



Subject card

Subject name and code	, PG_00071333						
Field of study	Mechanical Engineering						
Date of commencement of studies	February 2025	Academic year of realisation of subject			2025/2026		
Education level	second-cycle studies	Subject group					
Mode of study	Part-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Division of Manufacturing and Production Engineering -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Aleksandra Wiśniewska					
	Teachers	dr inż. Aleksandra Wiśniewska					
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	18.0	0.0	0.0	0.0	0.0	18
	E-learning hours included: 0.0						
	eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=4060						
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	18	0.0		0.0	18	
Subject objectives	Understanding and practical use of methods for systemic improvement of production processes to improve efficiency, quality and productivity.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_K82] is equipped to participate actively in lectures, seminars and laboratory classes conducted in foreign language	The student is prepared to actively participate in training, workshops and seminars on Lean Manufacturing, Six Sigma and TPM conducted in English, understands industry terminology and is able to engage in discussions on improving production processes.	[SK5] Assessment of ability to solve problems that arise in practice
	[K7_U82] is able to proficiently obtain and process information related to field of study and academic environment in foreign language at B2+ level of the Common European Framework of Reference for Languages (CEFR)	The student is able to search, analyze and synthesize information from English-language standards, publications and case studies on production improvement methods and use it to design process improvements.	[SU4] Assessment of ability to use methods and tools
	[K7_W12] identifies and interprets the main developmental trends and significant new achievements in the field of engineering and technical sciences and disciplines relevant to the course of study	The student identifies contemporary trends in production improvement, such as Lean Management, Six Sigma, TPM, production digitalization and integration of methods with the Industry 4.0 concept, and interprets their importance for the development of modern manufacturing systems.	[SW1] Assessment of factual knowledge
	[K7_U01] utilizes information obtained from the literature and other sources in the field of Mechanics and Mechanical Engineering and presents and analyses the results of solutions to technical problems in this field	The student uses production improvement methods (VSM, 5S, SMED, OEE, TPM, DMAIC) to analyze technical and organizational problems in production systems and presents the results of analyses and proposals for improvements based on process data and professional literature.	[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
Subject contents	<p>Course content – lecture</p> <ol style="list-style-type: none"> 1. Introduction to Production Improvement: The importance of continuous improvement (Kaizen), Improvement outcomes: cost reduction, quality improvement, productivity growth, improved communication, Improvement as an element of a company's competitive strategy. 2. Evolution of approaches to production organization H. Ford's mass production, Toyota Production System (TPS), The transition from scale efficiency to waste elimination, The concept of customer value. 3. Lean Manufacturing Philosophy and Principles Lean definition and principles: value, value stream, flow, pull system, continuous improvement, 7+1 types of waste (MUDA), The role of organizational culture and leadership. 4. Value Stream Mapping (VSM) Identification of material and information flow, Analysis of the current state and design of the future state, Identification of bottlenecks and losses. 5. 5S and Work Standardization Seiri, Seiton, Seiso, Seiketsu, Shitsuke, standardization as the foundation of process stability, visual workstation management. 6. Kanban System and Flow Control pull system, visual signals and inventory levels, synchronizing production with demand. 7. SMED Reducing Changeover Times the importance of production flexibility, internal and external activities, eliminating waste and standardizing changeovers. 8. TPM Total Productive Maintenance maximizing machine availability, autonomous maintenance, planned maintenance, operator involvement. 9. OEE Overall Equipment Effectiveness availability, efficiency, quality, indicator interpretation and its use. 		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	activity task test	60.0%	100.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Goldratt Eliyahu M. - Cel. Doskonałość w produkcji 2. Womack James P., Jones D. T. - Odchudzenie firm 3. Liker Jeffrey K. - Droga Toyoty 	
	Supplementary literature	<ol style="list-style-type: none"> 4. Imai Masaaki - Gemba Kaizen 5. Hines Peter, Taylor David -Organizacja Lean 	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Introduction to the subject Evolution of the improvement approach - comparing H. Ford's approach to Toyota Lean concept Value stream mapping 5S and work standardization Kanban system Reducing changeover times according to the SMED concept TPM OEE		

Practical activities within the subject	Not applicable
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