Subject card

Subject name and code	Modern Computational Tools I, PG_00047629
Field of study	Automatic Control, Cybernetics and Robotics

Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
Education level	first-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	5	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment

Conducting unit	Department of Decision Systems and Robotics -> Faculty of Electronics, Telecommunications and Informatics

Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Michał Czubenko
	Teachers	dr inż. Michał Czubenko

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 0.0						

Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
	Number of study hours	30	3.0	42.0	75

Subject objectives	Mastering the skills of programming in languages: MATLAB and Python, and tools associated with them.

Learning outcomes		Course outcome	Subject outcome	Method of verification
		[K6_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study	can implement appropriate algorithms in a high-level programming language	[SU1] Assessment of task fulfilment
		[K6_U03] can design, according to required specifications, and make a simple device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	is able to implement advanced IT systems to control the manipulator	[SU1] Assessment of task fulfilment
		[K6_W01] Knows and understands, to an advanced extent, mathematics necessary to formulate and solve simple issues related to the field of study	can use mathematical knowledge to solve advanced geometric problems and model dynamic systems	[SW1] Assessment of factual knowledge
		[K6_W04] Knows and understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such devices	has knowledge of the debugger, and can use advanced IDEs	[SW1] Assessment of factual knowledge
Subject contents	Subject treats about advanced usage of MATLAB, Simulink, Python scripting language in scientific projects.			
Prerequisites and co-requisites	• has a basic knowledge of mathematics, including calculus, algebra, geometry, probability and numerical methods, necessary to the description, analysis and synthesis of automatics and robotics systems, and the fundamental processes taking place in them • knows the problems associated with the implementation of the numerical methods, has knowledge of genetic algorithms and optimization • knows the principles of object-oriented programming			

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project	50.0%	65.0%
	Lab exercise	60.0%	35.0%

Recommended reading	Basic literature	http://www.mathworks.co.uk/help/index.html http://www.python.org/doc/
	Supplementary literature	http://www.mathworks.co.uk/help/index.html http://www.python.org/doc/
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable