NJSC SHAKARIM UNIVERSITY OF SEMEY

# EDUCATIONAL PROGRAM

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

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

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

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

**6B07301 - Geodesy and Cartography**
(Code and name of the educational program)

**Bachelor**
(Level of preparation)

**Semey**

# 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)

6B07301 - Geodesy and Cartography
(Code and name of the educational program)

bachelor
(Level of preparation)

Semey 2023

# PREFACE

## Developed

The educational program 6B07301 - Geodesy and Cartography in the direction of preparation 6B073 - Architecture and Civil engineering 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).

| Members of the Academic Committee | Full name | Academic degree, academic title, position | Signature |
|---|---|---|---|
| Head of the Academic Committee | Nurimkhan Gulnur | Dean of the faculty of Engineering and Technology | |
| Educational program manager | Baibossinova Kuralay | Senior lecturer of the Department of automation, information technology and urban planning | |
| Member of the AC | Kozhakhmetova Dinara | Head of the Department of automation, information technology and urban planning, PhD | |
| Member of the AC | Seitkazina Gulnur | Senior lecturer of the Department of automation, information technology and urban planning | |
| Member of the AC | Kemerbayev Nurgan | Director of LLP «GEOID» | |
| Member of the AC | Toktassyn Nurlan | Head of the topographer group of LLP FDI «Remstroytrest» | |
| Member of the AC | Shaidollayev Yerassyl | Student of the GK-007 group | |
| Member of the AC | Turdina Nurgul | Student of the GK-101 group | |

## Reviewing

| Full name of the reviewer | Position, place of work | Signature |
|---|---|---|
| Islamhanov Esengeldy | Director of LLP FDI «Remstroytrest» | |

## Reviewed

at the meeting of the Quality Assurance Commission of the Faculty of Engineering and Technology
Recommended for approval by the Academic Council of the University
Protocol № 4.6 "10" April 2023
Chairman of the Commission on Quality Assurance Abdilova G.

Approved at the meeting of the Academic Council of the University Protocol No. 8 "25" April 2023.

## 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.

## Content

# 1.Introduction

1.1.General data

The educational program "6B07301 Geodesy and Cartography" in the direction of training "6B073 Architecture and Construction", implemented by the Shakarim State University of Semey, was developed taking into account the needs of the regional labor market.

The educational program "6B07301 Geodesy and Cartography" is designed to train bachelors of engineering and technology in the direction "6B073 Architecture and Construction", carrying out professional activities in the field of geodesy and cartography.

The state program "Digital Kazakhstan", adopted on December 12, 2017, covers all areas of activity from healthcare to industry, including the field of geodesy. Digital technologies have become a solution to the problem of faster and more reliable creation, transfer and storage of information, in contrast to analog technologies. With digitalization in Kazakhstan, more and more geo-information maps are emerging, focused on industry data.

The professions in demand in Kazakhstan change every year, but for several years the demand for surveyors has been growing. Currently, the profession "Geodesy" has become one of the most popular in the labor market.

1.2.Completion criteria

The main criterion of completion of the educational process by preparation of bachelors is the development of students not less than 205 credits of theoretical training and at least 27credits of practices, at least 8credits in the preparation, writing and protection of diploma work (project), as well as the preparation and submission of a comprehensive examination. Total 240 credits

1.3.Typical study duration: 3,5 years

# 2.PASSPORT OF THE EDUCATIONAL PROGRAM

| | |
|---|---|
| **2.1.EP purpose** | Preparation of specialists with general cultural and professional competencies in the field of geodesy, cartography and geospatial data, etc., constituting the direction of training that meets the requirements of employers. |
| **2.2.Map of the training profile within the educational program** | |
| Code and classification of the field of education | 6B07 - Engineering, Manufacturing and Civil engineering |
| Code and classification of the direction of training | 6B073 - Architecture and Civil engineering |
| 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 | 6B07301 - Geodesy and Cartography |
| **2.3.Qualification characteristics of the graduate** | |
| Degree awarded / qualification | Bachelor of Engineering and Technology under the educational programme |
| Name of the profession / list of positions of a specialist | -engineer-surveyor,<br>-assistant surveyor,<br>-cartographer,<br>-positions of managers, scientific and technical workers, common to research, design, technological, design organizations. |
| OQF qualification level (industry qualification framework) | 6 Level on SQF |
| Area of professional activity | -all branches of the economy;<br>- Committee of the Republic of Kazakhstan on Land Management;<br>-state administration and land relations departments;<br>- military-industrial complex;<br>-civil and industrial construction;<br>-enterprises for the production of geodetic and land management works;<br>-private enterprises that have a license for the production of geodetic and land management works. |
| Object of professional activity | -the surface of the Earth; state geodetic networks and special purpose networks;<br>-construction sites of buildings and structures;<br>-civil, residential, transport, hydraulic engineering buildings and structures;<br>-mineral deposits; land plots;<br>-natural and natural-anthropogenic systems. |
| Types of professional activity | Organizational and managerial activities;<br>Production and technological activities;<br>Settlement and design activities;<br>Research activities;<br>Educational activities. |
| Graduate Model | Graduate Model EP 6B07301– "Geodesy and cartography"<br><br>1 Description of the EP<br>The model of the graduate of the educational program |

| | |
|---|---|
| | 6B07301 "Geodesy and cartography" in the field of training 6B073 – "Architecture and construction" was developed on the basis of the State Standard of the Republic of Kazakhstan dated 31.10.2018 No. 604. Preparation license number KZ38LAA00018432<br>The state program "Digital Kazakhstan", adopted on December 12, 2017, covers all spheres of activity from healthcare to industry, including the field of geodesy. Digital technologies have become a solution to the problem of faster and more reliable creation, transfer and storage of information in contrast to analog. With digitalization in Kazakhstan, there are more and more geoinformation maps focused on industry data. The professions in demand in Kazakhstan change every year, but for several years the demand for engineers-surveyors has been growing. Currently, the profession of "Geodesy" has become one of the most popular in the labor market.<br><br>2 The purpose of the educational program<br>Training of specialists with general cultural and professional competencies in the field of geodesy, cartography and geospatial data, etc., forming a training area that meets the requirements of employers.<br><br>3 Objectives of the educational program<br>The main objective of the program is to provide students with fundamental knowledge in the field of geodesy and cartography, including theoretical foundations, methods, tools and technologies used in these fields.<br><br>4 The results of the Bachelor`s degree in EP 6B07301 "Geodesy and Cartography" (6 qualification level of the NRC)_in accordance with the Dublin descriptors suggest the ability:<br>1. Demonstrate knowledge and understanding in the field of geodesy and cartography, based on advanced knowledge in the field under study; requirements of normative and methodological documents for the production of topographic and geodetic works; methodology of system analysis and design when performing work on the ground, etc.<br>2. Apply knowledge and understanding at a professional level, formulate arguments and solve problems in the field of geodesy and cartography;<br>3. To collect and interpret information for the formation of judgments taking into account social, ethical and scientific considerations;<br>4. Apply theoretical and practical knowledge to solve educational, practical and professional tasks in the field of geodesy and cartography;<br>5. Training skills necessary for independent continuation of further training in the field of geodesy and cartography;<br>6. know the methods of scientific research and academic writing and apply them in the field of geodesy and cartography;<br>7. Apply knowledge and understanding of facts, |

| | |
|---|---|
| | phenomena, theories and complex dependencies between them in the field of geodesy and cartography;<br>8. Understand the importance of the principles and culture of academic integrity.<br><br>4.1 Acquired competencies expressed in the achieved learning outcomes<br>1. Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society.<br>2. To process the received information about the object of research by methods of natural science disciplines<br>3. Use the basics of cartography and geodesy in solving various tasks on the ground<br>4. Demonstrate the ability to build plans and maps of the area by traditional and modern methods<br>5. Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geoinformation systems, as well as methods and tools for optimizing and improving geodetic production processes.<br>6. Process and analyze cartographic information obtained during Earth monitoring to ensure quality, observation of a digital terrain model<br>7. Perform geodetic works related to the creation of a survey justification of cadastral surveys and the assessment of relief-forming processes, analyze and process geodetic data and evaluate the characteristics of the relief<br>8. Solve geodetic tasks aimed at ensuring maximum efficiency and the required quality of engineering and geodetic works in the design, construction and operation of buildings and structures<br>9. Make geodetic measurements related to the solution of typical construction tasks<br>10. Demonstrate a comprehensive set of professional skills necessary for successful work in the geodetic industry, such as the development of academic writing skills, the ability to work with regulatory and technical documentation, understanding of economic and managerial aspects of geodetic production<br><br>4.2 Personal qualities of the graduate<br>Personal qualities include a technical mindset, mathematical abilities, attentiveness, physical training, good physical fitness, which will ensure high productivity at work. It is also worth noting such qualities as diligence, perseverance, accuracy, perseverance and the desire to finish the job started. The employee`s diligence and punctuality are especially appreciated. The achievements of a graduate depend not only on the actual professional skills, but also on the ability to work in a team, maintain relationships with colleagues. |

# 3.Modules and content of the educational program

## Module 1. Fundamentals of social and humanitarian knowledge

### Foreign language

| | |
|---|---|
| Discipline cycle | General educational disciplines |
| Discipline component | Compulsory component |
| SubjectID | 31167 (3023364) |
| Course | 1 |
| Term | 1 |
| Credits count | 5 |
| Practical and seminar classes | 45hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

#### Short description of discipline

*The content of the discipline «Foreign language» assumes the formation of students` intercultural and communicative competencies at B1 level. The discipline is aimed at mastering the knowledge, skills and abilities that allow using a foreign language in interpersonal communication and professional activity. All types of speech activity are taught, such as reading, writing, listening and production of texts of level complexity with a certain degree of grammatical and lexical correctness.*

#### Purpose of studying of the discipline

*Formation of intercultural and communicative competence of students in the process of foreign language education at a sufficient level (A2, pan-European competence) and the level of basic sufficiency (B1, pan-European competence). Depending on the level of training, the student at the time of completion of the course reaches the B1 level of the pan-European competence if the language level of the student at the start is higher than the A2 level of the pan-European competence.*

#### Learning Outcomes

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

#### Prerequisites

*School course*

#### Postrequisites

*Foreign language*

### Kazakh language

| | |
|---|---|
| Discipline cycle | General educational disciplines |
| Discipline component | Compulsory component |
| SubjectID | 31168 (3023366) |
| Course | 1 |
| Term | 1 |
| Credits count | 5 |
| Practical and seminar classes | 45hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

#### Short description of discipline

*The discipline is aimed at deepening the acquired knowledge of students in the framework of the school curriculum, as well as the use of language and speech means based on a full understanding of vocabulary and grammatical system of knowledge; the formation of socio-humanitarian worldview of students within the framework of the national idea of spiritual revival; free expression of mobile thought as a means of speech communication and in the process of communication; awareness of the national culture of the people, the ability to distinguish features of national cognition.*

#### Purpose of studying of the discipline

*Forms through phraseological units the recognition of national culture, its meaning as a linguistic unit related to spiritual culture; skills of identifying facts of national and cultural significance in the formation of Kazakh phraseology.*

#### Learning Outcomes

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

#### Prerequisites

*School course*

#### Postrequisites

*Kazakh language*

### Bases of economics, law and ecological knowledge

| | |
|---|---|
| Discipline cycle | General educational disciplines |

| | |
|---|---|
| Discipline component | University component |
| SubjectID | 31170 (3023533) |
| Course | 1 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| 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 technology, taking into account modern trends in the development of society.*

### Prerequisites

*School course*

### Postrequisites

*Basic and profile disciplines of the EP*

## Russian language

| | |
|---|---|
| Discipline cycle | General educational disciplines |
| Discipline component | Compulsory component |
| SubjectID | 31154 (3023365) |
| Course | 1 |
| Term | 1 |
| Credits count | 5 |
| Practical and seminar classes | 45hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline is intended for the development of the language personality of the student, who is able to carry out cognitive and communicative activities in Russian in the areas of interpersonal, social, professional, intercultural communication; for teaching students practical mastery of the Russian language in various areas of communication and various situations, mastering the specifics of functional semantic types and genres of functional styles of speech, enriching the vocabulary with special vocabulary, forming and improving the skills of monologue and dialogic speech.*

### Purpose of studying of the discipline

*The purpose of the program is to form the socio-humanitarian worldview of students in the context of the national idea of spiritual modernization, involving the development on the basis of national consciousness and cultural code of the qualities of internationalism, tolerant attitude to world cultures and languages as translators of world-class knowledge, advanced modern technologies, the use and transfer of which can ensure the modernization of the country and personal career growth of future specialists.*

### Learning Outcomes

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

### Prerequisites

*School course*

### Postrequisites

*Russian language*

## Physical Culture

| | |
|---|---|
| Discipline cycle | General educational disciplines |
| Discipline component | Compulsory component |
| SubjectID | 31169 (3023372) |

| | |
|---|---|
| Course | 1 |
| Term | 1 |
| Credits count | 2 |
| Practical and seminar classes | 60hours |
| Total | 60hours |
| Knowledge control form | Differentiated attestation |

### Short description of discipline
*It provides for the joint cooperation of a teacher and a student in the process of physical education throughout the training in the context of the requirements for the level of mastering the discipline, preparing students for participation in mass sports competitions; forms motivational and value attitudes towards physical culture and the need for systematic physical exercises and sports; gives basic knowledge about the use of physical culture and sports in the development of vital physical qualities.*

### Purpose of studying of the discipline
*The purpose of the program is the formation of social and personal competencies of students and the ability to purposefully use the means and methods of physical culture, ensuring the preservation, strengthening of health to prepare for professional activities; to the persistent transfer of physical exertion, neuropsychic stress and adverse factors in future work.*

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

### Prerequisites
*School course*

### Postrequisites
*Physical Culture*

## Kazakh language

| | |
|---|---|
| Discipline cycle | General educational disciplines |
| Discipline component | Compulsory component |
| SubjectID | 31547 (3023308) |
| Course | 1 |
| Term | 2 |
| Credits count | 5 |
| Practical and seminar classes | 45hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline is aimed at expanding language literacy, free communication with the environment and mental and ideological skills of the student, understanding the role of language in the process of mastering world- class knowledge through the formation of a future specialist`s worldview based on national consciousness and cultural code, improving the knowledge of the state language by future specialists, increasing the scope of use of the Kazakh language by specialists.*

### Purpose of studying of the discipline
*Ensuring high- quality mastery of the Kazakh language as a means of social, intercultural, professional communication through the formation of communicative competencies at all levels of language use.*

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

### Prerequisites
*Kazakh language*

### Postrequisites
*Basic and profile disciplines of the EP*

## Foreign language

| | |
|---|---|
| Discipline cycle | General educational disciplines |
| Discipline component | Compulsory component |
| SubjectID | 31549 (3023310) |
| Course | 1 |
| Term | 2 |
| Credits count | 5 |
| Practical and seminar classes | 45hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The content of the discipline «Foreign language» assumes the formation of students`linguo- cultural, socio- cultural, cognitive and*

*communicative competencies at B2 level. The discipline is aimed at deep and extended study of productive and receptive language material. As a result, the student must be able to understand all types of speech activity in accordance with the requirements of B2 level and master the subject content of the discipline and speech.*

### Purpose of studying of the discipline

*Formation of linguo- culturological, socio- cultural, cognitive and communicative competence of students in the process of foreign language education at the B2 level, pan-European competence. Depending on the level of training, the student at the time of completing the course reaches the level B2 of the pan-European competence, if the language level of the student at the start is higher than the level B1 of the pan-European competence.*

### Learning Outcomes

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

### Prerequisites

*Foreign language*

### Postrequisites

*Basic and profile disciplines of the EP Information and communication technology*

## History of Kazakhstan

| | |
|---|---|
| Discipline cycle | General educational disciplines |
| Discipline component | Compulsory component |
| SubjectID | 31541 (3023388) |
| Course | 1 |
| Term | 2 |
| Credits count | 5 |
| Lections | 30hours |
| Practical and seminar classes | 15hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Qualification examination |

### Short description of discipline

*The main stages of the history of Kazakhstan are studied with: nomadic statehood, Turkic civilization, the era of colonialism, the Soviet period, independence. The driving forces, trends, patterns of historical development are analyzed; problems: ethnogenesis of the Kazakh people, the formation of statehood, national liberation movements, demographic development. The skills of analyzing historical events and facts, working with historical literature are being formed.*

### Purpose of studying of the discipline

*The purpose of the discipline is to provide objective knowledge about the main stages of the development of the history of Kazakhstan from ancient times to the present.*

### Learning Outcomes

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

### Prerequisites

*School course*

### Postrequisites

*Philosophy*

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

| | |
|---|---|
| Discipline cycle | General educational disciplines |
| Discipline component | Compulsory component |
| SubjectID | 31853 (3023532) |
| Course | 1 |
| Term | 2 |
| Credits count | 8 |
| Lections | 30hours |
| Practical and seminar classes | 45hours |
| Independent work of a student under the guidance of a teacher | 55hours |
| Independent work of the student | 110hours |
| Total | 240hours |
| Knowledge control form | Examination |

### Short description of discipline

*The module of socio-political knowledge involves the study of four scientific disciplines – sociology, political science, cultural studies, psychology, each of which has its own subject, terminology and research methods. Interactions between these scientific disciplines are carried out on the basis of the principles of information complementarity; integrativity; methodological integrity of research approaches of these disciplines; generality of the methodology of learning, result-oriented; unified system representation of the typology of learning outcomes as formed abilities.*

### Purpose of studying of the discipline

*Formation of social and humanitarian worldview of students in the context of solving the problems of modernization of public*

*consciousness, defined by the state program "Looking into the Future: Modernization of Public Consciousness".*

### Learning Outcomes

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

### Prerequisites

*School course*

### Postrequisites

*Philosophy*

## Russian language

| | |
|---|---|
| Discipline cycle | General educational disciplines |
| Discipline component | Compulsory component |
| SubjectID | 31548 (3023309) |
| Course | 1 |
| Term | 2 |
| Credits count | 5 |
| Practical and seminar classes | 45hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline is intended for the development of the language personality of the student, who is able to carry out cognitive and communicative activities in Russian in the areas of interpersonal, social, professional, intercultural communication; to teach the scientific style of speech as a language of specialty, the creation of secondary texts, the formation of skills for the production of oral and written speech in accordance with the communicative goal and the professional sphere of communication, instilling the skills of speech etiquette, business rhetoric.*

### Purpose of studying of the discipline

*The purpose of the program is to form the socio-humanitarian worldview of students in the context of the national idea of spiritual modernization, involving the development on the basis of national consciousness and cultural code of the qualities of internationalism, tolerant attitude to world cultures and languages as translators of world-class knowledge, advanced modern technologies, the use and transfer of which can ensure the modernization of the country and personal career growth of future specialists.*

### Learning Outcomes

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

### Prerequisites

*Russian language*

### Postrequisites

*Basic and profile disciplines of the EP*

## Physical Culture

| | |
|---|---|
| Discipline cycle | General educational disciplines |
| Discipline component | Compulsory component |
| SubjectID | 31854 (3023369) |
| Course | 1 |
| Term | 2 |
| Credits count | 2 |
| Practical and seminar classes | 60hours |
| Total | 60hours |
| Knowledge control form | Differentiated attestation |

### Short description of discipline

*It provides for the joint cooperation of a teacher and a student in the process of physical education throughout the training in the context of the requirements for the level of mastering the discipline, the ability to exercise control and self-control in the process of classes, gaining knowledge on health promotion, hardening and increasing the body`s resistance to the effects of adverse factors of labor activity, mastering methods of selection of physical exercises and sports.*

### Purpose of studying of the discipline

*The purpose of the program is the formation of social and personal competencies of students and the ability to purposefully use the means and methods of physical culture, ensuring the preservation, strengthening of health to prepare for professional activities; to the persistent transfer of physical exertion, neuropsychic stress and adverse factors in future work.*

### Learning Outcomes

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

### Prerequisites

*Physical Culture*

### Postrequisites

*Physical Culture*

## Physical Culture

| | |
|---|---|
| Discipline cycle | General educational disciplines |
| Discipline component | Compulsory component |
| SubjectID | 31855 (3023370) |
| Course | 2 |
| Term | 1 |
| Credits count | 2 |
| Practical and seminar classes | 60hours |
| Total | 60hours |
| Knowledge control form | Differentiated attestation |

### Short description of discipline

*Provides for the joint cooperation of the teacher and the student in the process of physical education throughout the training in the context of the requirements for the level of mastering the discipline; increasing the level of physical fitness and developing physical qualities; mastering the technique of sports; education of discipline, collectivism, comradely mutual assistance; education of mental stability, development and improvement of basic motor qualities - endurance, strength, speed, dexterity, flexibility.*

### Purpose of studying of the discipline

*The purpose of the program is the formation of social and personal competencies of students and the ability to purposefully use the means and methods of physical culture, ensuring the preservation, strengthening of health to prepare for professional activities; to the persistent transfer of physical exertion, neuropsychic stress and adverse factors in future work.*

### Learning Outcomes

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

### Prerequisites

*Physical Culture*

### Postrequisites

*Physical Culture*

## World of Abai

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |
| SubjectID | 31856 (3023380) |
| Course | 2 |
| Term | 1 |
| Credits count | 3 |
| Lections | 15hours |
| Practical and seminar classes | 15hours |
| Independent work of a student under the guidance of a teacher | 20hours |
| Independent work of the student | 40hours |
| Total | 90hours |
| 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 technology, taking into account modern trends in the development of society.*

### Prerequisites

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

### Postrequisites

*Basic and profile disciplines of the EP*

## Information and communication technology

| | |
|---|---|
| Discipline cycle | General educational disciplines |
| Discipline component | Compulsory component |
| SubjectID | 31242 (3023534) |
| Course | 2 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 15hours |

| | |
|---|---|
| Laboratory works | 15hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline is aimed at mastering the conceptual foundations of the architecture of computer systems, operating systems and networks by students; formation of the ability to critically understand the role and signifcance of modern information and communication technologies in the era of digital globalization, new "digital" thinking, knowledge about the concepts of developing network and web applications, skills in using modern information and communication technologies in various felds of professional activity, scientifc and practical work, for self-educational and other purposes.*

### Purpose of studying of the discipline
*Formation of the ability to critically evaluate and analyze processes, methods of searching, storing and processing information, methods of collecting and transmitting information through digital technologies*

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

### Prerequisites
*School course Foreign language*

### Postrequisites
*Basic and profile disciplines of the EP*

## Physical Culture

| | |
|---|---|
| Discipline cycle | General educational disciplines |
| Discipline component | Compulsory component |
| SubjectID | 31857 (3023371) |
| Course | 2 |
| Term | 2 |
| Credits count | 2 |
| Practical and seminar classes | 60hours |
| Total | 60hours |
| Knowledge control form | Differentiated attestation |

### Short description of discipline
*Provides for the joint cooperation of the teacher and the student in the process of physical education throughout the training in the context of the requirements for the level of mastering the discipline; acquisition of versatile abilities and skills for the development of physical abilities, socio-cultural experience and socio-cultural values of physical culture and sports; development of communication skills, thinking, self-development, the formation of experience in the implementation of sports and recreational and training programs.*

### Purpose of studying of the discipline
*The purpose of the program is the formation of social and personal competencies of students and the ability to purposefully use the means and methods of physical culture, ensuring the preservation, strengthening of health to prepare for professional activities; to the persistent transfer of physical exertion, neuropsychic stress and adverse factors in future work.*

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

### Prerequisites
*Physical Culture*

### Postrequisites
*Physical Culture*

## Philosophy

| | |
|---|---|
| Discipline cycle | General educational disciplines |
| Discipline component | Compulsory component |
| SubjectID | 31545 (3023375) |
| Course | 3 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline is aimed at developing students` openness of consciousness, understanding their own national code and self-consciousness, spiritual modernization, competitiveness, realism and pragmatism, independent critical thinking, the cult of knowledge and education, a holistic view of philosophy as a special form of understanding the world, mastering key worldview concepts, as well as*

*the development and strengthening of the values of tolerance, intercultural dialogue and a culture of peace.*

### Purpose of studying of the discipline

*Formation in students of a holistic view of philosophy as a special form of knowledge of the world, its main sections, problems and methods of studying them in the context of future professional activities.*

### Learning Outcomes

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

### Prerequisites

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

### Postrequisites

*Basic and profile disciplines of the EP*

## Module 2. Science disciplines

## Mathematics

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |
| SubjectID | 31171 (3023367) |
| Course | 1 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| 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 technology, taking into account modern trends in the development of society.*

### Prerequisites

*School course*

### Postrequisites

*Basic and profile disciplines of the EP*

## The theory of mathematical processing of geodetic measurements

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31262 (3023344) |
| Course | 3 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline contains a systematic description of preliminary, equalizing and final calculations of planned geodetic networks and processing of the results. It also discusses the issues of establishing coordinate systems, relationships between them, reducing the results of field measurements to them, and some other issues. Due attention in the discipline is paid to the use of computers in which tasks are solved when processing measurements.*

### Purpose of studying of the discipline

*The purpose of the discipline is to master students` knowledge in the field of mathematical processing of initial measurement information and equation calculations for solving scientific and practical geodetic problems, taking into account measurement errors in*

*the creation of geodetic networks*

### Learning Outcomes

*ON 2 Process the information obtained about the object of study using the methods of natural science disciplines*
*ON 8 Solve geodetic problems aimed at ensuring maximum efficiency and the required quality of engineering and geodetic work in the design, construction and operation of buildings and structures.*

### Prerequisites

*Mathematics Introduction to the Profession of Surveyor-Cartographer*

### Postrequisites

*Basic and profile disciplines of the EP*

## The theory of mathematical processing of geodetic measurements

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31261 (3023343) |
| Course | 3 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline is devoted to studying the necessary information from probability theory and mathematical statistics, forming a clear understanding of the principles of processing geodetic measurements, as well as professional and general cultural competencies, teaching theoretical foundations and practical skills in mathematical processing of geodetic measurement results. Also, the theory of errors, equalization and design of geodetic networks are considered*

### Purpose of studying of the discipline

*teaching theoretical foundations and practical skills in mathematical processing of geodetic measurement results*

### Learning Outcomes

*ON 2 Process the information obtained about the object of study using the methods of natural science disciplines*
*ON 8 Solve geodetic problems aimed at ensuring maximum efficiency and the required quality of engineering and geodetic work in the design, construction and operation of buildings and structures.*

### Prerequisites

*Mathematics Introduction to the Profession of Surveyor-Cartographer*

### Postrequisites

*Basic and profile disciplines of the EP*

## Adjustment measurements

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31263 (3023345) |
| Course | 3 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline examines the main provisions of the theory of calculating errors of direct and indirect measurements, provides recommendations on the construction of graphs of measured dependencies, provides a concrete example of the design of a report on laboratory work. The appendix provides the basics of presenting the measurement result in modern terms of the uncertainty of the result. This discipline gives them the opportunity to get a clear idea of the rules for processing the results of their measurements, which they perform in practical work.*

### Purpose of studying of the discipline

*The purpose of studying the discipline is to form students with a minimum of knowledge in the field of measurements, which allows a young specialist to improve in the future, independently make technical decisions at the international, regional and national levels, as well as skills in applying methods and practical basics of the course in calculating errors of measuring instruments, total errors of measuring channels.*

### Learning Outcomes

*ON 2 Process the information obtained about the object of study using the methods of natural science disciplines*
*ON 8 Solve geodetic problems aimed at ensuring maximum efficiency and the required quality of engineering and geodetic work in the*

*design, construction and operation of buildings and structures.*

### Prerequisites

*Mathematics Introduction to the Profession of Surveyor-Cartographer*

### Postrequisites

*Basic and profile disciplines of the EP*

## Module 3. Basics of cartographic and geodesic measurements

## Introduction to the Profession of Surveyor-Cartographer

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |
| SubjectID | 31153 (3023381) |
| Course | 1 |
| Term | 1 |
| Credits count | 6 |
| Lections | 30hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 40hours |
| Independent work of the student | 80hours |
| Total | 180hours |
| Knowledge control form | Examination |

### Short description of discipline

*The basic discipline that studies theoretical concepts and applied problems of geodesy as a science of the earth. The content of the discipline forms a modern understanding of the means and methods of creating topographic maps (plans), geodetic surveying used in various branches of the national economy. Students will learn how to measure geometric relations between elements of the earth`s surface with geodetic instruments, mathematically process the obtained field data and represent them on maps and plans.*

### Purpose of studying of the discipline

*Formation among students of a modern understanding of the discipline of geodesy, as a science of the Earth, used in various fields of knowledge and practical human activities, about the means and methods of geodetic work in topographic and geodetic surveys, the creation and adjustment of topographic plans, in solving engineering, cadastral and other tasks .*

### Learning Outcomes

*ON 3 Use the fundamentals of cartography and geodesy to solve various problems on the ground*

### Prerequisites

*School course*

### Postrequisites

*Basic and profile disciplines of the EP*

## Cartography

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |
| SubjectID | 31210 (3023311) |
| Course | 1 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Laboratory works | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination and term work/Project |

### Short description of discipline

*The discipline "Cartography", is a basic discipline that gives basic knowledge of the theoretical background of cartographic science, including the teaching of the creation and use of cartographic works, maps and methods of cartographic research, plays an important role and importance in the preparation of bachelor educational program "Geodesy and Cartography".*

*Cartography includes a broad range of questions on the creation of topographic and thematic maps at various scales in a wide variety of scientific areas of the economy.*

### Purpose of studying of the discipline

*- development of spatial imagination and logical thinking skills;*
*- acquaintance with topographic, geographical maps and atlases, their properties as figurative and symbolic models of reality;*
*- teaching methods and methods of cartographic display of objects and phenomena;*
*- study of the theoretical and practical foundations of cartography;*
*- study of graphic constructions and design of maps, plans and profiles;*
*- computational processing of measurement results using electronic computers;*
*- creation and updating of topographic and thematic maps in the interests of the national economy, for research and protection of the environment and natural resources.*

### Learning Outcomes

*ON 3 Use the fundamentals of cartography and geodesy to solve various problems on the ground*
*ON 4 Demonstrate the ability to draw plans and maps of the terrain using traditional and modern methods*

### Prerequisites

*Introduction to the Profession of Surveyor-Cartographer*

### Postrequisites

*Basic and profile disciplines of the EP*

## Topographical drawing

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |
| SubjectID | 31213 (3023547) |
| Course | 1 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline includes basic issues and principles in the field of topographic, cartographic and land surveying graphics, features of plotting, as well as the process of drawing on graphic materials. The basics of drawing conventional topographic, cartographic and land surveying signs, fonts and their application to create plans and maps, which are an integral part of the colorful design of documents of cartographic and other land surveying production are studied. Additionally presented to the study of the basics of computer graphics*

### Purpose of studying of the discipline

*Studying the methods and techniques of line, font and colorful design of graphic documents of cartographic and land management production.*

### Learning Outcomes

*ON 3 Use the fundamentals of cartography and geodesy to solve various problems on the ground*
*ON 4 Demonstrate the ability to draw plans and maps of the terrain using traditional and modern methods*

### Prerequisites

*Introduction to the Profession of Surveyor-Cartographer*

### Postrequisites

*Computer graphics in construction Computer drawing in design Smart technologies in construction Digital technologies in the organization, management and planning of buildings Autocad in pojecting BIM-technologies in the design, construction and operation of buildings and structures*

## Educational - field geodetic practice

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |
| SubjectID | 31217 (3023548) |
| Course | 1 |
| Term | 2 |
| Credits count | 6 |
| Study practics | 180hours |
| Total | 180hours |
| Knowledge control form | Total mark on practice |

### Short description of discipline

*Educational - field geodetic practice is an important part of the educational process, which forms the students` theoretical knowledge of the discipline "Geodesy" professional skills of geodetic measurements on the ground using modern geodetic means and technologies. During the practice students consolidate, expand and deepen theoretical knowledge, learn to perform topographic and engineering-geodesic works with the necessary accuracy in conditions close to the production.*

### Purpose of studying of the discipline

*The purpose of studying the discipline is to consolidate the knowledge gained by students in lectures and practical classes, as well as the formation of practical skills and abilities, general cultural, professional competencies.*

### Learning Outcomes

*ON 3 Use the fundamentals of cartography and geodesy to solve various problems on the ground*
*ON 4 Demonstrate the ability to draw plans and maps of the terrain using traditional and modern methods*

### Prerequisites

*Introduction to the Profession of Surveyor-Cartographer*

### Postrequisites

*Industrial practice I*

## Geodetic Instrumentation

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |

| | |
|---|---|
| SubjectID | 31237 (3023550) |
| Course | 2 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Laboratory works | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline "Geodesic Instrumentation" is a basic discipline that studies the development of geodetic instruments, their standardization and metrological support of measurements.*
*This course allows you to study the requirements for geodetic instruments, the arrangement of mechanical components of electrical instruments, the development of measurement methods, the design of geodetic instruments, and the processing of the results of the study of instruments.*
*Studies the main parameters and requirements in instrumentation, production, technical and design activities and proceeds from the requirements of geodesy to the measurement results*

### Purpose of studying of the discipline
*To give an idea about the structure and design of surveying instruments*

### Learning Outcomes
*ON 3 Use the fundamentals of cartography and geodesy to solve various problems on the ground*

### Prerequisites
*Introduction to the Profession of Surveyor-Cartographer*

### Postrequisites
*Basic and profile disciplines of the EP*

## Higher Geodesy

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | University component |
| SubjectID | 31238 (3023374) |
| Course | 2 |
| Term | 1 |
| Credits count | 8 |
| Lections | 30hours |
| Practical and seminar classes | 45hours |
| Laboratory works | 0hours |
| Independent work of a student under the guidance of a teacher | 55hours |
| Independent work of the student | 110hours |
| Total | 240hours |
| Knowledge control form | Examination and term work/Project |

### Short description of discipline
*The discipline that studies the modern achievements of science and production higher geodesy, the basics of scientific processing field measurements and surveying techniques using the latest geodetic instruments. The content includes topics related to determining the shape, size, gravitational field of the Earth, establishment of a coordinate system, creation of state reference geodetic networks to ensure the accuracy and density of mapping of the area and performance of engineering and geodesic works, study of geodynamic phenomena*

### Purpose of studying of the discipline
*studying the geometry of the earth`s ellipsoid, solving problems on the surface of the ellipsoid, building geodetic networks using satellite geodesy methods*

### Learning Outcomes
*ON 3 Use the fundamentals of cartography and geodesy to solve various problems on the ground*

### Prerequisites
*Introduction to the Profession of Surveyor-Cartographer*

### Postrequisites
*Basic and profile disciplines of the EP*

## Digital models and terrain maps

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31321 (3023322) |
| Course | 3 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |

| | |
|---|---|
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline is based on the study of digital maps of the terrain in the form of theory and practice, the use of cartographic information and different methods, such as digital technical, as well as, obtaining and using, updating and changing methods of storage of digital maps. Also in the course of the discipline will be mastered the future of scientific and technical design of digital maps with a digital model of the Earth, the compilation and means of processing, also the application of information on digital maps.*

### Purpose of studying of the discipline
*The purpose of studying this discipline is to form basic ideas among future specialists about the methods of creating and analyzing digital terrain models using geographic information systems (GIS) and using them in various fields of geoecology, hydrology, geomorphology, nature management, etc.*

### Learning Outcomes
*ON 4 Demonstrate the ability to draw plans and maps of the terrain using traditional and modern methods*

### Prerequisites
*Applied Geodesy*

### Postrequisites
*Basic and profile disciplines of the EP*

## Module 4. Automation and new technologies in geodesic production

## Computer drawing in design

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31223 (3023316) |
| Course | 2 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline is devoted to the study and practical development of computer technology in graphics application packages, develops spatial imagination of students. In addition, the study of State Standards Unified system of design documentation, the basic principles and rules of design documentation. Students study ways of graphic representations, fulfillment of sketches of details, drawing up of design and technical documentation creation of volume models with the help of AutoCAD computer program*

### Purpose of studying of the discipline
*The purpose of teaching the discipline "Computer drawing in design" is computer engineering training: for students of builders. The tasks include providing the student with a minimum of fundamental engineering and geometric knowledge and knowledge in the field of drawing and modeling.*

### Learning Outcomes
*ON 3 Use the fundamentals of cartography and geodesy to solve various problems on the ground*
*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*

### Prerequisites
*Topographical drawing*

### Postrequisites
*Final examination Smart technologies in construction Digital technologies in the organization, management and planning of buildings BIM-technologies in the design, construction and operation of buildings and structures*

## Autocad in pojecting

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31234 (3023549) |
| Course | 2 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |

| | |
|---|---|
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline is devoted to the study of the AutoCAD program, mastering the AutoCAD interface, creating 2D/3D models. In the process of studying this discipline, students learn how to draw various drawings in this program, edit, form images of various formats, draw projections of objects, form an image of schemes using AutoCAD. Two-and three-dimensional modeling is also implemented: the main elements of 3D modeling, the creation of orthogonal projections. Learn to draw two- dimensional and three- dimensional objects in AutoCAD*

### Purpose of studying of the discipline
*The study of the basic principles of computer-aided design fundamentals of drawing in AutoCAD*

### Learning Outcomes
*ON 3 Use the fundamentals of cartography and geodesy to solve various problems on the ground*
*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*

### Prerequisites
*Topographical drawing*

### Postrequisites
*Final examination Smart technologies in construction Digital technologies in the organization, management and planning of buildings BIM-technologies in the design, construction and operation of buildings and structures*

## Computer graphics in construction

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31219 (3023315) |
| Course | 2 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline is devoted to the study and practical development of methods for the development of text and drawing*
*design documentation using modern graphic editors, as well as the development of students` ability to spatial imagination.*
*In the course students study the application of computer technology in the system AutoCAD in the construction of graphic models: drawings, objects in construction. Construction of drawing elements: walls, window blocks, doors, sizing, symbols*

### Purpose of studying of the discipline
*The purpose of teaching the discipline "Computer graphics in construction»: preparing students for independent, creative work, performing which they must demonstrate basic knowledge when working with the computer-aided design program AutoCAD.*

### Learning Outcomes
*ON 3 Use the fundamentals of cartography and geodesy to solve various problems on the ground*
*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*

### Prerequisites
*Topographical drawing*

### Postrequisites
*Final examination Smart technologies in construction Digital technologies in the organization, management and planning of buildings BIM-technologies in the design, construction and operation of buildings and structures*

## Laser scanners in geodesy

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31251 (3023385) |
| Course | 2 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*Students learn the principles of operation of ground laser scanners, acquaint with the history of laser scanners, pass laser location methods and traditional methods of topographic surveying, methods of laser-location images acquisition, information about navigational support of laser location, airborne laser- location survey. During the discipline they receive information about the concept of laser-location methods of collecting geospatial data, economic aspects of laser-location means, information about instrumental means of laser scanners.*
### Purpose of studying of the discipline
*The purpose of studying the discipline is to get acquainted with laser scanners, the technique of terrestrial laser scanning, as well as its application in applied geodesy. Mastering software products for processing laser scanning data, their main functions and choosing the right software product*
### Learning Outcomes
*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*
*ON 8 Solve geodetic problems aimed at ensuring maximum efficiency and the required quality of engineering and geodetic work in the design, construction and operation of buildings and structures.*
### Prerequisites
*Basic and profile disciplines of the EP*
### Postrequisites
*Basic and profile disciplines of the EP*

## Software packages for computer-aided design

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31248 (3023359) |
| Course | 2 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The study of the discipline will become familiar with the basic principles of CAD, methods of classification of design processes and design work, to form knowledge, skills, automation process design and design documentation in the design of buildings and structures using modern software systems. To achieve the goal is given a review of the structure and principles of computer-aided design, provides an overview of the components and software tools CAD.*
### Purpose of studying of the discipline
*The main purpose of the discipline "Software systems for computer- aided design" is to familiarize students with the fundamental principles of CAD, their classification, methods of formalization of the design and construction process, ways of using information technologies to automate design, design and technological work.*
### Learning Outcomes
*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*
### Prerequisites
*Basic and profile disciplines of the EP*
### Postrequisites
*Basic and profile disciplines of the EP*

## Modern technologies in geodesic production

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31250 (3023360) |
| Course | 2 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline "Modern technologies in geodesic production" is necessary to expand the knowledge and skills of students in various areas of geodesy and familiarization with modern methods and instruments to perform high-precision geodetic works, as well as to master the software products for high-precision measurement processing tasks and study the processing in these programs to solve scientific and practical geodetic tasks*

### Purpose of studying of the discipline

*The discipline introduces students of geodesists to modern methods and instruments for performing high-precision geodetic works and discusses in detail software products for processing high-precision measurements.*

### Learning Outcomes

*ON 3 Use the fundamentals of cartography and geodesy to solve various problems on the ground*
*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Basic and profile disciplines of the EP*

## Electronic instruments and methods of geodetic measurements

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31270 (3023357) |
| Course | 3 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Laboratory works | 0hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*A discipline that studies electronic instrumentation, equipment, and technology for performing topographic surveys, as well as methods and algorithms for cameral processing heterogeneous topographic and cartographic data for the purposes of compiling and updating topographic plans and maps. The content of the discipline is aimed at forming the future specialist`s professional competence in the application of innovative technologies for geodetic measurements based on the use of laser, electronic and automated systems.*

### Purpose of studying of the discipline

*To teach students to conduct topographic surveys using modern instruments, equipment and technologies; - processing of heterogeneous topographic and cartographic information for the purposes of compiling and updating topographic plans and maps;*

### Learning Outcomes

*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Basic and profile disciplines of the EP*

## New technologies of cartographic production

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 31282 (3023338) |
| Course | 3 |
| Term | 1 |
| Credits count | 7 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Laboratory works | 30hours |
| Independent work of a student under the guidance of a teacher | 45hours |
| Independent work of the student | 90hours |
| Total | 210hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline "New technologies of cartographic production" is a discipline studying the application of new technologies and methods of cartographic production to solve scientific and practical geodetic and cartographic problems. During the study of the discipline students learn how to make and edit maps, basic methods of researching phenomena on maps and plans, the requirements for new types of*

*geodetic maps and plans*

### Purpose of studying of the discipline

*Studies the theory and methods of cartographic mapping of objects and phenomena of nature and society, that is, the construction of the map language, cartographic sign systems; artistic design of maps (cartographic design), their colorful design in relation to new information technologies, based on the development of the design of maps and cartographic semiotics.*

### Learning Outcomes

*ON 4 Demonstrate the ability to draw plans and maps of the terrain using traditional and modern methods*

*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*

### Prerequisites

*Introduction to the Profession of Surveyor-Cartographer Geodetic Instrumentation*

### Postrequisites

*Basic and profile disciplines of the EP*

## Modern geodetic instruments and technologies

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 31288 (3023555) |
| Course | 3 |
| Term | 1 |
| Credits count | 7 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Laboratory works | 30hours |
| Independent work of a student under the guidance of a teacher | 45hours |
| Independent work of the student | 90hours |
| Total | 210hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline studies the use of modern geodetic instruments and technologies for solving scientific and practical geodetic problems. Students will be able to master the technical characteristics, design and methods of geodetic measurements of geodetic instruments and equipment widely used in modern geodetic work. The discipline allows you to study the methods of geodetic measurements, automation of methods for recording radiation and line measurements, as well as mathematical processing of measurement results obtained by digitalization and others.*

### Purpose of studying of the discipline

*The main goal of this discipline is to master the knowledge and skills of students in the use of modern geodetic instruments and technologies to solve scientific and practical geodetic problems.*

### Learning Outcomes

*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*

### Prerequisites

*Introduction to the Profession of Surveyor-Cartographer Geodetic Instrumentation*

### Postrequisites

*Basic and profile disciplines of the EP*

## Technology of creating geodetic reference networks by modern methods

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 31284 (3023356) |
| Course | 3 |
| Term | 1 |
| Credits count | 7 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Laboratory works | 30hours |
| Independent work of a student under the guidance of a teacher | 45hours |
| Independent work of the student | 90hours |
| Total | 210hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline "Technology of creating geodetic reference networks by modern methods" is a discipline that studies the geodetic reference networks, technologies and methods of creating networks. This course allows you to study modern methods of creating geodetic networks, as well as the implementation of topographic survey of different scales, the removal of building axes in reality and other tasks of geodetic production necessary to solve scientific and practical geodetic tasks*

### Purpose of studying of the discipline
*Carrying out a complex of practical and computational work in order to study the technology of creating reference and survey geodetic networks using global navigation satellite systems*
### Learning Outcomes
*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*
### Prerequisites
*Introduction to the Profession of Surveyor-Cartographer Geodetic Instrumentation*
### Postrequisites
*Basic and profile disciplines of the EP*

## BIM-technologies in the design, construction and operation of buildings and structures

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31313 (3023557) |
| Course | 3 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline allows students to master key tools, such as Autodesk Revit and AutoCAD Civil 3D, for creating information models of buildings and structures. Students learn the basics of working with the software, including creating geodetic models, integrating geodata, analyzing spatial relationships, and visualizing results. The course also includes practical exercises during which students develop projects using BIM technologies, taking into account the geodetic aspects of design, construction and operation*
### Purpose of studying of the discipline
*The purpose of the discipline is to provide students with key skills and knowledge in the use of Autodesk Revit software, AutoCAD Civil 3D and BIM technologies for the design and modeling of buildings and structures, taking into account geodetic aspects.*
### Learning Outcomes
*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*
### Prerequisites
*Computer graphics in construction Computer drawing in design Topographical drawing Autocad in pojecting*
### Postrequisites
*Basic and profile disciplines of the EP Final examination*

## Smart technologies in construction

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31336 (3023319) |
| Course | 3 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline "Smart Technology in Construction" is a basic discipline that delivers students information about current technologies in the design of engineering networks, and even more thoroughly explore the global construction industry, detect errors and shortcomings by comparing and analyzing, which in the end allow to make a choice of a rational option, using a computer model of the building and structure*
### Purpose of studying of the discipline
*The purpose of mastering the discipline "Smart technologies in construction" is to prepare the future student for independent work on mastering new technologies by optimizing technological modes.*
### Learning Outcomes
*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production*

*processes.*

### Prerequisites

*Computer graphics in construction Computer drawing in design Topographical drawing Autocad in pojecting*

### Postrequisites

*Basic and profile disciplines of the EP Final examination*

## Application of global navigation satellite systems in geodesy

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |
| SubjectID | 31309 (3023560) |
| Course | 3 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*Discipline "Application of global navigation satellite systems in geodesy" introduces students to the principles and methods of using GNSS in geodetic work. Students learn the basics of GNSS functioning, the principles of determining coordinates and heights, as well as methods for processing and analyzing the received data. They also master specialized GNSS software and learn how to use them in various geodetic tasks.*

### Purpose of studying of the discipline

*The purpose of the discipline "Application of global navigation satellite systems in geodesy" is to familiarize students with the principles and methods of using global navigation satellite systems in geodetic work. The main goal is to prepare students for the use of GNSS to determine coordinates, heights and perform various geodetic tasks.*

### Learning Outcomes

*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*

### Prerequisites

*New technologies of cartographic production Technology of creating geodetic reference networks by modern methods Modern geodetic instruments and technologies*

### Postrequisites

*Basic and profile disciplines of the EP Final examination*

## Digital technologies in the organization, management and planning of buildings

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31334 (3023320) |
| Course | 3 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline "Digital technologies in the organization, management and planning of buildings" prepares students for organizational, technical, experimental, research and design work associated with modern technology: modeling modern, high-performance structural elements of buildings and structures. The discipline considers questions about digital technologies and their types; digital technologies in the construction industry; the specifics of the current methods of design; technologies for developing solutions using computer technology*

### Purpose of studying of the discipline

*The purpose of studying the subject is to introduce future engineers to the prospects and examples of using digital technologies to improve the efficiency and quality of construction.*

### Learning Outcomes

*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*

### Prerequisites

*Computer graphics in construction Computer drawing in design Topographical drawing Autocad in pojecting*

### Postrequisites
*Basic and profile disciplines of the EP Final examination*

## Module 5. Land monitoring, mapping and digitization

## Geoinformatics in a cadastre

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31232 (3023342) |
| Course | 2 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline "Geoinformatics in cadastre" is basic and studies the modern state of cadastre and geoinformatics, shows the possibilities of modern GIS technologies in various scientific spheres of agriculture, as well as automation of land cadastre processes. The discipline considers the issues of modeling in the cadastre, studying cadastral registration and evaluation, cadastral maps and methods of creating and editing digital thematic maps by using MAPINFO software*

### Purpose of studying of the discipline
*The purpose of the discipline is to study natural and socio-economic systems in the cadastre (their structure, connections, dynamics, functioning in space and time) through computer modeling based on databases and geographical knowledge.*

### Learning Outcomes
*ON 6 Process and analyze cartographic information obtained during Earth monitoring to ensure the quality, observation of the digital terrain model*

### Prerequisites
*Basic and profile disciplines of the EP*

### Postrequisites
*Basic and profile disciplines of the EP*

## Organization and planning of topographic surveys

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31233 (3023387) |
| Course | 2 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The basic discipline is devoted to the study of the basics of organization and planning of topographic surveys and acquire knowledge about innovative methods and means of surveying, graphic and digital registration of their results. The content of the discipline is aimed at forming the students` ability to apply modern technologies for obtaining field topographic and geodetic data, including aerospace and GIS technologies for mapping territories and construction design, updating the existing stock of maps*

### Purpose of studying of the discipline
*Acquaintance with the organization and planning of topographic work, the study of modern technologies and methods of topographic surveys, the possibilities of computer and satellite technologies for automating field measurements and creating original topographic plans, mastering innovative methods of topographic work.*

### Learning Outcomes
*ON 3 Use the fundamentals of cartography and geodesy to solve various problems on the ground*
*ON 7 Perform geodetic work related to the creation of a survey justification for cadastral surveys and the assessment of relief-forming processes, analyze and process geodetic data and assess the characteristics of the relief*

### Prerequisites
*Basic and profile disciplines of the EP*

### Postrequisites
*Basic and profile disciplines of the EP*

## Mapping modeling

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31254 (3023552) |
| Course | 2 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline "Mapping modeling" is the basic one, which introduces students to the basic methods and techniques for creating and visualizing cartographic models. The discipline will allow you to study the principles of generating high-rise models, creating digital elevation models and spatial data analysis. The discipline also includes mastery of specialized modeling software, which allows the development of informative maps and geographic information systems based on geospatial data.*

### Purpose of studying of the discipline
*The acquisition by students of general and special knowledge and skills in modeling the thematic content of maps in scientific and practical activities, as well as the formalized use of cartographic models in conducting geographical research.*

### Learning Outcomes
*ON 6 Process and analyze cartographic information obtained during Earth monitoring to ensure the quality, observation of the digital terrain model*

### Prerequisites
*Cartography*

### Postrequisites
*Basic and profile disciplines of the EP*

## Map projection and computer design

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31246 (3023336) |
| Course | 2 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline "Map projection and computer design" is a basic discipline that studies methods of designing maps and atlases of various types, properties, perception, as well as the rules of applying graphics in the design of cartographic works to solve scientific and practical geodetic and cartographic problems. Studying this discipline will allow you to quickly, with high quality design various topographic-geodesic and cartographic materials in the software, as well as to master the subtleties of computer design*

### Purpose of studying of the discipline
*Formation of students` knowledge, skills and practical skills in the field of the basics of theory and practice of design of cartographic works, visual aids, their properties and rules of application in the design of various maps and atlases, computer methods of graphic production of originals*

### Learning Outcomes
*ON 3 Use the fundamentals of cartography and geodesy to solve various problems on the ground*
*ON 6 Process and analyze cartographic information obtained during Earth monitoring to ensure the quality, observation of the digital terrain model*

### Prerequisites
*Cartography*

### Postrequisites
*Basic and profile disciplines of the EP*

## Industrial practice I

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |
| SubjectID | 31247 (3023350) |
| Course | 2 |
| Term | 2 |

| | |
|---|---|
| Credits count | 7 |
| Working practice | 210hours |
| Total | 210hours |
| Knowledge control form | Total mark on practice |

### Short description of discipline
*Deepening and consolidation of theoretical knowledge obtained in geodesy and engineering geodesy, cartography, photogrammetry. Performing engineering- topographic surveys, designing plan and height geodetic support, the implementation of angular and linear measurements in the polygonometer course, performing tachymetric surveying As a result of field work performance deciphering the results. When performing computational and graphic works, students learn how to prepare papers according to the requirements of the State Standard*

### Purpose of studying of the discipline
*- consolidation and deepening of the student`s theoretical training, aimed at acquiring practical skills and competencies in the field of professional activity.*

### Learning Outcomes
*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*
*ON 6 Process and analyze cartographic information obtained during Earth monitoring to ensure the quality, observation of the digital terrain model*

### Prerequisites
*Educational - field geodetic practice*

### Postrequisites
*Industrial practice II*

## Drafting, editing and publishing maps

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31252 (3023551) |
| Course | 2 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline "Drawing, editing and publishing maps" will introduce students to the basic principles of creating and editing cartographic materials. The discipline provides an opportunity to study the methods of collecting and processing geodetic data, to analyze various cartographic projections and symbolism. In addition, the discipline will allow them to master the software for creating and editing maps, which allows them to design and publish high-quality cartographic products that meet modern requirements and standards*

### Purpose of studying of the discipline
*To give a more complete picture of geographical maps and other cartographic works, as a special way of displaying reality. To acquaint with methods of creating maps, both with traditional and geographic information systems. This perception of geographical maps increases the efficiency of their use in scientific research and practical activities.*

### Learning Outcomes
*ON 6 Process and analyze cartographic information obtained during Earth monitoring to ensure the quality, observation of the digital terrain model*

### Prerequisites
*Cartography*

### Postrequisites
*Basic and profile disciplines of the EP*

## Soil bonitization and land valuation

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 31256 (3023329) |
| Course | 2 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |

| | |
|---|---|
| Knowledge control form | Examination |

### Short description of discipline
*The discipline is devoted to the formation of basic knowledge about the living shell of the Earth - soil, properties, formation, the study of the soil formation process, the influence of environmental factors; the role of soil in nature. Students study the role of soil in the conservation of biological diversity; the importance of soil in human life, the pattern of zonal distribution of soils on the Earth`s surface; soil fertility, its categories, elements, as well as changes in the agricultural use of soils.*

### Purpose of studying of the discipline
*The objectives of the discipline (module) are: acquaintance with the theoretical and practical problems of assessing soil fertility as the main means of production in agriculture; acquaintance of students with the basics of maintaining a land cadastre and modern methods of assessing soil fertility; methods of soil bonification, land assessment, soil certification.*

### Learning Outcomes
*ON 6 Process and analyze cartographic information obtained during Earth monitoring to ensure the quality, observation of the digital terrain model*
*ON 7 Perform geodetic work related to the creation of a survey justification for cadastral surveys and the assessment of relief-forming processes, analyze and process geodetic data and assess the characteristics of the relief*

### Prerequisites
*Basic and profile disciplines of the EP*

### Postrequisites
*Basic and profile disciplines of the EP*

## Geodetic support of land works

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 31259 (3023554) |
| Course | 2 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline "Geodetic support of land works" is devoted to the study of methods and principles of geodetic support of various land works. Students study the work of conducting geodetic measurements, creating and processing geodetic networks, as well as assessing and controlling the quality of the data obtained. This discipline is key to ensuring the accuracy and reliability of earthworks, ensuring the successful implementation of projects and meeting quality standards.*

### Purpose of studying of the discipline
*Obtaining knowledge about the methods and principles of geodetic support for land works and providing the necessary knowledge and skills to effectively perform geodetic measurements and control data quality.*

### Learning Outcomes
*ON 6 Process and analyze cartographic information obtained during Earth monitoring to ensure the quality, observation of the digital terrain model*
*ON 7 Perform geodetic work related to the creation of a survey justification for cadastral surveys and the assessment of relief-forming processes, analyze and process geodetic data and assess the characteristics of the relief*

### Prerequisites
*Basic and profile disciplines of the EP*

### Postrequisites
*Basic and profile disciplines of the EP*

## Environmental Monitoring

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 31255 (3023327) |
| Course | 2 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline "Environmental monitoring" is devoted to the study of the concept of environmental safety and sustainable development of*

*the environment. Students study different types and systems of environmental monitoring, their purpose and content, structures, methods of monitoring organization taking into account the characteristics of different types of economic activity; ways of spatial data localization, the essence, specificity, and properties of geo-environmental information, modern geographic information systems*

### Purpose of studying of the discipline

*The purpose of the study is to give students an understanding of the information system of observations, assessment and prediction of changes in the state of the environment, created to highlight the anthropogenic component of these changes against the background of natural processes*

### Learning Outcomes

*ON 6 Process and analyze cartographic information obtained during Earth monitoring to ensure the quality, observation of the digital terrain model*

*ON 7 Perform geodetic work related to the creation of a survey justification for cadastral surveys and the assessment of relief-forming processes, analyze and process geodetic data and assess the characteristics of the relief*

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Basic and profile disciplines of the EP*

## GIS in Geodesy and Cartography

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |
| SubjectID | 31277 (3023556) |
| Course | 3 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Laboratory works | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination and term work/Project |

### Short description of discipline

*The discipline "GIS in Geodesy and Cartography" is a basic discipline that studies the creation and updating of topographic and thematic maps and spatial data models based on the results of decoding images obtained by different methods, allowing the collection and analysis of topographic-geodesic and cartographic materials and GIS technologies to study the natural resource potential of the country, as well as geoanalysis and modeling*

### Purpose of studying of the discipline

*Training of highly qualified specialists with theoretical knowledge and practical skills in the use of methods and means of automatic processing of geographic information, the use of GIS technologies and database management systems.*

### Learning Outcomes

*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*

*ON 6 Process and analyze cartographic information obtained during Earth monitoring to ensure the quality, observation of the digital terrain model*

### Prerequisites

*Cartography Introduction to the Profession of Surveyor-Cartographer*

### Postrequisites

*Basic and profile disciplines of the EP*

## Aerosurvey

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31320 (3023325) |
| Course | 3 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*A discipline that studies a set of works for obtaining topographic maps, plans and CMM using materials for photographing terrain from aircraft or from space. It considers one of the main types of survey work, which allows, with a sharp increase in the productivity of field work, to transfer the bulk of the work on obtaining information about the area to the office conditions using automation and computer*

*technology*

### Purpose of studying of the discipline

*The purpose of studying the special discipline "Aerial Photography" is to provide students with knowledge, skills and abilities to conduct geodetic measurements and calculations using planned aerial photographs of landscape construction objects.*

### Learning Outcomes

*ON 4 Demonstrate the ability to draw plans and maps of the terrain using traditional and modern methods*

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Basic and profile disciplines of the EP*

## Geology and Geomorphology

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31319 (3023331) |
| Course | 3 |
| Term | 2 |
| Credits count | 3 |
| Lections | 15hours |
| Practical and seminar classes | 15hours |
| Independent work of a student under the guidance of a teacher | 20hours |
| Independent work of the student | 40hours |
| Total | 90hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline "Geology and Geomorphology" is a basic discipline that studies the geological internal structure and magnetism of the Earth, the Earth`s crust and its processes. In the course students will study endogenous, exogenous and metamorphogenetic processes; learn to determine and characterize the morphological and genetic types of terrain, give the main characteristics of the relief; classification of minerals, rocks, their composition and properties*

### Purpose of studying of the discipline

*Study of the relief of the earth`s surface and the processes that form it. Obtaining knowledge and studying the internal structure of the Earth, endogenous and exogenous morphogenetic processes, geomorphological activity of glaciers and the zoning of glacial complexes of the relief*

### Learning Outcomes

*ON 7 Perform geodetic work related to the creation of a survey justification for cadastral surveys and the assessment of relief-forming processes, analyze and process geodetic data and assess the characteristics of the relief*

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Final examination Software in cartography Methods of creation and development of the state geodetic network Geodetic monitoring of engineering buildings and structures*

## Engineering geology

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31312 (3023558) |
| Course | 3 |
| Term | 2 |
| Credits count | 3 |
| Lections | 15hours |
| Practical and seminar classes | 15hours |
| Independent work of a student under the guidance of a teacher | 20hours |
| Independent work of the student | 40hours |
| Total | 90hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline "Engineering Geology" introduces students to the basics of studying the geological structure of the earth`s crust, its influence on engineering structures. Students learn the methods of engineering and geological surveys, which allow assessing the geological conditions of construction and determining the properties of soils. The course also includes the study of basic soil processes and their impact on engineering structures. Knowledge of engineering geology is essential for the safe and efficient design and construction of various engineering facilities.*

### Purpose of studying of the discipline

*The purpose of the discipline "Engineering Geology" is to develop students` skills of analysis and decision-making based on geological information. During the training, students learn to assess the risks associated with geological conditions and soil properties, and apply this knowledge to make informed decisions in the design and construction of engineering facilities.*

### Learning Outcomes

*ON 7 Perform geodetic work related to the creation of a survey justification for cadastral surveys and the assessment of relief-forming processes, analyze and process geodetic data and assess the characteristics of the relief*

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Final examination Software in cartography Methods of creation and development of the state geodetic network Geodetic monitoring of engineering buildings and structures*

## Topographic Mapping

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31318 (3023313) |
| Course | 3 |
| Term | 2 |
| Credits count | 3 |
| Lections | 15hours |
| Laboratory works | 15hours |
| Independent work of a student under the guidance of a teacher | 20hours |
| Independent work of the student | 40hours |
| Total | 90hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline "Topographic mapping" is a basic discipline that allows to understand geographical maps and plans, to learn methods of their compilation and proper analysis and their use to solve various geodetic and cartographic problems. During the course, students will learn how to perform a comprehensive description of the territory presented on a map or plan; draw cartographic grids in various projections, plot objects on them*

### Purpose of studying of the discipline

*Formation of professional competencies necessary for creating and updating topographic maps of land and water areas based on aerial and satellite images, the transformation of which into a cartographic image is based on a field geographical study of the area*

### Learning Outcomes

*ON 4 Demonstrate the ability to draw plans and maps of the terrain using traditional and modern methods*
*ON 7 Perform geodetic work related to the creation of a survey justification for cadastral surveys and the assessment of relief-forming processes, analyze and process geodetic data and assess the characteristics of the relief*

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Final examination Software in cartography Methods of creation and development of the state geodetic network Geodetic monitoring of engineering buildings and structures*

## Automation of photogrammetric works

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 31338 (3023334) |
| Course | 3 |
| Term | 2 |
| Credits count | 7 |
| Lections | 30hours |
| Laboratory works | 45hours |
| Independent work of a student under the guidance of a teacher | 45hours |
| Independent work of the student | 90hours |
| Total | 210hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline is devoted to the study of methods, technologies and means of automated photogrammetric processing of images obtained by aerospace and ground survey systems and obtaining a digital terrain model. The discipline focuses on consideration of theoretical foundations of digital photogrammetry associated with the processing of digital images to solve various problems of processing aerial survey and remote sensing data and questions about modern hardware and software.*

### Purpose of studying of the discipline

*It teaches the transformation of digital images, digital processing of aerial photographs, modeling of topographic characteristics of the terrain, creating digital terrain models.*

### Learning Outcomes

*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*
*ON 6 Process and analyze cartographic information obtained during Earth monitoring to ensure the quality, observation of the digital terrain model*

### Prerequisites
*GIS in Geodesy and Cartography*
### Postrequisites
*Basic and profile disciplines of the EP*

## Technology of photogrammetric processing of aerospace images

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 31337 (3023335) |
| Course | 3 |
| Term | 2 |
| Credits count | 7 |
| Lections | 30hours |
| Laboratory works | 45hours |
| Independent work of a student under the guidance of a teacher | 45hours |
| Independent work of the student | 90hours |
| Total | 210hours |
| Knowledge control form | Examination |

### Short description of discipline
*A major discipline that studies modern methods and algorithms of photogrammetric processing of aerospace imagery and remote sensing data and synthesis of thematic layers of geospatial information used to solve problems of creating digital topographic products for various purposes. Students study the basics of photogrammetric processing of aerial and satellite images to create orthophotomaps of terrain, digital situation models, digital terrain models and digital terrain models.*
### Purpose of studying of the discipline
*The purpose of mastering the discipline is to familiarize students with the methods of photogrammetric processing of remote sensing data and ground photography.*
### Learning Outcomes
*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*
*ON 6 Process and analyze cartographic information obtained during Earth monitoring to ensure the quality, observation of the digital terrain model*
### Prerequisites
*GIS in Geodesy and Cartography*
### Postrequisites
*Basic and profile disciplines of the EP*

## Photogrammetry and remote sensing

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 31339 (3023559) |
| Course | 3 |
| Term | 2 |
| Credits count | 7 |
| Lections | 30hours |
| Laboratory works | 45hours |
| Independent work of a student under the guidance of a teacher | 45hours |
| Independent work of the student | 90hours |
| Total | 210hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline "Photogrammetry and remote sensing" is devoted to the study of the basic principles and methods of processing photogrammetric data and data obtained by remote sensing of the Earth. Students learn the processes of capturing, analyzing and interpreting images, as well as master specialized software for data processing and modeling. The course also covers important applications of photogrammetry and remote sensing in the fields of geodesy, geology, ecology and geoinformatics*
### Purpose of studying of the discipline
*study of theoretical and practical knowledge on the main types of photogrammetric processes, methods for their evaluation and analysis of the quality of the obtained materials, correction of maps and plans, as well as in solving various engineering problems related to the creation of maps and plans of various scales and thickening of the reference photogrammetric network.*
### Learning Outcomes
*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*
*ON 6 Process and analyze cartographic information obtained during Earth monitoring to ensure the quality, observation of the digital terrain model*
### Prerequisites

*GIS in Geodesy and Cartography*

### Postrequisites

*Basic and profile disciplines of the EP*

## Methods of creation and development of the state geodetic network

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 31349 (3023376) |
| Course | 4 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Laboratory works | 0hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline is aimed at the effective and widespread use of traditional and satellite geodesy methods in the construction of state geodetic networks.*
*The questions of construction and adjustment of satellite geodetic networks are considered. A high-precision geodetic network, class 1 satellite geodetic networks and special-purpose geodetic networks are being studied.*
*The specifics of the creation and development of state geodetic networks for geodetic and navigational positioning, use in the fields of science, technology, economics*

### Purpose of studying of the discipline

*Get acquainted with the theoretical and practical issues of the construction and equalization of satellite geodetic networks, which include a high-precision geodetic network, satellite geodetic networks of the 1st class and geodetic networks of special purpose. To form general cultural and professional competencies in the field of creation and development of state geodetic networks, their practical application for geodetic and navigation positioning, their use in various fields of science, technology, economics.*

### Learning Outcomes

*ON 6 Process and analyze cartographic information obtained during Earth monitoring to ensure the quality, observation of the digital terrain model*

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Final examination*

## Software in cartography

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 31348 (3023348) |
| Course | 4 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*The study of the discipline will deepen the knowledge of students using theory and practice when creating cartographic material using programs - AutoCAD, MapInfo, CredoDAT.*
*Features of GIS are primarily due to the increasing importance of software in the current development and the need for mapping.*
*The specifics of the development and study of the basics of programming modules and programs for GIS, carried out within the framework of.*

### Purpose of studying of the discipline

*To form students` understanding of the use of animation, multimedia and Internet technologies in cartography, to introduce professional developments of new geoinformation technologies using the Internet.*

### Learning Outcomes

*ON 6 Process and analyze cartographic information obtained during Earth monitoring to ensure the quality, observation of the digital terrain model*

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Final examination*

## Module 6. Engineering and geodesic works of buildings and constructions

## Applied Geodesy

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | University component |
| SubjectID | 31257 (3023553) |
| Course | 2 |
| Term | 2 |
| Credits count | 10 |
| Lections | 30hours |
| Practical and seminar classes | 30hours |
| Laboratory works | 30hours |
| Independent work of a student under the guidance of a teacher | 70hours |
| Independent work of the student | 140hours |
| Total | 300hours |
| Knowledge control form | Examination and term work/Project |

### Short description of discipline

*The discipline "Applied Geodesy" is a comprehensive study of the basic methods and tools of engineering geodesy and engineering surveys. Students will master the skills of performing geodetic work in the construction of various objects, including buildings, roads, bridges and other engineering structures. They will study the methods of marking work, leveling, topographic surveys, as well as methods of geodetic control and quality control of the work performed.*

### Purpose of studying of the discipline

*Gaining knowledge and revealing the features of the principles, methods and technologies of engineering and geodetic work in surveying, designing, erecting and operating structures and technical equipment.*

### Learning Outcomes

*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*

*ON 8 Solve geodetic problems aimed at ensuring maximum efficiency and the required quality of engineering and geodetic work in the design, construction and operation of buildings and structures.*

### Prerequisites

*Higher Geodesy*

### Postrequisites

*Basic and profile disciplines of the EP*

## The complex of topographic and geodesic works during engineering surveys in construction

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31273 (3023358) |
| Course | 3 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline «The complex of topographic and geodesic works during engineering surveys in construction» examines the basics of topographic-geodesic works in construction, in particular methods, means and technologies of work at the stage of engineering surveys. The content includes topics that consider modern technology complex problem, economic and technical research area of future construction, in order to obtain the information necessary to solve the main problems of design, construction and operation of buildings and structures*

### Purpose of studying of the discipline

*When carrying out construction activities, it studies topographic and geodetic works.*

### Learning Outcomes

*ON 8 Solve geodetic problems aimed at ensuring maximum efficiency and the required quality of engineering and geodetic work in the design, construction and operation of buildings and structures.*

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Basic and profile disciplines of the EP*

## Fundamentals of Structural Safety of Buildings and Structures

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31275 (3023361) |
| Course | 3 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline "Fundamentals of Structural Safety of Buildings and Structures" is a basic discipline of the educational program, studying the basic concepts and methods in the field of buildings and structures safety during construction and operation to solve a number of state and construction tasks. In the course of study students will be able to predict potential risks and develop measures to eliminate them*

### Purpose of studying of the discipline

*The purpose of mastering the discipline is the formation of knowledge, skills and abilities to determine the structural safety of buildings and structures at the stages of design, construction and operation of residential and industrial buildings and structures*

### Learning Outcomes

*ON 8 Solve geodetic problems aimed at ensuring maximum efficiency and the required quality of engineering and geodetic work in the design, construction and operation of buildings and structures.*
*ON 9 Make geodetic measurements related to solving typical construction tasks*

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Basic and profile disciplines of the EP*

## Geodetic support for the construction of engineering structures

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31306 (3023561) |
| Course | 3 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline "Geodetic support for the construction of engineering structures" introduces students to the basic methods and tools of geodetic measurement and control in the construction process. Students learn the principles of selecting and placing geodetic networks, perform topographic and geodetic work, and analyze and interpret the data obtained. Learners will be able to apply the data obtained in practice to ensure the quality and accuracy of construction projects.*

### Purpose of studying of the discipline

*The purpose of the discipline "Geodetic support for the construction of engineering structures" is to familiarize students with the basic methods and tools of geodetic measurement and control in the process of construction of engineering structures. The main goal is to prepare students to use surveying software to ensure the quality and accuracy of construction projects.*

### Learning Outcomes

*ON 9 Make geodetic measurements related to solving typical construction tasks*

### Prerequisites

*Applied Geodesy*

### Postrequisites

*Basic and profile disciplines of the EP*

## Fundamentals of industrial construction

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31317 (3023347) |
| Course | 3 |
| Term | 2 |

| | |
|---|---|
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline "Fundamentals of industrial construction" is a basic discipline that studies the basic concepts of the design of an industrial building and construction in general, the master plan of these projects, technical and economic indicators. The discipline examines the issues of building materials and sanitary equipment, compliance with the requirements of health standards and regulations. During the study the student will get acquainted with modern technologies of erection, methods of design of industrial enterprises; recommendations on the selection, application of the most effective building materials.*

### Purpose of studying of the discipline
*It is aimed at studying the creation of various structures for industrial and industrial purposes (for example, factories and factories).*

### Learning Outcomes
*ON 9 Make geodetic measurements related to solving typical construction tasks*

### Prerequisites
*Basic and profile disciplines of the EP*

### Postrequisites
*Software in cartography Methods of creation and development of the state geodetic network Geodetic monitoring of engineering buildings and structures*

## Building Technology Design

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31314 (3023382) |
| Course | 3 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline "Building Technology Design" is a basic discipline, considered a special part of construction, studying methods and technologies of building design, responding to market requirements and meeting quality standards. The discipline deals with the feasibility study and allows you to choose the right scheme of the building, will allow you to argue the calculation of sections, to prove the strength and reliability of the building in the process of operation under any conditions.*

### Purpose of studying of the discipline
*the formation of students` professional abilities in technical, organizational, managerial decisions that allow them to comprehensively solve the problems of building design.*

### Learning Outcomes
*ON 9 Make geodetic measurements related to solving typical construction tasks*

### Prerequisites
*Basic and profile disciplines of the EP*

### Postrequisites
*Software in cartography Methods of creation and development of the state geodetic network Geodetic monitoring of engineering buildings and structures*

## Industrial practice II

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |
| SubjectID | 31315 (3023351) |
| Course | 3 |
| Term | 2 |
| Credits count | 7 |
| Working practice | 210hours |
| Total | 210hours |
| Knowledge control form | Total mark on practice |

### Short description of discipline
*This course is used to study the basic concepts of systems of coordinates and heights, the principles of the construction of state geodetic networks, the principles of modern geodetic instruments, geodetic measurement techniques, composition and technology of*

*geodetic work, providing the creation of topographic plans.*
*Deepening of the initial professional experience of the student, development of general and professional competencies, checking his readiness for independent work activities in the workplace.*

### Purpose of studying of the discipline

*- consolidation and improvement of professional skills acquired in the course of training, studying in the studied specialty,*
*- development of general and professional competencies,*
*- mastering modern production processes,*
*- adaptation of students to the specific conditions of the activities of enterprises and organizations of various organizational and legal forms.*

### Learning Outcomes

*ON 5 Demonstrate skills and abilities in the field of geodetic data processing, analysis of measurement results, development and application of geographic information systems, as well as methods and tools for optimizing and improving geodetic production processes.*
*ON 8 Solve geodetic problems aimed at ensuring maximum efficiency and the required quality of engineering and geodetic work in the design, construction and operation of buildings and structures.*

### Prerequisites

*Industrial practice I*

### Postrequisites

*Pre-diploma practice Production practice III*

## Technology of construction production

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31303 (3023346) |
| Course | 3 |
| Term | 2 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline "Technology of construction production" is a basic discipline that studies the theoretical foundations, methods of execution of certain processes, routines of execution of construction processes preceding the study of the main concepts and regulations of construction and geodesic products for the solution of construction and geodesic tasks. The aim of the discipline is to form knowledge and skills in the field of technological design of construction processes, organization of transportation of construction cargoes, organization of processes and works.*

### Purpose of studying of the discipline

*The purpose of the discipline is to study the methods of performing construction processes that ensure the processing of building materials, semi-finished products and structures with a qualitative change in their condition, physical and chemical properties, geometric dimensions in order to obtain construction products of a given quality.*

### Learning Outcomes

*ON 9 Make geodetic measurements related to solving typical construction tasks*

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Software in cartography Methods of creation and development of the state geodetic network Geodetic monitoring of engineering buildings and structures*

## Geodetic monitoring of engineering buildings and structures

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 31350 (3023564) |
| Course | 4 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline allows students to master the methods and techniques of geodetic monitoring to monitor and control the state of*

*construction objects. Students learn the principles of working with modern equipment, analyze the data obtained and evaluate the deformations and movements of structures. The course includes practical exercises where students monitor real objects and analyze the results to make appropriate decisions and ensure the safety of structures.*

### Purpose of studying of the discipline

*Training of future specialists in the basics of theoretical and practical knowledge on the main types of geodetic works to determine precipitation and displacement of buildings and structures, as well as in solving various engineering problems related to landslide processes*

### Learning Outcomes

*ON 8 Solve geodetic problems aimed at ensuring maximum efficiency and the required quality of engineering and geodetic work in the design, construction and operation of buildings and structures.*

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Final examination*

## Module 7. Professional skills and management of geodetic production

## Information security and information protection

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 31229 (3023341) |
| Course | 2 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline "Information security and information protection" is a basic discipline that studies the legislation of the Republic of Kazakhstan and foreign countries in the field of protection of intellectual property objects. Protection of information on geodetic and cartographic objects (location of points in the coordinate network) to ensure information security. Protection of infrastructure of geoinformation systems is an urgent task in the modern world*

### Purpose of studying of the discipline

*To study the state of information security, in which its confidentiality, integrity and availability are ensured.*

### Learning Outcomes

*ON 6 Process and analyze cartographic information obtained during Earth monitoring to ensure the quality, observation of the digital terrain model*

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Basic and profile disciplines of the EP*

## Methods of Academic Writing

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |
| SubjectID | 31342 (3023565) |
| Course | 4 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline

*The discipline "Methods of Academic Writing" is basic and provides students with the necessary skills and tools to successfully write scientific papers of various types. Students learn the basic rules for the design of scientific texts, develop critical thinking skills, learn to analyze and synthesize information, and structure their ideas and arguments. This discipline plays an important role in the formation of competent and competent authors of scientific papers*

### Purpose of studying of the discipline

*The purpose of the discipline is to develop students` academic writing skills. The discipline is aimed at developing students` ability to effectively and efficiently write scientific texts and other types of academic papers.*

### Learning Outcomes
*ON 10 Demonstrate a comprehensive set of professional skills necessary for successful work in the surveying industry, such as the development of academic writing skills, the ability to work with regulatory and technical documentation, an understanding of the economic and management aspects of surveying production*

### Prerequisites
*Basic and profile disciplines of the EP*

### Postrequisites
*Final examination*

## Normative and technical documentation in geodesy

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |
| SubjectID | 31341 (3023563) |
| Course | 4 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline is devoted to the study of the system of national standards regulating issues (GOST) in the field of geodesy and remote sensing, national standards regulating the creation, dissemination and use of spatial data and geodetic products. And also, the current state standards in the field of photogrammetry, state standards in the field of remote sensing of the Earth. Students will get acquainted with professional standards in the field of geodesy and the use of the results of space activities.*

### Purpose of studying of the discipline
*The purpose of the discipline is to familiarize students with the main regulatory and technical documents regulating geodetic activities. The discipline is aimed at developing the understanding and application of regulatory and technical documentation in the process of planning, execution and control of geodetic works.*

### Learning Outcomes
*ON 10 Demonstrate a comprehensive set of professional skills necessary for successful work in the surveying industry, such as the development of academic writing skills, the ability to work with regulatory and technical documentation, an understanding of the economic and management aspects of surveying production*

### Prerequisites
*Basic and profile disciplines of the EP*

### Postrequisites
*Final examination*

## Economics and management of geodetic production

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |
| SubjectID | 31340 (3023562) |
| Course | 4 |
| Term | 1 |
| Credits count | 3 |
| Lections | 15hours |
| Practical and seminar classes | 15hours |
| Independent work of a student under the guidance of a teacher | 20hours |
| Independent work of the student | 40hours |
| Total | 90hours |
| Knowledge control form | Examination |

### Short description of discipline
*The discipline "Economics and management of geodetic production" is devoted to the study of economic aspects and management principles related to the organization and management of geodetic production. The discipline will allow you to study the basics of economic theory, budgeting, financial planning, as well as the principles of organization and management of geodetic projects. The study of the discipline will allow you to develop decision-making skills, cost optimization and resource management in the geodetic field.*

### Purpose of studying of the discipline
*Formation of students` knowledge and skills in the field of economics and management for geodetic production. The discipline is aimed at developing professional competencies necessary for successful work in the geodetic industry, including an understanding of economic principles, management concepts and decision-making skills.*

### Learning Outcomes
*ON 10 Demonstrate a comprehensive set of professional skills necessary for successful work in the surveying industry, such as the development of academic writing skills, the ability to work with regulatory and technical documentation, an understanding of the economic and management aspects of surveying production*

### Prerequisites
*Basic and profile disciplines of the EP*
### Postrequisites
*Final examination*

## Pre-diploma practice

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 31351 (3023352) |
| Course | 4 |
| Term | 1 |
| Credits count | 7 |
| Working practice | 210hours |
| Total | 210hours |
| Knowledge control form | Total mark on practice |

### Short description of discipline
*Pre-diploma practice of students is a stage of training, and made after the development of the program of theoretical and practical courses of delivery. Pre-diploma practice is carried out for students to master the initial professional experience, check the professional readiness of the future specialist to self-employment*
### Purpose of studying of the discipline
*- analysis of the collected theoretical and practical material for use in the work on the diploma project.*
*- application of the obtained theoretical and practical skills and knowledge to improve the competence of the graduate*
### Learning Outcomes
*ON 8 Solve geodetic problems aimed at ensuring maximum efficiency and the required quality of engineering and geodetic work in the design, construction and operation of buildings and structures.*
*ON 10 Demonstrate a comprehensive set of professional skills necessary for successful work in the surveying industry, such as the development of academic writing skills, the ability to work with regulatory and technical documentation, an understanding of the economic and management aspects of surveying production*
### Prerequisites
*Industrial practice II*
### Postrequisites
*Final examination*

## Production practice III

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 31352 (3023389) |
| Course | 4 |
| Term | 1 |
| Credits count | 7 |
| Working practice | 210hours |
| Total | 210hours |
| Knowledge control form | Total mark on practice |

### Short description of discipline
*This course is necessary to prepare for the final certification based on practical experience in the current production. (production facility). The course is conducted after studying the theory and practice blocks and passing the intermediate certification. The information obtained helps students to gain initial professional experience, to test themselves in professional readiness as a future specialist*
### Purpose of studying of the discipline
*The purpose of Industrial practice III is to prepare students to solve geodetic tasks to ensure the effectiveness of the required quality required for engineering and geodetic works of buildings and structures*
### Learning Outcomes
*ON 8 Solve geodetic problems aimed at ensuring maximum efficiency and the required quality of engineering and geodetic work in the design, construction and operation of buildings and structures.*
*ON 10 Demonstrate a comprehensive set of professional skills necessary for successful work in the surveying industry, such as the development of academic writing skills, the ability to work with regulatory and technical documentation, an understanding of the economic and management aspects of surveying production*
### Prerequisites
*Industrial practice II*
### Postrequisites
*Final examination*

## Final examination

Writing and defending a graduation project or preparing and passing a comprehensive exam

## Thesis project

| | |
|---|---|
| Credits count | 8 |

## Comprehensive exam

| | |
|---|---|
| Credits count | 8 |

# 4.Summary table on the scope of the educational program

# «6B07301 - Geodesy and Cartography»

| Name of discipline | Cycle/ Component | Term | Number of credits | Total hours | Lec | SPL | LC | IWST | IWS | Knowledge control form |
|---|---|---|---|---|---|---|---|---|---|---|
| **Module 1. Fundamentals of social and humanitarian knowledge** | | | | | | | | | | |
| Foreign language | GER/CC | 1 | 5 | 150 | | 45 | | 35 | 70 | Examination |
| Kazakh language | 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 |
| Russian language | GER/CC | 1 | 5 | 150 | | 45 | | 35 | 70 | Examination |
| Physical Culture | GER/CC | 1 | 2 | 60 | | 60 | | | | Differentiated attestation |
| Kazakh language | GER/CC | 2 | 5 | 150 | | 45 | | 35 | 70 | Examination |
| 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 |
| The module of socio-political knowledge (sociology, political science, cultural studies, psychology) | GER/CC | 2 | 8 | 240 | 30 | 45 | | 55 | 110 | Examination |
| Russian language | GER/CC | 2 | 5 | 150 | | 45 | | 35 | 70 | 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 |
| **Module 2. Science disciplines** | | | | | | | | | | |
| Mathematics | BS/US | 1 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| The theory of mathematical processing of geodetic measurements | BS/CCh | 5 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| The theory of mathematical processing of geodetic measurements | BS/CCh | 5 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Adjustment measurements | BS/CCh | 5 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| **Module 3. Basics of cartographic and geodesic measurements** | | | | | | | | | | |
| Introduction to the Profession of Surveyor-Cartographer | BS/US | 1 | 6 | 180 | 30 | 30 | | 40 | 80 | Examination |
| Cartography | BS/US | 2 | 5 | 150 | 15 | | 30 | 35 | 70 | Examination and term work/Project |
| Topographical drawing | BS/US | 2 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Educational - field geodetic practice | BS/US | 2 | 6 | 180 | | | | | | Total mark on practice |
| Geodetic Instrumentation | BS/US | 3 | 5 | 150 | 15 | | 30 | 35 | 70 | Examination |
| Higher Geodesy | AS/US | 3 | 8 | 240 | 30 | 45 | 0 | 55 | 110 | Examination and term work/Project |
| Digital models and terrain maps | BS/CCh | 6 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| **Module 4. Automation and new technologies in geodesic production** | | | | | | | | | | |
| Computer drawing in design | BS/CCh | 3 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Autocad in pojecting | BS/CCh | 3 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Computer graphics in construction | BS/CCh | 3 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Laser scanners in geodesy | BS/CCh | 4 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Software packages for computer-aided design | BS/CCh | 4 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Modern technologies in geodesic production | BS/CCh | 4 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Electronic instruments and methods of geodetic measurements | BS/CCh | 5 | 5 | 150 | 15 | 30 | 0 | 35 | 70 | Examination |
| New technologies of cartographic production | AS/CCh | 5 | 7 | 210 | 15 | 30 | 30 | 45 | 90 | Examination |
| Modern geodetic instruments and technologies | AS/CCh | 5 | 7 | 210 | 15 | 30 | 30 | 45 | 90 | Examination |
| Technology of creating geodetic reference networks by modern methods | AS/CCh | 5 | 7 | 210 | 15 | 30 | 30 | 45 | 90 | Examination |
| BIM-technologies in the design, construction and operation of buildings and structures | BS/CCh | 6 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Smart technologies in construction | BS/CCh | 6 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Application of global navigation satellite systems in geodesy | BS/US | 6 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Digital technologies in the organization, management and planning of buildings | BS/CCh | 6 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| **Module 5. Land monitoring, mapping and digitization** | | | | | | | | | | |
| Geoinformatics in a cadastre | BS/CCh | 3 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Organization and planning of topographic surveys | BS/CCh | 3 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Mapping modeling | BS/CCh | 4 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Map projection and computer design | BS/CCh | 4 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Industrial practice I | BS/US | 4 | 7 | 210 | | | | | | Total mark on practice |
| Drafting, editing and publishing maps | BS/CCh | 4 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Soil bonitization and land valuation | AS/CCh | 4 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Geodetic support of land works | AS/CCh | 4 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Environmental Monitoring | AS/CCh | 4 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| GIS in Geodesy and Cartography | BS/US | 5 | 5 | 150 | 15 | | 30 | 35 | 70 | Examination and term work/Project |
| Aerosurvey | BS/CCh | 6 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Geology and Geomorphology | BS/CCh | 6 | 3 | 90 | 15 | 15 | | 20 | 40 | Examination |
| Engineering geology | BS/CCh | 6 | 3 | 90 | 15 | 15 | | 20 | 40 | Examination |
| Topographic Mapping | BS/CCh | 6 | 3 | 90 | 15 | | 15 | 20 | 40 | Examination |
| Automation of photogrammetric works | AS/CCh | 6 | 7 | 210 | 30 | | 45 | 45 | 90 | Examination |
| Technology of photogrammetric processing of aerospace images | AS/CCh | 6 | 7 | 210 | 30 | | 45 | 45 | 90 | Examination |
| Photogrammetry and remote sensing | AS/CCh | 6 | 7 | 210 | 30 | | 45 | 45 | 90 | Examination |
| Methods of creation and development of the state geodetic network | AS/CCh | 7 | 5 | 150 | 15 | 30 | 0 | 35 | 70 | Examination |
| Software in cartography | AS/CCh | 7 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| **Module 6. Engineering and geodesic works of buildings and constructions** | | | | | | | | | | |
| Applied Geodesy | AS/US | 4 | 10 | 300 | 30 | 30 | 30 | 70 | 140 | Examination and term work/Project |
| The complex of topographic and geodesic works during engineering surveys in construction | BS/CCh | 5 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Fundamentals of Structural Safety of Buildings and Structures | BS/CCh | 5 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Geodetic support for the construction of engineering structures | BS/CCh | 6 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Fundamentals of industrial construction | BS/CCh | 6 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Building Technology Design | BS/CCh | 6 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Industrial practice II | BS/US | 6 | 7 | 210 | | | | | | Total mark on practice |
| Technology of construction production | BS/CCh | 6 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Geodetic monitoring of engineering buildings and structures | AS/CCh | 7 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| **Module 7. Professional skills and management of geodetic production** | | | | | | | | | | |
| Information security and information protection | BS/CCh | 3 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Methods of Academic Writing | BS/US | 7 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Normative and technical documentation in geodesy | BS/US | 7 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Economics and management of geodetic production | BS/US | 7 | 3 | 90 | 15 | 15 | | 20 | 40 | Examination |
| Pre-diploma practice | AS/CCh | 7 | 7 | 210 | | | | | | Total mark on practice |
| Production practice III | AS/CCh | 7 | 7 | 210 | | | | | | Total mark on practice |
| **Final examination** | | | | | | | | | | |
| Thesis project | | 8 | 8 | 240 | | | | | | |
| Comprehensive exam | | 8 | 8 | 240 | | | | | | |