

**COURSE SPECIFICATION**

Course code	full-time programme:	M#2-S2-ME-PT-109
	part-time programme:	
Course title in Polish	Programowanie obrabiarek CNC i centrów obróbkowych	
Course title in English	CNC Programming and Machining Centre Programming	
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 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 I
	part-time programme	Semester I
Pre-requisites	-	
Examination required (YES/NO)	YES	
ECTS value	3	

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

LEARNING OUTCOMES

Category of outcome	Outcome code	Course learning outcomes	Corresponding programme outcome code





Knowledge	W01	The student has a detailed and in-depth knowledge of the programming of CNC machine tools and machining centres for machining machine parts using cavity techniques, and has a structured and in-depth knowledge of the construction of various types of machine tools for cavity machining and materials. Has in-depth and advanced knowledge to program CNC machine tools and machining centres.	MiBM2_W05
	W02	The student has in-depth knowledge related to the principles of creating and reading technical and technological documentation covering technological processes and simulating the operation of machine tools using simulators and specialised software.	MiBM2_W06
Skills	U01	The student is able to apply knowledge in the area of programming CNC machine tools and machining centres to design technological processes and manufacturing. They are able to evaluate, critically analyse the developed technological process.	MiBM2_U01
	U02	The student is able to prepare, using correct terminology from the field of mechanics and mechanical engineering, technological documentation concerning the developed technological process. The student is able to prepare a description of the results of the task, taking into account various aspects of the developed technological process. He/she is able to analyse and synthesise the results obtained.	MiBM2_U04
	U03	The student is able to design a technological process of typical machine parts with the use of a machine tool controller or a suitable simulator and to select suitable machines and equipment for this purpose.	MiBM2_U07
Competence	K01	The student is prepared to think and act in an entrepreneurial manner in order to optimise organisational activities in the programming of CNC machine tools and machining centres.	MiBM2_K03

COURSE CONTENT

Mode of instruction	Topics covered
lecture	Lectures include information on the operation and programming of CNC machine tools and machining centers. Students will be introduced to the operation and process programming of selected CNC machine tool controls and machining centers, as well as the specialized software and simulators that enable the programming of CNC machine tools and machining centers.
laboratory	Laboratory classes will include exercises to familiarize students with the design, technological capabilities, operation and programming of CNC machine tools and machining centers. The scope of laboratory courses will include: <ul style="list-style-type: none"> • development of technological process using lathe control, • development of the technological process using the lathe control simulator, • development of technological process using the milling machine control, • development of a technological process using the simulator of the milling machine control,





project	<p>As part of the project class, projects will be carried out to familiarize students with the programming of CNC machine tools and machining centers.</p> <p>The scope of the project classes will include:</p> <ul style="list-style-type: none"> development of a turning technology project for a numerically controlled machine tool, development of a milling technology project on a CNC machine tool.
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ASSESSMENT METHODS

Outcome code	Methods of assessment					
	Oral examination	Written examination	Test	Project	Report	Other
W01		X				
W02		X				
U01				X	X	
U02				X	X	
U03				X	X	
K01						X

ASSESSMENT TYPE AND CRITERIA

Mode of instruction	Assessment type	Assessment criteria
lecture	examination assessment	Successful completion of the final exam. Score of 50% or higher.
laboratory	non-examination assessment	Successful completion of course evaluations. The final grade is the arithmetic average.
project	non-examination assessment	Successful completion of projects developed in class. The final grade will be 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	15								h
2.	Other contact hours (office hours, examination)	4		2	2								h
3.	Total number of contact hours	53										h	
4.	Number of ECTS credits for contact hours	2,1										ECTS	
5.	Number of independent study hours	22										h	
6.	Number of ECTS credits for independent study hours	0,9										ECTS	
7.	Number of practical hours	50										h	
8.	Number of ECTS credits for practical hours	2,0										ECTS	
9.	Total study time	75										h	



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10.	ECTS credits for the course <i>1 ECTS credit = 25-30 hours of study time</i>	3	ECTS
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READING LIST

1. Jerzy Honczarenko: Obrabiarki sterowane numerycznie, Wydawnictwo Naukowe PWN 2019
2. Witold Habrat: Obsługa i programowanie obrabiarek CNC, KaBe 2015
3. G. Boothroyd, W., A. Knight: Fundamentals of Machining and Machine Tools, University of Rhode Island Kingston, Rhode Island
4. J. Shih Albert: Machining and Machine Tools, Springer-Verlag GmbH, Springer-Verlag GmbH, Springer Us New York N.Y. 2015
1. Hassan Abdel-Gawad El-Hofy: Fundamentals of Machining Processes: Conventional and Nonconventional Processes, Taylor & Francis INC International Concepts 2013



Politechnika Świętokrzyska
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