code	Methods of assessment <i>(Mark with an X where applicable)</i>					
	Oral examination	Written examination	Test	Project	Report	Other
W01		X				
W02		X				
U01					X	
U02					X	
K01						X

ASSESSMENT TYPE AND CRITERIA

Mode of instruction*	Assessment type	Assessment criteria
lecture	examination assessment	The pass mark is a minimum of 50% for the examination.
laboratory	non-examination assessment	Regular class attendance. A minimum of 50% for all the in-class post-lab tests. A pass mark for each post-lab report..

*) Please delete rows in the table above that are not applicable.

OVERALL STUDENT WORKLOAD

ECTS weighting							
	Activity type	Student workload					Unit
		L	C	Lab	P	S	
1.	Scheduled contact hours	15		30			h
2.	Other contact hours (office hours, examination)	4		2			h
3.	Total number of contact hours	51					h
4.	Number of ECTS credits for contact hours	2					ECTS
5.	Number of independent study hours	49					h
6.	Number of ECTS credits for independent study hours	2					ECTS
7.	Number of practical hours	62					h
8.	Number of ECTS credits for practical hours	2,5					ECTS
9.	Total study time	100					h
10.	ECTS credits for the course <i>1 ECTS credit = 25-30 hours of study time</i>	4					ECTS

READING LIST

1. Praca zbiorowa pod redakcją Z. Humiennego „Geometrical Product Specifications - Course for Technical Universities” – Oficyna Wydawnicza Politechniki Warszawskiej, 2001.
2. Connie L. Dotson, Fundamentals of dimensional metrology, Cengage Learning, 2016.
3. D. J. Whitehouse: Handbook of Surface and Nanometrology, CRC Press, 20 gru 2010
4. S. Adamczak, W. Makiela, Metrologia w budowie maszyn – zadania z rozwiązaniami, PWN, 2018, Warszawa,
5. S. Adamczak, W. Makiela, Podstawy metrologii i inżynierii jakości dla mechaników – ćwiczenia praktyczne, PWN, Warszawa, 2010.