

**NPJSC «Kazakh National Research Technical University  
named after K. I. Satbayev»  
Institute of Architecture and Civil Engineering named after T.K. Basenov  
Department of "Architecture"**

## **CURRICULUM PROGRAM**

**6B07307 / 6B02101  
«ARCHITECTURE and DESIGN»**

**Bachelor of Engineering and Technology in Architecture  
Bachelor of Arts in Design**

on the basis of the following majors of the invalid Classifier of specialties:  
**5B042000—«Architecture», 5B042100—«Design»**

1st edition  
in accordance with the SES of higher education 2022 y.

**Almaty 2023**

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The program is drawn up and signed by the parties:

From KazNRTU named after K. I. Satbayev:

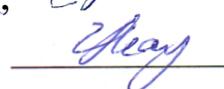
1. Head of the Department

 Sultanova K.R.

2. Director of Institute

 Kuspangaliev B.U.

3. The Chairman of the UMG department,  
Assoc. professor

 Maulenova G.D.

From employers:

1. Co-Chairman of the Advisory Board of the Institute,  
deputy Director OC «KA Stroy Ltd»

 Karmanov Sh.D.

Approved at the meeting of the Educational and methodical Council of the Kazakh National Research Technical University named after K. I. Satbayev. Protocol No. 4 of 14.01.2023 y.

### Qualification:

Level 6 of the National qualifications framework:

#### 07 Engineering, manufacturing and construction industries:

073 Architecture and construction:

6B07301 (0731) Architecture and urban planning (bachelor).

#### 02 Arts and Humanities:

021 Art:

6B02102 (0212) Fashion, interior design and industrial design.

**Professional competence:** Design of objects of architecture, urban planning; development of interior design, fashion and industry; the use of information technology in the field of architectural and design engineering.

**Short description of the program**

- Purpose of professional activity:
  - the formation of the human environment, a functional structure for his professional activities;
  - development of design and estimate documentation of buildings, constructions and their complexes, landscape and town-planning objects, monuments of architecture, promotion of achievements of architectural and town-planning activity.
- Tasks of professional activity:
  - solution of issues of architectural and construction design of residential, public buildings, their complexes;
  - functional organization, design solutions, aesthetics and harmony of the designed objects.
- Direction of professional activity:
  - architectural and construction design, study of experience in the design of populated areas, civil buildings and promotion of achievements in the field of architecture.
- Content of professional activities:
  - development of design and estimate documentation, implementation of production and technological or pedagogical activity, historical and theoretical analysis of the performed works, their generalization and promotion.
- The working curriculum adheres to the main international concepts in the field of training of architects and designers. This program is prepared in accordance with the basic principles of international concepts in the field of training of architects and designers, set out in the Charter of UNESCO-ISA.

***According to the UNESCO-ISA Charter, at the present stage architectural education should include the following aspects:***

- ability to create architectural projects that meet both aesthetic and technical requirements;
- adequate knowledge of the history and theory of architecture and related arts, as well as technical and humanitarian Sciences;
- knowledge of fine arts as a factor influencing the quality of architectural design;
- adequate knowledge in the field of urban design, urban planning and skills required in the planning process;
- understanding the relationship between people and structures, between structures and their environment; awareness of the need to relate structures and spaces between them with human needs and scale;
- understanding of the importance of the architectural profession and the role of the architect in society, in particular, in the preparation of design tasks, which should take into account social factors;
- understanding the methods of research and preparation of tasks for the design of the object;
- understanding the design of building structures, construction and engineering problems associated with the design of buildings;
- adequate knowledge of physical problems and technologies, as well as the functions of buildings in order to ensure their conditions of internal comfort and protection from climatic influences;
- mastering the design skills necessary to meet customer requirements within the constraints imposed by cost factors and building codes;
- knowledge of industries, organizations, regulations and procedures for translating design concepts into buildings and integrating plans into overall planning.

The following points should be taken into account in the development of additional education curricula:

- awareness of responsibility for humanitarian, social, cultural, urban planning, architectural values, for the preservation of the environment and architectural heritage;
- - adequate knowledge of methods and means of implementation of environmentally sustainable design, conservation and rehabilitation of the environment;
- - development of creative competence in the field of construction equipment, based on a deep knowledge of scientific disciplines and construction methods related to architecture;
- - adequate knowledge of project financing, project management, methods of cost control and rules of commissioning;
- - development of research skills as an integral part of architectural education, both for students and teachers.

## Requirements for applicants

- *Description of mandatory standard requirements for admission:* is carried out according to the applications of the applicant who has completed in full secondary, specialized secondary education on a competitive basis in accordance with the points of the certificate issued by the results of the unified national test with a minimum score of at least 65 points.
- *Special requirements for admission to the program if available, including for graduates of 12 summer schools, colleges of applied bachelor programs, etc.:* basic level of training in drawing and drawing.

Credit transfer rules for accelerated (reduced) education on the basis of 12-year secondary, secondary technical and higher education

Code	Type of competence	Description of competence	The result of the competence	Responsible
<b>GENERAL</b> (Implies full training with possible additional depending on the level of knowledge)				
G1	Communicativeness	- fluent monolingual oral, written and communicative skills - ability to communicate fluently with a second language - ability to use communicative communication in different situations - there are basics of academic writing in the native language - diagnostic test for language level	Full 4-year training with the development of at least 240 academic credits (including 120 contact classroom academic credits) with the possible transfer of credits in the second language where students have advanced level. The language level is determined by the diagnostic test	Department of Kazakh and Russian languages, Department of English
G2	Mathematical literacy	- basic mathematical thinking at the communication level – the ability to solve situational problems on the basis of the mathematical apparatus of algebra and began	Full 4-year training with the development of at least 240 academic credits (including 120 contact classroom academic credits). With a positive diagnostic test, the level of Mathematics 1, with a negative	Department of mathematics
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		mathematical analysis - diagnostic test for mathematical literacy in algebra	– the level of Algebra and the beginning of the analysis	
<b>SPECIFIC</b> (implies reduced training due to credit transfer depending on the level of knowledge on competencies for graduates of 12-year-old schools, colleges, universities, including humanitarian and economic areas)				
S1	Communicativeness	- fluent bilingual oral, written and communication skills - ability to communicate fluently with a third language - text writing skills of different styles and genres - skills of deep understanding and interpretation of own work of a certain level of complexity (essay) - basic aesthetic and theoretical literacy as a condition of full perception, interpretation of the original text	Full credit transfer by language (Kazakh and Russian)	Department of Kazakh and Russian language
S2	Mathematical literacy	- special mathematical thinking using induction and deduction, generalization and concretization, analysis and synthesis, classification and systematization, abstraction and analogy - ability to formulate, substantiate and prove provisions - application of General mathematical concepts, formulas and extended spatial perception for mathematical problems - full understanding of the basics of mathematical analysis	Credit transfer in Mathematics (Calculus) I	Department of mathematics
S3	English	- readiness for further self-study in English in various fields of knowledge - willingness to gain experience in project and	Transfer of English language credits above academic to professional level (up to 15 credits)	Department of English
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		research work using English		
S4	Computer skills	<ul style="list-style-type: none"> <li>- basic programming skills in one modern language</li> <li>- use of software and applications for training in various disciplines</li> <li>-availability of a global standard language level certificate</li> </ul>	Credit transfer on discipline Introduction to information and communication technologies, Information and communication technologies	Department of software engineering
S5	Humanities and social competence and behavior	<ul style="list-style-type: none"> <li>- understanding and awareness of the responsibility of each citizen for the development of the country and the world</li> <li>- ability to discuss ethical and moral aspects in society, culture and science</li> </ul>	Credit transfer in the Modern history of Kazakhstan (except for the state exam)	Department of social Sciences
		<ul style="list-style-type: none"> <li>- critical understanding and polemic ability to debate current scientific hypotheses and theories</li> </ul>	Credit transfer in philosophy and other Humanities	

**PROFESSIONAL**

(implies reduced training due to credit transfer depending on the level of knowledge on competencies for graduates of colleges, AB schools, universities, including humanitarian and economic areas)

P1	Professional competence	<ul style="list-style-type: none"> <li>- critical perception and deep understanding of professional competencies at level 5 or 6</li> <li>- ability to discuss and debate professional issues within the framework of the mastered program</li> </ul>	Credit transfer for basic professional disciplines, including introduction to the specialty, architectural composition, figure I, figure II, painting, sculpture, design, architectural color and lighting, landscape architecture, educational and industrial practice	Producing Department
P2	General engineering competences	<ul style="list-style-type: none"> <li>- basic General engineering skills and knowledge, ability to solve General engineering problems and problems</li> <li>- be able to use application software packages for processing experimental data, solving systems of algebraic and differential equations</li> </ul>	Credit transfer for General engineering disciplines (Engineering systems of buildings and structures, Building construction)	Producing Department
P3	Engineering and computer	<ul style="list-style-type: none"> <li>- basic skills of using computer programs and</li> </ul>	Credit transfer in the following disciplines: professional	Producing Department

	competence	software systems to solve General engineering problems	modeling, etc.	t
P4	Socio-economic competences	-critical understanding and cognitive ability to reason on contemporary social and economic issues - basic understanding of economic evaluation of objects of study and profitability of industry projects	Credit transfer on socio- humanitarian and technical- economic disciplines in the offset of the elective cycle	Producing Departmen t

The University may refuse to transfer credits if the low diagnostic level is confirmed or the final grades in the completed disciplines were below A and B.

## Requirements for completion of studies and diploma

- *Description of the compulsory standard requirements for graduation and the award of an academic degree of a **Bachelor of Engineering and Technology in Architecture** or a **Bachelor of Arts in Design**: the development of at least 260 academic credits of theoretical training and 14 academic credits of the final thesis.*

## Working curriculum of the educational program

**MAJOR CURRICULUM for 2020-2021 academic year admission**  
**Educational program 6B07301 / 6B02101 - "Architecture and design"**

**Group of Educational programs B073 - "Architecture" / B031 - "Fashion, interior design and industrial design"**

Full-time study      Study duration : 4 years      Academic degree: Bachelor of Engineering and Technology / of Arts

Year of study	Code	Name of discipline	Cycle	Total Credits	lec/lab/prj/WS	Code	pre-requisites	Code	Name of discipline	Cycle	Credits	lec/lab/prj/WS	Code	pre-requisites	
															1 semester (fall 2020)
1	LNG1051	Beginner (A1)	G	6	0/0/3/3	S3	Diagnostic test	LNG1052	Elementary English (A1)	G	6	0/0/3/3	S4	LNG1051	
	LNG1052	Elementary English (A1)						LNG1053	General English 1 (A2)					LNG1052	
	LNG1053	General English 1 (A2)						LNG1054	General English 2 (A2)					LNG1053	
	LNG1054	General English 2 (A2)						LNG1055	Academic English (B1)					LNG1054	
	LNG1055	Academic English (B1)						LNG1056	Business English (B2)					LNG1055	
	LNG1056	Business English (B2)						LNG1057	Professional English (B2+)					LNG1056	
	LNG1012	Kazakh/Russian (A2)	G	4	0/0/2/2	S1	Diagnostic test	LNG107	Academic Kazakh/Russian (B1)	G	6	0/0/3/3	S1	LNG10121	
	LNG1012.1	Academic Kazakh/Russian (B1)						LNG107	Business Kazakh language (Advanced Russian language) (B2)					LNG1012.1	
	LNG1012.2	Business Kazakh/Russian (B2)	B	6	1/0/2/3	S2	Diagnostic test	1101	Elective	B	6	0/0/3/3	P1-3	LNG1012.2	
	MAT00110	Algebra and introduction to calculus						ARC156	Drawing II					ARC155	
	MAT239	Analytical geometry						ARC113	Architectural drawing					ARC155	
	ARC436	Introduction to the specialty (Architecture and design)	B	6	1/0/2/3	P1-3	no	ARC104	Architectural composition	B	6	1/0/2/3	P1-3	ARC436	
ARC155	Drawing I	B	6	0/0/3/3	P1-3	no	ARC157	Sculpture	B	6	0/0/3/3	P1-3	no		
GEN101	Engineering and Computer Graphics	B	6	1/0/2/3	P1-3	no	HUM100	Contemporary History of Kazakhstan	G	6	1/0/2/3	S6	no		
KFK101	Physical education I	G	4	0/0/2/2			KFK102	Physical education II	G	4	0/0/2/2				
<b>Total:</b>				<b>38</b>	<b>38</b>			<b>Total:</b>				<b>40</b>	<b>40</b>		
2	LNG1053	General English 1 (A2)	G	6	0/0/3/3	no	LNG1052	General English 2 (A2)	G	6	0/0/3/3	no	LNG1053	General English 1 (A2)	
	LNG1054	General English 2 (A2)					LNG1054	Academic English (B1)					LNG1054		
	LNG1055	Academic English (B1)					LNG1056	Business English (B2)					LNG1055		
	LNG1056	Business English (B2)					LNG1057	Professional English (B2+)					LNG1056		
	LNG1057	Professional English (B2+)					2102	Elective					LNG1056		
	HUM126	Social-political knowledge					G	8					4/0/0/4	S6	no
	HUM124	Philosophy	G	6	1/0/2/3	S5	no	CIV124	Engineering systems of buildings and structures	B	6	2/0/1/3	P1-3	no	
	CIV199	Engineering mechanics	B	6	1/0/2/3	P1-3	MAT00110	CIV164	Building construction	B	6	2/0/1/3	no	CIV199	
	ARC450	Design I	B	6	0/0/3/3	P1-3	no	ARC451	Design II	B	6	0/0/3/3	no	ARC450	
	ARC116	Painting	B	6	0/0/3/3	P1-3	ARC156	ARC142	Professional modeling I	B	6	0/0/3/3	no	no	
	<b>Total:</b>				<b>38</b>	<b>38</b>			<b>Total:</b>				<b>36</b>	<b>36</b>	
	3	ARC438	Integrated design I	P	6	0/0/3/3	no	ARC451	ARC440	Integrated design III	P	6	0/0/3	no	ARC438
ARC439		Integrated design II	P	6	0/0/3/3	no	ARC451	ARC441	Integrated design IV	P	6	0/0/3	no	ARC439	
ARC143		Professional modeling II	B	6	0/0/3/3	no	ARC142	ARC132	Basic of BIM-technology	P	6	0/0/3	no	ARC143	
3203		Electives	B	6				3214	Electives	B	6				
3204		Electives	B	6				3215	Electives	B	6				
3205		Electives	B	6				3216	Electives	B	6				
<b>Total:</b>				<b>36</b>	<b>36</b>			<b>Total:</b>				<b>36</b>	<b>36</b>		
4	ARC442	Integrated design V	P	6	0/0/3/3	no	ARC440	ARC444	Integrated design VII	P	6	0/0/3/3	no	ARC442	
	ARC443	Integrated design VI	P	6	0/0/3/3	no	ARC441	ARC445	Integrated design VIII	P	6	0/0/3/3	no	ARC443	
	4309	Electives	P	6				4311	Electives	P	6				
	4310	Electives	P	6				ECA001	Preparation & writing of thesis (project)	FA	4				
	ECA001	Preparation & writing of thesis (project)	FA	4				ECA103	Thesis (project) defence	FA	6				
	<b>Total:</b>				<b>28</b>	<b>24</b>			<b>Total:</b>				<b>28</b>	<b>18</b>	

Additional academic programmes (AAP)				
Year of study	Code	Name of discipline	Credits	Semester
2	AAP122,132	Physical education III, IV	0	3-4
1	AAP107	Sports club sectional	0	2
1	AAP101	Internship	2	2
2	AAP109	Industrial internship I	2	4
3	AAP103	Industrial internship II	4	6
2-3	AAP500	Military training	0	3-6

Total number of credits			
Cycle of disciplines	Credits		
	compu- sary	elective	total
Cycle of general disciplines (G)	56	12	68
Cycle of basic disciplines (B)	84	36	120
Cycle of special disciplines (S)	54	18	72
<b>Total of theoretical study:</b>			<b>194 66 260</b>
Extra education	8	0	8
Final attestation (FA)	14	0	14
<b>Total of AAP &amp; FA:</b>			<b>22 0 22</b>
<b>TOTAL:</b>			<b>216 66 282</b>

**ELECTIVE DISCIPLINES OF THE TRAINING PROGRAM**  
**Educational program 6B07301 / 6B02101 - "Architecture and design"**  
**Group of Educational programs B073 - "Architecture" / B031 - "Fashion, interior design and industrial design"**

Form of study: full-time      Duration of study: 4 years      Academic degree: Bachelor of Engineering and Technology / of Arts

Year of study	Element code for curriculum	Code of discipline	Specialization area	Name of the discipline	Cycle	Credits	lec/lab/pr/IWS	Prerequisites	
<b>2 semester (spring 2020)</b>									
1	1101	LNG107	Architecture Design	Professional Kazakh Language (C1)	G	6	0/0/3/3		
		LNG107		Professional Russian Language (C1)					
		LNG107		Business Kazakh Language) (B2)					
	<b>Total:</b>						6		
<b>4 semester (spring 2021)</b>									
2	2102	LNG109	Architecture Design	IELTS Preparation	G	6	0/0/3/3	LNG 1056	
		LNG110		Intercultural Communication					
		LNG117		Technical Writing					
		LNG118		Public speaking					
		LNG119		Productivity skills					
		LNG120		GRE preparation					
		LNG121		Academic Writing					
<b>Total:</b>						6			
<b>5 semester (autumn 2021)</b>									
3	3203	ARC115	Architecture	Urban planning	B	6	2/0/1/3		
		ARC452	Graphic design	Calligraphy and typography					
		ARC453	Industrial Design	History of design, science and technology					
		ARC185	Architectural design	History of interior					
		ARC454	Landscape design	History of landscape art					
	3204	ARC413	ARC174	Architecture	Regional aspects of architecture	B	6	2/0/1/3	
			Graphic design	Art culture of Kazakhstan					
			Industrial Design						
			Architectural design						
	3205	ARC183	ARC159	Architecture	Modern materials in architecture	B	6	2/0/1/3	
			Graphic design	Modern materials in design					
			Industrial Design						
			Architectural design						
			Landscape design						
	<b>Total:</b>						18		
<b>6 semester (spring 2022)</b>									
3	3206	ARC456	Architecture	Aesthetics in architecture	B	6	1/0/2/3		
		ARC457	Graphic design	Polygraphic design					
		ARC187	Industrial Design	The Basics of Visual Culture					
		ARC458	Architectural design	Ecological Aspects of Design Design					
		ARC459	Landscape design	Decorative plant growing					
	3207	ARC461	ARC138	Architecture	Principles of Sustainable Architecture	B	6	1/0/2/3	
			ARC460	Graphic design	Package design				
			Industrial Design	Ergonomics					
			Architectural design						
	3208	ARC186	ARC462	Landscape design	Urboecology	B	6	1/0/2/3	
			ARC129	Architecture	Landscape architecture				
			ARC463	Graphic design	Design and advertising technologies				
			ARC464	Industrial Design	Typology of industrial design				
ARC180			Architectural design	Typology of the architectural environment					
<b>Total:</b>						18			
<b>7 trimester (autumn 2022)</b>									
4	4309	ARC117	Architecture	Engineering improvement and transport	P	6	1/0/2/3		
		ARC465	Graphic design	Digital modeling I			0/0/3/3		
		ARC181	Industrial Design	Construction of object design II					
		ARC473	Architectural design	Modeling Technologies in Design II					
		ARC474	Landscape design	Design of hydraulic structures in the urban environment					
	4310	ARC466	ARC475	Architecture	Reconstruction and modernization of buildings and complexes	P	6	1/0/2/3	
			Graphic design	Color Light Modeling					
			Industrial Design	Light-color organization of the environment					
			Architectural design						
			Landscape design						
<b>Total:</b>						12			
<b>8 trimester (spring 2023)</b>									
4	4311	ARC403	Architecture	Pre-project analysis I	P	6	0/0/3/3		
		ARC424	Graphic design	Pre-project analysis in design I					
			Industrial Design						
			Architectural design						
			Landscape design						
<b>Total:</b>						6			

## **Descriptors of level and scope of knowledge, skills and competences**

A – knowledge and understanding:

A1 – Demonstrate knowledge and understanding at a professional level;

A2 – Communicate your findings and knowledge clearly;

A3 – Strive to obtain the most advanced knowledge in the profession.

B – application of knowledge and understanding:

B1 – Independent development and promotion of various options for solving professional problems with the use of theoretical and practical knowledge;

B2 – Apply knowledge to new or unfamiliar situations;

B3 – the Ability to address problems in broader cross-cutting areas related to professional activities.

C – formation of judgments:

C1 – to collect the necessary information;

C2 – be Able to interpret information to form judgments based on social, ethical and professional scientific considerations;

C3 – Make judgments based on incomplete or partial information.

D – personal abilities:

D1 – Readiness for social mobility;

D2 – Readiness to adapt to new situations, re-evaluation of experience;

D3 – Ability to self-study.

## Competencies upon completion of the training

Б – Basic knowledge and skills;

Б1 – o Have basic knowledge in the field of natural science (social, humanitarian, economic) disciplines that contribute to the formation of a highly educated person with a broad outlook;

Б2 – have the skills of using information technology in the field of architectural design;

Б3 – to possess the skills of acquiring new knowledge necessary for professional activity and continuing education in the master's degree.

П – Professional competence, including according to the requirements of industry professional standards:

П1 – a Wide range of theoretical and practical knowledge in the professional field;

П2 – to make their Own informed decisions in the professional architectural activities;

П3 – to Possess modern means, methods and forms of architectural design (including innovative (conceptual) and specialized character);

П4 – Responsible approach to the preservation of social, cultural, urban planning and architectural values in the design process;

П5 – In design practice to promote the protection of the environment and architectural heritage;

П6 – to Rely on the principles of sustainable development in architectural design;

П7 – Contribute to the creation of a humane environment in their professional activities.

O – Human, social and ethical competences:

O1 – to Know the social and ethical values based on public opinion, traditions, customs, social norms and to be guided by them in the professional activity;

O2 – Be tolerant to the traditions and culture of other peoples of the world; know the basics of the legal system and legislation of Kazakhstan;

O3 – be Able to adequately navigate in different social situations;

O4 – to Be able to work in a team, to defend your point of view correctly, to offer new solutions;

O5 – be Able to find compromises, correlate your opinion with the opinion of the team;

O6 – Strive for professional and personal growth.

C – Special and managerial competences:

C 1 – Independent management and control of the processes of labor and educational activity within the framework of the strategy, policy and goals of the organization, discussion of the problem, reasoning of conclusions and competent information handling;

C 2 – Have basic economic knowledge;

C3 – Have a scientific understanding of management and marketing in architectural design and construction.

### **Minor additional education policy**

In the development of at least 12 credits in the disciplines of the program, including the following mandatory disciplines:

M1 – Architectural composition

M2 – Design I

M3 – Design II

an additional specialty Minor is assigned with the issuance of an Appendix to the diploma of the established sample.

## **Supplement to the diploma according to the standard ECTS**

Bachelor of Engineering and Technology in Architecture or Bachelor of Arts in Design, Level 6 of the national qualifications framework with the right to guide employees with taking responsibility for the result at the unit level.

The application is developed according to the standards of the European Commission, the Council of Europe and UNESCO/CEPES. This document serves only for academic recognition and is not an official confirmation of the document on education. Without a diploma of higher education is not valid. The purpose of completing the European Annex is to provide sufficient data on the holder of the diploma, the qualification obtained, the level of this qualification, the content of the training program, the results, the functional purpose of the qualification, as well as information on the national education system. The model of the application on which the estimates will be translated uses the European credit transfer or transfer system (ECTS).

The European diploma Supplement provides an opportunity to continue education in foreign universities, as well as to confirm the national higher education for foreign employers. When traveling abroad for professional recognition will require additional legalization of the diploma of education. The European diploma Supplement is completed in English upon individual request and is issued free of charge.

## **Introduction to the specialty (Architecture and design)**

CODE – ARC436

CREDIT – 6 (1/0/2/3)

PREREQUISITE – none

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

**The aim** of the course is to acquaint students with the basic approaches and understanding of architectural education and the formation of basic knowledge and skills necessary for the study of professional disciplines.

**The objectives** of the course – the formation of skills to study the activities of the architect, designer, artist and their effective use to solve creative and practical problems in the professional field.

### BRIEF DESCRIPTION OF THE COURSE

The course "Introduction to the specialty" gives the basic concepts of architectural and artistic composition, practiced skills. The basic concepts and key moments of the history of architecture are given.

### KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Student

**know:**

- objective properties of the form and features of their perception by the person;
- basic techniques identify and harmonize forms;
- the main elements of graphics, types of architectural composition and their features;

**be able to:**

- perform various types of exercises on propaedeutics, architectural graphics, composition in graphic technique, technique of color collage and layout of thick paper, revealing the expressive possibilities of the basic properties of the three-dimensional form;
- to use means, techniques of graphic presentation of architectural composition in the process of development of architectural projects;

**own:**

- graphic tools and techniques;
- methods of compositional analysis of architectural works;
- the method of compositional modeling of architectural form.

the basic concepts of architectural and artistic composition are given, practical skills are practiced. The basic concepts and key moments of the history of architecture are given.

## Architectural composition

CODE – ARC104

CREDIT – 6 (1/0/2/3)

PREREQUISITE – none

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

**The purpose of the discipline:** is to develop students ' professional spatial-imaginative thinking, aesthetic taste and sense of form.

### BRIEF DESCRIPTION OF THE COURSE

Discipline "Architectural composition" is a major discipline in accordance with the working curriculum.

Composition – one of the fundamental disciplines that occupy an important place in the training of students. The role of architectural composition is due to the fact that its basic concepts, terms and means serve as a methodological basis for the main profiling discipline – architectural design, forming the professional qualities of the future specialist.

### KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Student

**need to know:**

- basic concepts of architectural composition;
- main means of composition;
- the basic laws of composition;

**must be able:**

- perform different types of composition in the technique of color collage and paper layout;
- revealing the expressive possibilities of the basic properties of the three-dimensional form;
- use the means of architectural composition in the process of consistent implementation of practical exercises.

## Mathematics I

CODE – MAT00121

CREDIT – 6 (1/0/2/3)

PREREQUISITE – Elementary mathematics-school course/diagnostic test

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

**The main purpose of the course** – to give the future specialist a certain amount of knowledge on the sections of the course "Mathematics-I", necessary for the study of related engineering disciplines. Introduce students to the ideas and concepts of mathematical analysis. The main attention is paid to the formation of basic knowledge and skills with a high degree of understanding of differential and integral calculus.

#### **Course objective:**

acquisition of knowledge necessary for the effective use of rapidly developing mathematical methods; acquisition of skills in the construction and study of mathematical models; knowledge of the fundamental sections of mathematics necessary for solving research and practical problems in the professional field.

### BRIEF DESCRIPTION OF THE COURSE

The course "Mathematics-I" provides an introduction to the analysis, differential and integral calculus.

### KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

The study of this discipline will allow the student to apply the course "Mathematics-I" to solve simple practical problems, find tools sufficient for their research, and obtain numerical results in some standard situations.

## Modern history of Kazakhstan

CODE – HUM113

CREDIT – 6 (1/0/2/3)

PREREQUISITE – none

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

**The aim of the course** is to familiarize students of technical specialties with the main theoretical and practical achievements of the national historical science on the history of modern Kazakhstan, complex and systematic study of the main stages of the formation and development of Kazakhstan's society.

- to analyze the features and contradictions of the history of Kazakhstan in the Soviet period;
- to reveal the historical content of the foundations of the laws of political, socio-economic, cultural processes at the stages of formation of an independent state;
- to promote the formation of students ' citizenship;
- to educate students in the spirit of patriotism and tolerance, belonging to the people, the Fatherland.

### BRIEF DESCRIPTION OF THE COURSE

The course Modern history of Kazakhstan is an independent discipline and covers the period from the beginning of the twentieth century to the present day. The modern history of Kazakhstan studies the national liberation movement of the Kazakh intelligentsia in the early XX century, the period of creation of the Kazakh ASSR, as well as the process of formation of a multinational society.

### KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

- knowledge of events, facts and phenomena of Modern history of Kazakhstan;
- knowledge of the history of ethnic groups living in Kazakhstan;
- knowledge of the main stages of formation of the Kazakh statehood;
- ability to analyze complex historical events and predict their further development;
- ability to work with all kinds of historical sources;
- ability to write essays and scientific articles on the history of the Fatherland;
- the ability to operate with historical concepts;
- ability to debate;
- skills of independent analysis of historical facts, events and phenomena;
- public speaking skills.

## **Kazakh/Russian**

CODE – – LNG101

CREDIT – 4 (0/0/2/2)

PREREQUISITE – diagnostic test

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

- to teach students to perceive by hearing statements on known topics relating to home, school, leisure;
- understand texts on personal and professional topics containing the most frequent words and expressions;
- be able to talk on everyday topics; describe their experiences; Express their opinions; retell and evaluate the content of the book read, seen the film;
- be able to create simple texts on well-known topics, including those related to professional activities.

### BRIEF DESCRIPTION OF THE COURSE

The language material of the course is selected in such a way that the student, mastering the lexical and grammatical minimum, had the opportunity to get acquainted with typical communicative situations and in such situations was able to correctly assess them and choose the appropriate model (strategy) of speech behavior.

The main emphasis of training is transferred from the process of knowledge transfer to the training of the ability to use the target language in the implementation of various types of speech activities, which are reading (provided the reading is understood), listening (under the same condition) and the production of texts of a certain complexity with a certain degree of grammatical and lexical correctness.

The material for the lessons is chosen so that students, studying Kazakh/Russian, acquire the skills of reading, writing and understanding of spoken language on the basis of simultaneous mastering of the basics of grammar (phonetics, morphology and syntax) and word usage during constant repetition with gradual complication of tasks.

### KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

The student under the condition of active organization of work in the classroom and conscientious homework by the end of the first semester acquires the skills corresponding to the European level A2 (Threshold according to the classification of ALTE), that is, is on the threshold of the level of independent language proficiency.

## English

CODE – LNG1051-1057

CREDIT – 24 (0/0/12/12)

PREREQUISITE – diagnostic test /LNG1051-1056

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### LNG1051

#### THE PURPOSE AND OBJECTIVES OF THE COURSE

Discipline English “Beginner's English” is intended primarily for learning. This course is also suitable for those who have only a General basic knowledge of the language. After passing this level, the student will be able to confidently communicate on basic topics in English, learn the basics of grammar and lay a Foundation that will improve their skills in the next stage of learning English.

Post-requisites of the course: Elementary English.

### LNG1052

#### THE PURPOSE AND OBJECTIVES OF THE COURSE

The discipline “Elementary English” – is the Foundation of learning English, which is aimed at the development of receptive skills of students (reading and listening) and productive skills (writing and speech), analysis of basic knowledge, the use and memorization of the main grammatical rules and mastering the peculiarities of pronunciation and elementary vocabulary, as well as promoting self-study and critical thinking.

Course prerequisites: Beginner.

Post-requisites of the course: General 1.

### LNG1053

#### THE PURPOSE AND OBJECTIVES OF THE COURSE

The purpose of the General English 1 course is to provide students with the opportunity to gain sufficient knowledge to become more fluent in everyday social and academic settings. Students work on improving pronunciation, vocabulary and grammar. At this level, the main task will be to consolidate the skills acquired earlier, to learn how to make and correctly apply complex syntactic structures in the English language, as well as to achieve a really good pronunciation.

Course prerequisites: Elementary English.

Post-requisites of the course: General 2.

### LNG1054

#### THE PURPOSE AND OBJECTIVES OF THE COURSE

The course “General English 2” is designed for students who continue to study “General English 1”. The course is focused on the ability to actively use in practice most aspects

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of the times of the English language, conditional sentences, phrases in passive voice, etc. At this stage, the student will be able to maintain a conversation with several interlocutors or Express their point of view. Student significantly expands your vocabulary, which will allow him to freely Express your thoughts in any situation. At the same time, it will be supplemented with various synonyms and antonyms of already familiar words, phrasal verbs and stable expressions.

Course prerequisites: General 1.

Post-requisites of the course: Academic English.

### LNG1055

#### THE PURPOSE AND OBJECTIVES OF THE COURSE

The main purpose of the English language course “Academic English” is the development of academic language skills. Discipline is a language style that is used in writing academic papers (paragraph, abstract, essay, presentation, etc.). This course is designed to help students become more successful and effective in their learning by developing critical thinking skills and self-study.

Course prerequisites: General 2.

Post-requisites of the course: Professional English.

### LNG1056

#### THE PURPOSE AND OBJECTIVES OF THE COURSE

“Business English” is the English language for business communication, business and career. Knowledge of business English is useful for negotiations and business correspondence, preparation of presentations and informal communication with business partners.

Features of training are that it is necessary not only to master the vocabulary, but also to learn new skills: presentation, communication, language, professional.

Course prerequisites: IELTS 5.0 and/or academic English

Post-requisites of the course: professional English, grade 5.5-6.0 IELTS

### LNG1057

#### THE PURPOSE AND OBJECTIVES OF THE COURSE

“Professional English” course is designed for students of B2+ level, the purpose of which is to improve the language competence of students in the relevant professional fields. The main objective of the course is to teach students to work with texts, both audio and written, in the specialty. The curriculum is based on the necessary vocabulary (words and terms), often used in the English language for special purposes. Students will acquire professional English language skills through integrated content-and language-based learning, master vocabulary in order to read and understand original

sources with a high degree of independence, and practice various communicative models and vocabulary in specific professional situations.

Course prerequisites: Business English.

Post-requisites of the course: any elective course.

## Drawing I

CODE – ARC155

CREDIT – 6 (0/0/3/3)

PREREQUISITE – none

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

**The aim of the course** is to form knowledge, skills and creativity in the field of drawing.

### BRIEF DESCRIPTION OF THE COURSE

The discipline "drawing" includes a section "Drawing three-dimensional geometric shapes and geometric three-dimensional compositions", which is divided into drawing geometric bodies, drawing faceted shapes and drawing bodies of rotation. Architectural and subject-spatial environment. Graphic techniques of architectural design sketches. The study of architectural forms and structures, objects – monuments of architecture and modern architecture. Transfer of perspective construction, construction of the form which is based on geometrical bodies and figures; development and improvement of drawing technique; study and knowledge of the constructive nature of architectural forms; expanding the range of visual means.

### KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Student

need to know:

- fundamentals of perspective image;
- basics of light and shadow transmission of three-dimensional objects;
- the basic principles of three-dimensional forms;

must be able:

- finding the correct linking of the composition in a specified format;
- find the right proportions of parts and shapes;
- to build a framework of three-dimensional form;
- draw simple geometric shapes;
- perform three-dimensional compositions;
- perform a graphical flow of volumetric forms.

## Drawing II

CODE – ARC156

CREDIT – 6 (0/0/3/3)

PREREQUISITE – ARC155

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

**The purpose of the** discipline is the development of spatial representation of students.

### BRIEF DESCRIPTION OF THE COURSE

The discipline "Drawing 2" is a practical course with a total of 45 hours of classroom training, SRSP and SRS. "Drawing 2" includes the section "drawing of interior and exterior", which is divided into drawing of small architectural forms, drawing of details and fragments of architecture drawing of interior and exterior.

### KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Student

**need to know:**

- fundamentals of perspective image;
- basics of light and shadow transmission of three-dimensional objects;
- the basic principles of three-dimensional forms;

**must be able:**

- to correctly portray the nature of the interior, the decoration of architectural elements;
- to determine the structural features of specific architectural works;
- a sense of proportions and subtle gradations of chiaroscuro and color, shades; holistic perception, as well as to perceive the view of the space, dividing it into General and private;
- develop observation, compositional sense and taste;
- work with a variety of modern art materials and tools for architects and designers.

## Painting

CODE – ARC116

CREDIT – 6 (0/0/3/3)

PREREQUISITE – ARC155

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

**The purpose of the discipline:** obtaining theoretical knowledge and practical skills necessary for the understanding and development of creative imagination, aimed at the acquisition of skills and practical work.

### BRIEF DESCRIPTION OF THE COURSE

In the system of architectural education painting is given the role of the subject, giving a direct opportunity to master one of the necessary practical skills of the design profession. The program of discipline provides for practical training, course work. Watercolor technique. «Grisaille.» Short-term study with vegetables. Watercolor technique. «Grisaille.» Short-term study with vegetables. Still life of the items of a contrasting colour and a Study in technique "gouache". Complicated still life in the technique of "gouache".

### KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Student

**need to know:**

- basics of coloristics;
- basics of color science;
- basic painting techniques;

**must be able:**

- use color and shape as a means of expressing your thoughts;
- the ability to develop the necessary skills and skills to competently depict from life still life, landscape;
- acquisition of professional skills as a result of daily practical exercises in drawing and painting from nature;
- develop observation, compositional sense and taste;
- feeling proportion and subtle gradations of light and shade and colors, their various shades.

## Sculpture

CODE – ARC157

CREDIT – 6 (0/0/3/3)

PREQUISITE – ARC155

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

**The purpose of the discipline:** to form knowledge, skills and creativity on the visual plane of volume, material and space.

### BRIEF DESCRIPTION OF THE COURSE

Skills of step-by-step modeling of three-dimensional and relief images. Composite organization three-dimensional plastic space of volumes and proportions in a classic material. Development of spatial thinking, technical skills, sense of form, composition, combinatorics. Development of analytical thinking and sense of transformation of volume into a flat image without losing individual features of objects. Technical methods of modeling. Mastering the possibilities of clay and plasticine. Linear and aerial perspective. Transfer rules on the pictorial plane of volume, material and space. Trends in the direction of the features of modern sculpture.

### KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Student

**need to know:**

- the basics of modeling form;
- basics of working with different materials;
- rules of transfer of volume, material and space.

**must be able:**

- use space and form as a means of expressing your thoughts;
- the ability to develop the necessary skills and skill to correctly depict the nature of the reliefs, bas-reliefs, high reliefs;
- acquisition of professional skills as a result of daily practical exercises in drawing and modeling from nature;
- develop observation, compositional sense and taste..

## Information and communication technologies

CODE – CSE174

CREDIT – 6 (2/1/0/3)

PREREQUISITE – none

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

Training in the use of modern information technologies in the field of professional activity.

The objectives of the course include:

- reveal the basic concepts of architecture of computer systems;
- to reveal the basic concepts of information and communication technologies and subject terminology;
- learn how to work with the software interfaces of operating systems;
- learn how to work with data in a different view, both structured and unstructured tabular;
- to teach how to apply the basic principles of information security;
- expand the concepts of data formats and multimedia content. Learn how to work with typical multimedia data processing applications. Use modern approaches to the presentation of the material;
- uncover the concepts of modern social, cloud and email platforms and ways to work with them;
- to teach how to use the methods of algorithmization and programming to solve problems of automation of business processes.

### BRIEF DESCRIPTION OF THE COURSE

The course contains a training program aimed at leveling the basic knowledge of students in the field of information and communication technologies. It contains a full range of topics, according to the standard Curriculum of GOSO, with the predominance of education of practical skills of working with data, algorithmization and programming. The course is designed to teach students not only the basic concepts of architecture and modern infrastructure of information and communication technologies, but also to learn how to use these tools to solve applied problems. To teach to optimize processes, to apply adequate models and methods of solving practical problems using modern methods and tools of information technology, to automate routine processes, to be productive and effective.

## KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Students will know:

- Device to the computer;
- Architecture of computing systems;
- Information and communication technology infrastructure;
- Interfaces of modern operating systems;
- Modern tools for working with data of different nature and purpose;
- Types of information security threats, principles, tools and methods of data protection;
- python programming language.

Students will be able to:

- Work with interfaces of modern operating systems;
- Work with modern application software to work with data of different nature and purpose;
- Use modern social, cloud, mail platforms for business processes;
- Programming in algorithmic programming language;
- Analyze, model, design, implement, test and evaluate information and communication technology systems.

## Philosophy

CODE – HUM124

CREDIT – 6 (1/0/2/3)

PREQUISITE – Modern history of Kazakhstan

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

The aim of the course is the formation of cognitive, operational, communicative, self-educational competencies for problem solving:

- to contribute to the development of adequate worldview in the modern world;
- to form creative and critical thinking in students;
- to distinguish the ratio of spiritual and material values, their role in human life, society and civilization;
- to contribute to the definition of their attitude to life and the search for harmony with the world around them.

### BRIEF DESCRIPTION OF THE COURSE

"Philosophy" is the formation of a holistic worldview that has evolved in the context of the socio-historical and cultural development of mankind. Familiarity with the basic paradigms of the methodology of teaching philosophy and education in the classical and post-classical traditions of philosophy. Philosophy aims to develop a sustainable life goals, finding the meaning of his existence as a special form of spiritual production. Contributes to the formation of the moral image of the individual with the ability of critical and creative thinking. Theoretical sources of this course are the concepts of Western, Russian, Kazakh scientists on the history and theory of philosophy.

### KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

- knowledge of basic terms, main concepts and problems of philosophy;
- knowledge of the main philosophical ways of solving ideological issues in the context of culture;
- ability to analyze the history of philosophical thought;
- the ability to determine alternative ways of setting and solving ideological issues in the history of human development;
- ability to identify the main theoretical approaches in the relationship between man and society;
- the ability to control the method of doing the work;
- search skills systematization of the material;
- skills to discuss and make rational decisions freely;
- skills of ethical principles in professional activity.

## Professional modeling I

CODE – ARC142

CREDIT – 6 (0/0/3/3)

PREQUESITE – none

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**The purpose of the course:** "Professional modeling I" is designed for the development of graphic editors AutoCAD and ArchiCAD. Using these computer programs as a tool for drawing floor plans, plans and schemes of engineering communications, sections and facades of buildings, as well as the construction of axonometric and perspective images of objects, students will be able to create realistic architectural projects.

### BRIEF DESCRIPTION OF THE COURSE

The discipline "Professional modeling I" is designed to study the principles of working with graphic editors Photoshop, CorelDRAW and AutoCAD and gain skills with these programs. The development of these programs allows students to create realistic designs. The AutoCAD program is a tool for drawing floor plans, sections and facades of buildings and for building axonometric and perspective images of objects, Photoshop graphics editor allows post-processing of images, and CorelDRAW – layout of the project.

**Expected results:** As a result of studying the discipline, students should develop the knowledge and skills necessary for the future professional activity of students in the field of design. to establish a connection between the tasks of the architect and the opportunities provided by computer technology; to create computer three-dimensional images of objects; the minimum cost of funds to realize the architectural project.

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## Professional modeling II

CODE – ARC143

CREDIT – 6 (0/0/3/3)

PREQUISITE – ARC142

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**The purpose of the discipline:** mastering multimedia technology; creating multimedia presentations and video presentations; mastering the tools of multimedia technologies.

### BRIEF DESCRIPTION OF THE COURSE

General principles of work with 3ds MAX graphical editor, its interface and animation modeling. General methods of constructing images using basic and extended primitives, two-dimensional forms. Edit images using modifiers. Library of materials and textures. The order of creation of light sources. Lighting settings, creating special effects 3ds MAX. Camera installation. Animation type. Moving objects in a three-dimensional scene. Changing the position of the object. The position coordinates of the object. Controllers. Using the Reactor module, the Morpher modifier and Particle Flow particles. Built-in Video Post module. Adobe Premiere Pro Program.

**Expected results:** knowledge of computer modeling and creation of video presentations of design projects; knowledge of the possibilities of using multimedia systems in business, the composition and structure used in multimedia systems, hardware and software, technology of working with text, graphics, sound, animation when creating computer presentations.

## Professional modeling III

CODE – ARC144

CREDIT – 6 (0/0/3/3)

PREQUISITE – ARC143

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**The purpose of the discipline:** mastering multimedia technology; creating multimedia presentations and video presentations; mastering the tools of multimedia technologies.

### BRIEF DESCRIPTION OF THE COURSE

Special principles of working with 3ds MAX graphical editor, its interface and animation modeling. Camera installation. Animation type. Moving objects in a three-dimensional scene. Changing the position of the object. The position coordinates of the object. Controllers. Using the Reactor module, the Morpher modifier and Particle Flow particles. Built-in Video Post module. Adobe Premiere Pro Program.

**Expected results:** knowledge of computer modeling and creation of video presentations of design projects; knowledge of the possibilities of using multimedia systems in business, the composition and structure used in multimedia systems, hardware and software, technology of working with text, graphics, sound, animation when creating computer presentations.

## Design I

CODE – ARC143

CREDIT – 6 (0/0/3/3)

PREREQUISITE – ARC142

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**The purpose of the discipline** – functional, constructive, technical and imaginative solution of architecture of low-rise residential building (1, 2 at least 3.4 storey), mastering the process of designing this type of object for housing with a specific functional and planning structure.

### BRIEF DESCRIPTION OF THE COURSE

The content of the material is aimed: to develop students-architects skills in the design of the most promising today low-rise individual houses (single-family) in urban and rural areas; to get acquainted with this type of housing by examples in domestic and foreign practice in accordance with local climatic, ethnic, structural and technical features; to train the organization of zoning of the internal space of the house in accordance with the functional and sanitary requirements for modern housing; on formation of theoretical knowledge for creation of economic and effective (for concrete town-planning conditions) residential objects of this type for the purpose of their further introduction in practice.

**Expected results:** ability to develop in educational design a creative idea at the proper compositional and graphic level, taking into account social, technical and artistic features of the designed object; to design an economical, comfortable or elite low-rise; to create expressive images of a modern residential house in accordance with the local climatic, ethnic, structural and technical features of the design of housing; application of knowledge gained in the study of related disciplines (development of structural schemes of building units, the use of modern building materials, drawings in computer or manual graphics, the ability to make working and demonstration models, the ability to select the architectural style of the building, etc.

## Design II

CODE – ARC143

CREDIT – 6 (0/0/3/3)

PREQUISITE – ARC142

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**The purpose of the discipline** Design II – one of the fundamental subjects in the curriculum of the architect. The purpose of teaching this discipline is to teach students the primary skills of designing public buildings, the development of creative thinking in solving design problems, improving the techniques of "supply" of project materials.

### BRIEF DESCRIPTION OF THE COURSE

The course project of students-architects of the 2nd year is to draw up a design architectural solution and a brief description of the monofunctional building, for the conditions of the city, suburban areas or rural areas. Features of the developed monofunctional building should be reflected in the title on the tablets and in the content of the annotation to the topic "Monofunctional building" and contain information on: the number of blocks of the object and their purpose; number of storeys; location area; urban situation (for example: "Exhibition pavilion in a residential area of Astana").

**Expected results:** the study of the most striking examples of exhibition pavilions from the world practice, the optimal use of certain types of structures, knowledge of the composition and area of the premises necessary for the organization and successful functioning of the exhibition space, the ability to use the regulatory recommendations of the Republic of Kazakhstan concerning exhibition buildings, the ability to create original ideas of design solutions, the ability to develop projects of exhibition pavilions.

## **Architectural colouring and lighting**

CODE – ARC103

CREDIT – 6 (2/0/1/3)

PREREQUISITE – ARC116

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

The purpose of teaching the discipline is the formation of the bachelor's basic knowledge of coloristics, color psychology, symbolism in architecture, design and art, i.e. disciplines that link different sections of humanitarian, accurate and natural science knowledge through the idea of the symbolic nature of the studied processes.

The course aims to link knowledge from the field of architecture, design, volumetric-spatial design, color, composition, cultural studies, etc., obtained from previously attended courses.

The discipline of "Light and color organization of urban areas" aims:

-to provide a certain amount of system knowledge on the basics of the theory of color and light, the laws of color science and symbolism in architecture, art and design;

In accordance with the purpose of teaching the following tasks:

- development of students ' moral and aesthetic sense, awakening interest in independent creativity;
- development of a bachelors of systematized knowledge about the most important theories of color and the semantic range represented in the last decade;
- formation of basic knowledge in the field of color of the city.

### BRIEF DESCRIPTION OF THE COURSE

Discipline "Architectural color and lighting" is the most important link in the program of theoretical training of bachelor-architect. The lecture course of the considered umkd gives an idea of the basic techniques of architectural space design. Included information forming a set of ideas about the artistic or architectural lighting facades of buildings, structures, green spaces, with the aim of creating expressive light images of these objects. The concepts are revealed, the ideas about the color solution of architectural objects are given.

The practical course contains sections on the color scheme of facades of architectural objects and approaches to modern light-volume architectural design. The presented program makes a serious bias to the study of color and light in the urban environment.

## KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Student

**need to know:**

- the main directions, ideas and problems of color theory in architecture, design and art for use in project activities;
- basic principles and trends of modern analysis of sign systems, including architecture and urban environment;
- system concepts of color and symbol, to understand the meaning of science and design in the General cultural evolution of mankind;
- communication of the course with other disciplines and its role in the practical activities of the designer;
- the main directions, ideas and problems of symbols of General and architectural.

**must be able:**

- use the knowledge gained in the development of educational material of subsequent disciplines, as well as in further professional activities;
- use color and artificial sign systems to create an artistic image of the design project;
- design with knowledge of color and symbol in architecture, art and design;
- apply modern methods and approaches when working on design projects;
- critically assess the place and role of color in modern architectural theories, theory and methodology of design.

## Landscape architecture

CODE – ARC129

CREDIT – 6 (1/0/2/3)

PREREQUISITE – ARC103

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

To master and apply in practice the methods of aesthetic and functional optimization of environmental architectural objects during their reconstruction or conversion. To understand the main stylistic directions of landscape architecture, to analyze environmental objects in different categories (space, function, composition, scale, unity, image, etc.).

### BRIEF DESCRIPTION OF THE COURSE

Discipline "landscape architecture", gives the student an idea of the historical and global trends in landscape design, teaches to create new solutions based on them. Develops the student's ability to see non-standard solutions, to understand their meaning, to learn how to find ways to create their original landscape objects, to use new means of landscape architecture in urban spaces for their aesthetic harmonization, as well as for their optimization in terms of functionality and ecology.

### KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Student

**need to know:**

- the main directions, ideas and problems of landscape architecture for use in project activities;
- basic principles and trends of modern analysis of landscape forms, including architecture and urban environment;
- communication of the course with other disciplines and its role in the practice of the architect;
- the main directions, ideas and problems of symbols of General and architectural.

**must be able:**

- use the knowledge gained in the development of educational material of subsequent disciplines, as well as in further professional activities;
- design with knowledge of the landscape in architecture and design;
- apply modern methods and approaches in project activities.

## **Integrated design I**

CODE – ARC438

CREDIT – 6 (0/0/3/3)

PREREQUISITE – CIV164

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### **THE PURPOSE AND OBJECTIVES OF THE COURSE**

The purpose of the project "Blocked house" is acquaintance in the process of architectural design with the residential cell, the design system in low-rise construction. The objectives of this training stage is to get acquainted with: – the basics of design techniques (content, sequence, stages of work); – with the design of the territory of a blocked residential building as an independent fragment of space and its elements; – with the basics of a complex (functional, artistic and compositional, – three-dimensional and constructive) solutions of the building; – with elements of the interior space of the home (development of the concept of socio-functional, ergonomic and substantive content).

### **BRIEF DESCRIPTION OF THE COURSE**

A blocked residential building is a type of low-rise residential building, usually consisting of several apartments (blocks) located in a row, with isolated separate entrances to each apartment and apartment land plots (or without them). The efficiency and simplicity of the structures of the blocked residential building make them the most promising for low-rise urban construction. Before multi-storey apartment buildings, they have a number of advantages, including: a large area of residential and commercial premises, direct connection of the apartment with the garage and other household premises, a separate entrance to the apartment from the street, the possibility of "growth" and adaptation of apartments to the changed needs of the inhabitants. But the main advantage is the connection with the earth. The plot, located near the house, serves as the best recreational area, which is, in fact, a continuation of housing, a possible resource for its development. The use of blocked residential development in urban and rural settlements allows, along with the formation of a socially favorable and controlled living environment, to increase the percentage of green areas and thereby create conditions for the environmental efficiency of residential development.

## KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Student

### **need to know:**

- methodology and sequence of course projects;
- functional, structural, technical and figurative characteristics of the design object;
- conditions for the construction of residential buildings by industrial methods using advanced building materials and structures;
- conditions and possibilities of application of various effective finishing materials;
- demographic situation in the area of potential placement and construction of the blocked house;
- planning solutions of block apartments for different family members (for large families, families with disabilities, as well as for two, three, four, five or more people in the family, including for complex families from several generations);
- basic tools and techniques of composite modeling of the designed object.

### **must be able:**

- to develop in educational design a creative idea at the proper compositional and graphic level, taking into account social, technical and artistic features of the designed object;
- design an economical low-rise housing apartment type due to: a) blocking the kitchen, sanitary unit or bathroom of neighboring block apartments along the common transverse load-bearing wall to reduce engineering risers; b) the optimal design step of the bear

## **Integrated design II**

CODE – ARC439

CREDIT – 6 (0/0/3/3)

PREREQUISITE – ARC438

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### **THE PURPOSE AND OBJECTIVES OF THE COURSE**

To master and be able to apply in practice methods of work with normative and reference literature in the field of architectural design of preschool educational institutions, to make functional and planning schemes and space-planning decisions. Be able to analyze the urban situation in application to specific architectural tasks. To understand the main stylistic and typological directions in application to the problems of designing preschool educational institutions.

### **BRIEF DESCRIPTION OF THE COURSE**

Pre-school institutions are the most popular objects of civil engineering, the design and construction of which is closely connected with the implementation of the housing program and the restructuring of the system of public education, as well as with the social sphere of life. A particularly important role in the design should be given to the influence of the architectural environment on the formation of the child's personality, excluding the negative effects of monotonous monotony on his psychology. At the present stage, while reducing the "unaddressed" design of typical buildings, it is necessary to take more careful account of regional climatic and national characteristics, the specifics of the social needs of the population, the characteristics of demography. Building projects should meet the challenges of humanization of the living environment, high architectural, artistic and aesthetic requirements.

## KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Student

**need to know:**

- features of space-planning decisions, functional communication of various groups of rooms of DOE;
- the basis of the formation of the architectural image of preschool educational institutions, their typology, purpose, scale;

**must be able:**

- to use knowledge in the practice of educational architectural design, to determine the typological characteristics, spatial structure of modern objects, depending on the urban planning and environmental conditions of the urban environment;
- develop creative thinking skills;
- expressive graphic means to implement architectural ideas.

**own:**

- typology of objects of architecture of public buildings, to identify the main factors affecting the formation of the image and space-planning scheme, to be able to create bright ,interesting architectural objects, to analyze the urban situation, for a competent solution of communication links, including transport, pedestrian and visual, guided by the basic laws of landscape composition using relief techniques and methods of geoplasty and coloristic design of the object to create landscaping adjacent to the object area.

## **Integrated design III**

CODE – ARC440

CREDIT – 6 (0/0/3/3)

PREREQUISITE – ARC439

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

The discipline of "Integrated architectural design III. Design of a medium-rise residential building" is intended to give the future architect not only the amount of knowledge and skills to solve architectural problems, but also the ability to see in a particular building system of social, technical and artistic problems, without which the creative personality of the architect can not develop. In addition to the above, another important goal of this project is to familiarize with the design standards of residential buildings of medium height (in the SN and IP and other special literature).

### BRIEF DESCRIPTION OF THE COURSE

Discipline "Complex architectural design III" is the most important link in the program of theoretical training of bachelor-architect. The objectives of the discipline are: to develop the knowledge and skills necessary for the future professional activity of students in the design of economical housing apartment type; to acquire the skills of students to develop planning and design schemes and components of medium-rise residential building, independent selection of the appropriate type of housing for urban or rural construction and specific urban situation; to the selection of expressive forms of architectural graphics and layout execution of the project.

### KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Student

**need to know:**

- methodology and sequence of course projects;
- functional, structural, technical and figurative characteristics of the design object;
- conditions for the construction of medium-rise residential buildings by industrial methods using advanced building materials and structures;
- conditions and possibilities of application of various effective finishing materials;
- demographic situation in the area of potential placement and construction of the blocked house;
- planning solutions of apartments for different family members (for large families, families with disabilities, as well as for two, three, four, five or more people in the family, including for complex families from several generations);
- basic tools and techniques of composite modeling of the designed object.

**must be able:**

- to develop in educational design a creative idea at the proper compositional and graphic level, taking into account social, technical and artistic features of the designed object;
- design an economical medium-rise dwelling apartment type due to: a) blocking the kitchen, sanitary unit or bathroom of neighboring apartments along a common transverse load-bearing wall or partition to reduce engineering risers; b) the optimal design step of the bearing transverse walls of the house (up to 7.2 m inclusive); C) reducing the perimeter of the outer walls; d) the organization of the attic 6th residential floor and the rational use of the basement or basement floors;
- to create an expressive image of a modern residential building in accordance with the local climatic, ethnic, structural and technical features of the design of the dwelling;
- apply the knowledge gained in the study of related disciplines (to develop structural schemes and components of the building, the master plan, to carry out drawings in computer graphics, to make working and demonstration models, to select the architectural style of the building, etc.).

## Integrated design IV

CODE – ARC441

CREDIT – 6 (0/0/3/3)

PREREQUISITE – ARC440

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

To form students ' understanding of one of the most complex types of public buildings – Schools.

### BRIEF DESCRIPTION OF THE COURSE

The course is intended for students-architects and is mandatory in the preparation of a specialist designer. Discipline "Complex architectural design IV" is a continuation of the theme of "Educational institutions" and reveals the theme of school buildings. The content of the course is aimed at full mastery of the methods of designing schools, as well as a holistic view of the processes taking place in this type of buildings.

### KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Student

**need to know:**

- the processes that take place inside school buildings
- school design standards
- the latest trends in school design
- basics of child psychology
- features of the educational process

**must be able:**

- find relationships between different functional areas
- to design a multifunctional space
- develop a master plan for school buildings
- to predict future process design spaces

**must own:**

- special terminology denoting the types of schools
- basic knowledge of architectural physics
- information on the composition of the school premises

## **Integrated design V**

CODE – ARC442

CREDIT – 6 (0/0/3/3)

PREQUISITE – ARC441

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

The discipline "Complex design V" is designed to give the future architect not only the amount of knowledge and skills to solve architectural problems, but also the ability to see in a particular building system of social, technical and artistic problems, without which the creative personality of the architect can not develop. In addition to the above, another important goal of this project is to familiarize with the design standards of residential buildings of high floors (in Snips and other special literature).

### BRIEF DESCRIPTION OF THE COURSE

Brief description of the course: "Integrated design V" –is to draft an architectural solution and a brief description of the project: – "Hotel for 500 seats" or a hotel for recreation (resort, tourist) for the conditions of the city, development areas or urban areas, as well as mountain and coastal zones. Features of the developed hotel complexes should be reflected in the title on the tablets and in the content of the annotation to the topic and contain information on: – the number of rooms and the list of public areas; – number of floors; – the area of accommodation; – urban situation.

## KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Student

### **need to know:**

- methods of collection and analysis of raw materials;
- methodology and sequence of course projects;
- functional, structural, technical and figurative characteristics of the design object;
- conditions of construction of complexes by industrial methods using advanced building materials and structures;
- conditions and possibilities of application of various effective finishing materials;
- demographic situation in the area of potential location and construction of complexes;
- planning solutions of rooms or offices for a certain type and direction;
- the sequence of the course project;
- principles of creative search for a rational design concept;
- definition of the main stages of project activities and the content of sections of the project of public buildings;
- basic tools and techniques of composite modeling of designed objects.

### **must be able:**

- to prepare design specification and work program;
- to develop in educational design a creative idea at the proper compositional and graphic level, taking into account social, technical and artistic features of the designed object;
- to design a hotel for 500 seats with the development of a public area with the solution of complex functional and architectural and artistic tasks for the formation of complex residential and public areas on the basis of several complexes: a) the optimal constructive step of the bearing walls of buildings; b) reducing the perimeter of the outer walls; C) the rational use of service or public floors, etc.
- to create an expressive image of the modern complex in accordance with the local climatic, ethnic, structural and technical features of the design;
- analyze the urban situation, including objects of gravity, movement and behavior of pedestrians, forms of use of adjacent areas, spatial characteristics of the environment, terrain, orientation of the site, etc.;
- to be able to focus on solving the main functional and architectural composition problems of urban planning, the problems of organization of the material environment for human life;
- to apply professional skills of wide use of compositional graphic possibilities in connection with normative and reference literature.

## Integrated design VI

CODE – ARC443

CREDIT – 6 (0/0/3/3)

PREREQUISITE – ARC442

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

The purpose of the discipline "Design of Office complex with Parking" is to give the future architect not only the amount of knowledge and skills to solve architectural problems, but also the ability to see in a particular building system of social, technical and artistic problems, without which the creative personality of the architect can not develop. In addition to the above, another important goal of this project is to familiarize with the design standards of public buildings.

### BRIEF DESCRIPTION OF THE COURSE

The objectives of the discipline are: to develop the knowledge and skills necessary for the future professional activity of students in the design of office buildings and Parking lots, to acquire the skills of students to develop planning and design schemes and Parking units, self-selection of the appropriate type of Parking for urban construction and specific urban situation; to the selection of expressive forms of architectural graphics and layout execution of the project.

### KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Student

**need to know:**

- methodology and sequence of course projects;
- requirements for a public building of this type;
- functional, structural, technical and figurative characteristics of the design object.

**must be able:**

- to develop in educational design a creative idea at the proper compositional and graphic level, taking into account social, technical and artistic features of the designed object;
- suggest building type;
- independently solve research problems of sufficient complexity; – ensure the correct functional zoning of the building and the scheme of movement of vehicles;
- to create the unity of urban planning, transport and layout solutions of the building;
- to create an expressive image of a modern office building with Parking in accordance with the local climate, design and technical features of the design;
- apply the knowledge gained in the study of related disciplines (to develop structural schemes and components of the building, the master plan, to carry out drawings in computer graphics, to make working and demonstration models, to select the architectural style of the building, etc.).

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## **Integrated design VII**

CODE – ARC444

CREDIT – 6 (0/0/3/3)

PREREQUISITE – ARC443

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

The discipline "Complex design VII" is intended to give the future architect not only the amount of knowledge and skills to solve architectural problems, but also the ability to see in a particular building system of social, technical and artistic problems, without which the creative personality of the architect can not develop. In addition to the above, another important goal of this project is to familiarize with the design standards of residential buildings of high floors (in Snips and other special literature).

### BRIEF DESCRIPTION OF THE COURSE

The objectives of the discipline "Complex design VII" are: to develop the knowledge and skills necessary for the future professional activity of students in the design of housing apartment type; to acquire the skills of students to develop planning and structural schemes and units of residential complexes, independent selection of the appropriate type of housing for urban construction and specific urban situation; to the selection of expressive forms of architectural graphics and layout execution of the project.

## KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Student

### **need to know:**

- methodology and sequence of course projects;
- functional, structural, technical and figurative characteristics of the design object;
- conditions of construction of residential complexes by industrial methods using advanced building materials and structures;
- conditions and possibilities of application of various effective finishing materials;
- demographic situation in the area of potential placement and construction of high-rise residential complexes;
- planning solutions of apartments for different family members (for large families, two, three, four, five or more people in the family, etc.);
- basic tools and techniques of composite modeling of the designed object.

### **must be able:**

- to develop in educational design a creative idea at the proper compositional and graphic level, taking into account social, technical and artistic features of the designed object;
- to design a residential complex with the solution of complex functional and architectural and artistic problems on the formation of a complex living environment on the basis of several complexes; a) the optimal constructive step of the bearing transverse walls of the house; C) reducing the perimeter of the outer walls; d) the organization of the attic upper residential floor and rational use;
- to create an expressive image of a modern residential complex in accordance with the local climatic, ethnic, structural and technical features of the housing design;
- apply the knowledge gained in the study of related disciplines (to develop structural schemes and components of the building, the master plan, to carry out drawings in computer graphics, to make working and demonstration models, to select the architectural style of the building, etc.).

## **Integrated design VIII**

CODE – ARC445

CREDIT – 6 (0/0/3/3)

PREREQUISITE – ARC444

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### **THE PURPOSE AND OBJECTIVES OF THE COURSE**

The purpose of the discipline – functional zoning of the city is to achieve a rational location of all parts of the city, taking into account the architectural and planning, economic and sanitary solutions. Small town – aesthetic qualities, potentially inherent in the situational features of the area, should be taken into account when solving all issues of city planning, from the choice of territory and zoning and ending with the composition of the city plan and its parts.

The city is the main form of human settlement. It is the center of industry, science and culture. It is necessary to study the climatic, hydrological, engineering - geological conditions, as well as the aesthetic possibilities of the surrounding landscape.

### **BRIEF DESCRIPTION OF THE COURSE**

The content of the material is aimed at: the development of students-architects skills in design as a rule, small, it eventually passes into the category of large cities. The emergence of new small towns, an intensive increase in their number indicates that they are brought to life by the needs of the national economy, playing a significant role in the formation and development of settlement systems at different hierarchical levels; analyzing the area, the student needs to see the dominant natural conditions in order to choose a particular method of architectural and planning composition of the city; as a single ensemble, should be the main creative work of the student on the project, by examples in domestic and foreign practice in accordance with local climatic, ethnic, sanitary and hygienic features; on training of the organization of zoning of internal space according to functional requirements on formation of theoretical knowledge for creation of economic and effective (for specific town-planning conditions) objects of this type for the purpose of their further introduction in practice.

The objectives of the discipline are:

- to develop knowledge and skills necessary for the future professional activity of students in the field of small town design;
- the acquisition of students ' skills in the development of planning schemes of a small town, self-selection of the appropriate small town for rural construction and the specific urban situation.

The sequence of work on the image of the city should correspond to the sequence of formation of its planning structure. From the very beginning of the design of the city

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should be conceived of its silhouette. At the stages of development of the planning structure, the main compositional axes are determined and the compositional nodes are placed. Further improvement of the architectural and planning structure should be carried out in parallel with the formation of architectural ensembles and their placement in the city plan, as well as the identification of architectural accents. The mutual arrangement of zones characterizes the General functional organization of the territory of the city, and the relationship determines the construction of these zones on the basis of the road network, the system of cultural and consumer services, landscaping and gardening.

## KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Student

### **need to know:**

- mastering the methodology of collection and analysis of raw materials for Integrated design VIII. Design of a small town and the sequence of course projects;
- familiarization with the principles of creative search for a rational design concept, residential – for accommodation of residential buildings, public buildings and structures;
- definition of the main stages of project activities and content of project sections;
- industrial, where industrial enterprise and related objects;
- communal warehouse, which includes warehouses, garages, motor depots, public transport parks;
- conditions and possibilities of application of various effective finishing materials;
- external transport – to accommodate stations, ports, marinas, transport devices and facilities;
- recreation – to accommodate urban parks, beaches and other recreational facilities located within the city limits;
- basic tools and techniques of composite modeling of the designed object.

### **must be able:**

- compositional object modeling and situation analysis;
- self-preparation of the design assignment and work program;
- to develop in educational design a creative idea at the proper compositional and graphic level, taking into account social, technical and artistic features of the designed object;
- graphic design and manufacture of layouts;
- professional skills wide use of composite graphics capability in conjunction with the regulatory and reference books;
- analysis of the urban situation, including objects of gravity, movement and behavior of pedestrians, forms of use of adjacent areas, spatial characteristics of the environment, terrain, orientation of the site;

- a) mainly, the student needs to focus on solutions to the main functional and architectural and compositional problems of urban planning, the problems of organization of the material environment for human life;
- b) after determining the size of the residential zone, the student must place on its territory residential and public buildings, sports facilities, green spaces, as well as city streets and squares;
- the idea of the student should take part in the search for an interesting and rational type of future housing;
- in addition to residential development, the residential area is a number of buildings and structures, they are a system of cultural and consumer services, a network of children's institutions, hospital complexes, apply the knowledge gained in the study of related disciplines (to carry out drawings in computer graphics, make demonstration models, select the architectural style of the building, etc.).

## Basics of BIM technologies

CODE – ARC132

CREDIT – 6 (0/0/3/3)

PREREQUISITE – ARC144

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

To master and apply BIM technologies in practice for functional optimization of the design process. Understand basic tools, build and analyze spatial models in different project situations.

### BRIEF DESCRIPTION OF THE COURSE

The course is intended to give a General idea of BIM-technologies, its advantages and features. The main task is to introduce future architects to innovative technologies necessary for further project activities. In addition, the basic skills of working in specific information models with the use of BIM-technologies are given.

### KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Professional skills acquired during the course:

- ability to competently explain the benefits of BIM-technologies, their use;
- the ability to determine to which case it is necessary to use BIM-technology;
- skills in special computer programs.

Management skills acquired during the course:

- ability to correctly set collective and individual tasks for project solutions;
- ability to make the most effective design decisions;
- skills of working in the project team.
- communication skills acquired during the course:
- ability to work in a team with subcontractors in project activities;
- ability to find and correct conflicts in joint project activities;
- the ability to create and control a plan for collaboration in the BIM model.

## **Preparation & writing of thesis (project)**

CODE – ECA001

CREDIT – 6

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### BRIEF DESCRIPTION OF THE COURSE

Work on the thesis: collection of materials, analysis, sketching, execution, design.

## **Thesis (project) defense**

CODE – ECA103

CREDIT – 6

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### THE PURPOSE AND OBJECTIVES OF THE COURSE

Completion of the thesis – the final stage of training, reflecting the overall level of training of the graduate.

### BRIEF DESCRIPTION OF THE COURSE

The thesis is performed in several stages:

- pre-project analysis;
- expert survey;
- preparation of architectural and planning tasks;
- development of the project concept;
- performance of Clausura on the theme of the thesis;
- clarification of the project concept;
- development of basic project drawings;
- clarification of the project;
- writing an explanatory note on the main sections;
- coordination of topics with the experts;
- development of a three-dimensional model of the object;
- the completion of the project, the visualization;
- passing the anti-plagiarism procedure;
- obtaining admission to the defense of the thesis;
- defense of the thesis (project).