

## The list of academic disciplines of the university component

**6B06 - Information and Communication Technologies**  
(Code and classification of the field of education)

**6B061 - Information and communication technologies**  
(Code and classification of the direction of training)

**0610**  
(Code in the International Standard Classification of Education)

**B057 - Information technology**  
(Code and classification of the educational program group)

**6B06106 - SMART systems and programming**  
(Code and name of the educational program)

**bachelor**  
(Level of preparation)

**set of 2023**

**Developed**

By the Academic Committee of the EP  
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**Reviewed**

at the meeting of the Quality Assurance Commission of the Faculty of Engineering and Technology  
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Chairman of the Commission on Quality Assurance Abdilova G.

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**Approved**

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

## Bases of economics, law and ecological knowledge

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

### Short description of discipline

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

### Purpose of studying of the discipline

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

### Learning Outcomes

*ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society*

### Learning outcomes by discipline

*ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society*

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

### Prerequisites

*School course*

### Postrequisites

*Basic and profile disciplines of the EP*

## Algorithms and data structures

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

### Short description of discipline

*This course is aimed at developing an understanding of algorithms and data structures, which are the basis for the development of effective software solutions. The course includes the study of various algorithmic approaches and methods, such as sorting, searching, graphs and trees, and also covers various data structures. In the course of training, students will study a variety of algorithms and data structures and acquire the skills to use them to solve complex programming problems.*

### Purpose of studying of the discipline

*The purpose of this discipline is to master and understand the basic algorithms and data structures necessary for the development of effective software solutions*

### Learning Outcomes

*ON3 Work with large amounts of data, including processing, storing and managing them*

### Learning outcomes by discipline

- 1) understand the basic concepts and principles related to algorithms and data structures*
- 2) can apply their knowledge and understanding of algorithms and data structures to solve specific problems*
- 3) can analyze various aspects of algorithms and data structures, such as execution time, complexity and optimality.*
- 4) can use their knowledge, understanding and analytical skills to create new algorithms and data structures that will be efficient and optimal*

### Prerequisites

*School course*

### Postrequisites

*Basics of programming in Kotlin Basics of Java programming Educational practice*

## Introduction to the profession

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

### Short description of discipline

*This course is aimed at familiarizing students with the basic concepts of the programmer's profession, as well as with the specifics of working in web programming and mobile development. It is aimed at the formation of basic knowledge and skills necessary for a successful start in the profession of a programmer in this field. In the course of training, students learn the basics of programming, as well as modern tools and technologies used in web and mobile development*

### **Purpose of studying of the discipline**

*The purpose of this discipline is to familiarize students with the basic concepts and principles of the programmer's profession in the field of web programming and mobile development*

### **Learning Outcomes**

*ON4 Design, develop algorithms for solving various tasks and programs using the principles of object-oriented programming and functional programming*

### **Learning outcomes by discipline**

- 1) will have knowledge about various aspects of their profession, including the basics of programming, tools and technologies used in web programming and mobile development*
- 2) will be able to understand the basic principles and concepts related to the profession of a programmer, as well as the specifics of working in the field of web programming and mobile development*
- 3) will be able to analyze problems and find ways to solve them in the professional activity of a programmer in the field of web programming and mobile development*

### **Prerequisites**

*School course*

### **Postrequisites**

*Basic and profile disciplines of the EP*

## **Mathematics**

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

### **Short description of discipline**

*The purpose of this course is to provide students with fundamental training in mathematics. The course is aimed at forming a sufficiently high culture of mathematical thinking among students and developing the ability to creatively approach problem solving. In addition to studying the fundamental foundations of higher mathematics (elements of analytical geometry, linear algebra, mathematical analysis, differential equations), the course assumes consideration of various applications of mathematics to solving production problems from the field of professional specialization.*

### **Purpose of studying of the discipline**

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

### **Learning Outcomes**

*ON3 Work with large amounts of data, including processing, storing and managing them*

### **Learning outcomes by discipline**

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

### **Prerequisites**

*School course*

### **Postrequisites**

*Basics of Java programming*

## **Basics of WEB development**

Discipline cycle	Profiling discipline
Course	1
Credits count	5
Knowledge control form	Examination

### **Short description of discipline**

*This course forms students' practical skills and knowledge in the field of WEB technologies. The course is aimed at learning the programming languages HTML, CSS, JavaScript, as well as learning the basic principles of WEB development. Students will learn how to create static and dynamic web pages, work with databases, use frameworks, libraries for WEB development. In the course of training, students will gain practical skills and knowledge necessary to work in the field of WEB technologies.*

### **Purpose of studying of the discipline**

*The purpose of this discipline is to form students' practical skills and knowledge in the field of WEB technologies*

### **Learning Outcomes**

*ON8 Develop web applications and intuitive user interfaces using various programming languages, technologies and frameworks*

### **Learning outcomes by discipline**

- 1) they will have knowledge in the field of HTML, CSS and JavaScript programming languages, as well as the basic principles of WEB development.*
- 2) will be able to apply their knowledge and skills to create static and dynamic web pages, work with databases, use frameworks and libraries for WEB development*
- 3) will be able to create new web pages using their knowledge and skills in the field of WEB technologies*

### **Prerequisites**

*School course*

## Postrequisites

Advanced WEB technologies

## Production practice 1

Discipline cycle	Basic disciplines
Course	1
Credits count	3
Knowledge control form	Total mark on practice

### Short description of discipline

"Industrial Practice 1" provides students with the opportunity to gain practical experience in solving problems in the field of programming, software development and testing. It is aimed at developing skills of teamwork, decision-making and problem solving, as well as the development of creativity and independence in the implementation of projects. During the internship, students will work under the guidance of experienced mentors and will be able to apply their knowledge in practice.

### Purpose of studying of the discipline

The purpose of the "Production Practice 1" is to provide students with the opportunity to gain practical experience in solving problems in the field of programming, software development and testing. This practice is aimed at developing the skills of teamwork, decision-making and problem solving, as well as the development of creativity and independence of students in the implementation of projects.

### Learning Outcomes

ON10 Manage the software lifecycle, including planning, development, testing and implementation.

ON12 To present the results of the work in front of the team and clients, demonstrating professionalism and knowledge of the subject area

### Learning outcomes by discipline

1)gain knowledge about production processes and organization of production in the field of programming

2)understand the basic concepts and principles related to production processes and organization of production in the field of programming

can apply their knowledge and understanding in the production environment in the field of programming

3)can analyze various aspects of production processes in the field of programming, such as software quality, developer productivity, software development costs, etc.

4)can use their knowledge, understanding and analytical skills to create new ideas and solutions in the field of software production.

### Prerequisites

Educational practice

### Postrequisites

Production practice 2

## MySQL Database Management Systems

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

### Short description of discipline

This course will introduce students to the MySQL database management system. The course is aimed at the formation of knowledge and skills of working with MySQL DBMS, including the creation, modification, filling, maintenance of databases. During the training, students will learn the basics of SQL, database concepts, and also gain experience in creating and optimizing queries. The knowledge gained will be useful for developing applications that require working with MySQL databases.

### Purpose of studying of the discipline

The purpose of this discipline is to familiarize students with the MySQL database management system

### Learning Outcomes

ON7 Design and develop databases, including choosing a suitable data model, creating tables, defining relationships between tables, constraints and indexes

### Learning outcomes by discipline

1)know and understand the basic concepts and principles related to MySQL database management systems

2)can apply their knowledge and understanding of MySQL database management systems to solve specific tasks

3)can use their knowledge, understanding and analytical skills to create new ideas and solutions in the field of MySQL database management systems

### Prerequisites

Algorithms and data structures

### Postrequisites

Extended NoSQL databases

## Educational practice

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

### Short description of discipline

The educational practice is aimed at familiarizing students with the professional environment and programming technologies, as well as the practical application of the acquired knowledge in real projects. The course promotes the development of teamwork skills, project planning and management, program code development and debugging. Students actively participate in real programming projects to gain practical experience and prepare for a future career in the IT field.

### **Purpose of studying of the discipline**

*The purpose of the training practice is to familiarize students with the professional environment and programming technologies, as well as in the practical application of the acquired knowledge in real projects.*

### **Learning Outcomes**

*ON4 Design, develop algorithms for solving various tasks and programs using the principles of object-oriented programming and functional programming*

### **Learning outcomes by discipline**

- 1) knows the basic theoretical and practical aspects of programming in a specific field*
- 2) is able to use various tools and technologies to solve programming problems*
- 3) is able to work in a team, exchange ideas and knowledge, as well as communicate effectively with colleagues and management*

### **Prerequisites**

*Algorithms and data structures*

### **Postrequisites**

*Production practice 1*

## **Basics of programming in Kotlin**

Discipline cycle	Profiling discipline
Course	1
Credits count	5
Knowledge control form	Examination

### **Short description of discipline**

*This course introduces students to the basics of programming in Kotlin. The course is aimed at the formation of basic knowledge, programming skills necessary to create applications in the Kotlin language. During the training, students will learn the basics of syntax, the structure of the language, and also learn how to create and debug simple programs on Kotlin. The acquired knowledge will help students to create applications on Kotlin, use them in their further professional activities.*

### **Purpose of studying of the discipline**

*The purpose of this course is to introduce students to the basics of programming in Kotlin.*

### **Learning Outcomes**

*ON2 Design and develop a user interface for mobile applications, taking into account the features of mobile devices and their interaction with the user*

### **Learning outcomes by discipline**

- 1) know and understand the basic concepts and principles related to the Kotlin programming language*
- 2) can apply their knowledge and understanding of the Kotlin programming language to solve specific tasks*
- 3) can use their knowledge, understanding and analytical skills to create new ideas and solutions in the field of programming in the Kotlin language*

### **Prerequisites**

*Algorithms and data structures*

### **Postrequisites**

*Mobile Application Development (Android)*

## **Advanced WEB technologies**

Discipline cycle	Profiling discipline
Course	1
Credits count	5
Knowledge control form	Examination

### **Short description of discipline**

*This course continues to form students' knowledge and practical skills in the field of WEB technologies. The course is aimed at studying advanced technologies, frameworks for WEB development, such as React, Angular, Vue.js, Node.js. Students will learn how to create dynamic, interactive web applications, work with the backend of web applications, use modern tools for developing and testing WEB applications. In the course of training, students will gain practical knowledge necessary to work in the field of WEB technologies*

### **Purpose of studying of the discipline**

*The purpose of this course is to continue the formation of students' knowledge and practical skills in the field of WEB technologies and to study advanced technologies and frameworks used in WEB development, such as React, Angular, Vue.js and Node.js .*

### **Learning Outcomes**

*ON8 Develop web applications and intuitive user interfaces using various programming languages, technologies and frameworks*

### **Learning outcomes by discipline**

- 1) they will have knowledge in the field of advanced technologies and frameworks for WEB development, such as React, Angular, Vue.js and Node.js .*
- 2) can apply their knowledge and skills to create advanced and interactive web applications, use modern tools and frameworks for WEB development*
- 3) will be able to create new and innovative web applications using their knowledge and skills in the field of advanced WEB technologies*

### **Prerequisites**

*Basics of WEB development*

### **Postrequisites**

*Development and deployment of WEB applications Multilevel WEB applications and Internet technologies Internet technologies*

## **Computer network security**

Discipline cycle	Basic disciplines
Course	2

Credits count	5
Knowledge control form	Examination

### Short description of discipline

The discipline "Computer Network Security" presents the basic principles and methods of information protection in network environments. It covers the main aspects of threats, vulnerabilities and protection mechanisms in computer networks. During the course, students study modern security standards, authentication and data encryption protocols, as well as methods for detecting and preventing cyber attacks. The course provides students with the necessary skills to ensure network security and protect important information resources.

### Purpose of studying of the discipline

The purpose of the discipline "Computer Network Security" is to familiarize students with the basic principles and methods of information protection in network environments.

### Learning Outcomes

ON5 Manage and administer network systems, including configuring and maintaining network equipment, configuring network security and solving problems in network systems.

### Learning outcomes by discipline

- 1) briefly outlines the main threats and methods of protecting computer networks.
- 2) explain the concepts of network security and apply these concepts in their work
- 3) apply methods of protecting computer networks in practice, ensuring the security of web applications and mobile applications.
- 4) analyze the security risks of computer networks and develop protection strategies.
- 5) create secure computer networks and integrate security into web and mobile applications using modern technologies and methods.

### Prerequisites

Computer networks

### Postrequisites

Designing WEB applications

## World of Abai

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

### Short description of discipline

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

### Purpose of studying of the discipline

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

### Learning Outcomes

ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society

### Learning outcomes by discipline

- 1) Analyzes the philosophical and artistic foundations of works, historical facts related to the creative heritage of Abai Kunanbayev, Shakarim Kudaiberdiyev, Mukhtar Auezov
- 2) Uses in practice the humanistic ideas of Abai's philosophical and artistic works
- 3) Assesses the place and significance of Abai's works in the history of literature and science

### Prerequisites

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

### Postrequisites

Basic and profile disciplines of the EP

## Python object-oriented programming

Discipline cycle	Profiling discipline
Course	2
Credits count	8
Knowledge control form	Examination

### Short description of discipline

The Python object-oriented programming course is aimed at developing students' skills and knowledge in an object-oriented approach to programming in Python. The course includes the study of the basic concepts of OOP, such as encapsulation, inheritance and polymorphism, as well as training in application development using OOP and frameworks. At the end of the course, students will have the opportunity to develop high-quality software solutions in Python.

### Purpose of studying of the discipline

The purpose of this discipline is to form students' skills and knowledge in an object-oriented approach to programming in Python

### Learning Outcomes

ON4 Design, develop algorithms for solving various tasks and programs using the principles of object-oriented programming and functional programming

### Learning outcomes by discipline

- 1) memorize the basic principles of object-oriented programming and the Python language
- 2) understand the principles of application design and development using OOP
- 3) are able to create and use classes, objects, inheritance, polymorphism, exceptions, etc.

4) are able to use OOP to solve real programming problems

### Prerequisites

Algorithms and data structures

### Postrequisites

Basic and profile disciplines of the EP

## Mobile Application Development (Android)

Discipline cycle	Profiling discipline
Course	2
Credits count	5
Knowledge control form	Examination

### Short description of discipline

The purpose of this course is to familiarize students with the Android platform and the basics of mobile application development. The course is aimed at developing the skills of developing user interfaces, using standard and third-party libraries, working with databases and network queries. The program also includes the development and refinement of real mobile applications for the practical application of the acquired knowledge.

### Purpose of studying of the discipline

The purpose of this discipline is to familiarize students with the Android platform and the basics of mobile application development

### Learning Outcomes

ON2 Design and develop a user interface for mobile applications, taking into account the features of mobile devices and their interaction with the user

### Learning outcomes by discipline

- 1) can explain the principles of Android applications and their components.
- 2) can create, debug and test mobile applications on Android.
- 3) can evaluate the effectiveness of various approaches and tools in the development of mobile applications on Android.
- 4) can evaluate the quality and performance of Android applications they have created.
- 5) can create complex mobile applications using various technologies and tools on the Android platform.

### Prerequisites

Basics of programming in Kotlin

### Postrequisites

Cross-platform mobile development

## Production practice 2

Discipline cycle	Basic disciplines
Course	2
Credits count	7
Knowledge control form	Total mark on practice

### Short description of discipline

"Industrial Practice 2" is aimed at consolidating and deepening the theoretical knowledge acquired by students during their studies, as well as at acquiring practical skills and competencies. The practice is aimed at developing teamwork skills, software design and development. Students participate in the development and implementation of the project using modern technologies and programming tools. The result of the practice is a finished product and practical experience in the field of programming.

### Purpose of studying of the discipline

The purpose of the "Production Practice 2" is to consolidate and deepen the theoretical knowledge gained by students during their studies, as well as to acquire practical skills and competencies in the field of software development.

### Learning Outcomes

ON4 Design, develop algorithms for solving various tasks and programs using the principles of object-oriented programming and functional programming

### Learning outcomes by discipline

- 1) gain knowledge about the product that is being developed within the framework of production practice, development technologies and tools used.
- 2) understand the basic concepts and principles related to product development within the framework of production practice
- 3) can apply their knowledge and understanding to the development of specific parts of the product within the framework of production practice
- 4) can analyze various aspects of product development, such as code quality, product performance and scalability, security issues, etc.
- 5) can use their knowledge, understanding and analytical skills to create new ideas and solutions in the field of product development

### Prerequisites

Production practice 1

### Postrequisites

Production practice 3

## Blender computer graphics and visual effects

Discipline cycle	Profiling discipline
Course	2
Credits count	5
Knowledge control form	Examination

### Short description of discipline

This course is aimed at developing students' knowledge and skills of working with computer graphics and creating visual effects in the Blender program. The course covers topics such as 3D object modeling, texturing, lighting, animation, compositing and creating visual



effects. As a result of the training, students will be able to create high-quality computer graphics and visual effects for various projects in the entertainment industry, advertising, architecture and many other fields.

### **Purpose of studying of the discipline**

The purpose of this discipline is to form students` knowledge and skills of working with computer graphics and creating visual effects using the Blender program.

### **Learning Outcomes**

ON9 Design computer graphics using various tools and techniques to create unique visual compositions

### **Learning outcomes by discipline**

- 1) Learn the basic principles of working with the Blender program and its interface.
- 2) Master animation techniques, including the creation of frame animations, kinematic circuits and inverse kinematics.
- 3) Develop their creative intuition and ability to analyze and solve problems in the field of computer graphics.
- 4) Will be able to apply their knowledge and skills in the entertainment industry, advertising, architecture and other areas where the creation of high-quality computer graphics and visual effects is required.

### **Prerequisites**

Basics of WEB development Advanced WEB technologies

### **Postrequisites**

Designing WEB applications Designing Web Application design

## **Cross-platform mobile development**

Discipline cycle	Profiling discipline
Course	2
Credits count	5
Knowledge control form	Examination

### **Short description of discipline**

The course is aimed at developing students` knowledge and skills in developing mobile applications that can work on different platforms. The course covers topics such as application development using React Native, Xamarin, Flutter, Cordova and other cross-platform technologies, working with APIs and databases, optimization and application testing. As a result of the training, students will be able to create high-quality, scalable mobile applications for different operating systems.

### **Purpose of studying of the discipline**

Formation of students` knowledge and skills in the field of mobile application development that can work on various platforms

### **Learning Outcomes**

ON2 Design and develop a user interface for mobile applications, taking into account the features of mobile devices and their interaction with the user

### **Learning outcomes by discipline**

- 1)gain knowledge about modern technologies of cross-platform mobile development, including frameworks and tools such as React Native and Flutter.
- 2)understand the basic principles of cross-platform mobile development
- 3)create cross-platform mobile applications using various frameworks and tools
- 4) evaluate the quality of cross-platform mobile applications developed by other developers.

### **Prerequisites**

Advanced WEB technologies MySQL Database Management Systems Basics of programming in Kotlin Project management

### **Postrequisites**

Own mobile development Game development on Unity Designing WEB applications

## **Extended NoSQL databases**

Discipline cycle	Profiling discipline
Course	2
Credits count	5
Knowledge control form	Examination

### **Short description of discipline**

This course introduces students to the concepts and methods of working with extended NoSQL databases, develops practical skills of their use in projects. The course covers NoSQL data models, indexing, aggregation, transactionality, scalability, as well as features of working with specific solutions. The result of the training is the ability to create efficient, scalable NoSQL databases for various applications and task.

### **Purpose of studying of the discipline**

The purpose of this discipline is to familiarize students with the concepts and methods of working with extended NoSQL databases (Not Only SQL), as well as the development of practical skills for their use in projects.

### **Learning Outcomes**

ON7 Design and develop databases, including choosing a suitable data model, creating tables, defining relationships between tables, constraints and indexes

### **Learning outcomes by discipline**

- 1)understand the basic principles of NoSQL databases, their varieties and applications.
- 2)Are able to design and implement NoSQL databases, optimize their performance and manage them.
- 3)use modern tools and technologies to work with NoSQL databases

### **Prerequisites**

MySQL Database Management Systems

### **Postrequisites**

Designing WEB applications

## **Business Analytics**

Discipline cycle	Basic disciplines
Course	3
Credits count	5
Knowledge control form	Examination

### Short description of discipline

The discipline is aimed at teaching students methods of data analysis and statistical methods. As part of the course, students study the basics of business analytics, business process analysis, data analysis, project planning and management. They also study the principles and methods of visual modeling using UML. During the course, students will learn how to use UML to create class diagrams, sequence diagrams, state diagrams and other types of diagrams that allow you to model business processes and systems.

### Purpose of studying of the discipline

The purpose of this discipline is to teach students methods of data analysis and statistical methods, as well as to master the basics of business analytics and project management

### Learning Outcomes

ON3 Work with large amounts of data, including processing, storing and managing them

### Learning outcomes by discipline

- 1) Briefly outlines the basics of business intelligence, including methods and tools for data analysis and statistical methods.
- 2) Plan and manage data analysis projects, including defining project goals, objectives, resources and schedules.
- 3) Model business processes and systems using UML, using approaches that meet the requirements and goals of data analysis.
- 4) Analyze the results of data analysis and statistical methods, draw conclusions and make recommendations based on the results obtained.

### Prerequisites

Basic and profile disciplines of the EP

### Postrequisites

Final examination

## Research project

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

### Short description of discipline

This discipline is intended for the implementation of projects in the field of IT. Within the framework of this discipline, students will receive the necessary knowledge and skills for conducting research in the field of IT, as well as for designing, developing, and implementing applications for mobile and web platforms. The purpose of the discipline is to develop the skills of independent research and analysis of technological solutions in the field of IT, as well as the ability to apply the knowledge gained to develop high-quality, functional applications.

### Purpose of studying of the discipline

The purpose of the course "Research Project" is to teach students the basics of conducting research, designing, developing and implementing applications for mobile and web platforms in the field of information technology.

### Learning Outcomes

ON10 Manage the software lifecycle, including planning, development, testing and implementation.

ON11 Conduct a research project, including the formulation of a task, data collection and analysis, application of statistical methods and presentation of research results

### Learning outcomes by discipline

- 1) To carry out research work in the field of IT.
- 2) Design applications for mobile and web platforms.
- 3) Develop applications for mobile and web platforms.
- 4) Research and analyze technological solutions in the field of IT.
- 5) Apply the acquired knowledge to develop high-quality applications.
- 6) Implement innovative solutions in IT projects.
- 7) Document and present the results of IT projects.

### Prerequisites

Basic and profile disciplines of the EP

### Postrequisites

Final examination

## Designing WEB applications

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

### Short description of discipline

The discipline "WEB Application Design" is the study of methods and technologies used for the design and development of WEB applications.

The main purpose of the discipline is to teach students the methods of designing WEB applications, as well as familiarization with the basic concepts and technologies used in their development. Students study various architectural models, interface design methods, as well as development technologies such as HTML, CSS, JavaScript, PHP, Ruby on Rails and others.

### Purpose of studying of the discipline

The purpose of this discipline is to teach students methods and technologies for designing and developing WEB applications

## Learning Outcomes

ON10 Manage the software lifecycle, including planning, development, testing and implementation.

ON11 Conduct a research project, including the formulation of a task, data collection and analysis, application of statistical methods and presentation of research results

### Learning outcomes by discipline

1) Design WEB applications, taking into account the requirements for functionality, interface and performance.

2) Use various architectural models, such as client-server architecture and the MVC (Model-View-Controller) model, to develop WEB applications.

3) Apply interface design methods, including creating diagrams and layouts of the user interface, as well as managing user interaction with the application.

4) Use various WEB application development technologies, such as HTML (HyperText Markup Language), CSS (Cascading Style Sheets), JavaScript, PHP (Hypertext Preprocessor), Ruby on Rails and others, to create functionality and visual design of applications.

5) Design databases and integrate them with WEB applications using SQL (Structured Query Language) and database management technologies.

6) Develop and test WEB applications using appropriate methods and tools to ensure their quality and reliability.

### Prerequisites

Blender computer graphics and visual effects

### Postrequisites

Final examination

## Game development on Unity

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

### Short description of discipline

This discipline is the study of tools and technologies necessary to create computer games on the Unity platform. The discipline is aimed at teaching students how to create games on the Unity platform. This includes the study of various aspects of game creation, such as the creation of game objects, gameplay management, , user interface development. As a result of studying the discipline, students will have the skills necessary to create computer games on the Unity platform.

### Purpose of studying of the discipline

The purpose of this discipline is to teach students the basics of developing computer games on the Unity platform.

### Learning Outcomes

ON2 Design and develop a user interface for mobile applications, taking into account the features of mobile devices and their interaction with the user

ON10 Manage the software lifecycle, including planning, development, testing and implementation.

### Learning outcomes by discipline

1) Create game objects.

2) Manage the gameplay.

3) Develop a user interface.

4) Optimize gaming performance.

5) Implement game mechanics.

6) Test and debug the game code.

7) Design and create game levels.

### Prerequisites

Basics of programming in Kotlin

### Postrequisites

Final examination