



RTU Course "Materials Handling and Transportation Technologies"

15E01 Aeronautikas tehnoloģiju katedra

General data

Code	TDT700
Course title	Materials Handling and Transportation Technologies
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Post-graduate Studies
Course type	Professional
Field of study	Transport
Responsible instructor	Aleksandrs Urbahs
Academic staff	Kristīne Carjova
Volume of the course: parts and credits points	1 part, 4.0 Credit Points, 6.0 ECTS credits
Language of instruction	LV, EN, RU, DE
Possibility of distance learning	Not planned
Abstract	<p>The subject considers the issues related to cargo handling and transportation technologies. It gives a description of a storage facility, demonstrates the basic principles of cargo handling, provides the classification of equipment intended for cargo lifting and transportation (cargo gripping mechanisms, devices for removing cargo, belt conveyors, cargo transfer equipment, dedicated devices, etc.).</p> <p>The subject also considers the issues of storage facility organization, purposes and functions as well as the peculiarities of cargo storage and service systems at air, rail, sea and road terminals. It describes possible mechanical and automated equipment for transport operations.</p>
Goals and objectives of the course in terms of competences and skills	<p>The aim of the subject is to provide knowledge about the basic concepts, models and methods of storing and handling systems for different types of cargo. Students should be provided with knowledge of the basic concepts, models and methods of warehouse logistics as well as with practical skills for solving the problems of warehouse logistics.</p> <p>Students should be familiarized with mechanical and automated equipment used in the field of transport. Students should be provided with the opportunity to acquire knowledge about vehicle structure and calculation methods. Students should be taught to develop and implement real terminals for handling different types of cargo at transport hubs</p>
Structure and tasks of independent studies	<p>Analytical work with scientific literature and other sources of information. Independent investigation of cargo storage and handling systems during practical classes in accordance with a task version and methodical guidelines, preparation and defence of reports; preparation for practical classes; filling in reports on Laboratory Works and preparation for their defence.</p>
Recommended literature	<ol style="list-style-type: none"> 1. Urbahs A., Cerkovņuks A. Intermodālie konteineru pārvadājumi. – R.: RTU Izdevniecība, 2003.-496 lpp. 2. Urbahs A. Transporta terminālu tehnoloģisko procesu mehanizācijas līdzekļi. Mācību līdzeklis. - Rīga, RTU, 2006, 131 lpp. 3. International Freight Forwarders. - Can_Ship Overseans Inc., Canada, Toronto.-2003. 4. Johnson, J. Williams., Modern Logistics. Institute of Oriental Studies, 2005. - 624 p. 5. Mahoney John H. International freight transportation connections.- Westpoint, Connecticut, USA, 1999. 6. Логистические транспортно-грузовые системы: Учебник для студ. высш. учеб. заведений. – Под ред. В.М. Николашина. М.: Издательский центр «Академия», 2003.-304 с. 7. Bauer Angela. Lagermodellierung für logistische Netze. Dt. Verkehrs-Verl., ISBN: 3871542725, 2002, 234 p. 8. Bode, W.; Preuß, R.W.: Comprehensive introduction to intralogistics . A reference book by the STILL Akademie 2005. 9. Askin, R.G.; Standridge, C.R.: Modeling and analysis of manufacturing systems; John Wiley & Sons 1993.
Course prerequisites	Preliminary knowledge in transport and logistics

Course outline

Theme	Hours
General description of transport systems	2
Combined transport systems	2
Characteristics of cargo units	2
Cargo packaging	2
Containerization	4
Labelling and identification of cargo units in logistic systems	4
Basic principles of cargo handling, cargo handling systems	2
Functions and objectives of transport terminals and warehouses	2
Structure, description and costs of operations at transport terminals and warehouses	4
Piece goods handling terminals. Liquid cargo handling terminals. Bulk cargo handling terminals	4
Mechanical and automated equipment for implementing technological processes at transport terminals and warehouses	4

Characteristic elements of mechanical and automated equipment. Classification of load lifting and transportation machine	2
Flexible elements (chains, ropes, cables) of load lifting machines. Load-grappling devices. Rope pulley blocks. Brakes	4
Mechanical equipment for transport works. Simple lifting mechanisms. Pullers	2
Load lifting mechanisms	2
Cranes. Cantilevers and bridge cranes	4
Loaders. Container loaders	2
Automated equipment for transport works. Classification and characteristics of continuous machines	2
Belt conveyors and specialized equipment. Conveyors and shifting machines	4
Gravity transfer devices	2
Estimation of productivity of transport machines	2
Operating safety of cargo loading equipment. Methods and devices for the diagnostics of vehicle loading equipment	2
Design of cargo handling systems	4

Learning outcomes and assessment

Learning outcomes	Assessment methods
Students know and are able to explain the main concepts, models and methods of cargo handling and transportation systems.	Test. Exam
Students know the basic principle of cargo handling, have knowledge about cargo handling systems and technologies and are able to apply this knowledge in their everyday work	Solution of tasks – practical works. Test. Exam.
Students are able to analyse the operation of transport terminals and warehouses and to characterize main areas, stacking systems and a technological process	Solution of tasks – practical works. Test. Exam.
Students understand the concepts about load lifting and transportation mechanisms and their use in transport systems	Solution of tasks – practical works. Test. Exam.
Students know the characteristic elements and mechanisms of load lifting machines and are able to explain why they are necessary and what functions they perform. Students are able to carry out calculations related to design, durability, efficiency and capacity of load lifting mechanisms and elements	Solution of tasks – practical works. Test. Exam.
Students have knowledge about mechanization and automation systems and technologies for cargo handling and are able to use this knowledge in their everyday work	Solution of tasks – practical works. Test. Exam.

Study subject structure

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	4.0	6.0	2.0	1.0	1.0		*	