

**COURSE SPECIFICATION**

Course code	full-time programme:	M#2-S1-ME-KWW-411
	part-time programme:	
Course title in Polish	Budowa obrabiarek sterowanych numerycznie	
Course title in English	CNC Machine Tools: Design and Operation	
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	Computer-Aided Manufacturing
Department responsible	Department of Machine Design and Machining
Course leader	dr inż. Łukasz Nowakowski
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 IV
	part-time programme	
Pre-requisites	Theory of Machines, Fundamentals of Machining	
Examination required (YES/NO)	NO	
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	The student has an in-depth knowledge of the nomenclature, construction, principle of operation of various types of machine tools and determination of the basic parameters of their operation. He is familiar with the manufacturing techniques of machine parts, and has knowledge of the construction of various types of systems for machining and shaping materials.	MiBM1_W06 MiBM1_W07
	W02	The student knows the methods to design the technological process. The student has detailed knowledge related to selected issues in the field of design, manufacturing technology of basic components of machinery and equipment.	MiBM1_W09 MiBM1_W11
Skills	U01	The student is able to use knowledge from the area of basic sciences to formulate and solve engineering tasks in various areas of mechanics and mechanical engineering, at the stage of design, construction, selection of materials and manufacturing. The student is able to evaluate, critically analyze and synthesize the obtained results and express his opinions and comments.	MiBM1_U01 MiBM1_U04
	U02	The student is able to obtain information from the literature and design a simple technological process in the field of mechanics and mechanical engineering and select appropriate machinery and equipment for this purpose.	MiBM1_U03 MiBM1_U08
Competence	K01	The student is ready to critically evaluate his knowledge and the need to improve his professional qualifications (through second and third degree studies, postgraduate studies, professional courses).	MiBM1_K01 MiBM1_K03

COURSE CONTENT

Type of instruction lecture	Topics covered
lecture	The following program content will be imparted in the course of lectures, including: development trends of modern machine tools, fundamentals and examples of modular construction and basic properties of machine tools, technical solutions and construction of the most important assemblies and components: bodies, guiding connections, main and feed motion drives, pallet and tool coding systems. The characteristics of four basic groups of CNC machine tools will be presented: lathes and turning centers, milling machines and milling centers, grinders, and machine tools implementing hybrid manufacturing technologies.



laboratory	<p>The laboratory classes will include exercises aimed at familiarize students with the construction and technological capabilities of selected machine tools.</p> <p>The scope of the laboratory classes will include:</p> <ul style="list-style-type: none"> • construction, equipment and technological capabilities of the CTX turning center 310 ECO, • construction, equipment and technological capabilities of the CTX turning center ALPHA 500, • construction, equipment and technological capabilities of the milling center AVIA VMC 800, • construction, equipment and technological capabilities of the milling center HERLME B 300, • construction, equipment and technological capabilities of the milling center DMU 50 with PH150 pallet system, • construction, equipment and technological capabilities of tool grinding machine SACCKE UWIC,
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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	non-examination assessment	A positive completion of the final colloquium. Obtaining at least 50% of the points.
laboratory	non-examination assessment	Positive completion of class reports. The final grade is the arithmetic average.

OVERALL STUDENT WORKLOAD

ECTS weighting													
No.	Activity type	Student workload										Unit	
		full-time programme					part-time programme						
		L	C	Lb	P	S	L	C	Lb	P	S		
1.	Scheduled contact hours	15		15									h
2.	Other contact hours (office hours, examination)	2		2									h
3.	Total number of contact hours	34										h	
4.	Number of ECTS credits for contact hours	1,4										ECTS	
5.	Number of independent study hours	16										h	

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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 <i>1 ECTS credit = 25-30 hours of study time</i>		2	ECTS

READING LIST

1. Jerzy Honczarenko: Obrabiarki sterowane numerycznie, Wydawnictwo Naukowe PWN 2019
2. Witold Habrat: Obsługa i programowanie obrabiarek CNC, KaBe 2015