SYLLABUS

Course description

Course code	Course	Systemy MES		
ME/O/I/NST/C2b		Manufacturing Execution System		
Language of instruction	English			
Academic year	2025/2026			
field of study:	Mechanical Engineering			
field of specialisation:	All			
Educational level	first-cycle studies			
Education profile	General academic			
Mode of study	Part-time studies			
Semester(s)	5			
Affiliation with a group of classes	C. Group of courses to choose from			
Course status	Electable			
Types of classes, instruction hours, ECTS credits	Types of classes	Number of instruction hours	Number of ECTS credits	
	Lecture	8 [h]	4 ECTS	
	Classes	-- [h]		
	Lab	16 [h]		
Linkage of the course	with the education profile	Related to the conducted scientific activity in the discipline to which the field of study is assigned	1 ECTS	
	with qualifications	It is used to acquire engineering competences by the student	4 ECTS	
	with science discipline	Mechanical engineering	2 ECTS	
Form of teaching	Traditional – classes organized at the University /classes conducted using distance learning methods and techniques			
Prerequisites	knowledge of mathematics, mechatronics, economy			
Department	Faculty of Mechanical Engineering			
Coordinator	dr inż. Marcin Wikło, prof. URad			
The website of the basic organizational unit	http://wm.uniwersytetradom.pl			
E-mail address, phone number of the coordinator	m.wiklo@urad.edu.pl			

LEARNING OUTCOMES, CURRICULUM CONTENT, TEACHING CLASSES, VERIFICATION OF LEARNING OUTCOMES

Learning Objective:	C1 – Learning the requirements for modern MES systems in production management C2 – Acquiring basic skills in the analysis

	and optimization of the production process in an enterprise supporting the idea of Industry 4.0.
Curriculum Content:	Connectivity/sensors/mobility - data from sensors, location systems and IIoT devices as components enriching MES systems with new information Cloud computing/advanced analytics - collecting and sharing data and drawing conclusions MES integration with other management systems MES development trends: IIoT, AI and digital twin Exercises on the CP factory system with the MES software dedicated to the production planning, management, and reporting.
Didactic (educational) methods:	Informative lecture and practical exercises
Course assessment type, the criteria for assessing the achieved learning outcomes, and the method of calculating the final grade:	The condition for passing the course is to achieve all the required learning out comes specified for the course. The average obtained by the students' grades from the exam-lecture and the project-lab exercises

Learning outcomes for the course in relation to the field of study learning outcomes and the type of classes				Methods of verifying learning outcomes	
Learning outcome number	Description of the learning outcomes for the course (PEU) A student who has passed the course (**W**) knows and understands / (**U**) can / (**K**) is ready to:	Field of study learning outcome (KEU)	Types of classes	Form of verification (credits)	Methods of testing and assessment
W1	Knows the information technology and software to collect and manage data in production execution system Knows the cons and pros of AI utilization in the production management systems	K_WG01 K_WG09 K_WG14 K_WG15 K_WG18	Lectures	in class tests	Tests grades
U1	Is able to perform a simple analysis of the production process based on collected/available data Is able execute production program with controllable way Can gathering information from the database to assess the production process Can use English language in communication in group and to gather information from the system	K_UW01 K_UW04 K_UW14 K_UK18	Project	Projects	Project grades
K1	Is aware of the responsibility related to decisions made within the scope of engineering activities, especially in terms of their own safety and the safety of others.	K_KK01 K_KK02	Lectures / Project	Verbal evaluation	Verbal evaluation

Literature and teaching aids
Primary literature: 1. Tarun Jana, Dynamic Scheduling by Agent Based Holonic Manufacturing System: Concepts, Framework, Execution – LAP LAMBERT Academic Publishing 12 stycznia 2018 Kost G. Łebkowski P. Węsierski Ł. 2. Liwowski B. Kozłowski R. Podstawowe zagadnienia zarządzania produkcją, Oficyna Ekonomiczna, 2006 3. Płonka S. Wielokryterialna optymalizacja procesów wytwarzania części maszyn, 2021, PWN Additional literature: 1. Szatkowski K. Nowoczesne zarządzanie produkcją, Ujęcie procesowe, 2021, PWN 2. Pająk, E. Zarządzanie produkcją, 2017, PWN Study aids:

Student workload required to achieve the assumed learning outcomes – the balance of ECTS credits		
Attendance, participation	Student workload [h].	
	Student's self-study hours Classes without a teacher (ZBN)	Classes
Participation in lectures/classes/lab	X	24 [h]
Preparation for lectures/classes/lab , Preparation for ... credit / exam	76 [h]	X
Total student workload Preparation for ... credit / exam	76 [h]/ 3 ECTS	24 [h]/ 1 ECTS
ECTS points per subject	4 ECTS	

Additional information, comments
In the case of students with special needs, including disabilities, and chronic illnesses, the methods and forms of verification of learning outcomes specified above (in the syllabus) are adapted to the individual needs of these students, as appropriate. Detailed rules and forms of support for students with special needs, including those with disabilities and chronically ill, during classes, credits, and exams are specified in: University Regulations (Regulamin Studiów Uniwersytetu Technologiczno-Humanistycznego w Radomiu), Study Regulations (Zasady Studiowania), and Procedure for Ensuring Accessibility of the Educational Process to Students with Special Needs, Including Those with Disabilities and Chronically ill (Procedura dotycząca zapewnienia dostępności procesu kształcenia studentom ze szczególnymi potrzebami, w tym: z niepełnosprawnością, przewlekle chorych).