The list of academic disciplines of the university component

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)

set of 2023

Semey 2023

Developed
By the Academic Committee of the EP
The head of the AC Nurymkhan G.N.
EP Manager Zhumadilov I.T.

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Chairman of the Commission on Quality Assurance Abdilova G.

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Approved
at the meeting of the Academic Council of the University
Protocol № 1 "01" of September 2023
Chairman of the Academic Council of the University Orynbekov D.R.

Bases of economics, law and ecological knowledge

Discipline cycle	General educational disciplines
Course	1
Credits count	5
Knowledge control form	Examination

Short description of discipline

The integrated discipline includes the main issues and principles in the field of fundamentals of law and anti- corruption culture, economics, entrepreneurship and leadership, ecology and life safety. Features of the use of regulatory legal acts, the ability to use the business, ethical, social, economic, entrepreneurial and environmental standards of society. Specifics of environmental-legal, economic, entrepreneurial relations, leadership qualities and principles of combating corruption.

Purpose of studying of the discipline

It consists in studying the basic patterns of the functioning of living organisms, the biosphere as a whole and the mechanisms of their sustainable development under the conditions of anthropogenic impact and emergency situations; in understanding the concept of corruption, the legitimacy of the fight against it, the content of the state penal policy; in the formation of students` basic fundamental stable knowledge on the basics of economic theory, in instilling the skills and abilities of economic thinking; in introducing students to the theory and practice of entrepreneurship, to the basics of creating their own business; in the formation of theoretical knowledge and practical skills for the development and improvement of leadership qualities.

Learning Outcomes

ON 1 Demonstrate socio- cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society.
ON 2 He is able to use natural science and mathematical knowledge for orientation in the modern information space.

Learning outcomes by discipline

* analyzes the issues of safety and conservation of the natural environment as the most important priorities of life;*
* demonstrates knowledge of the fundamentals of nature management and sustainable development, assesses the impact of man-made systems on the environment;*
* shows knowledge of the main regulatory legal acts of the Republic of Kazakhstan, their understanding and application;*
* shows knowledge of the patterns of development of economic processes, clearly formulates his own position, finds and clearly sets out arguments in its defense;*
* is able to characterize the types of entrepreneurial activity and the entrepreneurial environment, draw up a business plan, create an entrepreneurial structure and organize its activities;*
* knows the fundamental provisions about the role of leadership in managing large and small social groups.*

Prerequisites

School course

Postrequisites

Bases of economics, law and ecological knowledge

Introduction to construction

Discipline cycle	Basic disciplines
Course	1
Credits count	3
Knowledge control form	Examination

Short description of discipline

The discipline «Introduction to Construction» is one of the leading specialties of disciplines that form a shallowing idea of the chosen profession, professional knowledge and skills of an engineer. The study of the discipline is based on knowledge of the history of the domestic and foreign construction industry. Introduction of students into the course of their specialties with a brief description of the technology of construction of buildings and structures, structural systems.

Purpose of studying of the discipline

Introduction of students in the course of their specialties with a brief description of the technology of construction of buildings and structures, structural systems

Learning Outcomes

ON 3 Distinguish the types and properties of building materials and structures used.

Learning outcomes by discipline

1 understand the essence and social significance of your future profession
2 make decisions in standard and non-standard situations and be responsible for them
3 organize your own activities, choose typical methods and ways of performing professional tasks

Prerequisites

School course

Postrequisites

The architecture Design and estimate work

Mathematics

Discipline cycle	Basic disciplines
Course	1
Credits count	5
Knowledge control form	Examination

Short description of discipline

The purpose of this course is to provide students with fundamental training in mathematics. The course is aimed at forming a sufficiently high culture of mathematical thinking among students and developing the ability to creatively approach problem solving. In addition to

studying the fundamental foundations of higher mathematics (elements of analytical geometry, linear algebra, mathematical analysis, differential equations), the course assumes consideration of various applications of mathematics to solving production problems from the field of professional specialization.

Purpose of studying of the discipline

creation of the basis for the development of logical thinking and mathematical culture. Formation of basic knowledge and acquisition of basic skills of using mathematical apparatus for solving theoretical and applied problems, as well as the necessary level of mathematical training for mastering other applied disciplines studied within a specific profile; skills of working with special mathematical literature

Learning Outcomes

ON 1 Demonstrate socio- cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society.

Learning outcomes by discipline

1) Selects methods of mathematical analysis and modeling, theoretical and experimental research of applied problems
2) Uses mathematical symbolism to express quantitative and qualitative relations of objects
3) Applies methods of visual graphical representation of research result

Prerequisites

School course

Postrequisites

Mathematics

Physics

Discipline cycle	Basic disciplines
Course	1
Credits count	3
Knowledge control form	Examination

Short description of discipline

In process of studying this discipline, students get acquainted with the basic laws, concepts of all sections of physics. Physics is an area of experimental science, performing laboratory work and tasks, students are convinced of unity of the theory and practice of experiments. Students have the opportunity to gain knowledge on the subject in any area of their specialty.

Purpose of studying of the discipline

Formation of ideas about the role of experimental and theoretical methods of cognition of the surrounding world, development of skills for independent solving of physical problems, motivation to study modern scientific literature.

Learning Outcomes

ON 1 Demonstrate socio- cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society.

Learning outcomes by discipline

1) Assesses the degree of reliability of the results obtained using experimental research methods;
2) Uses various physical concepts, laws, theories in practice;
3) Applies knowledge of the basic laws of physics in solving professional problems.

Prerequisites

School course

Postrequisites

Physics

Construction drawing

Discipline cycle	Basic disciplines
Course	1
Credits count	5
Knowledge control form	Examination

Short description of discipline

The discipline is the best means of developing constructive geometric thinking and spatial imagination in future engineers, studying ways of constructing various geometric spatial objects, ways of obtaining their drawings at the level of graphic models and the ability to solve problems on these drawings, without which no engineering creativity is unthinkable. Due to the general tendency to visualize any information, the role of geometric and graphic components in the educational sphere is increasing.

Purpose of studying of the discipline

Give basic knowledge, abilities and skills in performing and reading drawings, to give information about construction plans and designs, learn to read blueprints, ensuring the conditions for the preparation of competitive and highly skilled young professional, in demand on the labour market.

Learning Outcomes

ON 3 Distinguish the types and properties of building materials and structures used.
ON 5 Design and calculate building structures .

Learning outcomes by discipline

1 choose suitable methods and means of solving engineering and geodetic problems using AutoCAD;
2 create projects in AutoCAD and work with them;
3 import data into AutoCAD and create digital terrain models and route plans based on them;

Prerequisites

School course

Postrequisites

The architecture Autocad in pojecting

Educational practice

Discipline cycle	Basic disciplines
Course	1
Credits count	2
Knowledge control form	Total mark on practice

Short description of discipline
The objectives of the training practice is to obtain the primary professional skills of working professions, understanding the nature and purpose of construction projects, the technological basis of construction production of buildings and structures. Basic knowledge is based on the study of professional disciplines of curriculum of relevant courses

Purpose of studying of the discipline
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Learning Outcomes
ON 3 Distinguish the types and properties of building materials and structures used.

Learning outcomes by discipline
Distinguishes the types and properties of building materials and structures used

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
Final examination

Academic writing and the basics of scientific research

Discipline cycle	Basic disciplines
Course	2
Credits count	3
Knowledge control form	Examination

Short description of discipline
The discipline "Academic Writing and methods of scientific research" is a course designed to develop students` academic writing skills and familiarize them with the basic research methods necessary for successful study in higher education and preparation for scientific activity.
A brief description of the content of the discipline:
Introduction to Academic Writing: In this part of the course, students are introduced to the basics of academic writing, including the structure of scientific articles, reviews, annotations, and rules for citation and bibliography design.
Scientific Research: Here students study the methods of scientific research, including the formulation of a research question, research planning, data collection and analysis, and interpretation of results.
Academic argumentation: This section of the course focuses on the development of argumentation skills in scientific papers, including the use of logical connections, data analysis and the reinforcement of conclusions with scientific evidence.
Ethics and Academic Integrity: Students learn to adhere to ethical standards in scientific activities, including citation rules and plagiarism prevention.
Design and presentation of scientific research: In the last part of the course, the question of how to properly design and present the results of scientific research in oral and written form is considered.

Purpose of studying of the discipline
The purpose of studying the discipline "Academic writing and methods of scientific research" is to form students` skills of high-quality and effective scientific writing. This discipline is designed to develop students` ability to express their research ideas and conclusions in writing, following academic standards. In addition, the goal is to teach methods of scientific research, which will allow students to successfully conduct research and create high-quality scientific papers.

Learning Outcomes
ON 1 Demonstrate socio- cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society.

Learning outcomes by discipline
The results of training in the discipline "Academic writing and methods of scientific research" include:
Mastering the skills of scientific writing: Students reach a level that allows them to compose scientific texts qualitatively and systematically, including essays, abstracts and scientific articles. They learn the rules of structuring texts, design of bibliographic lists and academic citation.
Ability to conduct research: Students learn to develop research plans, collect, analyze and interpret data, as well as present them in the form of scientific reports and papers. They master the methods of scientific research and critical thinking.
Compliance with scientific ethics and standards: Learning outcomes include understanding and compliance with ethical standards of scientific activity, including citation rules, avoidance of plagiarism and respect for copyright.
Such results allow students to successfully participate in scientific research, as well as to qualitatively design and publish their scientific works, which is an important element of their professional and scientific training.

Prerequisites
School course

Postrequisites
Final examination

The architecture

Discipline cycle	Basic disciplines
Course	2
Credits count	5

Knowledge control form	Examination and term work/Project

Short description of discipline
The discipline "Architecture" is included in the cycle of basic disciplines.
The course "Architecture", designed for students of engineering and construction universities and faculties according to the Educational Program 6B07302 "Construction", studies the subject of future creative activity of civil engineers - design and construction of civil and industrial buildings and structures. The acquired knowledge and skills are consolidated by completing the course work. The study of this course ends with an exam.

Purpose of studying of the discipline
The purpose of teaching the discipline "Architecture" is to provide students with knowledge about the principles of designing buildings and structures, about the basics of architectural and construction design of residential and public buildings.

Learning Outcomes
ON 3 Distinguish the types and properties of building materials and structures used.
ON 5 Design and calculate building structures .

Learning outcomes by discipline
1 present the skills of working with regulatory materials in design and construction
2 apply theoretical and practical knowledge in solving urban planning tasks
3 model the project of residential, public, industrial buildings and structures

Prerequisites
Construction drawing

Postrequisites
Technology of construction of buildings and structures Design and estimate work

Engineering mechanics

Discipline cycle	Basic disciplines
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline
Engineering mechanics is currently a complex discipline that includes theoretical mechanics, material resistance, and structural mechanics. Large structures, high-rise buildings, airplanes, as well as various machines widely used in the national economy are manufactured according to pre-prepared projects. The project fully reflects various data, such as materials and dimensions of a complex structure and its individual elements, properties of forces acting on them.

Purpose of studying of the discipline
The purpose of teaching the discipline «Engineering mechanics» is to provide students with theoretical knowledge about the conditions of equilibrium of material bodies under the influence of force systems, the study of stress-strain state of typical structural elements and perform calculations for strength, stiffness and stability

Learning Outcomes
ON 3 Distinguish the types and properties of building materials and structures used.
ON 5 Design and calculate building structures .

Learning outcomes by discipline
1 simulate and investigate complex physical and mechanical processes
2 design mechanical and thermal systems, including thermodynamic and thermal processes in power plants, man-made and natural processes
3 develop new mechanisms and devices, including autonomous mechanisms and robots

Prerequisites
Mathematics

Postrequisites
Construction structures

World of Abai

Discipline cycle	Basic disciplines
Course	2
Credits count	3
Knowledge control form	Examination

Short description of discipline
The discipline is aimed at studying historical facts, the philosophical and artistic foundations of the works of Abay Kunanbaev, Shakarim Kudaiberdiev, which form worldview and aesthetic values, the student`s ability to express his opinion, practical skills and perception of such human qualities as morality, honesty, artistic character. The genius of the writers of Kazakh literature and the role of M. Auezov in the study and popularization of Abai`s heritage, the significance of his works for history, literature and science are determined.

Purpose of studying of the discipline
Formation of the meaning of philosophical and ideological being, understanding of the problems raised in the works of Abai Kunanbayuly, Shakarim Kudaiberdiuly, Mukhtar Auezov and application of the acquired knowledge in the practice of everyday life.

Learning Outcomes
ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society.

Learning outcomes by discipline

1) Analyzes the philosophical and artistic foundations of works, historical facts related to the creative heritage of Abai Kunanbayev, Shakarim Kudaiberdiyev, Mukhtar Auezov
2) Uses in practice the humanistic ideas of Abai`s philosophical and artistic works

3) Assesses the place and significance of Abai`s works in the history of literature and science

Prerequisites

School course

Postrequisites

Philosophy

Industrial practice I

Discipline cycle	Basic disciplines
Course	2
Credits count	5
Knowledge control form	Total mark on practice

Short description of discipline

Industrial practice I consists in that by direct participation of the student in activity of the production or research organization, to fix the received theoretical knowledge and to get professional abilities and skills, and also to join the social environment of the enterprise (organization).

Purpose of studying of the discipline

The purpose of the practice is to familiarize students with the organization of construction production. During the internship, the student should study the production conditions in which modern construction takes place, expand his technical horizons, gain experience in applying the theoretical knowledge obtained to solve practical problems.

Learning Outcomes

ON 5 Design and calculate building structures .

Learning outcomes by discipline

Designs and calculates building structures

Prerequisites

Educational practice

Postrequisites

Production practice III

Construction structures

Discipline cycle	Basic disciplines
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline

The purpose of teaching the discipline "Building Structures" is to provide students with knowledge about the work of building structures made of reinforced concrete, stone, metal and plastics under various types of stress conditions, as well as methods of their calculation and design. Building structures are load– bearing systems, the strength, stability and deformability of which is determined by a calculation confirming their ability to resist acting loads and impacts.

Purpose of studying of the discipline

The purpose of teaching the discipline «Construction structures» is to provide students with knowledge about the work of building structures made of reinforced concrete, stone, metal, wood and plastics in various types of stress, as well as methods of their calculation and design

Learning Outcomes

ON 3 Distinguish the types and properties of building materials and structures used.
ON 5 Design and calculate building structures .

Learning outcomes by discipline

1 Designs and calculates building structures
2 Methodology for calculating building structures by limit states
3 Methodology of material selection for structural elements and their connections

Prerequisites

Basic and profile disciplines of the EP Introduction to construction

Postrequisites

Metal structures Technology of construction of buildings and structures

Stone and reinforced concrete structures

Discipline cycle	Profiling discipline
Course	3
Credits count	5
Knowledge control form	Examination

Short description of discipline

The purpose of the discipline is the formation of professional knowledge in the field of design, calculation and operation of prefabricated and monolithic reinforced concrete structures. Tasks of mastering the discipline:
- to introduce materials, types of sections of bent, compressed, stretched elements and teach them to choose a rational option from them, justifying their choice;
- teach to determine the calculated combinations of loads.

Purpose of studying of the discipline

The purpose of mastering the discipline: the formation of professional knowledge in the field of calculation and design of reinforced concrete and stone structures.

Learning Outcomes

ON 3 Distinguish the types and properties of building materials and structures used.
ON 5 Design and calculate building structures .

Learning outcomes by discipline

Designs and calculates building structures
Basic physical-mechanical, technical and construction properties of various concrete, reinforcement and stone
Modern methods and procedure for calculating basic building structures made of concrete, reinforced concrete, stone

Prerequisites

Introduction to construction Stone and reinforced concrete structures

Postrequisites

Technology of construction of buildings and structures The construction of special buildings and structures

Technology of production construction

Discipline cycle	Profiling discipline
Course	3
Credits count	5
Knowledge control form	Examination and term work/Project

Short description of discipline

According to the discipline, the theoretical foundations of the implementation of individual production processes are studied. Before mastering the methods and regulations, the provisions on construction products, elements of construction processes of the organization of labor of construction workers are studied. The purpose of studying the discipline is the formation of knowledgeand skills in the field of organization of all processes and works necessary to obtain construction products in the form of buildings and structures.

Purpose of studying of the discipline

The purpose of studying the discipline "Technology and organization of construction production" is to form knowledge and skills in the field of technological design of construction processes, organization of transportation of construction goods, organization of execution of all processes and works necessary to obtain construction products in the form of finished buildings and structures.

Learning Outcomes

ON 3 Distinguish the types and properties of building materials and structures used.
ON 5 Design and calculate building structures .

Learning outcomes by discipline

Plans the organization and technology of construction production of buildings and structures
The main provisions and tasks of construction production; types of features of construction processes and works
Acquisition of knowledge of the theoretical foundations of organization and planning in construction production

Prerequisites

Construction materials The architecture

Postrequisites

Technology of construction of buildings and structures

Industrial practice II

Discipline cycle	Basic disciplines
Course	3
Credits count	5
Knowledge control form	Total mark on practice

Short description of discipline

Industrial practice II is a type of training sessions directly focused on professional and practical training of students. It serves as a basis for the development of methods of organization, planning and management in the construction of buildings and structures, the organization of reconstruction and operation of buildings and structures.

Purpose of studying of the discipline

The purpose of the practical training is to consolidate theoretical knowledge in the studied disciplines, to familiarize students with the nature and features of their future activities on the basis of developing professional skills and gaining professional experience both within a single organization and in economic sectors.

Learning Outcomes

ON 7 Design energy efficient and information modeling of buildings.

Learning outcomes by discipline

Analyzes the geo research and design foundation

Prerequisites

Industrial practice I

Postrequisites

Production practice III

Technology of construction of buildings and structures

Discipline cycle	Profiling discipline
Course	3
Credits count	5
Knowledge control form	Examination and term work/Project

Short description of discipline

The purpose of studying the discipline is to form students` basic principles of technological design of construction works.
The purpose of mastering the discipline is the formation of the student`s competencies in the field of construction of multi-storey buildings and structures, the development by students of the theoretical foundations and regulations for the construction of buildings and structures of various structural systems of prefabricated, monolithic and prefabricated - monolithic structures.

Purpose of studying of the discipline
The purpose of mastering the discipline "Technology of construction of buildings and structures" is the formation of the student`s competencies in the field of construction of high-rise and large-span buildings and structures, the development by students of the theoretical foundations and regulations of methods for the construction of buildings and structures of various structural systems from prefabricated, monolithic and prefabricated-monolithic structures.
Learning Outcomes
ON 5 Design and calculate building structures .
ON 6 Analyze geo research and design foundations.
ON 9 Plan the organization and technology of construction production of buildings and structures.
Learning outcomes by discipline
Plans the organization and technology of construction production of buildings and structures
Formation of knowledge of the theoretical foundations of the construction of the main types of buildings
Formation of knowledge of basic technical means for the construction of buildings and skills of rational choice of technical means
Prerequisites
Technology of production construction
Postrequisites
Final examination

Projecting and construction of energy efficient buildings

Discipline cycle	Profiling discipline
Course	4
Credits count	6
Knowledge control form	Examination and term work/Project

Short description of discipline
The discipline "Design and construction of energy-efficient buildings" forms the bachelor`s principles of designing buildings with low energy consumption and energy efficiency, students gain knowledge of renewable energy sources, energy conservation in the production of building materials, rational consumption of energy resources. The use of natural resources in energy-efficient construction by calculating the main factors, fuel and energy, in order to ensure the professional training of future specialists in the design area and reduce heat loss in civilian buildings.
Purpose of studying of the discipline
Use of Natural Resources in energy-efficient construction by calculating fuel and energy, basic factors in order to ensure professional training of future specialists in the design area and reduce heat loss in civil buildings.
Learning Outcomes
ON 3 Distinguish the types and properties of building materials and structures used.
ON 5 Design and calculate building structures .
ON 9 Plan the organization and technology of construction production of buildings and structures.
ON 10 Develop technology for testing and reconstruction of buildings.
Learning outcomes by discipline
- designs buildings with low energy consumption and energy efficiency
- considers issues of renewable energy sources, energy conservation in the production of building materials,
- applies rational consumption of energy resources in the design
Prerequisites
The architecture Technology of production construction Design and estimate work
Postrequisites
Final examination

Technology reconstruction of buildings

Discipline cycle	Profiling discipline
Course	4
Credits count	6
Knowledge control form	Examination and term work/Project

Short description of discipline
The discipline studies the basic provisions of the technology of reconstruction of buildings and structures. As well as design technologies for the reconstruction of buildings and structures, Organization of construction in the context of the reconstruction of existing enterprises. Reconstruction of foundations and foundations. Dismantling of buildings, installation and dismantling of building structures. Reinforcement technology of building structures. Mastering modern methods of pre-project research, evaluation of existing ones.
Purpose of studying of the discipline
The purpose (goals) of mastering the discipline: - formation of knowledge about the reconstruction of construction objects using modern materials and technologies. Tasks: - mastering modern methods of pre-project research, evaluating existing ones. buildings and design of measures to strengthen and restore the structures of buildings and structures.
Learning Outcomes
ON 3 Distinguish the types and properties of building materials and structures used.
ON 5 Design and calculate building structures .
ON 10 Develop technology for testing and reconstruction of buildings.
Learning outcomes by discipline
- Shows basic knowledge of building design and reconstruction
- demonstrates methods of installation and dismantling of building structures,
- applies knowledge to strengthen the structures of existing buildings
Prerequisites

Technology of production construction

Postrequisites

Final examination