COURSE SPECIFICATION

Course code	full-time programme:	**M#2-S1-ME-704**
	part-time programme:	
Course title in Polish	**Zastosowanie robotyki**	
Course title in English	**Application of robotics**	
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 Mechatronics and Weapons Engineering**
Course leader	**Ryszard Dindorf**
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		**compulsory**
Language of instruction		**English**
Semester of delivery	full-time programme	**Semester VII**
	part-time programme	
Pre-requisites		
Examination required (YES/NO)		**NO**
ECTS value		**2**

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

LEARNING OUTCOMES

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

Knowledge	W01	Possesses structured, advanced knowledge in the field of robotics, including detailed knowledge of the structure, kinematics and application of robots, necessary to formulate and solve technical problems in the design and engineering of robotic workstations.	MiBM1_W04
	W02	Has in-depth knowledge of the names, construction, and operating principles of industrial robots, determining the basic parameters of their work, as well as technical solutions used in various areas of robotics application.	MiBM1_W06
Skills	U01	Is able to critically analyze the functioning of and evaluate existing solutions in the field of robotics, is able to identify and diagnose an engineering problem in the field of robotics and propose methods of solving it, taking into account various industrial conditions	MiBM1_U10
	U02	Is able to analyse and organise simple robotic systems taking into account the principles of managing robotic production, using mathematical models and methods as well as computer simulations.	MiBM1_U15
Competence	K01	Is ready to critically evaluate existing knowledge and the need to acquire new information both from the literature and from experts in the field of robotics.	MiBM1_K01
	K02	Is aware of the need to independently supplement and expand knowledge in the field of robotics, critically approaches the knowledge acquired. Understands the need and knows the possibilities of continuous improvement (2nd and 3rd degree studies, postgraduate studies, courses) aimed at improving professional, personal and social competences.	MiBM1_K03

COURSE CONTENT

Type of instruction lecture	Topics covered
lecture	Introduction to robotics. Robot construction and kinematics. Robot gripper construction and application. Robot application in industrial processes. Mobile robot application. Collaborative robot application. Autonomous robot application. Robot safety.
laboratory	Construction, control and application of Cartesian robots. Construction, control and application of SCARA robots. Construction, control and application of articulated robots.

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	
U02					X	
K01						X
K02						X

ASSESSMENT TYPE AND CRITERIA

Mode of instruction	Assessment type	Assessment criteria
lecture	non-examination assessment	Positive pass on the final test. At least 50% of points.
laboratory	non-examination assessment	Positive pass on the course reports. The final grade is an arithmetic mean.

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.	**Total number of contact hours**	**34**										h
4.	**Number of ECTS credits for contact hours**	**1,4**										ECTS
5.	**Number of independent study hours**	**16**										h
6.	**Number of ECTS credits for independent study hours**	**0.6**										ECTS
7.	**Number of practical hours**	**25**										h
8.	**Number of ECTS credits for practical hours**	**1**										ECTS
9.	**Total study time**	**50**										h
10.	**ECTS credits for the course** *1 ECTS credit = 25-30 hours of study time*	**2**										ECTS

READING LIST

1. Honczarenko J.: Roboty przemysłowe: budowa i zastosowanie. WNT, Warszawa 2004.
2. Morecki A., Knapczyk J., Podstawy robotyki. Teoria i elementy manipulatorów. WNT, Warszawa 1999.
3. Jezierski E.: Dynamik robotów, WNT 2006.
4. Merlet J.P.: Parallel robots. Springer 2006
5. Morecki A., Oderfeld J.: Teoria maszyn i mechanizmów, PWN, 1987.
6. Olszewski M.: Manipulatory i roboty przemysłowe. WNT, Warszawa, 1985.
7. Niederliński A.: Roboty przemysłowe, WSiP, Warszawa 1981

8. Craig J.: Wprowadzenie do robotyki, WNT, Warszawa, 1995.
9. Spong M. W., Vidyasagar M.: Dynamika i sterowanie robotów, WNT, Warszawa, 1997.
10. Tchoń K., Mazur A., Dulęba I., Hossa R., Muszyński R.: Manipulatory i roboty mobilne, Akademicka Oficyna Wydawnicza PLJ, Warszawa, 2000.
11. Olszewski M., Barczyk J., Falkowski J. L., Kościelny W. J.: Manipulatory i roboty przemysłowe – automatyczne maszyny manipulacyjne, WNT, Warszawa, 1992.
12. Pritschow G.: Technika sterowania obrabiarkami i robotami przemysłowymi, Wydawnictwo Politechniki Wrocławskiej, Wrocław 1995.