



## COURSE SPECIFICATION

Course code	full-time programme:	<b>M#2-S2-ME-PT-212</b>
	part-time programme:	
Course title in Polish	<b>Zaawansowane modelowanie powierzchniowe</b>	
Course title in English	<b>Advanced Surface Modelling</b>	
Valid from (academic year)	<b>2024/2025</b>	

## GENERAL INFORMATION

Programme of study	<b>MECHANICAL ENGINEERING</b>
Level of qualification	<b>second-cycle</b>
Type of education	<b>academic</b>
Mode of study	<b>full-time programme</b>
Specialism	<b>Design and Manufacturing</b>
Department responsible	<b>Department of Machine Design and Machining</b>
Course leader	<b>dr inż. Michał Skrzyński</b>
Approved by	<b>dr hab. Jakub Takosoglu, prof. PŚk, Dean of the Faculty of Mechatronics and Mechanical Engineering</b>

## COURSE OVERVIEW

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

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

## LEARNING OUTCOMES





Category of outcome	Outcome code	Course learning outcomes	Corresponding programme outcome code
Knowledge	W01	Has detailed and in-depth knowledge of structural modelling and design in its broadest sense, including prototyping. Be familiar with the main trends in these areas.	MiBM2_W03 MiBM2_W12
	W02	Has a sound and in-depth knowledge that supports the solution of various types of engineering problems related to construction and surface modelling using CAD (Computer Aided Design) software.	MiBM2_W06 MiBM2_W12
Skills	U01	Be able to select and use methods and tools in the areas of design, construction and prototyping using computer aided design (CAD) software.	MiBM2_U02 MiBM2_U13
	U02	Be able to design a complex engineering task of a practical nature in the areas of design and construction, using appropriate methods and tools. Be able to complete a project using advanced design tools, including surface modelling tools.	MiBM2_U08 MiBM2_U13
	U03	Be able to make informed use of computer software in the area of mechanics and mechanical engineering in the field of surface design and construction.	MiBM2_U13
Competence	K01	Be aware of the need for self-directed learning and expansion of knowledge, including familiarisation with new applications and modelling techniques.	MiBM2_K01

## COURSE CONTENT

Mode of instruction	Topics covered
lecture	Bonded curves, connections between curves, characteristic points of curves. Base curves, derived curves, curve editing and analysis. Creation of surfaces from curves, by curve mesh, N-sided surface, by points, curve fitting, from STL object. Operations on surfaces. Surface editing, surface analysis. Checking the correctness of geometry, checking the quality of surfaces, checking the properties of surfaces.
laboratory	Practical exercises in creating models using surface modelling. Creating curves: point set, line, spiral, curve by definition, curve on surface, glued curve, curve fitting, directional curve, bridging curve, curve projection. Editing and analysis of curves. Creation of surfaces: by curves, by curve grid, studio surface, N-side, by points, on poles. Editing surfaces. Surface continuity studies, section analysis, reflection analysis, line of distinction, analysis: radii, slopes, gradients, deviation from pattern.

## ASSESSMENT METHODS

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





K01						X
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**ASSESSMENT TYPE AND CRITERIA**

Mode of instruction	Assessment type	Assessment criteria
lecture	non-examination assessment	Achieving at least 50% of the points on the exam.
laboratory	non-examination assessment	Achieving at least 50% of the points on the exam.

**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.	<b>Total number of contact hours</b>	<b>34</b>										h	
4.	<b>Number of ECTS credits for contact hours</b>	<b>1,4</b>										ECTS	
5.	<b>Number of independent study hours</b>	<b>16</b>										h	
6.	<b>Number of ECTS credits for independent study hours</b>	<b>0,6</b>										ECTS	
7.	<b>Number of practical hours</b>	<b>25</b>										h	
8.	<b>Number of ECTS credits for practical hours</b>	<b>1,0</b>										ECTS	
9.	<b>Total study time</b>	<b>50</b>										h	
10.	<b>ECTS credits for the course</b> <i>1 ECTS credit = 25-30 hours of study time</i>						<b>2</b>					ECTS	

**READING LIST**

1. Mazur D., Rudy M.: Modelowanie w systemie NX CAD. Oficyna Wydawnicza Politechniki Rzeszowskiej Rzeszów 2016
2. Menchen P., Budzyński A.: NX 8.5 Ćwiczenia. GMSystem Wrocław 2012
3. Menchen P.: NX 9.0. Ćwiczenia „Od koncepcji do wytwarzania – krok po kroku”. GM System Wrocław 2013
4. Przybylski W., Deja M.: Komputerowo wspomagane wytwarzanie maszyn. Podstawy i zastosowanie. WNT Warszawa 2007
5. Antosiewicz M.: Modelowanie powierzchniowe, Tom I. Wydawnictwo CAMdivision, Rzeszów 2022
6. Antosiewicz M.: Modelowanie powierzchniowe, Tom II. Wydawnictwo CAMdivision, Rzeszów 2022
7. Józwiak D., Antosiewicz M.: Podstawy modelowania Synchronous & Realize Shape, Wydawnictwo CAMdivision, Miękkonia 2015
8. Curran Kelly Curran, Stenerson Jon Stenerson, CNC Machining & Turning Center Programming and Operation, Independently Published, 2021
9. Sachidanand Jha, Siemens Nx Exercises, Independently Published, 2019





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Rzeczpospolita  
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Dofinansowane przez  
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10. Shih Randy H., Parametric Modeling with Siemens NX, SDC Publications, 2023



Politechnika Świętokrzyska  
Kielce University of Technology

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Wydział Mechatroniki  
i Budowy Maszyn