COURSE SPECIFICATION

Course code	full-time programme:	**M#2-S1-ME-405B**
	part-time programme:	
Course title in Polish	**Podstawy programowania**	
Course title in English	**Fundamentals of Programming**	
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	**all**
Department responsible	**Department of Machine Design and Machining**
Course leader	**dr hab. inż. Jarosław Gałkiewicz, prof. PŚk**
Approved by	**dr hab. Jakub Takosoglu, prof. PŚk, Dean of the Faculty of Mechatronics and Mechanical Engineering**

COURSE OVERVIEW

Course type		**programme-specific**
Course status		**elective**
Language of instruction		**English**
Semester of delivery	full-time programme	**Semester IV**
	part-time programme	
Pre-requisites		
Examination required (YES/NO)		**NO**
ECTS value		**3**

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

LEARNING OUTCOMES

Category of outcome	Outcome code	Course learning outcomes	Corresponding programme outcome code
Knowledge	W01	Knows and understands basic numerical methods used in engineering practice.	MiBM1_W01
	W02	Knows and understands the necessary structure of the language for programming in the RAD environment and the possibilities of using it to solve engineering problems in the field of mechanical engineering.	MiBM1_W03
Skills	U01	Is able to apply knowledge of programming to solve typical engineering tasks.	MiBM1_U01
	U02	Is able to use the capabilities of a programming language in the RAD environment and a high-level programming language to present the results of his work, with particular emphasis on creating data visualization (creating charts).	MiBM1_U02 MiBM1_U05
	U03	Is able to write extensive scripts using conditional, selection, and repetition instructions, using, among others, operations performed on matrices and vectors.	MiBM1_U02 MiBM1_U05
Competence	K01	Is ready to independently complete the knowledge of using the Python language for engineering analysis.	MiBM1_K03

COURSE CONTENT

Type of instruction lecture	Topics covered
lecture	Presentation of the RAD environment and basic elements of the programming language used. Input/output operations (working with files). Functions and complex data structures. Event handling. Searching for errors in the code (debugging). Implementation of popular algorithms in the RAD environment and their visualization.
laboratory	Writing programs in the RAD environment related to the content presented at the lecture: conditional instructions and input/output, loops, debugging, event handling, solving engineering problems using simple numerical methods. Laboratory exercises using a high-level programming language to solve problems encountered in engineering practice regarding: matrices and vectors, conditional instructions and repetition, defining functions, creating 2D graphs and solving equations.

ASSESSMENT METHODS

Outcome code	Methods of assessment *(Mark with an X where applicable)*					
	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	The pass mark is a minimum of 50% for the final test.
laboratory	non-examination assessment	A pass marks for all control tasks (project and tests). The final grade is the arithmetic average.

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		30								
2.	Other contact hours (office hours, examination)	2		2								h
3.	**Total number of contact hours**	**49**										h
4.	**Number of ECTS credits for contact hours**	**2,0**										ECTS
5.	**Number of independent study hours**	**26**										h
6.	**Number of ECTS credits for independent study hours**	**1,0**										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
10.	**ECTS credits for the course** *1 ECTS credit = 25-30 hours of study time*	**3**										ECTS

READING LIST

1. https://www.lazarus-ide.org/
2. Delphi w przykładach dla początkujących. Robert Trafny, PWN, 2018.
3. Delphi 7. Kompendium programisty, Adam Boduch, Helion, 2007.
4. Introduction to the Lazarus IDE. Lazar Hristov, ISBN 978-619-7546-86-6, 2024.
5. https://code.sd/startprog/
6. Lazarus - The Complete Guide. M. van Canneyt, M. Gärtner, S. Heinig, F. Monteiro de Cavalho, I. Ouedraogo, Blaise Pascal Magazine, 2011.
7. MATLAB i Simulink. Mrozek B., Mrozek Z. Poradnik użytkownika. Wydawnictwo Helion, 2017.
8. Technika obliczeń inżynierskich w MATLABIE. Wciślik M., Wydawnictwo Politechniki Świętokrzyskiej, 2021.
9. https://www.mathworks.com/