

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Materials Handling and Storage Systems		Code 1010621271010622395
Field of study Transport	Profile of study (general academic, practical) (brak)	Year /Semester 4 / 7
Elective path/specialty Railway Transport	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 1 Classes: 1 Laboratory: - Project/seminars: -		No. of credits 2
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences		ECTS distribution (number and %) 2 100%
Responsible for subject / lecturer: Marek Zablocki PhD (Eng) email: Marek.Zablocki@put.poznan.pl tel. 616652056 Faculty of Machines and Transport Piotrowo Street 3, 60-965 Poznan		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	basic knowledge from the field of theory of machines, economy, mathematics and logistics;
2	Skills	logical thinking, utilisation of information acquired from the library, Internet, standards, catalogues, systematic designing;
3	Social competencies	understanding the need of acquiring transferred knowledge;
Assumptions and objectives of the course: Objectives of the subject: gaining knowledge in the following areas: process analysis; modelling and management of close-transport and storage systems; ability of practical designing of simple close-transport and storage systems;		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. Has a structured, theoretically founded knowledge in the field of logistics, including: structure of logistic systems, exploitation of synergies, decision-making problems in micrologistic systems, the importance of logistics in the supply, inventory and finished goods development models, the importance of logistics in the transport, logistics services, logistics chains, shipping. - [K1A_W09] 2. Has a detailed knowledge of the transport systems, including: evaluation of transportation systems, types of transport processes, selection of methods for the tasks, the coordination of transportation with loading points, leading the carriage, dispatching and maintenance service, internal transport in plants and warehouses, flexible transport systems. - [K1A_W10] 3. Has a structured, theoretically founded knowledge in the field of transport means, general characteristics and classification of vehicles, types, construction and operation of the internal transport means, characteristics and classification of mechanical vehicles - construction and basic technical parameters, characteristics, classification, basic technical characteristics - [K1A_W14]		
Skills:		

1. Is able to obtain information from the literature, internet, databases and other sources in Polish and English. Can integrate the information to interpret and learn from them, create and justify opinions. - [K1A_U01]
2. Is able to communicate using a variety of techniques in a professional environment and other environments using the formal record of the design, technical drawings, concepts and definitions in the scope of the study area. - [K1A_U02]
3. Is able to use the languages: native and international (English) at a level sufficient to enable understanding of technical texts and writing using dictionaries with technical descriptions of machines in their field technology (knowledge of technical terminology). - [K1A_U03]
4. Has the ability to self-educate using modern teaching tools such as remote lectures, webpages and databases, educational software, electronic editions. - [K1A_U06]
5. Is able to analyze objects and technical solutions, can search the catalogs and manufacturers websites for ready-made components of machinery and equipment, including means and facilities for transport and storage, evaluate their suitability for use in own technical and organizational projects. - [K1A_U10]
6. Is able to use acquired mathematical theories to create and analyze simple models of transport and logistics systems. - [K1A_U18]
7. Is able to create a system schematics, select items and perform basic calculations of the magazine layout. - [K1A_U19]
Social competencies:
1. Understands the need and knows the possibilities of lifelong learning, knows the need for acquiring new knowledge for professional development. - [K1A_K01]
2. Is able to think and act in an entrepreneurial manner, make decisions, work for the development of the employer and the society. - [K1A_K07]

Assessment methods of study outcomes		
Lecture: course credits obtained on the basis of a colloquium;		
Classes: credits obtained on the basis of a colloquium, grades received for assignments solved during classes as well as evaluation of design assignments prepared at home;		
Course description		
? Definition of storage and internal transport. Evolution of the process from transport action through transport process to transport system. Impact of logistics on system development.		
? Systemic approach in phases of identification, designing and implementation of close-transport and storage systems. Integrated flow of energy, materials and information in transport systems (physical circulation of goods, energy and information in a storehouse). Logistics technique ? transport processes, functional classification planes in the material flow technique. Functioning of a storehouse.		
? Impact of means of logistics technique (cargoes in internal transport, means of transport and storehouse equipment, including: cranes, trucks, piling machines, transporters, devices servicing loading units, means used to form and de-palletize palette loading units, equipment used to control the size of loading units, their safety, mechanisms needed for sorting and storage of goods, bar codes, storehouses) on the functioning of the system. Discussion of selected means of storehouse equipment or other elements of a close-transport system. Flexible systems of production and transport.		
? Examples of solutions of existing and functioning systems of internal transport and storage.		
? Methodology of designing a storehouse and close-transport systems (designing process, choice of concept from the point of view of the extent of automation of storage work; methodological choice of the concept of the solution of stages of the technological process; systematised choice of the arrangement of storehouses as well as means of servicing and equipment; optimisation of storehouse size). Composition of the design team. Technology and organisation of storehouse work. Storehouse processes ? flow management of cargo and information flows ? division, tasks and actions of automatic control of the flow of materials. System effectiveness and costs. Designing of connection of the system with means of distant-transport.		
Basic bibliography:		
Additional bibliography:		
Result of average student's workload		
Activity	Time (working hours)	
1. -	45	
Student's workload		
Source of workload	hours	ECTS

Total workload	45	2
Contact hours	32	1
Practical activities	13	1