

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Cargo Science		Code 1010624271010610215
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) part-time	
No. of hours Lecture: 12 Classes: - Laboratory: - Project/seminars: -		No. of credits 1
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 %) 100 1%
Responsible for subject / lecturer: Adam Redmer Eng. PhD email: adam.redmer@put.poznan.pl tel. +48 61 665 21 29 Faculty of Machines and Transport 3 Piotrowo street, 60-965 Poznan, Poland		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	student has a basic knowledge of logistics (including transportation and warehousing) moreover packaging and physics as well
2	Skills	student is able to accumulate information, interpret it, reasoning based on it, express and justify opinions, identify, associate and interpret phenomena occurring in a practice
3	Social competencies	student is aware of the importance and understands non-technical aspects and effects of transportation processes, including those connected with cargos
Assumptions and objectives of the course: -to give to students a basic theoretical and practical knowledge of cargo management as well as methods and techniques of forming, transporting, handling and storing cargo units in connection with a real life solutions allowing for such operations.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Students know the notion, features and types of cargo units. Know types and methods of forming cargo units. - [K1A_W10] 2. Students know principles of loading and fastening cargo units on vehicles. Know principles and techniques of cargo units labeling and identification. - [K1A_W14] 3. Students know main transportation technologies and associated with them legislative aspects. Know principles of cargo units monitoring during transportation processes and loss and damage procedures. - [K1A_W21]		
Skills:		
1. Students are able to design transportation processes of selected types of commodities. Are able to select cargo units forming and fastening methods. - [K1A_U16] 2. Students are able to assess transportability of cargo units and transportation risks. Are able to select appropriate labeling and identification techniques. - [K1A_U16] 3. Students are able to carry out a loss and damage procedure (transportation claim). - [K1A_U16]		
Social competencies:		
1. Students are aware of the significance of cargo units forming process and risks and responsibilities associated with this. - [K1A_K01] 2. Students are aware of potential technical, economic and social effects that an improper / incorrect forming, transportation and storing of cargo units may cause. - [K1A_K01] 3. Students are able to develop independently their knowledge of cargo management. - [K1A_K02]		

Assessment methods of study outcomes		
-A final exam based on the knowledge obtained within the lectures (a multiple choice test).		
Course description		
<p>-Cargo management ? introduction to the subject: the essence of the cargo management, cargo units versus commodities, main types of cargo units, transportability, transportation losses and damage risks, shock sensitivity, basic classifications of commodities and cargo units.</p> <p>Caro units: definition, essence and purpose, cargo units forming means and techniques ? classification and types including: boxes, pallets, containers and batches. Stretch wrapping and strapping.</p> <p>Dimensions of cargo units and packages: basic dimension chains, dimension interrelationships of packages and cargo units ? ISO containers, loading parameters of vehicles.</p> <p>Labeling and identification: definition and basic legislative aspects, main types and methods of labeling, labeling of cargo units (pallettes and containers), basic rules of correct labeling, barcodes, logistics label and RFID.</p> <p>Transportation and handling technologies: definition, types and characteristics, selection of an appropriate technology ? general rules, transportation technology for selected types of commodities ? characteristics and techniques, forklifts (technical characteristics, the 13 basic moves, accessories), palette trucks, semi-trailers and trailers, dump trucks.</p> <p>Loads location and securing on vehicles: a load distribution (basic rules, trailer pins, trailer pins, axle loads and their measurement), factors influencing load safety, load securing ? techniques: belts, fasteners, blocking and bracing, anti-sliding mats, dunnage air bags and the 10 rules of the correct load securing in transportation.</p> <p>Legislative basis of transportation of selected types of commodities: transportation law versus loads that require special treatment, main types of loads that require special treatment, perishable goods, dangerous goods, transportation of animals, and oversized loads.</p> <p>Transportation losses and damages: transportation claims, causes and procedures, insurances, loads monitoring.</p>		
Basic bibliography:		
<ol style="list-style-type: none"> 1. Korzeń Z.: Logistyczne systemy transportu bliskiego i magazynowania. Tom I: Infrastruktura, technika, informacja. Instytut Logistyki i Magazynowania w Poznaniu, Poznań, 1998 (in Polish) 2. Mindur L. (red.): Technologie transportowe XXI wieku. Instytut Technologii Eksploatacji ? PIB, Warszawa, 2008 (in Polish) 3. Mokrzyński H.: Ładunkoznawstwo. Technologia zabezpieczenia ładunków w transporcie. WKiŁ, Warszawa, 1985 (in Polish) 4. Krasowska K., Popek M.: Ładunkoznawstwo. Wydawnictwo Uczelniane AM Gdynia, Gdynia, 2006 (in Polish) 5. Podręcznik Stosowania Systemu EAN?UCC. Instytut Logistyki i Magazynowania, Poznań, 2004 (in Polish) 6. Prochowski L. Żuchowski A.: Technika transportu ładunków. WKiŁ, Warszawa, 2009 (in Polish) 		
Additional bibliography:		
<ol style="list-style-type: none"> 1. Karpień Ł., Skrzypek M.: Towaroznawstwo ogólne. Wydawnictwo Akademii Ekonomicznej w Krakowie, Kraków, 2000 (in Polish) 2. Korzeniowski A., Skrzypek M., Szyszka G.: Opakowania w systemach logistycznych. Instytut Logistyki i Magazynowania w Poznaniu, Poznań, 2001 (in Polish) 3. Lisińska-Kuśnierz M., Ucherek M.: Współczesne opakowania. Wydawnictwo Naukowe PTTŻ, Kraków, 2003 (in Polish) 4. Praca zbiorowa: Kody Kreskowe. Rodzaje, standardy, sprzęt, zastosowania. Instytut Logistyki i Magazynowania, Poznań, 2000 (in Polish) 5. Pusty T.: Przewóz materiałów niebezpiecznych. Poradnik kierowcy. WKiŁ, Warszawa, 2003 (in Polish) 6. Sikorski P.M., Zembrzycki T.: Spedycja w praktyce. Polskie Wydawnictwo Transportowe, Warszawa, 2006 (in Polish) 		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in lectures	30	
2. Individual consultations	0	
3. Participation to a final exam	15	
Student's workload		
Source of workload	hours	ECTS
Total workload	30	1
Contact hours	15	1
Practical activities	0	0