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# **COURSE SPECIFICATION**

Course code	full-time programme:	M#2-S1-ME-KWW-605
	part-time programme:	
Course title in Polish	Programowanie obrabiarek s	sterownych numerycznie II
Course title in English	CNC Programming II	
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. Piotr Maj
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	full-time programme	Semester VI			
delivery	part-time programme				
Pre-requisites					
Examination required (YES/NO)		NO			
ECTS value		4			

Mode of instruction		lecture	class	laborator y	project	seminar
No. of hours	full-time programme	15		15	30	
per semester	part-time programme					

# LEARNING OUTCOMES

Category of Outcome code Course learning outcomes	Corresponding programme outcome code
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Projekt "Dostosowanie kształcenia w Politechnice Świętokrzyskiej do potrzeb współczesnej gospodarki" nr FERS.01.05-IP.08-0234/23





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	W01	The student has structured knowledge of the construction and design of machine parts, programming of numerically controlled machine tools and issues related to mechanics.	MiBM1_W03
Knowledge	W02	The student has knowledge of the construction of numerically controlled machine tools, techniques for manufacturing machine parts, knows the principles of creating technical documentation, knows basic measurement methods for verifying the accuracy of machined items.	MiBM1_W07 MiBM1_W09 MiBM1_W11
Skills	U01	The student is able to program the operation of a numerically controlled machine tool based on a designed technological process using computer software.	MiBM1_U02 MiBM1_U08
	U02	Is able to use CAD/CAM software to design machine components.	MiBM1_U19
Competence	K01	Is ready to critically evaluate the knowledge he/she has and is aware of the need to expand his/her knowledge of the construction and operation of numerically controlled machine tools.	MiBM1_K01 MiBM1_K03

# **COURSE CONTENT**

Type of instruction lecture	Topics covered
lecture	Construction of numerically controlled machine tools (lathes, milling machines), kinematic systems, technological capabilities of machine tools. Fundamentals of programming numerically controlled machine tools: program structure, defining a semi-finished product, types and applications of machining tools, tool library, machining cycles, programming simple tool paths.
laboratory	Preparing a numerically controlled lathe for work. Selection of a semi-finished product, selection and measurement of tools, selection of machining parameters, setting the program zero point, creating a simple program, simulation and starting the machining process.
project	Familiarization with the operation of a numerically controlled machine tool control simulator, development of a technological process for a numerically controlled milling machine and lathe. Development of a model and technical drawing of a selected item using a CAD program, selection of a machine tool, holder and tools, selection of technological parameters and development of a program controlling the operation of a numerically controlled machine tool.

### ASSESSMENT METHODS

Outcome	Methods of assessment (Mark with an X where applicable)								
code	Oral examination	Written examination	Test	Project	Report Other				
W01			Х						
W02			Х						



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U01		Х	Х	
U02		Х	Х	
K01			Х	Х

# ASSESSMENT TYPE AND CRITERIA

Mode of instruction	Assessment type	Assessment criteria
lecture	non-examination assessment	Successful completion of the final test. Obtaining at least 50% of the points.
laboratory	non-examination assessment	Positive assessment of course reports. Obtaining at least 50% of points from the written colloquium. The final grade is an arithmetic mean.
project	non-examination assessment	Final assessment based on obtaining at least 50% of points from the developed project. Obtaining at least 50% of points from the written colloquium.

# OVERALL STUDENT WORKLOAD

ECTS weighting												
		Student workload									Unit	
No.	Activity type	full-time programme				part-time programme						
1.	1. Scheduled contact hours	L	С	Lb	Ρ	S	L	С	L b	Ρ	s	h
		15		15	30							
2.	Other contact hours (office hours, examination)	2	2 2 2								h	
3.	Total number of contact hours	66								h		
4.	Number of ECTS credits for contact hours	2,6									ECTS	
5.	Number of independent study hours		34								h	
6.	Number of ECTS credits for independent study hours		1,4								ECTS	
7.	Number of practical hours		75								h	
8.	Number of ECTS credits for practical hours	3,0								ECTS		
9.	Total study time	100				h						
10.	ECTS credits for the course 1 ECTS credit = 25-30 hours of study time					4	4					ECTS

### **READING LIST**

- 1. Honczerenko J. Obrabiarki sterowane numerycznie. PWN, 2019
- 2. Kaczmarek J. Podstawy obróbki wiórowej, ściernej i erozyjnej. Warszawa: Wydawnictwo Naukowo-Techniczne, 1971.
- 3. Habrat W, Wdowik R. Ustawianie maszyny sterowanej numerycznie, 2012
- 4. Paderewski K. Zarys kinematyki obrabiarek. Warszawa: Wydawnictwa Naukowo-Techniczne, 1976.
- 5. Witold Habrat: Obsługa i programowanie obrabiarek CNC Podręcznik operatora, Kabe 2015









Rzeczpospolita Polska Dofinansowane przez Unię Europejską



- 6. Wit Grzesik, Piotr Kiszka, Piotr Niesłony: Programowanie obrabiarek CNC, Wydawnictwo Naukowe PWN 2019
- 7. Cichosz P.: Narzędzia skrawające, WNT 2009



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