



# EDUCATIONAL PROGRAM

**6B07 - Engineering, Manufacturing and Civil engineering**  
(Code and classification of the field of education)

**6B073 - Architecture and Civil engineering**  
(Code and classification of the direction of training)

**0730**

(Code in the International Standard Classification of Education)

**B074 - Urban planning, construction works and civil engineering**  
(Code and classification of the educational program group)

**6B07302 - Civil engineering**  
(Code and name of the educational program)

**Bachelor**  
(Level of preparation)

**Semey**

## **Educational program**

**6B07 – Engineering, manufacturing and construction industries**  
(Code and classification of the field of education)

**6B073 - Architecture and construction**  
(Code and classification of the direction of training)

**0730**  
(Code in the International Standard Classification of Education)

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**6B07302 - Civil Engineering**  
(Code and name of the educational program)

**bachelor**  
(Level of preparation)

# PREFACE

## Developed

The educational program 6B07302 - Civil Engineering in the direction of preparation 6B073 - Architecture and construction on the basis of the State Compulsory Standards of Higher and Postgraduate Education approved by the Order of the Ministry of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022 No 2 (as amended by the order) was developed by the Academic Committee dated 20.02.2023 No 66).

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## Reviewed

At the meeting of the Quality Assurance Commission of the Faculty of Engineering and Technology Protocol №3 "15" of January 2024

At the meeting of the Commission on Academic Quality of the Higher School of Artificial Intelligence and Civil Engineering

Recommended for approval by the University Academic Council Protocol №1 "06" of June 2024

Chairman of the Commission on Academic Quality A.Adykanova

## Approved

at a meeting of the University Academic Council by protocol No. 6/1 of January 19, 2024.

at a meeting of the University Academic Council by protocol No. 11 of June 28, 2024.

# Content

1. Introduction

2. PASSPORT OF THE EDUCATIONAL PROGRAM:

2.1. EP purpose;

2.2. Map of the training profile within the educational program:

Code and classification of the field of education;

Code and classification of the direction of training;

Code in the International Standard Classification of Education;

Code and classification of the educational program group;

Code and name of the educational program;

2.3. Distinctive features of the OP (double degree/joint, OVPO-partner, Double major, innovative);

2.4. Qualification characteristics of the graduate:

Degree awarded / qualification;

Name of professional standard;

Atlas of new professions;

Regional standard;

Name of the profession / list of positions of a specialist;

OQF qualification level (industry qualification framework);

Area of professional activity;

Object of professional activity;

Types of professional activity;

2.5. Graduate Model.

3. Modules and content of the educational program

4. Summary table on the scope of the educational program 6B07302 - Civil Engineering»

# 1.Introduction

## 1.1.General data

The educational program "6B07302 Civil engineering", implemented by the Shakarim University of Semey by the Department of Construction and Geodesy, was developed taking into account the needs of the regional labor market.

The educational program "6B07302 Civil engineering" is intended for the preparation of bachelors of engineering and technology in the direction of training 6B073 "Architecture and Construction", who carry out professional activities in the fields of industrial and civil construction, design of buildings and structures.

According to the Statistics Agency of the Republic of Kazakhstan, there are not enough engineers of technical specialties at enterprises, the popular professions of Kazakhstan change annually, but the demand for engineers and designers has been growing for several years. The latter are employed in construction companies and cooperate with designers and architects.

To date, all graduates of the educational program "6B07302 Civil engineering" who graduated from Shakarim University are employed and occupy places from design engineers to needlework positions.

When implementing the educational program, it is planned to use artificial intelligence tools in the educational process, thereby developing digital competencies among students in a rapidly changing technological environment.

The educational program provides for the education of a student with special educational needs in the conditions of a higher educational institution, as well as his socialization and integration into society.

## 1.2.Completion criteria

The main criterion for the completion of the educational process in the preparation of bachelors is the acquisition of at least 205 credits of theoretical training, as well as at least 27 credits of practice, not 8 credits for the preparation of diplomas. Total 240 credits.

1.3.Typical study duration: Typical training period: 4 years

## 2.PASSPORT OF THE EDUCATIONAL PROGRAM

<b>2.1.EP purpose</b>	<p>Preparation of bachelors with professional competence in the field of construction and design of buildings and structures for various purposes, inspection and reconstruction of existing buildings. EP 6B07302 Civil engineering aims to achieve in the course of training and education of such a level of readiness of the graduate to an independent life, which fully meets the social expectations of society regarding its ability to productive professional activity in modern society The application of this programme aims to achieve the following – development of bachelors ability to self-improvement and self-development, needs and skills; – to ensure the adaptation of higher education in the direction of training 6B073 «Architecture and construction» and research to the changing needs of society and the achievements of scientific thought; – to ensure recognition of the level of training in other countries – to provide higher mobility of graduates in the changing conditions of the labor market</p>
<b>2.2.Map of the training profile within the educational program</b>	
Code and classification of the field of education	6B07 - Engineering, manufacturing and construction industries
Code and classification of the direction of training	6B073 - Architecture and construction
Code in the International Standard Classification of Education	0730
Code and classification of the educational program group	B074 - Urban planning, construction works and civil engineering
Code and name of the educational program	6B07302 - Civil Engineering
<b>2.3.Distinctive features of the OP (double degree/joint, OVPO-partner, Double major, innovative)</b>	-
<b>2.4.Qualification characteristics of the graduate</b>	
Degree awarded / qualification	Bachelor of Engineering and Technology in the educational program
Name of professional standard	<ol style="list-style-type: none"> <li>1. Professional standard: "Construction of residential and non-residential buildings"</li> <li>2. Professional standard: "Architectural and urban planning works"</li> <li>3. Development of construction projects</li> <li>4. Construction of other structures not included in other groupings</li> <li>5. Installation and installation of prefabricated and monolithic structures</li> </ol>
Atlas of new professions	-
Regional standard	-
Name of the profession / list of positions of a specialist	Site master, engineer, design engineer, quality engineer, Construction supervision engineer, OaSH engineer, Repair engineer, Process engineer, construction laboratory engineer, Workshop head( head), Head of production laboratory, Head of Personnel Department, Head of Capital Construction Department, Head of Safety and Labor Protection

	Department, Head of Production Department, Head of Technical department, Head of repair shop, shift supervisor, work producer( foreman), Warehouse manager
OQF qualification level (industry qualification framework)	6 level of qualification in IQF and NQF
Area of professional activity	The sphere of professional activity of the graduate of the educational program is the construction, design and calculation of buildings and structures of industrial and civil construction, control in the field of construction production
Object of professional activity	The objects of professional activity of graduates of the educational program are construction and installation departments and organizations, factories for the production of construction products, utilities, enterprises for the operation and repair of construction machinery and equipment, joint-stock associations for construction
Types of professional activity	<p>Graduates of the educational program "6B07302 Civil engineering" can perform the following types of professional activities:</p> <p>Production and management activities:</p> <ul style="list-style-type: none"> <li>- manage teams that carry out construction and installation work on the construction, operation and reconstruction of buildings, structures, engineering systems and equipment; on the operation and repair of construction machinery, mechanical, electrical equipment and automation equipment;</li> </ul> <p>Design and engineering activities:</p> <ul style="list-style-type: none"> <li>- perform design work on the construction and reconstruction of buildings and structures, engineering systems, mechanical and electrical equipment and means of mechanization;</li> </ul> <p>Organizational and technological activities:</p> <ul style="list-style-type: none"> <li>- organize the work of construction, municipal organizations and enterprises;</li> </ul> <p>Scientific and pedagogical activity:</p> <ul style="list-style-type: none"> <li>- to participate in the implementation of research works and conduct scientific and pedagogical activities in general education organizations.</li> </ul>
<b>2.5. Graduate Model</b>	<p>The graduate model of the educational program "Construction" of Shakarim Semey University represents a qualified specialist in the field of construction, who has a wide range of knowledge and skills. The characteristics and qualities that a graduate should possess are given:</p> <ol style="list-style-type: none"> <li>1. Technical knowledge: The graduate has mastered the basics of construction theory and practice, including knowledge of building materials, structures, technologies and standards.</li> <li>2. Design and Planning: The graduate is able to participate in the design and planning of construction projects, including the creation of drawings, estimates and technical documentation.</li> <li>3. Project Management: The graduate has the skills to manage construction projects, including planning, budgeting and execution control.</li> <li>4. Safety and sustainability: The graduate knows the</li> </ol>

	<p>principles of ensuring safety on the construction site and pays attention to aspects of the stability of building structures to various influences.</p> <p>5. Using modern technologies: The graduate has the skills to work with modern technological tools and programs that help in the design and management of construction sites.</p> <p>6. Compliance with norms and standards: The graduate is familiar with the legislation and standards in the field of construction and building safety.</p> <p>7. Communication skills: The graduate is able to communicate effectively with colleagues, clients and other participants in the construction process.</p> <p>8. Ethics and professionalism: The graduate adheres to high professional and ethical standards, taking into account the interests of the customer and society.</p> <p>Such a graduate is able to successfully work in various areas of the construction industry, including design, construction, project management, as well as in government agencies and consulting firms. The graduate is ready to solve complex problems in the field of construction and contribute to the development of this important industry.</p>
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### **3. Modules and content of the educational program**

#### **Module 1. Fundamentals of social and humanitarian knowledge**

##### **Brief description of the module content**

This module reveals such aspects as: socio-cultural, economic-legal, environmental knowledge, communication skills, the use of information technology taking into account modern trends in the development of society.

##### **Module disciplines**

Foreign language

Kazakh(Russian) language (1)

Bases of economics, law and ecological knowledge

Physical Culture

Foreign language

History of Kazakhstan

Kazakh(Russian) language (2)

The module of socio-political knowledge (sociology, political science, cultural studies, psychology)

Physical Culture

Physical Culture

World of Abai

Information and communication technology

Physical Culture

Philosophy

#### **Module 2. Natural science disciplines**

##### **Brief description of the module content**

The Natural Sciences module includes key subjects such as mathematics, physics, chemistry and biology aimed at developing fundamental scientific knowledge. It provides students with the basic concepts and research methods necessary to understand natural phenomena. This module promotes the development of analytical thinking and problem solving skills that are important for future professionals in various fields of science and technology. As a result, students gain solid knowledge and skills that serve as the basis for further professional and academic growth.

##### **Module disciplines**

Mathematics

Physics

#### **Module 3. Fundamentals of architectural and construction activity**

##### **Brief description of the module content**

The module "Fundamentals of Architectural and Construction Activity" covers key disciplines such as architectural design, building materials and technologies, as well as the basics of engineering structures. It is aimed at developing the basic knowledge and skills necessary for planning and implementing construction projects. Students study the principles of design, functionality and sustainability of buildings, which contributes to their preparation for professional activity in the construction industry. The module provides a fundamental understanding of architectural and construction processes, forming the basis for further in-depth training and practice.

##### **Module disciplines**

Introduction to construction

Educational practice

The architecture

Construction materials

Architecture of industrial buildings

Engineering landscaping

Urbanism and city planning

#### **Module 4. Engineering systems and machines in civil engineering**

##### **Brief description of the module content**

The module "Engineering Systems and Machines in Civil Engineering" includes disciplines such as water supply and sanitation systems, heating and ventilation, as well as construction machinery and mechanisms. It is aimed at studying the principles of design, installation and operation of engineering systems that ensure comfort and safety in buildings. Students gain knowledge about modern technologies and equipment used in civil engineering, which contributes to their preparation for solving practical tasks in their professional activities. The module forms a comprehensive understanding of the role of engineering systems and construction machines in creating functional and efficient infrastructure facilities.

#### **Module disciplines**

Water supply and sewerage

Engineering systems of buildings and structure

Industrial practice I

Heating and ventilation systems

Hydraulics and hydraulic machines

The Sanitary equipment of buildings

Construction machines and equipment

### **Module 5. Design and calculation of building structures**

#### **Brief description of the module content**

The module "Design and Calculation of building structures" covers key disciplines such as theoretical mechanics, building statics, reinforced concrete and metal structures. It aims to study the principles and methods of designing reliable and sustainable construction projects. Students gain skills in performing calculations, modeling and analysis of structures using modern software tools. The module provides a deep understanding of the engineering aspects of design, which is the basis for creating safe and effective construction solutions.

#### **Module disciplines**

Autocad in projecting

Computer drawing in design

Engineering mechanics

Computer graphics in construction

Construction structures

Hydromechanics and water resources

Hydraulic Engineering

Design of Hydraulic structures

Stone and reinforced concrete structures

Organization of project documentation

Design and estimate work

Industrial practice II

Documentation, valuation and pricing of construction works

Production of metal structures

Metal structures

Installation of metal structures

### **Module 6. Geotechnical research and design of foundations in construction**

#### **Brief description of the module content**

The module "Geotechnical research and design of foundations in construction" includes disciplines such as engineering geology, soil mechanics, foundations and foundations, as well as geotechnical design. It is aimed at studying the properties of soils and their interaction with structures, which is the basis for safe and effective foundation design. Students master the methods of geotechnical research, analysis and calculation of foundations, which allows them to solve complex engineering problems. The module provides a comprehensive understanding of the geotechnical aspects of construction necessary to create reliable and durable foundation structures.

#### **Module disciplines**

Academic writing and the basics of scientific research

Geotechnics

Engineering geology and soil mechanics

Fundamentals of soil mechanics

## **Module 7. Energy-efficient design and information modeling of buildings**

### **Brief description of the module content**

The module "Energy Efficient Design and Building Information Modeling" includes disciplines such as energy efficient technologies in construction, fundamentals of building information modeling (BIM), and environmental design. It is aimed at studying the principles of creating energy-efficient and sustainable buildings using modern technologies and software. Students master methods for analyzing and optimizing the energy characteristics of buildings, as well as skills in working with BIM systems for integrated design. The module ensures the integration of environmental and digital approaches in design, which contributes to the training of specialists to meet the modern requirements of the construction industry.

### **Module disciplines**

BIM-technology in building design

Smart technologies in construction

Software packages for computer-aided design

Calculation of structures and systems of buildings by computer programs

Computer-aided design systems in construction

Digital technologies in organizations, management and planning of buildings

Projecting and construction of energy efficient buildings

## **Module 8. Regulatory and economic framework in construction**

### **Brief description of the module content**

The module "Regulatory and Economic Framework in Construction" includes disciplines such as construction law, construction economics, construction project management and cost estimation. It is aimed at studying the legislative, economic and managerial aspects necessary for the successful conduct of construction projects. Students master the methods of cost estimation, budget planning and risk management in construction. The module provides a comprehensive understanding of the regulatory and economic foundations, which contributes to the effective organization and implementation of construction processes.

### **Module disciplines**

Control and management of normative documentation at CIW

Normative and technical documentation in construction

## **Module 9. Organization and technology of construction production of buildings and structures and production of building materials**

### **Brief description of the module content**

The module "Organization and technology of construction production of buildings and structures and production of building materials" includes disciplines such as technology of construction of buildings and structures, organization of construction production, and production of building materials. It is aimed at studying the methods and technologies of construction, as well as the processes of manufacturing and using building materials. Students learn practical skills in construction project management, optimization of construction processes and quality control of materials. The module provides a comprehensive understanding of the production and technological aspects of construction, which is necessary for efficient and high-quality construction work.

### **Module disciplines**

Geodetic works in the construction of structures

Geodesy

Systems of coordinates and altitudes in geodesy

Engineering geodesy

Technology of production construction

Technology of construction of buildings and structures

Automations topographergeodetic Work

Geodetic works on the construction of industrial site

Geodesic control in construction

Construction and operation of Urban highways

Operation of housing and communal services and Urban infrastructure

The construction of special buildings and structures  
The organization, management and planning in building  
Technologies of high-rise construction  
Pre-diploma practice  
Production practice III

## **Module 10. Technology of testing and reconstruction of buildings**

### **Brief description of the module content**

The module "Technology of testing and reconstruction of buildings" includes disciplines such as methods of testing building structures, building reconstruction technologies, and diagnostics of the condition of construction facilities. It is aimed at studying methods for assessing the technical condition of buildings and structures, as well as technologies for their modernization and restoration. Students master the skills of conducting tests and diagnostics, develop solutions to extend the service life and improve the operational characteristics of buildings. The module provides a comprehensive understanding of the inspection and reconstruction processes, which contributes to improving the reliability and safety of construction sites.

### **Module disciplines**

Tests of buildings and structures  
Construction in seismic areas  
Technical maintenance of buildings  
Technical operation and testing of buildings and structures  
Technology reconstruction of buildings

### **Final examination**

#### **Brief description of the module content**

Writing and defending a thesis or preparing and passing a comprehensive exam.

### **Module disciplines**

Thesis project  
Comprehensive exam

## 4. Summary table on the scope of the educational program «6B07302 - Civil Engineering»

Name of discipline	Cycle/ Component	Term	Number of credits	Total hours	Lec	SPL	LC	IWST	IWS	Knowledge control form
<b>Module 1. Fundamentals of social and humanitarian knowledge</b>										
Foreign language	GER/CC	1	5	150		45		35	70	Examination
Kazakh(Russian) language (1)	GER/CC	1	5	150		45		35	70	Examination
Bases of economics, law and ecological knowledge	GER/US	1	5	150	15	30		35	70	Examination
Physical Culture	GER/CC	1	2	60		60				Differentiated attestation
Foreign language	GER/CC	2	5	150		45		35	70	Examination
History of Kazakhstan	GER/CC	2	5	150	30	15		35	70	Qualification examination
Kazakh(Russian) language (2)	GER/CC	2	5	150		45		35	70	Examination
The module of socio-political knowledge (sociology, political science, cultural studies, psychology)	GER/CC	2	8	240	30	45		55	110	Examination
Physical Culture	GER/CC	2	2	60		60				Differentiated attestation
Physical Culture	GER/CC	3	2	60		60				Differentiated attestation
World of Abai	BS/US	3	3	90	15	15		20	40	Examination
Information and communication technology	GER/CC	4	5	150	15	15	15	35	70	Examination
Physical Culture	GER/CC	4	2	60		60				Differentiated attestation
Philosophy	GER/CC	5	5	150	15	30		35	70	Examination
<b>Module 2. Natural science disciplines</b>										
Mathematics	BS/US	1	5	150	15	30		35	70	Examination
Physics	BS/US	1	3	90	15	15		20	40	Examination
<b>Module 3. Fundamentals of architectural and construction activity</b>										
Introduction to construction	BS/US	1	3	90	15	15		20	40	Examination
Educational practice	BS/US	2	2	60						Total mark on practice
The architecture	BS/US	3	5	150	15	30		35	70	Examination and term work/Project
Construction materials	BS/US	3	5	150	15	15	15	35	70	Examination
Architecture of industrial buildings	BS/US	4	5	150	15	30		35	70	Examination
Engineering landscaping	BS/CCh	5	5	150	15	30		35	70	Examination
Urbanism and city planning	BS/CCh	7	5	150	15	30		35	70	Examination

<b>Module 4. Engineering systems and machines in civil engineering</b>										
Water supply and sewerage	BS/CCh	4	5	150	15	30		35	70	Examination
Engineering systems of buildings and structure	BS/CCh	4	5	150	15	30		35	70	Examination
Industrial practice I	BS/US	4	5	150						Total mark on practice
Heating and ventilation systems	BS/CCh	4	5	150	15	30		35	70	Examination
Hydraulics and hydraulic machines	BS/CCh	5	5	150	15	30		35	70	Examination
The Sanitary equipment of buildings	BS/CCh	5	5	150	15	30		35	70	Examination
Construction machines and equipment	BS/CCh	5	5	150	15	30		35	70	Examination
<b>Module 5. Design and calculation of building structures</b>										
Autocad in pojecting	BS/CCh	2	5	150	15	30		35	70	Examination
Computer drawing in design	BS/CCh	3	5	150	15	30		35	70	Examination
Engineering mechanics	BS/US	3	5	150	15	30		35	70	Examination
Computer graphics in construction	BS/CCh	3	5	150	15	30		35	70	Examination
Construction structures	BS/US	4	5	150	15	30		35	70	Examination
Hydromechanics and water resources	BS/CCh	5	5	150	15	30		35	70	Examination
Hydraulic Engineering	BS/CCh	5	5	150	15	30		35	70	Examination
Design of Hydraulic structures	BS/CCh	5	5	150	15	30		35	70	Examination
Stone and reinforced concrete structures	AS/US	5	5	150	15	30		35	70	Examination
Organization of project documentation	BS/CCh	6	5	150	15	30		35	70	Examination
Design and estimate work	BS/CCh	6	5	150	15	30		35	70	Examination
Industrial practice II	BS/US	6	5	150						Total mark on practice
Documentation, valuation and pricing of construction works	BS/CCh	6	5	150	15	30		35	70	Examination
Production of metal structures	AS/CCh	6	5	150	15	30		35	70	Examination
Metal structures	AS/CCh	6	5	150	15	30		35	70	Examination
Installation of metal structures	AS/CCh	6	5	150	15	30		35	70	Examination
<b>Module 6. Geotechnical research and design of foundations in construction</b>										
Academic writing and the basics of scientific research	BS/US	3	3	90	15	15		20	40	Examination
Geotechnics	BS/CCh	4	5	150	15	15	15	35	70	Examination
Engineering geology and soil mechanics	BS/CCh	4	5	150	15	15	15	35	70	Examination
Fundamentals of soil mechanics	BS/CCh	4	5	143	15	15	8	35	70	Examination
Foundations and bases	BS/CCh	5	5	150	15	30		35	70	Examination
<b>Module 7. Energy-efficient design and information modeling of buildings</b>										
BIM-technology in building design	BS/CCh	6	5	150	15	30		35	70	Examination

Smart technologies in construction	BS/CCh	6	5	150	15	30		35	70	Examination
Software packages for computer-aided design	BS/CCh	6	5	150	15	30		35	70	Examination
Calculation of structures and systems of buildings by computer programs	BS/CCh	6	5	150	15	30		35	70	Examination
Computer-aided design systems in construction	BS/CCh	6	5	150	15	30		35	70	Examination
Digital technologies in organizations, management and planning of buildings	BS/CCh	6	5	150	15	30		35	70	Examination
Projecting and construction of energy efficient buildings	AS/US	7	6	180	30	30		40	80	Examination and term work/Project
<b>Module 8. Regulatory and economic framework in construction</b>										
Control and management of normative documentation at CIW	AS/CCh	7	5	150	15	30		35	70	Examination
Normative and technical documentation in construction	AS/CCh	7	5	150	15	30		35	70	Examination
<b>Module 9. Organization and technology of construction production of buildings and structures and production of building materials</b>										
Geodetic works in the construction of structures	BS/CCh	4	5	150	15	30		35	70	Examination
Geodesy	BS/CCh	4	5	150	15	30		35	70	Examination
Systems of coordinates and altitudes in geodesy	BS/CCh	4	5	150	15	30		35	70	Examination
Engineering geodesy	BS/CCh	5	5	150	15	30		35	70	Examination
Technology of production construction	AS/US	5	5	150	15	30		35	70	Examination and term work/Project
Technology of construction of buildings and structures	AS/US	6	5	150	15	30		35	70	Examination and term work/Project
Automations topographergeodetic Work	BS/CCh	7	5	150	15	30		35	70	Examination
Geodetic works on the construction of industrial site	BS/CCh	7	5	150	15	30		35	70	Examination
Geodesic control in construction	BS/CCh	7	5	150	15	30		35	70	Examination
Construction and operation of Urban highways	BS/CCh	7	5	150	15	30		35	70	Examination
Operation of housing and communal services and Urban infrastructure	BS/CCh	7	5	150	15	30		35	70	Examination
The construction of special buildings and structures	AS/CCh	7	5	150	15	30		35	70	Examination
The organization, management and planning in building	AS/CCh	7	5	150	15	30		35	70	Examination
Technologies of high-rise construction	AS/CCh	7	5	150	15	30		35	70	Examination
Pre-diploma practice	AS/CCh	8	15	450						Total mark on practice
Production practice III	AS/CCh	8	15	450						Total mark on practice
<b>Module 10. Technology of testing and reconstruction of buildings</b>										
Tests of buildings and structures	AS/CCh	7	5	150	15	30		35	70	Examination
Construction in seismic areas	AS/CCh	7	5	150	15	30		35	70	Examination
Technical maintenance of buildings	AS/CCh	7	5	150	15	30		35	70	Examination
Technical operation and testing of buildings and structures	AS/CCh	7	5	150	15	30		35	70	Examination

Technology reconstruction of buildings	AS/US	7	6	180	30	30		40	80	Examination and term work/Project
<b>Final examination</b>										
Thesis project		8	8	240						
Comprehensive exam		8	8	240						



**NON-COMMERCIAL JOINT STOCK "SHAKARIM UNIVERSITY OF SEMEY"**

**EDUCATIONAL PROGRAM DEVELOPMENT PLAN**

6B07302 - «Civil Engineering»

for 2024-2028 academic year

Semey 2024

## Content

<b>№</b>	<b>Name of sections</b>	<b>Pages</b>
1.	Passport of the educational program development plan	3
2.	Analytical justification of the EP	4
2.1	Information about the educational program	4
2.2	Information about students	6
2.3	Internal and external conditions of EP development	6
2.4	Information about teaching staff implementing the educational program	7
2.5	Characteristics of the achievement of the EP	8
3	The main objectives of the EP development plan	9
4	EP risk and analysis	10
5	Action plan for the development of the EP	11

## 1. Passport of the Bachelor's Degree Development Plan 6B07302 - «Civil Engineering»

1	The basis for the development	Development program of the Non -Profit Limited Company «Shakarim University of Semey» for 2023-2029 The strategy and topics of the development plan of the OP are based in accordance with the educational policy of the Republic of Kazakhstan, the Strategic Plan of the Shakarim University for 2021-2025, the Work Plan of the Graduate School Artificial Intelligence and Construction, the quality goals of the Construction and Geodesy.
2	Terms of implementation	2024-2028
3	Expected results of implementation	Preparation of bachelors with professional competencies in the field of construction and design of buildings and structures for various purposes, inspection and reconstruction of existing buildings, capable of self-improvement and self-development, with the mobility of graduates in changing labor market conditions.

## **2. Analytical justification of the OP**

### **2.1 Information about the educational program**

The educational program has been developed in accordance with the National Qualifications Framework and Professional Standards, according to the Dublin Descriptors and the European Qualifications Framework. The typical period of mastering the bachelor's degree program is 4 years.

The main criterion for the completion of the educational process is the development of at least 240 credits, with the award of a bachelor's degree in OP 6B07302 – "Civil Engineering".

The educational program 6B07302 " Civil Engineering " has passed the specialized international IAAR accreditation for a period of 5 years, from 16.04.2021 to 15.04.2026 (BSN registration number: 130840007973).

This educational program is aimed at the formation of basic knowledge in the field of industrial and civil engineering technologies. The purpose of the training is to form the student's competencies in the field of calculation, design, design of buildings, structures and their structures, taking into account technologies, organizations of construction production, using design standards, standards, computer-aided design tools.

*The types and objects of professional activity are:*

- development of design documentation at the stage of architectural, construction and structural solutions of buildings and structures;
- construction of buildings using structures made of reinforced concrete, metal, wood and plastics;
- application of modern materials and methods of work in construction;
- application of modern software systems and computer modeling, automation of design and construction;
- development of project documentation at the stage of construction production technologies, works and construction organization;
- inspection and examination of buildings and structures;
- work in the field of management and operation of construction.

*The competitive advantages of this program include:*

- the possibility of obtaining design skills in modern software products;
- the use of modern methods, tools and technologies of training;
- comprehensive development of students' research skills, the possibility of their participation in the implementation of scientific projects in cooperation with leading enterprises in the construction sector.

The acquired skills of designing buildings and their structural elements will allow future graduates to carry out large-scale high-tech projects.

The program develops students' skills in analyzing and developing design documentation for architectural, construction and structural solutions of buildings and structures, construction production technologies, using mathematical and computer technologies and methods.

*Areas of knowledge and professional competencies:*

- architecture, design and construction;
- mathematical modeling, theoretical and structural mechanics;
- building structures (metal, reinforced concrete, stone, wood and plastics), foundations and foundations, soil mechanics;
- technologies of construction production, design of works and organization of construction;
- project management, pricing and estimated rationing, construction quality, technical regulation;
- computer modeling, computer-aided design, construction and construction management.

Depending on the chosen disciplines, students can learn in more detail the skills of performing calculations and designing building structures, designing buildings and structures taking into account the requirements for energy conservation, natural lighting, insolation, acoustics, technology design and organization of construction production, methods of structural research.

The knowledge and skills base laid down will allow the graduate of the Construction Department to find a job in the most liked direction, this is either the design of buildings and structures in a design organization, or the management of the construction process directly on the construction site, or the quality control of construction and installation work performed, or ensuring the durability of building structures.

## 2.2 Information about students

Mode of study Academic year	2024-2025 academic year	2025-2026 academic year	2026-2027 academic year	2027-2028 academic year
Grant	35	35	35	35
Contract	35	35	35	35
Total	70	70	70	70

## 2.3 Internal and external conditions for the development of EP

To implement the above-mentioned purpose of the educational program, the department has the appropriate material and technical resources. 9 classrooms are involved: 4 lecture halls, equipped with LSD projectors and interactive whiteboards, 3 computer classes with a LAN connection and unlimited Internet, 2 specialized laboratories. Thus, to date, the classroom fund of the department is sufficient for the successful implementation of the OP plan, only equipment should be improved. To attract students to research activities, there is a specialized laboratory "Building Materials" (1213 aud), in addition, certified laboratories of Silicate LLP, "Semey Cement Plant" LLP.

EP " Civil Engineering " is one of the first to implement dual training at the university since 2016. This makes it possible to conduct field classes at enterprises with the involvement of practitioners with sufficient experience in production. Dual training is carried out on the basis of leading large enterprises of the city such as: LLP PII "Semstroyproekt", LLP "Firm Asia" concrete plant, LLP "Partner-Energo Ltd", LLP "Semey-Department-Stroy", LLP "TurMerStroy", LLP "Semey Cement Plant", LLP "Architecture F", Vostok-Stroy LLP, "Arlanstroyontazh" LLP.

The financial resources of the OP are provided by the university budget, as well as research and international projects. Information resources are at the disposal of the OP and are represented by the library (including electronic publications), access to the Internet for all students and teaching staff, access to the local network of the university. There are open WI-FI zones. The personnel of the OP is fully staffed, according to the qualification requirements. The provision of educational programs with educational and methodological complexes of disciplines is 100%. The work on mobility has been well done: Cooperation between Kazakh Universities has been expanded (Gumilev ENU, IOC KAZGAS, EKSTU named after Serikbayev, KazNITU Satpayev, Toraigyrov University, Karaganda Industrial University, where the Construction educational program is directly implemented, also signed cooperation agreements with leading universities in Russia.

In 2015, a cooperation agreement was signed between the Siberian State University of Geosystems and Technologies (Russia). In 2016, an agreement was signed with Novosibirsk State University of Architecture and Civil Engineering (Russia).

During the development of the OP, employers took part in its discussion: E.S. Slyamkanov - Director of Semstroyproekt Design and Survey Institute LLP, A.M. Dyusembayev - Chief engineer, Partner Energo Ltd LLP, who represented the interests of leading specialists in the construction industry of the city.

According to the OP, contracts were concluded for the passage of industrial practice with PII Semstroyproekt LLP, POSZHB LLP, Firm Asia LLP, Semey-Dept-Stroy LLP, TurMerStroy LLP.

## **2.4 Information about teaching staff implementing the educational program**

The staff of the teaching staff of the department for the 2023-2024 academic year is 23 people, including 5 people with academic degrees and titles. The number of full-time teaching staff with academic degrees and titles has been increasing in recent years. The personnel policy pursued by the management of the department and the university, which is aimed at creating conditions and assisting in admission to the target PhD-doctoral program, contributes to maintaining stability. In order to improve the quality of the disciplines taught in Construction for the 2023-2024 academic year, practical teachers who are active employees of construction companies have been involved. These are: Chumichkin R.P., Toktasyn N.Zh., Moldakhanova A.B., Suleimenov D.S., Kayyrbayev E.B.

A number of teachers, such as Sadvakassova G.O., Kauassova M.A., Zhumadilov I.T. have practical experience working at enterprises: Sadvakassova G.O. – An engineer at the plant, Kauassova M.A. – an engineer at Klmstroyontazh LLP and a number of other enterprises, Zhumadilov I.T. – An Engineer at KGS LLP.

In order to improve the quality of teaching disciplines, the teachers of the department implementing the OP are activating the introduction and further application in the educational process of new information technologies, multimedia learning tools, active learning tools and elements of E-learning, Soigs, which enable students to better assimilate educational material and consolidate knowledge.

The teaching staff conducting classes on the OP has the necessary qualifications and level of education.

The number of full-time teaching staff conducting training sessions on this OP is 30 people. Including those with academic degrees and titles – 16, which is 53% of the total number of teachers. Among the teaching staff are Doctors of Technical Sciences, Candidates of Sciences, PhD, Masters.

## **2.5 Characteristics of the achievements of the EP**

The main indicator of the effectiveness of the educational program is the proportion of employed graduates. The dynamics of the share of those employed in recent years has been, respectively, by year: 2016 – 100%, 2017 – 95%, 2018 – 90%, 2019 – 100%, 2020 - 82%, 2021 - 88%, Attracting students to research is more than 65%. An important indicator of the relevance and relevance of educational programs, their compliance with modern trends in education is the academic mobility of students and teaching staff.

Involvement of professors of leading foreign universities in teaching and research activities. To improve the level of education, foreign scientists are invited to give lectures to students of this specialty, so from November 15-24, 2018, Professor Victor Nicholas Kalyakin of the University of Delaware, USA held a seminar on "Geosynthetic reinforcement of soil foundations: understanding their behavior through numerical modeling", Professor Viktor Kaliyakin came to lecture on the disciplines of Geotechnics, foundations and foundations with October 14-21, 2022, also November 13, 2020 Professor Akira Hasegawa, Hachinohe Institute of Technology, Japan conducted an online seminar for teachers of the department on the topic "Geotechnical design of foundations and foundations in seismic areas" (Geotechnical design of foundations and foundations in seismic areas).

## **3. The main objectives of the OP development plan**

For the effective implementation of the OP, the following tasks are defined:

- 1) Provide a level of education that meets modern requirements:
  - develop independent thinking, the ability to self-development and self-education;
  - to provide conditions that take into account the individual and personal characteristics of the student;
  - to create a creative atmosphere by organizing a system of electives, elective courses, clubs, sports sections, paid educational services;
  - to form a positive motivation of students for learning activities.
  - continue work on the organization and formation of specialized training;
- 2) To form a creatively working team of teachers:
  - to organize the study, implementation and improvement of technology and methods for diagnosing the quality of education;



- organize the publication of creative and scientific works of teachers;
- to continue the training of teachers on the use of information technology in the educational process.

3) To improve the organization of the educational process:

- to improve the interaction of academic disciplines on the basis of integration;
- to develop the differentiation of learning, the technology of problem-based learning;
- to introduce technologies that form key competencies into the educational process.

Expected final results of the implementation of the OP development plan:

1. Improving the quality of education;
2. Improving the efficiency of the education system, continuous professional growth of the teaching staff of the department;
3. Modernization of personnel, information and resource, material and technical potential;
4. The demand for graduates in the labor market.

#### 4. EP risk and analysis

№	Name of risks	Measures to eliminate
1	Reduction of the contingent of students in the EP	To conduct active career guidance work among the schools of the city and the Region of Abai. To participate in events held at the university level, In trips "Shakarim kerueni", etc. Attracting startup students, meeting with parents of graduates at parent meetings, engaging in research, etc. Formation of a positive image of the OP (through the release of highly qualified specialists and the introduction of research results, etc.);
2	Insufficient level of knowledge of the language for the introduction of multilingualism	Stimulating the teaching staff of the OP to increase the level of English language proficiency by attending additional courses in the foreign language.
3	Decrease in the level of employment	To increase cooperation with the leading industrial enterprises of the region, to expand the bases of practices, to increase academic hours in the dual type of training. To increase the interest of managers and part-time employees from enterprises by increasing wages as an engaged practitioner within the framework of dual training.
4	Insufficient development of external and internal academic mobility of students and teaching staff	Attracting students by increasing their interest to participate in academic mobility within the country and abroad.
5	The risk of reducing the settling down of teachers staff in the EP	To send young and promising teachers to the target PhD doctoral program. Improving the level of knowledge of a foreign language. To attract settled specialists by creating additional conditions by the university management.
6	Insufficiency of the material and technical base for OP	To acquire and update the material and technical base (computers, laboratory equipment) by submitting an application through the state procurement department.

## 5. Action plan for the development of the EP

№	Criteria	Expected results	Unit. Of measur.	2024-2025	2025-2026	2026-2027	2027-2028
<b>Направление 1. Учебно-методическое обеспечение</b>							
1.1	Updating the educational program based on professional standards, taking into account the recommendations of employers	Conducting an examination of the Educational program "Construction" in order to improve the practice orientation and development of professional competencies of graduates	fact	+		+	
1.2	Monitoring and updating catalogs of elective disciplines in accordance with the development of key and professional competencies, the demands of the labor market.	Improving the quality of the content of educational programs by including elective courses aimed at developing the key and professional competencies of graduates in accordance with the demands of the labor market.	fact	+		+	
1.3	Introduction of modern learning technologies into the educational process, contributing to the development of cognitive activity, communicative ability of students	Improving the quality of teaching academic disciplines, taking into account the novelty and variety of forms of work that contribute to the development of cognitive activity.	fact	+	+	+	+
1.3.1	Introduction of mass open online courses (MOOCs) in the educational process according to the educational program Construction	Introduction of disciplines into the educational process Improving the quality of teaching academic disciplines, taking into account the novelty and diversity of forms of work that contribute to the development of cognitive activity.	units		1		1

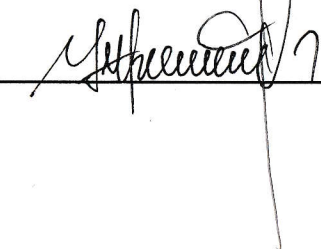
<b>1.4</b>	Involvement of social partners and employers in the development, examination of the implementation of educational programs	Improving the quality of implemented educational programs taking into account market demands and recommendations of employers	units	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>1.5</b>	Development and implementation of elective courses in English	Introduction of disciplines in English into the educational process	units		<b>1</b>		<b>1</b>
<b>1.6</b>	Conducting seminars and round tables on the application of innovative technologies in the educational process	Introduction of innovative technologies in the educational process	units	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>1.7</b>	Publication of educational, methodical and scientific literature on the implemented OP	Improvement of educational and methodological support in the disciplines of the implemented educational programs	units	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>1.8</b>	Conclusion of contracts with foreign and domestic partner universities in order to develop academic exchange of students of all levels and teaching staff	Creation of a database of foreign and domestic partner universities for the development of academic exchange of students of all levels and teaching staff	units	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>1.9</b>	Inviting students from partner universities to study for a semester, short-term internships, internships, etc.	Development of international recognition of educational programs, implementation of academic mobility programs for students	hum.	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>1.10</b>	Participation of teaching staff and students in international academic exchange programs	Development of international cooperation with foreign universities implementing educational programs in the field of Architecture and construction	hum.	<b>1</b>	<b>1</b>		<b>1</b>

<b>1.11</b>	Development of outgoing academic mobility of teaching staff and students in the direction of Architecture and construction	Improvement of the educational program based on the use of the experience of implementing such programs in leading foreign universities	hum.	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>Direction 2. Teaching staff</b>							
<b>2.1</b>	Professional development and training of scientific and pedagogical personnel for the implementation of educational programs once every 5 years	The share of teaching staff who have passed advanced training at the national and international level is at least 20%	hum.	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>2.2</b>	Advanced training, retraining, internships of teaching staff at the international level	Completion of at least 2 teachers of the advanced training program, retraining, internships of teaching staff at the international level	hum.	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>2.3</b>	Promotion of publications of the works of teaching staff in international publications indexed by the Web of Science and Scopus databases	Increase in the share of teaching staff who have published the results of scientific research in publications indexed by the Web of Science and Scopus databases – at least 30% of the total number of teaching staff	%	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>
<b>2.4</b>	Involvement of practical specialists in teaching and scientific activities	Participation in the implementation of educational programs of practitioners (at least 20% of specialists)	%	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>
<b>Direction 3. Internationalization of educational programs</b>							
<b>3.1</b>	Conclusion of agreements on international cooperation with foreign universities	Implementation of joint projects, preparation of scientific publications with foreign partners, creation of bases for scientific internships of students	units	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>

3.2	Attracting foreign students to study under the educational program "Construction"	Increasing the number of foreign students	hum.		1		1
3.3	Organization of joint scientific and practical events with international partners	Improving the efficiency of scientific and methodological activities of teaching staff, exchange of experience with foreign partners	units	1	1	1	1
3.4	Invitation of foreign specialists to give lectures and consultations on master's projects and dissertations	Improvement of the content component of educational programs based on the introduction of the experience of foreign specialists in the implementation of educational programs	units	1	1	1	1
3.5	Expansion of cooperation with Leading foreign scientific and educational organizations in order to attract the most qualified foreign specialists to the implementation of educational programs	Formation of key and professional competencies in accordance with the practice of leading universities	hum.	1	1	1	1
<b>Direction 4. Logistics and digitalization</b>							
4.1	Step-by-step equipment of classrooms with technical training tools (projectors, panels, interactive and multimedia whiteboards, multifunction devices, webcam, projector screen)	Equipping classrooms assigned to the department with technical training tools (projectors, panels, interactive and multimedia whiteboards, multifunctional devices, webcam, projector screen)	units	2	2	2	2


4.2	Automation of the educational process (testing, session management, student contingent movement, dean's office, department, teaching staff workload, schedule, library, syllabuses)	Information management based on the automation of the educational process (testing, session management, student contingent movement, dean's office, department, teaching staff workload, schedule, library, syllabuses)	fact	+	+	+	+
4.3	Replenishment of the full-text database of research results of teaching staff and students, teaching staff (articles, monographs, etc.)	Increase in the number of results of scientific works of scientists, research of teaching staff and students, teaching staff (articles, monographs, etc.)	units	1	1	1	1
4.4	Expansion of the fund of scientific and educational literature, including on electronic media for implemented educational programs	Ensuring the implementation of educational programs based on modern educational and information resources, including on electronic media	%	10	10	10	10
4.5	Monitoring the content and improvement of the faculty's website	Formation of the faculty's website on various aspects of the implementation of educational programs	%	100	100	100	100

Head of the Department



I. Zhumadilov

**REVIEWED**

at the meeting of the Commission on Academic Quality  
Graduate School Artificial Intelligence and Construction  
Minutes of the meeting № 1 «06» 06.2024  
Chairman CAQ  Adylkanova A.Zh.

**AGREED**

Dean  Kozhahmetova D.O.  
«06» 06.2024