COURSE SPECIFICATION

Course code	full-time programme:	**M#2-S2-ME-PT-113**
	part-time programme:	
Course title in Polish	**Obróbki wykończeniowe**	
Course title in English	**Fine Machining**	
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	**Design and Manufacturing**
Department responsible	**Department of Metal Science and Manufacturing Processes**
Course leader	**dr hab. inż. Wojciech Depczyński, prof. PŚk**
Approved by	**dr hab. Jakub Takosoglu, prof. PŚk, Dean of the Faculty of Mechatronics and Mechanical Engineering**

COURSE OVERVIEW

Course type		**specialism-related**
Course status		**compulsory**
Language of instruction		**English**
Semester of delivery	full-time programme	**Semester I**
	part-time programme	**Semester I**
Pre-requisites		**NO**
Examination required (YES/NO)		**YES**
ECTS value		**2**

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

LEARNING OUTCOMES

Category of outcome	Outcome code	Course learning outcomes	Corresponding programme outcome code
Knowledge	W01	He/she has an in-depth and structured knowledge of physics, including mechanics, kinematics optics, electricity and magnetism, in particular the knowledge necessary to understand the physical phenomena occurring in all types of machinery and mechanical devices, including systems enabling the shaping and processing of various types of materials and in vehicles, systems related to weapons technology.	MiBM2_W02
	W02	Has in-depth knowledge of the nomenclature, construction, principle of operation of various types of machinery, mechanical and mechatronic equipment and the determination of their operating parameters.	MiBM2_W02 MiBM2_W04
	W03	He has a detailed and in-depth knowledge of machine component manufacturing techniques, material joining methods, including incremental technologies, laser technologies, rapid prototyping and reverse engineering, as well as a structured and in-depth knowledge of the construction of various types of systems for machining and shaping materials.	MiBM2_W07
Skills	U01	Be able to apply knowledge of basic sciences such as physics and chemistry to the design of a finishing process.	MiBM2_U07
	U02	The student is able to use analytical and numerical methods to solve problems in engineering physics.	MiBM2_U11
	U03	He/she is able to organise the workplace and operate instruments and equipment in accordance with the principles of safety, environmental protection, ergonomics and fire regulations, and is able to work independently and as part of a team.	MiBM2_U12
Competence	K01	The student is ready to critically evaluate his/her knowledge and the necessity to improve professional qualifications (through second and third degree studies, postgraduate studies, professional courses).	MiBM2_K01 MiBM2_K03
	K02	Is aware of the need to acquire new information by independently completing and extending knowledge of physical issues and the measurement of physical quantities.	MiBM2_K01 MiBM2_K03 MiBM2_K04

COURSE CONTENT

Mode of instruction	Topics covered

lecture	Basic concepts of the surface layer, terminology, parameters characterising the state of the surface layer and the influence of interactions in manufacturing processes on the formation of its properties. Principles of the selection of parameters of the geometric structure of the surface in machine nodes as a function of assumed operating conditions and techno-economic factors of the product manufacturing process. Shaping the properties of the surface layer of machine components in machining processes. Shaping the characteristics of the abrasive surface layer using a magnetic field. Fundamentals of vibratory and embossed machining. Shaping the characteristics of the surface layer of machine components in surface treatment processes by burnishing and electrocontacting (physical basis of the process, conditions and functional effects of burnishing, technology, burnishing tools and machine tools). Surface smoothing with flexible tools.
laboratory	Deburring process studies Research on electro-chemical deburring. Vibro-abrasive machining tests. Surface polishing tests Testing of grinding with flexible coated tools

ASSESSMENT METHODS

Outcome code	Methods of assessment					
	Oral examination	Written examination	Test	Project	Report	Other
W01			X			
W02			X			
W03			X			
U01			X		X	
U02			X		X	
U03			X		X	
K01						X
K02						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 all the in-class tests.
laboratory	non-examination assessment	The pass mark is a minimum of 50 points out of a possible 100 for each post-lab report and the final in-class test.

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		**15**								
2.	Other contact hours (office hours, examination)	**4**		**2**								h

3.	**Total number of contact hours**	**36**		h
4.	**Number of ECTS credits for contact hours**	**1,4**		ECTS
5.	**Number of independent study hours**	**14**		h
6.	**Number of ECTS credits for independent study hours**	**0,6**		ECTS
7.	**Number of practical hours**	**25**		h
8.	**Number of ECTS credits for practical hours**	**1,0**		ECTS
9.	**Total study time**	**50**		h
10.	**ECTS credits for the course** *1 ECTS credit = 25-30 hours of study time*	**2**		ECTS

READING LIST

1. *Burakowski T., Roliński E., Wierzchoń T.: Inżynieria powierzchni metali. WPW Warszawa 1992.*
2. *Kocańda S.: Niszczenie zmęczeniowe. Warszawa, WNT 1978.*
3. *Nowicki B.: Struktura geometryczna chropowatość i falistość powierzchni. Warszawa WNT, 1991.*
4. *Przybylski W.: Technologia obróbki nagniataniem. Warszawa, WNT, 1987*
5. *Szulc S., Stefko A.: Obróbka powierzchniowa części maszyn. Warszawa, PWN 1976.*
6. *Ruszaj A.: Niekonwencjonalne metody wytwarzania elementów maszyn i narzędzi. Instytut Obróbki Skrawaniem, Kraków 1999.*
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