

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Materials Handling and Storage Systems</b>		Code <b>1010624351010622395</b>
Field of study <b>Transport</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>3 / 5</b>
Elective path/specialty <b>Railway Transport</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>part-time</b>	
No. of hours Lecture: <b>9</b> Classes: <b>9</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>2</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art <b>technical sciences</b> <b>Technical sciences</b>		ECTS distribution (number and %) <b>2 100%</b> <b>2 100%</b>
<b>Responsible for subject / lecturer:</b>  Marek - Zablocki email: marek.zablocki@put.poznan.pl tel. 616652056 IT ul. Piotrowo 3		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	basic knowledge from the field of theory of machines, economy, mathematics and logistics;
2	<b>Skills</b>	logical thinking, utilisation of information acquired from the library, Internet, standards, catalogues, systematic designing;
3	<b>Social competencies</b>	understanding the need of acquiring transferred knowledge;
<b>Assumptions and objectives of the course:</b> 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;		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Has a structured, theoretically founded knowledge in the field of logistics, including: structure of logistic systems, logistics management, exploitation of synergies, the importance of logistics in the supply, production and sales phases, 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: design of transport systems in a settlement, evaluation of transportation systems, types of transport processes, 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]		
<b>Skills:</b>		

<p>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]</p> <p>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]</p> <p>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]</p> <p>4. Has the ability to self-educate using modern teaching tools such as remote lectures, webpages and databases, educational software, electronic editions. - [K1A_U06]</p> <p>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]</p> <p>6. Is able to use acquired mathematical theories to create and analyze simple models of transport and logistics systems. - [K1A_U18]</p> <p>7. Is able to create a system schematics, select items and perform basic calculations of the magazine layout. - [K1A_U19]</p>
<p><b>Social competencies:</b></p> <p>1. Understands the need and knows the possibilities of lifelong learning, knows the need for acquiring new knowledge for professional development. - [K1A_K01]</p> <p>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]</p>

<b>Assessment methods of study outcomes</b>	
<p>Lecture: course credits obtained on the basis of a colloquium;</p> <p>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;</p>	
<b>Course description</b>	
<p>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.</p> <p>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.</p> <p>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.</p> <p>Examples of solutions of existing and functioning systems of internal transport and storage.</p> <p>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.</p> <p>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.</p>	
<p><b>Basic bibliography:</b></p> <p>1. Fijałkowski J.: Transport wewnętrzny w systemach logistycznych, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2003</p> <p>2. Korzeń Z.: Logistyczne systemy transportu bliskiego i magazynowania, tom I i II. Wyd. ILiM, Poznań 1998</p>	
<p><b>Additional bibliography:</b></p> <p>1. Fijałkowski J.: Technologia magazynowania, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 1995</p>	
<b>Result of average student's workload</b>	
Activity	Time (working hours)

1. Participation in the lecture, exercises	5	
2. Participation in the lecture, exercises	18	
3. Fixing the content of the lecture	3	
4. Participation in consultations	3	
5. Preparation for passing	3	
6. Participation in passing the lecture, classes	3	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	37	2
Contact hours	18	0
Practical activities	0	0