COURSE SPECIFICATION

Course code	full-time programme:	**M#2-S2-ME-102**
	part-time programme:	
Course title in Polish	**Techniki i metody planowania eksperymentu**	
Course title in English	**Design of Experiment Techniques**	
Valid from (academic year)	**2024/2025**	

GENERAL INFORMATION

Programme of study	**MECHANICAL ENGINEERING**
Level of qualification	**second-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. Damian Gogolewski, 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 I**
	part-time programme	**Semester I**
Pre-requisites		
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
Knowledge	W01	The student has advanced knowledge in planning and processing the results of an experiment.	MiBM2_W01
	W02	The student has advanced knowledge of mathematical modeling of technological processes	MiBM2_W06
Skills	U01	The student is able to use experimental methods to formulate and solve engineering tasks and research problems	MiBM2_U01
	U02	The student is able to plan and conduct experiments, including measurements and computer simulations, interpret the results obtained and draw conclusions	MiBM2_U11
Competence	K01	The student is able to professionally analyse experiments and technological processes	MiBM2_K02 MiBM2_K04

COURSE CONTENT

Mode of instruction	Topics covered
lecture	Methods of presenting experimental data. Methods of describing the population structure. Principles of design of an experiment. Verification of statistical hypotheses. Selected statistical tests. Methods of mathematical modeling of processes. Linear regression models, methods of estimation of parameters of a linear regression model. Generalized least squares method. Nonlinear regression. Statistical analysis of technological processes. Randomization tests. Study of the effect of process parameters on the process. Testing the influence of 1, 2, 3 or 4 factors.

ASSESSMENT METHODS

Outcome code	Methods of assessment					
	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	non-examination assessment	The pass mark is a minimum of 50% for the exam

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**	**0,0**										ECTS
9.	**Total study time**	**25**										h
10.	**ECTS credits for the course** *1 ECTS credit = 25-30 hours of study time*	**1**										ECTS

READING LIST

1. Pawłowski Z.,: „Statystyka matematyczna”, PWN, Warszawa 1976.
2. Adamczak S., Makieła W.: „Metrologia w budowie maszyn. Zadania z rozwiązaniami.” Wyd. II WNT Warszawa 2007.
3. Korzyński M.: Metodyka eksperymentu, WNT, Warszawa 2006.
4. Jaworski J., Morawski R., Olędzki J.: „Wstęp do metrologii i techniki eksperymentu” WNT Warszawa 1992.
5. Brandt S.: "Analiza danych", PWN, Warszawa 1998.
6. Mosiński F.: „Zastosowanie metod statystycznych dla inżynierów elektryków” Monografie Politechniki Łódzkiej, Łódź 2000.
7. Hamrol A. „Zarządzanie jakością z przykładami”, Wydawnictwo Naukowe PWN, Warszawa 2023