# Syllabus of the elective component

# **Interaction of Transport Modes**

Discipline	Interaction of Transport Modes
Higher education level	first (bachelor's degree)
Moodle course web-page	https://dl.khadi.kharkov.ua/course/view.php?id=126
Educational component volume	4 credits (120 hours)
Final control form	test
Consultations	according to the schedule
Department	Transport Systems and Logistics Department
Language of teaching	English
Course leader	Kovtsur Kateryna, PhD, Associate Professor
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# The educational component summary:

**The purpose is** development of practical skills for solving production functions and typical tasks of activity in the field of organization of transport and transshipment processes during the delivery of goods in mixed connections.

The subject of the study is an adapted system of concepts regarding the principles of organizing the interaction of transport modes to optimize the process of goods and passengers transportation and patterns of influence of internal and external factors on the efficiency of the transport systems functioning.

# The main tasks of an academic discipline are:

- formation of skills regarding the organization of the interaction of transport modes to optimize the process of goods and passengers transportation;

- presentation of influence patterns of internal and external factors on the functioning of transport systems efficiency;

- explanation of the choice of cargo and passenger transportation technology;

- explanation and use of modern approaches to modeling the process of various transport types interaction;

- solving issues of operational management of interaction processes at transport hubs and docking points.

# Prerequisites for studying the educational component:

Higher mathematics, probability theory and mathematical statistics.

# Competencies acquired by the applicants:

# General competences:

- skills in using information and communication technologies;
- ability to develop and manage projects;
- ability to work autonomously and in a team;

- knowledge and understanding of the subject area and understanding of professional activity.

#### Special (professional) competences:

- the ability to organize and manage loading and unloading operations and warehouse operations on road transport;

- the ability to organize and manage the transportation of goods by road transport;
- the ability to organize the interaction of transport modes;
- the ability to design transport (transport-production, transport-warehousing) systems

and their elements;

- the ability to evaluate the operational, technical and economical, technological, legal, social and environmental components of the transportation organization;

- the ability to organize international transportation;

- the ability to evaluate plans and proposals regarding the organization and technology of transportation made by other subjects, and to make the necessary changes based on the technical and operational parameters and principles of operation of objects and devices of the transport infrastructure, vehicles

- the ability to use modern information technologies, automated control systems and geo-information systems during the transportation process organization.

#### Training results:

- apply and use modern information and communication technologies to solve practical tasks related to the organization of transportation and design of transport technologies;

- research transport processes, experiment, analyze and evaluate the parameters of transport systems and technologies;

- find solutions for rational methods of organizing loading and unloading operations. Plan schedules for loading and unloading operations. Choose mechanisms and means of loading and unloading operations;

- organize and manage the transportation of goods in various connections. Choose the type, brand, type of vehicles and traffic routes. Monitor the progress of transportation;

- choose effective technologies for the interaction of transport modes. Analyze the possibilities of using various options for the interaction of transport modes;

- research kinds and types of transport systems. Find solutions for optimization of the transport systems parameters. Assess the efficiency of the infrastructure and the technology of the functioning of transport systems;

- organize international transportation. Apply customs documentation processing methods. Use of customs control methods;

- recognize the qualitative and quantitative indicators of the operation of vehicles. Evaluate the design elements of vehicles. Establish a connection between the design elements of vehicles;

- choose information systems for the organization of transportation. Operate automated control systems and navigation systems in the transportation process. Use electronic cards.

	Theme (L, PW, SEW)		hours	
Theme Nº			part-	
			time	
			training	
	L. Organization of interaction between of transport modes	2	1	
1	PW. Determination of the sphere of rational use of various	2	_	
	transport types		-	
	L. Evaluation of the interaction of transport networks and nodes	2	1	
	L. Organization of technical and technological interaction of	2	_	
	transport modes		_	
	SEW. Prospects for the transportation development in mixed		20	
	traffic. Resource provision of transportation	10	20	
	L. Coordination of transport and technical means characteristics	4	1	
2	SEW. Increasing the level of consistency of transportation means.			
	The influence of statistical characteristics of the transport system	10	20	
	on its carrying capacity.			
	L. Coordination of the transport facilities capacity and routes	2	1	
	PW. Capacity of transport network elements.	4	2	

#### Thematic plan

			hours	
Theme Nº			part-	
		time	time	
		training	training	
	L. Methods of organisation of the transportation hub.	4	1	
	PW. Processing capacity of the container site	2	-	
	CP. Experience of transport nodes. Methods of determining the	10	20	
	load of transport nodes on the network			
	L. Cargo transhipment using direct technology	2	1	
3	PW. Cargo transhipment by direct option	2	-	
Ŭ	L. A single technological process of various transport types	2	-	
	operation			
	SEW. Lechnical equipment of specialized sections of the cargo		15	
	yard. I ransport and production systems of cargo delivery.	10		
	Optimization of the number of loading and unloading			
	mechanisms.	2		
	L. Evaluation of the interaction of transport networks and nodes	2	-	
	Pw. Optimization of the vehicle processing queue	2	2	
	L. Development of measures to improve transport networks and	2	-	
1	DW Patianalization of cargo delivery and processing schemes			
4	with distribution between transport modes	2	-	
	SEW Transport podes on the transport network of the country			
	and regions classification of transport nodes principles of their	17	15	
	construction and development		10	
	L. Transportation technology in a mixed connection	2	2	
5	PW. Optimization of transport flow maintenance processes in	_	_	
	transport hubs	2	-	
	L. Development of a joint cargo delivery schedule	4	2	
	L. Economic, legal, and informational support for transportation in	•		
	mixed traffic	2	-	
	SEW. Norms of the technological process. Complex transport	10	16	
	service for shippers and consignees	10	10	
Sum	L	32	10	
	PW	16	4	
	SEW	72	106	
	120	120		

# **Teaching methods:**

1) verbal: traditional: lectures, explanations, talks, etc.;

2) visual: illustration method, demonstration method

3) practical (traditional): practical classes, group tasks.

# **Evaluation system and requirements:**

# Ongoing achievements

**1** The applicants' ongoing achievement in the performance of the both educational activities and self-education work while training is evaluated using a four-point scale with the further conversion into the 100-point scale. While evaluating all kinds of works provided by the educational program are taken into account.

**1.1** Lectures are evaluated by determining the quality of specific tasks performance.

**1.2** Practical classes are evaluated by the quality of performance of the tests or individual tasks, execution and design of the report on practical works.

**2** The final evaluation of the discipline is determined as a sum of points on:

- passed standard tests, verbal questioning, attendance and communication activity level;

- in-class practical tasks execution and theoretical preparation.

Applicants' evaluation score scale according to the ongoing control is given in table1.

 Table 1 – Points distribution under the themes defining a final test score according to the discipline ongoing assessment

Ongoing Assessment				Discipline total score	
Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	100
20	20	20	20	20	

# **Final estimation**

**1** The final test score is got by the applicant at the last double-lesson according to the discipline ongoing assessment. The condition to pass the test is not less than 60 points score.

**2** Higher education applicants who have an ongoing assessment score less than 60 points can increase it at the last class by taking a combination of written and oral tests that comprise both answering 2 professionally-oriented question and a problem solution with further commenting the work done or standard tests. The applicants who made the tasks previewed by the practical classes are allowed to pass the final test.

3 Extra-points are awarded to the applicants for participation in scientific events.

**3.1** Extra-points are added to the achieved sum of points by the higher education applicant for the current educational activity.

**3.2** The number of extra-points awarded for different types of individual tasks depends on their volume and importance:

- discipline prize-winning places on the at the international / all-ukrainian competition of scientific students' works - 20 points;

- discipline prize-winning places at all-Ukrainian olympiads - 20 points;

- participation in the international / all-Ukrainian competition of scientific students' works - 15 points

 participation in international / all-Ukrainian scientific conferences of students and young scientists – 12 points;

– participation in all-Ukrainian discipline competitions – 10 points

 participation in KhNAHU discipline competitions and scientific conferences – 5 points;

– implementation of individual scientific and research (educational and research) tasks of increased complexity – 5 points.

**3.3** The number of extra points might not exceed 20 points.

**4** The result of the study is evaluated on a two-point scale (passed/failed) according to table 2. The total score comprising the extra-points might not exceed 100 points.

According to 100-point scale	According to the national scale		
between 60 scores and 100 scores	Passed		
Less than 60 scores	Failed		

# **Table 2** – Conversion of the score into national evaluation system

# **Course policy:**

- the course involves working in the team, the environment in the audience is friendly, creative, open to constructive criticism;

-the discipline requires mandatory attendance of lectures and practical classes, as well as self-education work;

- self-education work involves studying certain discipline themes, which are submitted in accordance with the program for self-education work, or have been considered briefly;

 – all the tasks provided by the program must be completed within the prescribed timeframe; - if the higher education applicant is absent for valid reasons, he/she passes the completed tasks during the self-education work and consultations provided by the teacher;

while studying the course, higher education applicants should follow the rules of academic integrity set out in such documents: «Rules of academic integrity of participants of the KhNAHU Education process» (https://www.khadi.kharkov.ua/fileadmin/P\_Standart/pologeniya/stvnz\_67\_01\_dobroch\_1.p df), «Academic integrity. The text check of academic, scientific and qualification works for the plagiarism»

(https://www.khadi.kharkov.ua/fileadmin/P\_Standart/pologeniya/stvnz\_85\_1\_01.pdf), «Moral and ethical code of participants of the KhNAHU educational process»

(https://www.khadi.kharkov.ua/fileadmin/P\_Standart/pologeniya/stvnz\_67\_01\_MEK\_1.pdf). – in case of detecting the plagiarism, the applicant receives 0 points for the task and

must retake the tasks provided in the syllabus;

- cheating during control works and examinations is prohibited (including mobile devices). Mobile devices are only allowed to be used during online testing.

# **Recommended literature:**

1. Соловйова О. О. Загальний курс транспорту : навч. посібник / О.О. Соловйова, І. І. Висоцька, І. М. Герасименко. К. : НАУ, 2019. 244 с.

2. Aleksander Sładkowski. Modelling of the Interaction of the Different Vehicles and Various Transport Modes. – Lecture Notes in Intelligent Transportation and Infrastructure. – Silesian University of Technology Katowice, Poland, 2020. 527 p.

3. Sultana S., Weber J. Minicars, Maglevs, and Mopeds: Modern Modes of Transportation around the World. Santa Barbara, CA: ABC-CLIO. 2017. 380 p.

4. He Z. et al. Robustness assessment of multimodal freight transport networks. *Reliability. Engineering & System Safety*, 2021. 207, 107315, https://doi.org/10.1016/j.ress.2020.107315.

5. The International Transport Forum. Mode Choice in Freight Transport, ITF Research Reports, OECD Publishing, Paris. 2022. p.86.

6. Ковцур К.Г. Теоретичні основи формування стратегій розвитку транспортних систем / К.Г. Ковцур, Н.В. Пономарьова // Комунальне господарство міст. Науковотехнічний збірник. Серія: Технічні науки та архітектура. Випуск 142, ХНУМГ ім. Бекетова, 2018. С.91-95.

7. Kramberger T. Sustainable logistics and strategic transportation planning. *IGI Global.* 2016. 511 p.

8. Rodrigue, Jean-Paul. Transport modes and globalisation. In: Vickerman, Roger (eds.). International Encyclopedia of Transportation. UK: Elsevier, 2021. vol. 5, pp. 38-44.

# Additional sources:

1. Дистанційний курс з дисципліни «BBT». URL: http://dl.khadi.kharkov.ua/enrol/ index.php?id=126

2. Українська залізниця. URL: http://uz.gov.ua.

3. Державне агентство автомобільних доріг України. URL: <u>https://ukravtodor.gov.ua/</u>.

4. Incoterms 2020 : Official website of International chamber of commerce. URL: <u>https://iccwbo.org/resources-for-business/incoterms-rules/incoterms-2020/</u>

5. Адміністрація одеського морського порту. URL: <u>http://www.port.odessa.ua/</u>.

6. Міністерство інфраструктури України. URL: <u>https://mtu.gov.ua/</u>.

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