



## Subject card

Subject name and code	Design of supply systems, PG_00059497						
Field of study	Management and Production Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-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	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Zakład Technologii Maszyn i Automatykacji Produkcji -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Aleksandra Wiśniewska					
	Teachers	dr inż. Aleksandra Suchta dr inż. Sławomir Szymański dr inż. Aleksandra Wiśniewska					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	15.0	0.0	60
	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	60		6.0		34.0	100
Subject objectives	The student learns the goals and principles of the logistics system in the enterprise. By deepening the knowledge and performing simple exercises related to the analyzed areas of issues in the field of logistics and warehousing, the student can independently design a logistics system, starting from the development of a supply system and an optimized technological line, through the evaluation and selection of suppliers, and ending with efficient distribution.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_U05] is able - in accordance with a given specification, taking into account non-technical aspects - to design a complex device, object, system or process related to the studied engineering discipline, and to implement this project - at least in part - using appropriate methods, techniques and tools, if necessary, adapting to it the purpose of existing or developing new tools	The student is able to prepare a design of a supply system or optimize an existing supply system, using selected tools and methods enabling the determination of: the scope of employee responsibilities, the structure of the enterprise, the processes taking place in the enterprise, a list of processes, a sales process card, a warehousing process card, a supply process card, transport process cards, production process cards, complaint process cards.	[SU5] Assessment of ability to present the results of task [SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
	[K7_W04] has an organized knowledge of the life cycle of devices, facilities and technical systems, has an extensive knowledge of management.	The student knows the types of products and the differences between managing a production company and managing a service company. Based on the acquired knowledge of production systems, the student knows the specificity of production processes as well as the principles, methods and tools of production control. Based on the acquired knowledge of production processes and technical and information resources, the student is able to select methods and tools for analysis, control and optimization ensuring high quality and efficiency of production control processes.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation
	[K7_W01] knows and understands to a greater extent selected issues in the field of management and quality sciences and mechanical engineering, their location in the field of social sciences and engineering and technical sciences, as well as relationships with related disciplines, and sees the possibility of applying the knowledge in practice	The student is able to perform simple quantitative and qualitative analyzes and, on their basis, identify relationships that will be used to determine the principles characterizing the functioning of the analyzed facility and to select methods and tools for control and continuous improvement.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
	[K7_U08] is able to work in a group, assuming various roles in it, including managing a small team, assuming responsibility for the results his work	The student works in a project group, taking on various roles in the team and actively participating in the organization of the team's work aimed at achieving the assumed design and quality goals.	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject [SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information
	[K7_K01] is aware of the need to expand knowledge and verify the methods of solving problems by consulting experts	The student actively seeks solutions to emerging problems by expanding his or her knowledge, following news and trends, and establishing cooperation with external sources in order to seek opinions or obtain assistance in achieving tasks and goals.	[SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice [SK3] Assessment of ability to organize work [SK1] Assessment of group work skills

Subject contents	<p><b>Lectures [K7_W04: SW1, SW2; K7_W01: SW1, SW3; K7_U08: SU2, SU3; K7_U05: SU2, SU3; K7_K01: SK4]</b></p> <ol style="list-style-type: none"> <li>1. Logistics - definitions and goals of logistics. Definitions.</li> <li>2. Logistics system and process. Transport susceptibility of various types of goods.</li> <li>3. Logistics: procurement, production, distribution.</li> <li>4. Logistics infrastructure - material flow: types of warehouses; movement of goods through the warehouse; technical means used in the warehouse; methods of identifying commodity units; Pareto principle - scope of application; rules for arranging goods in the warehouse.</li> <li>5. Logistic infrastructure - information flow: application of the probability theory; basic methods of inventory management (ABC / XYZ, EOQ, MRP, DRP, JIT).</li> <li>6. Designing logistic systems and storage spaces.</li> <li>7. Analysis of the effectiveness of logistics systems.</li> <li>8. Provisions of EU Directives and provisions of technical supervision.</li> </ol> <p><b>Project - example [K7_W04: SW3, SW2; K7_W01: SW3; K7_U08: SU2, SU3, SU1, SU5; K7_U05: SU2, SU3, SU1, SU4, SU5; K7_K01: SK1, SK3, SK5, SK4]</b></p> <p>Optimization of logistics processes in a selected production or service company</p> <ol style="list-style-type: none"> <li>1. Responsibilities of employees</li> <li>2. Company structure</li> <li>3. Processes taking place in the enterprise</li> <li>4. Process list (hierarchy)</li> <li>5. Sales process card</li> <li>6. Storage process card (storage of semi-finished products)</li> <li>7. Procurement process card</li> <li>8. Transport process card</li> <li>9. Production process card</li> <li>10. Complaint process card</li> <li>11. Process improvement: <ul style="list-style-type: none"> <li>• Storage process</li> <li>• Procurement process</li> <li>• Production process</li> </ul> </li> </ol> <p><b>Exercises [K7_W01: SW3; K7_U08: SU2, SU3, SU1; K7_U05: Su2, SU3, SU1; K7_K01: SK5]</b>1. Pareto in the warehouse: problems, analysis, corrective actions.2. Planning of transport resources.3. Flows and capacity of the transport network, shortest route, optimal allocation.4. Load capacity: vehicle, pallet.</p>														
Prerequisites and co-requisites	<p>Knowledge of issues related to project management and human resources.</p> <p>Knowledge of issues related to the basics of production and service management.</p>														
Assessment methods and criteria	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Subject passing criteria</th> <th style="width: 33%;">Passing threshold</th> <th style="width: 33%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>exercises</td> <td>60.0%</td> <td>35.0%</td> </tr> <tr> <td>tests</td> <td>60.0%</td> <td>30.0%</td> </tr> <tr> <td>project</td> <td>60.0%</td> <td>35.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	exercises	60.0%	35.0%	tests	60.0%	30.0%	project	60.0%	35.0%
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Recommended reading	Basic literature	<p>Szymonik Andrzej , Chudzik Daniel, Nowoczesna koncepcja logistyki produkcji, Difin 2020</p> <p>Rudawska Anna, Logistyka procesów produkcji, Wydawnictwa Komunikacji i Łączności WKŁ 2016</p> <p>Gwynne Richards, Zarządzanie logistyką magazynową, Wydawnictwo Naukowe PWN 2021</p> <p>Jacyna Marianna, Lewczuk Konrad, Projektowanie systemów logistycznych., PWN 2016</p> <p>Bukowski L., Zapewnienie ciągłości dostaw w zmiennym i niepewnym otoczeniu., WSB 2016</p> <p>Materials and articles provided by the teacher</p>
	Supplementary literature	<p>Wojewódzka-Król Krystyna , Rolbiecki Ryszard, Infrastruktura transportu. Europa, Polska teoria i praktyka, Wydawnictwo Naukowe PWN 2018</p> <p>Pfohl Hans-Christian, Zarządzanie logistyką. Funkcje i Instrumenty., Biblioteka logistyka 1998</p> <p>Skowronek Czesław, Sarjusz-Wolski Zdzisław, Logistyka w przedsiębiorstwie., PWE 2013</p> <p>Materials and articles provided by the teacher</p>
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>Projektowanie systemów dostaw, ZiIP, IIst., sem02, specj. IPP, zima 23/24 - Moodle ID: 32566</p> <p><a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32566">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32566</a></p>
Example issues/ example questions/ tasks being completed	<p>Choosing a storage strategy. Arrangement of goods in the warehouse in accordance with the storage strategy. Supplies management. Selection of technical equipment for optimal handling of the warehouse. Logistics objectives. Definitions. Transport susceptibility of various types of goods. Types of magazines. The flow of goods through the warehouse. Technical measures used in the warehouse. Methods of identifying commodity units. The Pareto principle - scope of application. Rules for arranging goods in the warehouse. Application of the probability theory. Basic inventory management methods: ABC / XYZ, EOQ, MRP, DRP, JIT. Provisions of EU Directives and provisions of technical supervision.</p>	
Work placement	Not applicable	