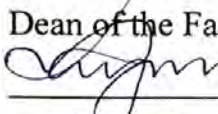


MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
NATIONAL AVIATION UNIVERSITY
 Faculty of Architecture, Civil Engineering and Design
 Computer Technologies of Airport Construction and Reconstruction
 Department

AGREED
 Dean of the Faculty

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 « 28 » 10 2022

APPROVED
 Vice Rector for Academics

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 « 01 » 11 2022



Quality Management System


COURSE TRAINING PROGRAM
 on
"Urban Planning and Transport"

Educational-Professional Program: «Industrial and Civil Engineering»
 Field of study: 19 «Architecture and Construction»
 Specialty: 192 «Building and Civil Engineering»

Form of training	Sem.	Total (hours/ ECTS credits))	Lec.	Prac.	Lab.	Self-study	Homeworks control works	CP / TP	Form of control
Full-time	3	135 / 4,5	17	51	–	67	–	TP -3s	Examination 3 rd semester
Part-time	–	–	–	–	–	–	–	–	–

Indices: CB-5-192-1/21-2.1.8

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The Course Training Program on “Urban Planning and Transport” is developed on the basis of the Educational-Professional Program “Industrial and Civil Engineering”, Bachelor Curriculum and Extended Curriculum № CB-5-192-1/21, № ECB-5-192-1/21 for training higher education seekers of the Bachelor degree of specialty 192 "Building and Civil Engineering" and corresponding normative documents.

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Master copy

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INTRODUCTION

The Course Training Program of the academic discipline "Urban Planning and Transport" was developed on the basis of the "Methodological recommendations for the development and execution of the syllabus of educational discipline of full-time and part-time forms of training", approved by rector's order № 249/roz. of 29.04.2021 and relevant regulatory documents.

1. EXPLANATORY NOTE

1.1. Role, goal and objectives of the academic discipline


The role of the discipline in the field of science and the system of professional training.

This academic discipline is the theoretical and practical basis of a set of knowledge and skills that form the profile of a specialist in the field of construction and civil engineering.

The goal of teaching the discipline is the formation of an urban worldview in students, the disclosure of modern scientific concepts, concepts, methods, necessary for solving professional engineering and scientific problems of choosing plots for development, rational placement of functional zones, mastering the basics of designing residential areas of the city, industrial territory, street and highway network, landscape and recreation area, as well as engineering and transport facilities, which will allow future specialists to apply the acquired knowledge and skills to create a full-fledged, comfortable environment for human life.

The objectives of the discipline are:

- mastering modern principles and methods of planning and development of the territory of settlements;
- master the typology and classification of settlements;
- study of problems and trends of development and construction of cities;
- study of the functional organization of the city territory;
- familiarization with the planning structure of the industrial area of the city and individual industrial complexes;
- familiarization with the features and principles of placement of zones and structures of external transport in the territory of cities;
- familiarization with planning schemes of the street network of the city.

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1.2. Educational outcomes of the academic discipline


As a result of studying the discipline, the applicant of higher education acquires: PLO5 – Use and develop technical documentation at all stages of the life cycle of construction products. PLO7 – Perform data collection, interpretation and application, including through the search, processing and analysis of information from various sources. PLO9 – Design building structures, buildings, structures and engineering networks, taking into account engineering and resource-saving measures, legal, social, environmental, technical and economic indicators, scientific and ethical aspects, and modern requirements of regulatory documentation in the field of architecture and construction, environmental protection and labor safety. PLO11 – Demonstrate an understanding of the design principles of urban areas and infrastructure. PLO12 – Have in-depth cognitive and practical skills/attainments, mastery and innovation at the level necessary to solve complex specialized tasks in the field of construction and civil engineering. PLO17 – Mastering work skills to work effectively independently (course and diploma design) or in a group (laboratory classes, including leadership skills in their implementation), the ability to obtain the desired result in a limited time with an emphasis on professional integrity and the exclusion of plagiarism.

1.3. Competencies obtained through the academic discipline

According to the content of the discipline, the applicant of higher education must be able to professionally assign possible options for the organization of the territory of settlements based on a comprehensive solution of socio-economic, sanitary-hygienic, engineering and technical problems in urban planning, reasonably choose appropriate solutions for the development of residential, industrial, landscape and recreational areas, design of street and road network, transport infrastructure of the city; use standard reference and scientific and technical literature; carry out the necessary calculations of the economic efficiency of project decisions; execute and read urban planning documentation.

IC. The ability to solve complex specialized tasks and practical problems in the field of construction or in the learning process, which involves the application of theories and methods of determining the strength, stability, durability, reliability and safety of buildings and structures; application of information technologies, software complexes, automated design systems.

General competences (GC): GC2 – Knowledge and understanding of the subject area and professional activity. GC5 – Ability to use information and communication technologies. GC6 – Ability to independently acquire knowledge

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by searching, processing and analyzing information from various sources. GC7 – Interpersonal skills. GC10 – Ability to save and multiply moral, cultural, scientific values and achievements of society based on understanding the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and technology, use different types and forms of physical training for active leisure and leading a healthy lifestyle.

Professional competences (PC): PC2 – Ability to critically understand and apply basic theories, methods and principles of economics and management for rational organization and management of construction production. PC3 – Ability to design building structures, buildings, structures and engineering networks (according to specialization), taking into account engineering and resource-saving measures, legal, social, environmental, technical and economic indicators, scientific and ethical aspects, and modern requirements of regulatory documentation in the field of architecture and construction, environmental protection and labor safety. PC4 – Ability to choose and use appropriate equipment, materials, tools and methods for designing and implementing technological processes of construction production. PC6 – Ability to perform engineering activities in the field of construction, compilation and use of technical documentation. PC7 – Ability to take responsibility for developing and making decisions in the field of architecture and construction in unpredictable work contexts. PC8 – Awareness of the principles of designing countryside territories.

1.4. Interdisciplinary links


This discipline is based on the knowledge of such disciplines as "Higher Mathematics", "Introduction to Civil Engineering", "Engineering Graphics" and is the basis for studying further disciplines, namely: "Engineering Geodesy", "Architecture of Buildings and Structures", "Construction Economics", "Organization of Construction", "Water Supply and Drain", "General Planning of Airports", "Highway Design".

2. PROGRAM OF THE ACADEMIC DISCIPLINE

2.1. Content of the academic discipline

The educational material of the discipline is structured on a modular basis and consists of three educational modules, namely:

- **educational module 1** "Planning and development of territories";

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- **educational module 2**"Transport system of the city", each of which is a logically complete, relatively independent, integral part of the discipline, mastering which involves a modular test and results analysis.

A separate third module (educational component EC39) is a Term Paper that is completed in the third semester. TP is an important component of consolidation and deepening of theoretical and practical knowledge and skills acquired by students in the process of mastering the educational material of the discipline "Urban Planning and Transport".

2.2. Module structure and integrated requirements for each module

Module №1 “Planning and development of territories”


Integrated requirements for module 1:

Know:the basic principles of planning and development of urban areas; typology and classification of settlements; spatial planning organization of urban areas; problems and trends in the development of the urban environment; peculiarities of planning and construction of residential and industrial territories; peculiarities of the development of urban and non-urban green areas and social infrastructure in settlements; the regulatory framework for planning and development of the territories of settlements; environmental conditions of urban planning.

Be able to:apply theoretical knowledge to develop a master plan of the city and other urban planning documentation; analyze and determine the influence of natural and climatic factors on the planning and development of urban areas; carry out calculations to determine the optimal size of functional areas of the city; to determine the prospective population of the city; analyze and evaluate the architectural and planning structure of the city; analyze and evaluate the social planning structure of the city; form, plan and develop production areas; determine the need and calculate the sizes of sanitary protection zones; calculate the required area of communal, warehouse, landscape and recreational areas.

Topic 1. Typology and classification of cities.

The importance of the "Urban Planning and Transport" course, its features and connection with other disciplines. Types of settlements and their classification. Analysis of settlements by population. Characteristics of settlements according to administrative and political significance. Division of cities according to the nature of functions. The main problems and prerequisites of urban development. Determination of prospects for the development of the city. The population of the city. Determination of the prospective population of cities. Legislative and

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regulatory framework for city planning and development. General plan of the city. Urban planning analysis of the territory. The influence of natural and climatic factors on the planning and construction of cities. Geomorphological conditions. Hydrogeological conditions. The influence of resource limitations on the conditions of city development. Assessment of the temperature regime of the territory. Assessment of the wind regime of the area.

Topic 2. Spatial planning organization of the territory of the settlement.

Urban organization of the territory of the settlement. Functional-planning structure of the city. Social-planning structure. Residential group. Principles of forming microdistricts. Residential area. Formation of planning districts of the city. Architectural-planning structure. Requirements for placement and design of urban and rural settlements.

Topic 3. Residential territory.

Peculiarities of residential area planning. Zone of residential development. Apartment building. Manor buildings and individual residential buildings. Blocked residential buildings. Public building zone. City center. Calculation of the distribution of the residential area. Determination of the area of the residential territory of the city.

Topic 4. Location and structure of the industrial area of the city.

Industrial zone of the city. The importance of industry in the formation of a city plan. General information about the industrial zone: classification of enterprises according to harmfulness, their location in the city. Sanitary-protective zones. Scientific and scientific-industrial zone. Utilities and organizations. Principles of formation of industrial districts. Calculation of the area of the sanitary-protective zone of the city. Calculation of the area of the communal zone of the city. Zone of agricultural production areas.


Topic 5. Landscape and recreational territory.

Urban development significance of green spaces. Green system of the city territory. Schemes of urban landscaping structures. Classification of green spaces. Green spaces for public use. Green areas of limited use. Special purpose green spaces. City parks. Calculation of the necessary green spaces of urban areas. Resort areas.

Module №2 “Transport system of the city”

Integrated requirements for module 2:

Know: types, classification and features of the operation of external transport; main types of urban communication routes; main characteristics of the network of streets and roads of settlements; main characteristics and classification of urban transport; peculiarities of the influence of transport on the planning and

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development of cities; basic principles and rules of operation of the transport system of cities.

Be able to: determine the density of the city's street, road and transport network; to divide the city territory into transport districts; to forecast the volume of passenger traffic between transport districts of the city; design the city transport network and the system of public transport routes in the city; calculate passenger correspondence between city districts; to develop a route scheme of city passenger transport; to select and substantiate the expediency of the operation of the appropriate type of urban passenger transport.

Topic 1. The territory of external transport of cities.

Types and classification of external transport. Railway transport, buildings and structures of railway transport. Motor transport, buildings and constructions of motor transport. Water transport, sea and river ports. Airports and airfields. Peculiarities of location of airports on the territory of cities.

Topic 2. Ways of communication in settlements.

Classification of urban roads. Street and road network. Classification of streets and roads of settlements. Transverse profiles and main elements of city streets. Classification of areas of settlements. Parking lots. Crossing of streets and roads. Railway tracks. Determination of the density of the street and road network of cities. Pedestrian crossings and public transport stops.

Topic 3. City transport.


General information about city transport, its meaning. Transport capacity. Classification of urban transport. Metro, city railway, monorail transport, tram, trolleybus, bus. Individual passenger transport. Mobility of the urban population. Division of the city territory into transport districts. Calculation of the main characteristics of passenger formation in districts. Determination of the average distance of movement of city residents. Construction of mass passenger transport network. Calculation of the number of passenger transport routes in the city.

Module № 3 Term Paper (TP)

Term Paper (TP) is performed in the third semester, in accordance with the approved guidelines in order.

The purpose and goals of the TP are to develop a scheme of the city's general plan, to acquire practical skills taking into account the factors that influence the choice of territory for the placement of certain functional zones in the settlement, to make rational and optimal decisions on zoning and planning of the city's territory, technical economic substantiation of the effectiveness of the adopted planning decisions and solving the issue of providing the city population with the necessary system of providing transport services.

Applicants of higher education perform TP in accordance with the approved guidelines in order to consolidate and deepen the theoretical knowledge and skills

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acquired by the student in the process of mastering all the material of the discipline in the field of planning and development of settlements, which are used in further when studying many subsequent disciplines of professional training of a specialist in building and civil engineering.

Completion of the TP is an important stage in preparation for participation in student conferences, implementation of course projects and works by future civil engineers.


The specific purpose of the TP is contained in the development of project solutions for the planning of the city territory in order to ensure the necessary measures regarding the location of the functional zones of the city and their possible development, the organization and placement of the city-wide center and other structural elements of the city, the selection of the optimal planning scheme of the street-road network, the determination of the necessary transport system of the city necessary for the organization of the transportation of goods and passengers, determining the needs of the rolling stock of passenger transport and establishing its type. At the same time, the tasks differ among themselves in terms of options.

For the successful implementation of the TP, the student must know the basics of planning and development of settlements; be able to calculate and rationally place the necessary areas of functional zones of the city, determine the required number of vehicles and the features of laying public passenger transport routes.


The time required to perform the TP is up to 30 hours of individual work.

2.3. Thematic plan of the academic discipline

№	Topic	Academic hours								
		Full-time study				Part-time study				
		Total	Lectures	Pract. classes	Self-study	Total	Lectures	Pract. classes	Self-study	
1	2	3	4	5	6	7	8	9	10	
Module №1 “Planning and development of territories”										
1.1	Typology and classification of cities	3 semester				3 semester				
		3	2	-	1	-	-	-	-	
1.2	Legislative and regulatory framework for city planning and development	3	-	2	1	-	-	-	-	
1.3	The population of the city. Determination of the prospective population of cities	3	-	2	1	-	-	-	-	
1.4	General plan of the city and detailed plan of territories	3	-	2	1	-	-	-	-	

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1.5	Spatial planning organization of the territory of the settlement.	3	2	-	1	-	-	-	-
1.6	Urban planning analysis of territories	3	-	2	1	-	-	-	-
1.7	Assessment of the temperature regime, air humidity and precipitation in the territory. Assessment of the wind regime of the area	3	-	2	1	-	-	-	-
1.8	The influence of resource limitations on the conditions of urban development	3	-	2	1	-	-	-	-
1.9	Residential territory	3	2	-	1	-	-	-	-
1.10	Features of urban traffic	3	-	2	1	-	-	-	-
1.11	Calculation of the area of the territory for the placement of a multi-apartment residential building	3	-	2	1	-	-	-	-
1.12	Determination of the area of the residential territory of the city	3	-	2	1	-	-	-	-
1.13	Location and structure of the industrial area of the city	3	2	-	1	-	-	-	-
1.14	Principles of formation of industrial districts. Calculation of the area of the sanitary protection zone of the city	3	-	2	1	-	-	-	-
1.15	Calculation of the area of the communal zone of the city	3	-	2	1	-	-	-	-
1.16	Zone of agricultural production areas	3	-	2	1	-	-	-	-
1.17	Landscape and recreational territory	3	2	-	1	-	-	-	-
1.18	Determining the area of the landscape and recreational area of the city	3	-	2	1	-	-	-	-
1.19	Resort and recreational areas	3	-	2	1	-	-	-	-
1.20	City parks	3	-	1	2	-	-	-	-
1.21	Module test №1	3	-	1	1	-	-	-	-
Total for Module №1		62	10	30	22	-	-	-	-
Module №2 "Transport system of the city"									
2.1	The territory of external transport of cities	3 semester							
		3	2	-	1	-	-	-	-
2.2	Calculation of the area of the territory of the external transport zone	3	-	2	1	-	-	-	-
2.3	Peculiarities of placement of external transport facilities on the territory of cities	3	-	2	1	-	-	-	-
2.4	Development of the scheme of the master plan of the city	3	-	2	1	-	-	-	-

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2.5	Communication routes in populated areas	3	2	-	1	-	-	-	-
2.6	Development of a cross profile of a city street	3	-	2	1	-	-	-	-
2.7	Peculiarities of the formation of transport districts in the territory of cities	3	-	2	1	-	-	-	-
2.8	Main elements of streets and roads of settlements	3	-	2	1	-	-	-	-
2.9	Public transport	5	3	-	2	-	-	-	-
2.10	Calculation of the number of passenger transport routes in the city	3	-	2	1	-	-	-	-
2.11	Choosing a type of city passenger transport	3	-	2	1	-	-	-	-
2.12	Calculation of the main characteristics of passenger formation of districts in the city	3	-	2	1	-	-	-	-
2.13	Comprehensive scheme of transport	3	-	2	1	-	-	-	-
2.14	Module test №2	2	-	1	1	-	-	-	-
Total for Module №2		43	7	21	15	-	-	-	-
Module № 3 Term Paper									
3.1	Functional and planning organization of the territory of the settlement	30	-	-	30	-	-	-	-
Total for Module №3		30	-	-	30	-	-	-	-
Total for Academic Discipline		135	17	51	67	-	-	-	-

2.4. List of questions for exam and final test

The list of questions and the tasks to prepare for the exam are developed by the teacher of the department in accordance with the work program and communicated to the students.

3. TRAINING MATERIALS FOR THE DISCIPLINE

3.1. Teaching Methods

When studying the discipline, the following teaching methods are used:


- explanatory-illustrative method;
- method of problem statement;
- reproductive method.

The implementation of these methods is carried out during lectures, demonstrations, independent work, work with educational literature.

3.2. Recommended literature

Basic literature

3.2.1. [Дідик В. В.](#) Планування міст Підручник/[Дідик В. В.](#), [Павлів А. П.](#)- Львів: Видавництво Львівської політехніки, 2006. 412 с.

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3.2.2. Безлюбченко О.С. Планування міст і транспорт: Навчальний посібник /[О.С. Безлюбченко, С.М. Гордієнко, О.В. Завальний](#). – Харків: ХНАМГ, 2006. – 138 с.

3.2.3. Поліщук В. П. Транспортне планування міст / В. П. Поліщук, О. В. Красильнікова, О. П. Дзюба. – Київ: Знання України, 2014. – 371 с.

3.2.4. Лобашов О. О. Конспект лекцій з курсу "Транспортне планування міст" / О. О. Лобашов. – Харків: ХНАМГ, 2011. – 31 с.

3.2.5. Рейцен Є. О. Організація і безпека міського руху: навчальний посібник / Є. О. Рейцен. – Київ: ТОВ «СІК ГРУПІ Україна, 2014. – 454 с.

Additional literature

3.2.6. Панченко Е., Дьомін М. та ін. Містобудування. Довідник проектування. К.: Укрархбудінформ, 2001. – 188с

3.2.7. ДБН Б.2.2-12:2019 Планування і забудова територій. – К.: МінрегіонУкраїни, 2019. – 179 с.

3.2.8. ДБН В.2.3-5-2018. Вулиці та дороги населених пунктів. – К.: МінрегіонУкраїни, 2018. – 55 с.

3.2.9. ДСТУ-Н Б В.1.1-27:2010 «Будівельна кліматологія» К.: МінрегіонбудУкраїни, 2011.- 123 с.

3.2.10. Степанчук О.В. Планування міст і транспорт: Методичні рекомендації до виконання курсового проекту для студентів напряму підготовки 192 «Будівництво та цивільна інженерія» / Уклад. О.В. Степанчук, О.І. Пилипенко. К.: НАУ, 2019. - 48 с.

3.2.11. Pylypenko O. Urban planning and transport: Term Paper Method Guide for students of speciality 192 "Construction and Civil Engineering" / O. Pylypenko, O. Stepanchuk. – Kyiv: NAU, 2019. – 36 с.

3.2.12. Степанчук О. В. Проектування вулично-дорожньої мережі міст: практикум / уклад.: О. В. Степанчук, С. Ю. Тімкіна, А. В. Вишневська. – Київ : НАУ, 2020. – 40 с.

3.3. Internet information resources


3.3.1. <https://er.nau.edu.ua/handle/NAU/23294>

3.3.2. <http://www.lib.nau.edu.ua>

3.3.3. <https://er.nau.edu.ua/bitstream/NAU/23294/7/09%20KR%20PMT.pdf>

3.3.4. <https://studfile.net/preview/5025649/>

3.3.5. <https://dbn.co.ua/> Державні будівельні норми України

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4. RATING SYSTEM OF KNOWLEDGE AND SKILLS ASSESSMENT

4.1. Evaluation of certain types of work done by students of the points made in accordance with Table 4.1.


Table 4.1.

Kind of Academic Activities	Maximum Grade		Kind of Academic Activities	Maximum Grade	
	Full-time study	Part-time study		Full-time study	Part-time study
semester 3					
Module №1 “Planning and development of territories”			Module №2 “Transport system of the city”		
Individual tasks	25	–	Carrying out practicals	25	–
<i>For carrying out a module test 1 a student must receive not less than</i>	15	–	<i>For carrying out a module test a student 2 must receive not less than</i>	15	–
Carrying out a module test №1	15	–	Carrying out a module test №2	15	–
Total for module №1	40	–	Total for module №2	40	–
Total for modules №1, №2				80	–
Semester examination				20	–
Total for academic discipline				100	
Module №3					
Kind of Academic Activities			Maximum Grade		
			Full-time study		
Performance of a Term Paper			60		
Defense of a Term Paper			40		
Performance and defense of a Term Paper Project			100		

4.2. A student is considered to have passed the module if both his/her Current Module Grade and Module Test Grade are positive .

4.3. The sum of the Current Semester Module Rating and Test Module Rating constitute the Total Module Rating which is entered in a module control register as a Rating Score and a National Scale Rating.

4.4. The Semester Module Grade received by the student for completing and defending the Term Paper in points, the National Scale and the ECTS Scale is entered in the test report, study card and individual curriculum of a student’s record


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book, for example, as follows: **92/Excellent/A**, **87/Good/B**, **79/Good/C**, **68/Satisfactory/D**, **65/Satisfactory/E**, etc.

4.5. The Semester Module Grade and the Graded Test together make up a Total Semester Grade which is calculated according to the National Scale and the ECTS Scale.

4.6. The Total Semester Grade in points, the National Scale and the ECTS Scale is written into the test report, study card and individual curriculum of a student's record book, for example, as follows: **92/Ex/A**, **87/Good/B**, **79/Good/C**, **68/Sat/D**, **65/Sat./E**, etc.

4.7. The Total Grade of the subject is equal the Total Semester Grade. The indicated Total Semester Grade of the subject is added to the Diploma Supplement.

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АРКУШ РЕЄСТРАЦІЇ РЕВІЗІЇ

№ пор.	Прізвищем'япо-батькові	Датаревізії	Підпис	Висновокщодоадекватності

(Ф 03.02 – 03)

АРКУШ ОБЛІКУ ЗМІН

№ зміни	№ листа (сторінки)				Підписо соби, яка внеслаз міну	Дата внесе ннязміни	Дата введенняз міни
	Зміненого	Заміненого	Нового	Анульо- ваного			

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УЗГОДЖЕННЯ ЗМІН

	Підпис	Ініціали, прізвище	Посада	Дата
Розробник				
Узгоджено				
Узгоджено				