EDUCATIONAL INSTITUTION: **KLAIPĖDA STATE UNIVERSITY OF APPLIED SCIENCES**
FACULTY OF TECHNOLOGIES
STUDY PROGRAMME: **TRANSPORT LOGISTICS TECHNOLOGIES**
NAME OF THE SUBJECT: **FREIGHT TRANSPORT**

Group of the subject*	Type of the subject**	Form of studies	Structure***				Total number of hours	Number of credits
			T	P	C	I		
SF	P	Full-time studies (FT)	80	60	10	120	270	10
		Part-time studies (PT)	28	32	90	120		

*Group of the subject: GS – general study subjects; SF – subjects of the study field.
**Type of the subject: C – compulsory subject; A – optional subject (alternative), FE – freely elective subject.
***Structure: T – theory; P – seminars, workshops, laboratory works; C – consultations; I – individual work.

Annotation

The subject analyses freight transport by various modes of transport: the basics of developing and realising transport services, modes of transport, their diversity and infrastructure, classification of cargoes, their volumes and flows, road vehicles used for freight transport and their selection criteria, cargo preparation for shipment, packaging, marking, freight transport organisation by road transport; freight transport in the EU and other countries, freight transport of dangerous and perishable goods, organisation of combined freight transport; organisation of the rolling stock work on the routes and their diversity, as well as cargo positioning and securing. A technological process of freight transport is designed: a mode of transport and vehicle combination are chosen, cargo quantity, it positioning and securing are assessed, the optimal route is prepared and the work on the route is organised.

The connection of results of the study programme with results of the study subject and study methods, as well as evaluation methods of the learning achievements

Results of the study programme	Results of the study subject	Study methods	Evaluation methods of the learning achievements
1. A student will be able to understand constructions of the rolling stocks, the principles of operation and exploitation, as well as to solve design tasks of technological process of freight transport and passenger transport by applying the fundamental engineering knowledge.	1.1. A student will be able to explain the organisational stages of technological process of freight transport by assessing modes and methods of transport	An involving lecture, a problem-solving method, workshops, discussion, analysis of literature, work in the groups	A test, semi-open questions and a practical task; Presentation and defence of the workshops (1-17), presentation of the course work in writing and its verbal defence
3. A student will be able to assess the structure of a transport system, its elements and their interoperability by designing technological processes of freight transport and passenger transport.	2.1. A student will be able to conclude technological processes of freight transport by assessing structure of a transport system, its elements and interoperability.	An involving lecture, a problem-solving method, workshops, discussion, analysis of literature, work in the groups	A test, semi-open questions and a practical task; Presentation and defence of the workshops (1-17), presentation of the course work in writing and its verbal defence
4. A student will be able to make technological decisions, regarding freight logistics by taking into account the freight	3.1. A student will be able to determine volumes and turnover of freight transport, as well as factors, influencing cargo disparity	A lecture, a problem-solving method, workshops, analysis of literature and work in the groups	A test, semi-open questions and a practical task; Presentation and defence of the workshops (1-17), presentation of the course work in writing and its

flows, selecting the rational transport route and vehicle combination.	and the needs of freight transport.		verbal defence
	3.2. A student will be able to conclude rational routes by assessing exploitation conditions and country requirements	An involving lecture, a problem-solving method, workshops, discussion, analysis of literature, work in the groups	A test, semi-open questions and a practical task; Presentation and defence of the workshops (1-17), presentation of the course work in writing and its verbal defence
	3.3. A student will be able to select a vehicle combination by assessing technical performance indicators	An involving lecture, a problem-solving method, workshops, discussion, analysis of literature, work in the groups	A test, semi-open questions and a practical task; Presentation and defence of the workshops (1-17), presentation of the course work in writing and its verbal defence
6. A student will be able to analyse problems, related to cargo storage and protection, their solution methods by assessing flows of cargoes and passengers and costs of technological process of transport, as well as to plan an effective work of vehicles.	6.1. A student will be able to conclude a technological process of freight transport.	An involving lecture, a problem-solving method, workshops, discussion, analysis of literature, work in the groups	A test, semi-open questions and a practical task; Presentation and defence of the workshops (1-17), presentation of the course work in writing and its verbal defence
	6.2. A student will be able to calculate and assess technical performance indicators.	An involving lecture, a problem-solving method, workshops, discussion, analysis of literature, work in the groups	A test, semi-open questions and a practical task; Presentation and defence of the workshops (1-17), presentation of the course work in writing and its verbal defence
8. A student will be able to create a technological process of cargo transport and passenger transport by automotive and rail transport, assessing legal regulations	8.1. A student will be able to assess the need for the documents that are necessary in the transport process and know the requirements for the document completion.	A lecture, a situation analysis, workshops, analysis of literature and work in the groups	A test, semi-open questions and a practical task; Presentation and defence of the workshops (1-17), presentation of the course work in writing and its verbal defence
9. A student will be able to work in a multidisciplinary group in a creative and responsible manner, to organise the assigned activities and to deepen its knowledge in the professional activities individually	9.1. A student will be able to prepare a course work, as well as to present and defend it.	Analysis of the information sources, individual work, group work, demonstration, discussions and consultations	Public presentation and defence of the course work

Contents and scope of the subject

Topic name and content description	Number of the contact hours, FT form			Number of the contact hours, PT form			I	Total number of hours
	T	P	C	T	P	C		
1. The basics of creating and realising transport services. Primary definitions; transport service; functional and physical components of a transport system; the influence of roads on the	2	2	-	2	1	1	6	10

transport process; road network in "ArcGIS" platform; the structure of a transport system and peculiarities of activities ***A course project***. Objectives – to analyse peculiarities, related to the organisation of freight transport in a given scenario. To analyse the possible roads of transport.								
2. Cargoes and their properties. Terms of a product and cargoes. Transportation properties of cargo. Classification of cargoes. Volumes of freight transport, their turnover and flows; optimisation of freight flows; formation and accumulation of cargo batches; **Workshop No 1.** Conclusion of cargo characteristics. **Workshop No 2.** Conclusion of a drawing (épure) of freight flows ***An individual work*** – to conclude cargo characteristics for the selected cargo. ***A course project***. Objectives – to analyse the selected cargo according to freight volumes and flows.	4	6	-	2	3	5	6	16
3. Cargo packaging, marking and loading. Cargo packages and containers; cargo packing and marking; cargo protection during transportation; loading technologies; loading technology of intermodal transport. **Workshop No 3.** To determine the necessary amount of pallets and containers. **Workshop No 4.** *Selection of cargo packaging, marking and labelling* ***A course project***, Objectives – to describe cargo marking and properly mark the selected cargo, to describe functions of transport packaging, to describe transport marking, to analyse conclusion of transport packages of cargoes and to describe packing of the chosen cargo.	4	6	1	2	3	6	6	17
4. General technological and organisational aspects of freight transport by using various modes of transport. Impact of globalisation to freight transport by various modes of transport; comparison of modes of freight transport; general principles of technological process of freight transport; participants of freight transport process; freight forwarding. **Workshop No 5.** *Conclusion of technological process of freight transport and characterisation of its participants* ***A course project***. Objectives – to conclude technological processes of freight transport and to characterise it	4	4		1	2	5	6	14
5. Selection of the transport mode for the freight transport. Technological peculiarities of intermodal transport; The easiest method to select transportation method; a complex method to select transportation method; typical spheres of use of different modes of transport. Intermodal terminals and logistics platforms; intermodal transport units.	4			1		3	4	8
6. Road vehicles used for freight transport: Commercial vehicles and trailers; performance characteristics of vehicles; selection of vehicle; tachographs. Terminals of satellite connection. Safety systems. An efficient use of vehicles, taking into account working time, cargo volume, tonnage, time of arrival, as well as control of the costs by applying "ArcGIS" platform. **Workshop No 6.** An efficient use of vehicle combination by organising freight transport ("ArcGIS" platform). **Workshop No 7.** Navigation on "ArcGIS" platform, tracking of	6	6	1	2	4	7	6	19

vehicle locations in real-time, overview of travel history. ***A course project***. Objectives – to analyse vehicles used for freight transport, to select proper and the most suitable vehicle for freight transport, to describe it and reason. To conclude traffic schedule for a given route and to calculate technical indicators of performance.								
7. Routes of freight transport. Selection of a route for road transport, general principles of analysis of the route network, optimisation of the routes, conclusion of the routes by "Microsoft AutoRoute" software. Presentation of "ArcGIS" platform. Solution options for the management of logistics and resources, and their adaptation for the conclusion of the routes. **Workshop No 8.** Conclusion of the routes by using "ArcGIS" platform. ***A course project***. Objectives – to describe classification of the routes, to analyse the principles of conclusion of the routes, to conclude the most optimum route by using "Microsoft AutoRoute" and "ArcGIS" software and to analyse it.	4	4	1	2	2	5	6	15
8. Freight transport technologies of perishable goods. Classification of cargoes; vehicles; legal regulations. **Workshop No 9.** Conclusion of technological process for freight transport of perishable goods. To conclude a route by using "ArcGIS" software.	4	2	1	1	1	5	4	11
9. Freight transport technologies of liquid bulk. Classification of cargoes; vehicles.	2	-	-	1	-	1	4	6
10. Technologies for the carriage of timber. Classification of cargoes; vehicles; legal regulations.	2	-	-	1	-	1	4	6
11. Technologies for the carriage of animals. Classification of cargoes; vehicles; legal regulations. **Workshop No 10.** Conclusion of technological process for carriage of animals. To conclude a route by using "ArcGIS" software.	2	2	1	1	1	3	4	9
12. Freight transport technologies of bulk and/or heavy lift cargoes. Classification of cargoes; vehicles; legal regulations. **Workshop No 11.** Conclusion of technological process for freight transport of bulk and/or heavy lift cargoes. To conclude a route by using "ArcGIS" software.	4	2	1	1	1	5	6	13
13. Freight transport of dangerous goods. Classification of cargoes; vehicles; legal regulations. **Workshop No 12.** Identification of dangerous goods and their preparation of transportation	6	4	-	1	2	7	4	14
14. 6. Securing of freight. Rules for arrangement and securing of freights, carried by road transport **Workshop No 13.** Planning of cargo arrangement ***A course project***. Objectives – to analyse the possibilities of cargo fastening in vehicle, to describe the possibilities of fastening of the chosen cargo.	4	4	1	2	2	6	6	15
15. Freight transport by road transport. Factors determining carriages by road transport; classification of carriages by road transport; organisation of freight transport by roads; indicators of transport process; types of carriers and their selection; shipment documents and their completion; planning of service areas by "ArcGIS" software. **Workshop No 14.** Planning of distribution of manufactured production for customers by applying "ArcGIS" software. **Workshop No 15.** Distribution of order points for many vehicles by applying "ArcGIS" software.	8	10	2	2	6	12	10	30

A course project. Objectives – to conclude a list of the necessary documents and to determine aspects of their completion.								
16. Freight transport by railway transport. Classification of carriages by railway transport; railway vehicles; organisation of freight transport by rail. **Workshop No 16.** Conclusion of technological process of freight transport by railway transport	2	2		1	1	2	6	10
17. Freight transport by maritime transport. Material-technical basis of maritime transport; classification of carriages, performed by maritime transport; technology of freight transport by maritime transport. **Workshop No 17.** Conclusion of technological process of freight transport by maritime transport	6	4	1	1	2	8	6	17
18. Freight transport by air transport. Technology of freight transport by air transport; air transport; regulation of air transport activities; air transport documentation.	2			1		1	6	8
19. Customs procedures. The concept and general characteristics of customs procedures; bringing of goods into the customs territory of the Community; performance of customs procedures.	6			2		4	6	12
20. Urban freight transport. Planning of employees' time, analysis and optimisation by applying "ArcGIS" platform	4			1		3	4	8
Preparation for defence of a course work	-	2	-	-	1	1	10	12
Total number of hours	**80**	**60**	**10**	**28**	**32**	**90**	**120**	**270**

Assessment system of results of the subject studies

Assessment criteria of results of the study subject
A student will sort the organisational stages of technological process of freight transport by assessing modes and methods of transport.
By concluding technological process of freight transport, a student assesses structure of a transport system, its elements and interoperability.
A student determines volumes and turnover of freight transport, as well as justifies factors, influencing cargo disparity and the needs of freight transport.
A student concludes rational routes by assessing exploitation conditions and country requirements.
A student selects vehicle combination, as well as calculates and assess technical performance indicators.
A student concludes technological process of freight transport for various cargoes by applying various methods of transport.
A student selects documents that are necessary for the transport process and correctly completes them.

Procedure of evaluation

A ten-point criterial grading system and cumulated grading are applied.

$$\textbf{IKV} = \sum_i^n x_i \times k_i \ ,$$

Where:
n – number of interim assessments,
Xi – evaluations for interim assessments and examination,
ki – weighted coefficients of interim assessments and examination.

$$\textbf{IKV} = X_1 \cdot 0.2 + X_2 \cdot 0.3 + X_3 \cdot 0.3 \ X_4 \cdot 0.2,$$

Where:
$\mathbf{X_1}$ – grading average (0.2) of 3 tests;
$\mathbf{X_2}$ – grading average (0.3) of 17 practical works;
$\mathbf{X_3}$ – content of a course work (0.3);
$\mathbf{X_4}$ – verbal presentation of a course work (0.2).

Recommended literature and other information sources

Primary literature and information sources

No	Literature and information sources	Number of copies	
		At the library of the Faculty of Technologies	At other libraries of Klaipeda State University of Applied Sciences
1.	Baublys A. (2002) *Krovinių vežimai*. Vilnius „Technika“	10	-
2.	Bazaras D., A.V. Vasiliauskas (2010). *Krovinių vežimo technologijos.* Vilnius „Technika“	10	-
3.	Jaržemskis A., Jaržemskis V. (2014) *Krovininis transportas.* Vilnius „Technika“	E-book	-
4.	Lowe,D. (2005). *Intermodal Freight Transport.* Oxford: Elsevier.	1	-
5.	Palšaitis R. (2011). *Tarptautinio verslo. Tarptautinis logistinis aptarnavimas.* Vilnius „Technika“	10	-
6.	Vasiliauskas A. V. (2013). *Krovinių vežimo technologijos.* Vilnius „Technika“	E-book	
7.	Молокович А.Д. (2014). *Транспортная логистика*. Минск “Издательство Гревцова”.	1	-

Additional literature and information sources	
No	**Literature and information sources**
1.	Baublys A (1996) *Transporto sistema*. Vilnius “Technika”
2.	Baublys A. (1996) *Transporto politika*. Vilnius “Technika”
3.	Baublys A. Vasilis V.(2005), *Transporto infrastruktūra*. Vilnius „Technika“
4.	Jurkauskas A. (2005) *Viešasis transportas*. Kaunas „Technologija“
5.	Jurkauskas A. (1996) *Transporto raida Lietuvoje*. KTU
6.	Minalga R. (1998) *Krovinių transporto sistema*. Vilniaus universiteto leidykla

Description of the subject was prepared by:

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