

**COURSE SPECIFICATION**

Course code	full-time programme:	M#2-S1-ME-703B
	part-time programme:	
Course title in Polish	Trendy rozwoju w przemyśle	
Course title in English	Development Trends in Industry	
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. Sławomir Błasiak, 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 VII
	part-time programme	
Pre-requisites		
Examination required (YES/NO)		NO
ECTS value		1

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

LEARNING OUTCOMES

Category of outcome	Outcome code	Course learning outcomes	Corresponding programme outcome code
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Knowledge	W01	He has an advanced structured knowledge of concepts and procedures in the field of national, European and international standardisation and knowledge of the importance of standards related to quality management and data security, he has a structured knowledge of law, including business law, protection of industrial property and intellectual property rights and principles of using patent information resources, e.g. in the field of technical solutions, industrial designs, utility models, etc.	MiBM1_W05
	W02	Have an advanced knowledge of methods to design a technological process. Have an advanced knowledge of basic measurement methods with particular reference to those used in his/her chosen field of specialisation. He/she has detailed knowledge connected with selected issues in the field of design, prototyping, broadly understood design, machine construction, technology of manufacturing basic elements of machines and devices, their operation, assessment of operating properties and wear, diagnosis of technical condition, repair technology and safe use, he/she knows and understands basic processes occurring in the life cycle of technical devices, objects and systems.	MiBM1_W11
	W03	The student knows and understands the basic principles for the creation and development of various forms of individual entrepreneurship using modern technologies and trends in the development of innovative industry.	MiBM1_W20
Skills	U01	Is able to obtain information from literature, databases and other sources in different languages on mechanics and mechanical engineering, design, history of applied construction solutions and prototyping; is able to combine obtained information, analyse and interpret, draw conclusions, formulate and justify opinions.	MiBM1_U03
	U02	Is able to critically analyse how existing technical solutions, equipment, facilities, systems, processes and services in the design, construction, manufacture and operation of machinery, is able to identify and diagnose an engineering problem in the field of mechanics and mechanical engineering and propose methods of solving it, taking into account different options.	MiBM1_U10
Competence	K01	He is ready to critically evaluate his knowledge and the need to acquire new information both from the literature and from experts in the field of mechanics and mechanical engineering.	MiBM1_K01
	K02	Is aware of the importance of communicating opinions and information in the field of mechanics and mechanical engineering to the public, acting for the benefit of the public and fulfilling appropriate functions in the public.	MiBM1_K05



**COURSE CONTENT**

Type of instruction lecture	Topics covered
lecture	To familiarise students with the basic issues related to the idea of Industry 4.0. Key technologies: CPS, cloud computing, MES, HMI, M2M, IoT AI and big data Requirements of Industry 4.0. Current state and development directions of Industry 4.0. Industry 5.0, or the fifth industrial revolution.

ASSESSMENT METHODS

Outcome code	Methods of assessment <i>(Mark with an X where applicable)</i>					
	Oral examination	Written examination	Test	Project	Report	Other
W01			X			
W02			X			
W03			X			
U01			X			
U02			X			
K01			X			
K02			X			

ASSESSMENT TYPE AND CRITERIA

Mode of instruction	Assessment type	Assessment criteria
lecture	non-examination assessment	Successful completion of the final assessment. Achieving at least 50 % of the credits.

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										
2.	Other contact hours (office hours, examination)	2										h
3.	Total number of contact hours	17										h
4.	Number of ECTS credits for contact hours	0,7										ECTS
5.	Number of independent study hours	8										h
6.	Number of ECTS credits for independent study hours	0,3										ECTS



7.	Number of practical hours	0		h
8.	Number of ECTS credits for practical hours	0,0		ECTS
9.	Total study time	25		h
10.	ECTS credits for the course <i>1 ECTS credit = 25-30 hours of study time</i>	1		ECTS

READING LIST

1. Szatkowski K.: Zarządzanie innowacjami i transferem technologii, Wydawnictwo Naukowe PWN, Warszawa, 2020.
2. Gwiazda A., Granosik G., Buchwald P.: Internet Rzeczy i jego przemysłowe zastosowania, PWE, 2023.
3. Moczydłowska J. M.: Przemysł 4.0 (?) Ludzie i technologie, Difin, 2022.
4. Gregor B., Kaczorowska-Spychalska D.: Technologie cyfrowe w biznesie. Przedsiębiorstwa 4.0 a sztuczna inteligencja, Wydawnictwo Naukowe PWN, 2022.
5. Brzychczy E., Rostek K.: Cyfrowa analiza danych i procesów, PWE, 2024.
6. Rashid A., Tjahjono B.: Achieving manufacturing excellence through the integration of enterprise systems and simulation. *Production Planning & Control*, 27(10), 2016, pp. 837-852;
7. Alur, Rajeev: Principles of cyber-physical systems, MIT Press, 2015; (6) Parkin M., Economics, 5th Edition, Hardcover, 2000.

