COURSE SPECIFICATION

Course code	full-time programme:	**M#2-S1-ME-KWW-508**
	part-time programme:	
Course title in Polish	**Komputerowe wspomaganie wytwarzania I**	
Course title in English	**Computer-Aided Manufacturing I**	
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 V**
	part-time programme	
Pre-requisites		**Computer-Aided Engineering Drawing, Fundamentals of Machining, CNC Machine Tools: Design and Operation**
Examination required (YES/NO)		**NO**
ECTS value		**4**

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

LEARNING OUTCOMES

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

Knowledge	W01	The student has a structured knowledge of engineering graphics and modern information technologies to support the design of technological processes.	MiBM1_W03 MiBM1_W06
	W02	The student knows the methods to design the technological process. He/she has detailed knowledge related to selected issues in the field of design, manufacturing technology of basic machine components and equipment.	MiBM1_W07 MiBM1_W11
Skills	U01	Able to consciously use computer software in the field of mechanical and mechanical engineering in the areas of design, construction, manufacturing techniques, presentation of work results.	MiBM1_U02 MiBM1_U04
	U02	Able to design a simple technological process in the field of mechanics and mechanical engineering and select appropriate machinery and equipment for this purpose.	MiBM1_U08 MiBM1_U09
	U03	Able to perform the design and process for machine components using CAD/CAM software, starting with a sketch and ending with a prototype.	MiBM1_U04 MiBM1_U19
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	As part of the conducted lecture classes, the following content will be conveyed on the operation of systems supporting the creation of technological processes. Students will be introduced to the operation of selected CAM programs for computer-aided manufacturing processes in the field of programming toolpaths for lathe machining and 3-axis milling machining.
laboratory	Laboratory classes will include exercises designed to familiarize students with the construction and technological capabilities of selected computer systems that support the creation of technological processes The scope of the laboratory classes will include: • creation of technological process in CAM programs - turning module, • development of lathe machining technology in a selected CAM program, • basics of creating technological process in CAM programs - milling module, • development of milling machining technology in a selected CAM program.
project	As part of the project classes, two technological process designs will be developed numerically using CAM type software for a lathe and a controlled milling machine. Students will develop technological documentation for the developed machining processes as part of the design classes.

ASSESSMENT METHODS

Outcome	Methods of assessment *(Mark with an X where applicable)*

code	Oral examination	Written examination	Test	Project	Report	Other
W01			x			
W02			x			
U01				x	x	
U02				x	x	
U03				x	x	
K01				x	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.
project	non-examination assessment	Successful completion of projects developed in class

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	30							
2.	Other contact hours (office hours, examination)	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**										ECTS

READING LIST

1. Krzysztof Augustyn: NX CAM. Programowanie ścieżek dla obrabiarek CNC, Helion
2. Piotr Niesłony: Podstawy programowania maszyn CNC w systemie CAD/CAM Mastercam, BTC 2012
3. NX CAM VIRTUAL MACHINE CNC Podręcznik programisty