CATALOG OF ELECTIVE DISCIPLINES

7M01 - Pedagogical sciences
(Code and classification of the field of education)

7M015 - Training of teachers in Natural science subjects
(Code and classification of the direction of training)

0114
(Code in the International Standard Classification of Education)

M012 - Training of computer science teachers (kazakh, russian, english languages)
(Code and classification of the educational program group)

7M01503 - Informatics
(Code and name of the educational program)

Master
(Level of preparation)

set of 2024

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Developed
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Reviewed
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Using of ICT at assessment of results of training

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

Short description of discipline

In the course of studying this discipline, topical issues of assessing the quality of the educational process, the taxonomy of educational goals and learning outcomes, as well as an objective approach to evaluation and the main stages of building the test are considered. They will learn how to use software tools for automating the process of performing and processing test results, universal software systems for preparing and applying test tasks, scaling methods and interpreting test results.

Purpose of studying of the discipline

Purpose of studying of the discipline:
establish a system of competences Master of Education in the field of information and communication technologies in the learning outcomes for the solution of pedagogical, research, design and methodological problems of professional activity.

Learning Outcomes

ON3 Apply knowledge of the theoretical foundations and technologies of teaching informatics and ICT.
ON4 Provide methodological support for the educational process.
ON5 Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program.

Learning outcomes by discipline

Apply knowledge of the theoretical foundations and technologies of teaching informatics and ICT
Provide methodological support for the educational process
Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program
Apply knowledge of the theoretical foundations and technologies of teaching computer science and ICT. Provide methodological support for the educational process.
Possess the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, and develop a research program

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Informatization of education and learning problems Modern methods of control and evaluation

Informatization methods of control and assessment of training results

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

Short description of discipline

In the study of the discipline, methods of assessing the reliability and reliability of pedagogical tests and a review of historical aspects of test control, algorithms and stages of development of control and measuring materials and methods of scaling test results, analysis of information systems for knowledge control are studied. A comparative analysis of the advantages and disadvantages of traditional and new methods of monitoring the evaluation of learning outcomes in the educational process will also be considered.

Purpose of studying of the discipline

Purpose of studying of the discipline:
Theory and methods of teaching Informatics, pedagogy, psychology, Informatics, Informatization and learning problems.

Learning Outcomes

ON3 Apply knowledge of the theoretical foundations and technologies of teaching informatics and ICT.
ON4 Provide methodological support for the educational process.
ON5 Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program.

Learning outcomes by discipline

Apply knowledge of the theoretical foundations and technologies of teaching informatics and ICT
Provide methodological support for the educational process
Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program
Apply knowledge of the theoretical foundations and technologies of teaching computer science and ICT. Provide methodological support for the educational process.
Possess the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, and develop a research program

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Competence-based learning in higher education

Modern methods of control and evaluation

Discipline cycle	Basic disciplines
Course	1
Credits count	5

Knowledge control form	Examination

Short description of discipline
In the course of studying the discipline, an overview of the issues of knowledge control, the classification of pedagogical testing and familiarization with the role of pedagogical testing as control in the education system is given. The testing process, the technological matrix as a model of pedagogical testing, as well as the composition and description of test tasks are studied. The issues of preparation of test tasks with the help of ICT, types and types of test tasks and their analysis are considered.

Purpose of studying of the discipline
Purpose of studying of the discipline: establish a system of education master`s competencies in the use of modern methods in the assessment of learning outcomes to address the educational, scientific and research tasks of professional activity .

Learning Outcomes
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.

Learning outcomes by discipline
To solve the tasks of their professional activity at the modern level, to demonstrate the ability to present information; to scientifically argue and defend their scientific point of view
Organize educational and research activities using mobile technologies.
To search, analyze and evaluate information necessary for setting and solving professional tasks in the field of education; owns planning technologies in professional activities in the field of scientific research
Apply knowledge of the theoretical foundations and technologies of teaching computer science and ICT. Provide methodological support for the educational process.
Possess the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, and develop a research program

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
Competence-based learning in higher education

Methods of teaching informatics in high school

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

Short description of discipline
When studying the discipline, undergraduates get acquainted with the concepts of the features of the goals, content, forms and methods of teaching computer science at the stage of higher professional education. They will learn how to select the content, form and methods of teaching computer science in Higher school. Acquires experience in preparing educational and methodological documents for the implementation of the educational process, determining the content, form and methods of teaching computer science in Higher education.

Purpose of studying of the discipline
formation of ideas about the features of the goals, content, form and methods of teaching computer science at the stage of higher professional education and training in the ability to select the content, form and methods of teaching computer science at Higher school.

Learning Outcomes
ON3 Apply knowledge of the theoretical foundations and technologies of teaching informatics and ICT.
ON4 Provide methodological support for the educational process.
ON5 Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program.

Learning outcomes by discipline
Apply knowledge of the theoretical foundations and technologies of teaching informatics and ICT
Provide methodological support for the educational process
Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research progr
Knowledge of the theoretical foundations and technologies of teaching ICT and computer science.
Implementation of methodological support of the educational process.
Have the ability to generalize and critically evaluate the results of domestic and foreign researchers, identify promising areas, develop a research program

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
Informatization of education and learning problems

Methods of using ICT in the educational process

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

Short description of discipline
This discipline is aimed at training undergraduates of pedagogical specialties to familiarize themselves with ICT and develop their skills

in the field of modern information, communication and educational technologies. The training program consists of several modules and the modules have an independent structure from each other. The methods of using ICT in distance learning, the educational system, their types and possibilities are also considered.

Purpose of studying of the discipline

The purpose of the course is to prepare the basic knowledge and skills formed by undergraduates in the field of information and communication technologies for use in their professional activities.

Learning Outcomes

ON3 Apply knowledge of the theoretical foundations and technologies of teaching informatics and ICT.
ON4 Provide methodological support for the educational process.
ON5 Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program.

Learning outcomes by discipline

Apply knowledge of the theoretical foundations and technologies of teaching informatics and ICT
Provide methodological support for the educational process
Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program
Apply knowledge of the theoretical foundations and technologies of teaching computer science and ICT. Provide methodological support for the educational process.
Possess the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, and develop a research program

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Informatization of education and learning problems

Methodological training of Informatics teacher at the University

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

Short description of discipline

The main conditions of scientific work, classification of pedagogical research, selection of the subject of research, subject and subject of research, as well as contradictions and problems of scientific research, goals and objectives and scientific research, methodological foundations and methods of research. Considers the analysis of scientific research in the field of theory and methods of teaching and informatization of computer science at the University, the experience of pedagogical research and the results of pedagogical research practice, methods of their processing.

Purpose of studying of the discipline

The purpose of studying the discipline is to form a body of knowledge about the possibilities of the future, about the principles of functioning of computer networks, common in various formats and distributed data on the organization of human access to data with the possibility of providing active influence on them.

Learning Outcomes

ON3 Apply knowledge of the theoretical foundations and technologies of teaching informatics and ICT.
ON4 Provide methodological support for the educational process.
ON5 Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program.

Learning outcomes by discipline

Apply knowledge of the theoretical foundations and technologies of teaching computer science and ICT.
To carry out methodological support of the educational process.
Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program
- Determine the content and choose the forms and methods of teaching computer science in higher educational institutions;
- To develop educational and methodological documentation for teaching computer science disciplines in higher educational institutions.

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Informatization of education and learning problems

Artificial neural networks

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

Short description of discipline

Examines important concepts and definitions of building artificial neural networks, their principles and technologies that allow training a neural network to solve the problem of forecasting and extracting hidden patterns from data. The topics covered for the course are: Introduction to artificial neural networks, deep learning in computer vision tasks, deep learning in natural language processing tasks and deep generative learning.

Purpose of studying of the discipline

The purpose of the discipline is to develop basic concepts, knowledge and skills in artificial neural networks and intelligent data processing. The main objectives of the discipline are: the development of undergraduates` knowledge about artificial neural networks,

the creation of artificial neural networks, training in working with data preprocessing methods and various types of artificial neural networks.

Learning Outcomes

ON8 To develop educational and methodological materials on the subjects taught, taking into account the integration of education, science and innovation.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.

Learning outcomes by discipline

Supervises the work on the evaluation and selection of models of artificial neural networks and tools for solving the task.
He directs the creation of artificial intelligence systems based on models of artificial neural networks and tools.
He manages projects for the development of artificial intelligence systems based on deep neural network models and fuzzy models and methods.

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Informatization of education and learning problems Modern methods of control and evaluation

Workshop on the development of digital educational resources using artificial intelligence

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

Short description of discipline

Augmented reality in the development of computer vision and digital education resources. The use of technologies for the development of auxiliary bots, natural language processing technologies. Computer vision technologies for recognition and detection tasks. Tracking technologies used in augmented reality applications. "Advanced intelligence" in education. Features of the development of the concept of the future digital educational resource using artificial intelligence. Opportunities to improve existing educational resources using artificial intelligence technologies.

Purpose of studying of the discipline

The objectives of the discipline are to develop undergraduates` in-depth knowledge and skills in the field of developing digital educational resources using artificial intelligence technologies.

Learning Outcomes

ON8 To develop educational and methodological materials on the subjects taught, taking into account the integration of education, science and innovation.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.

Learning outcomes by discipline

identifies areas of business activity that can potentially benefit from the analytics of project management for building complex systems based on big data analytics in various industries on the part of the customer

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Informatization of education and learning problems Competence-based learning in higher education Mobile learning and virtual reality

Teaching the basics of artificial intelligence in basic and additional general education

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

Short description of discipline

Methodological approaches to the study of elements of the AI system in the school computer science course. The structure and content of intelligent systems and technologies are considered as a new section of computer science in general education. And it is revealed in various meanings, And is described as a subject and as a textbook. The formation of students` digital skills is carried out through the creation and use of intelligent algorithms. The use of virtual and augmented reality technologies in the educational process is also considered.

Purpose of studying of the discipline

The purpose of the discipline is to develop basic concepts, knowledge and skills in artificial neural networks and intelligent data processing. The main objectives of the discipline are: the development of undergraduates` knowledge about artificial neural networks, the creation of artificial neural networks, training in working with data preprocessing methods and various types of artificial neural networks.

Learning Outcomes

ON8 To develop educational and methodological materials on the subjects taught, taking into account the integration of education, science and innovation.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue

and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.

Learning outcomes by discipline

Characteristics of the main components of the methodological system of teaching artificial intelligence in basic and additional general education;
the main provisions and patterns of artificial intelligence training;
the specifics of an inclusive approach in teaching artificial intelligence.
To determine the content, choose forms and methods of teaching artificial intelligence in basic and additional general education;
develop related educational and methodological documentation;

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Informatization of education and learning problems Modern methods of control and evaluation

Planning and organization of scientific and pedagogical research

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

Short description of discipline

This discipline examines the concepts of science, science and art, analysis of science, ethics of science, scientific criteria and organization of science of the Republic of Kazakhstan, Academic and university science, Science and research, stages of scientific and pedagogical research work. The algorithm of scientific and pedagogical research, the choice of the topic of scientific and pedagogical research, the significance of the topic, the concept and methodology of scientific research, the main research methods, the directions of the choice of research methods, the structure of scientific and educational work are also considered.

Purpose of studying of the discipline

The training plan for University Masters provides for training in the skills of writing a master`s thesis. During the training period, various educational and research works of undergraduates (preparation of abstracts, reports, scientific articles, research in research practice) are introduced into the educational process.

Learning Outcomes

ON8 To develop educational and methodological materials on the subjects taught, taking into account the integration of education, science and innovation.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.

Learning outcomes by discipline

Possess in-depth scientific knowledge in the field of software
Recognize the essence and significance of information in the development of modern society
Own the main methods, methods and means of obtaining, storing, processing information
Possess in-depth scientific knowledge in the field of software
Be aware of the essence and importance of information in the development of modern society
Possess the basic methods, methods and means of obtaining, storing, processing information

Prerequisites

Modern methods of control and evaluation

Postrequisites

The research work of a student, including an internship and the implementation of a master s thesis II

Applied methods of analysis and processing of information in research

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

Short description of discipline

The teaching of the discipline provides for the study of modern methods of applied statistics for processing and analyzing data found in sociological research and presented in various types of measurement scales, and the formation of undergraduates` skills in meaningful interpretation of results. At the same time, the use of one or another method together with the purpose of cognitive or practical activity is to learn to identify situations in which the subject of research or activity and activity is carried out.

Purpose of studying of the discipline

The objectives of the discipline are: the study of modern methods of applied statistics processing and analysis of data found in sociological studies and presented in various types of measurement scales; Formation of abilities meaningfully interpret the results.

Learning Outcomes

ON8 To develop educational and methodological materials on the subjects taught, taking into account the integration of education, science and innovation.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in

the field of scientific research.

Learning outcomes by discipline

Possess in-depth scientific knowledge in the field of software
Recognize the essence and significance of information in the development of modern society
Own the main methods, methods and means of obtaining, storing, processing information
Knowledge of methods for measuring data in sociology, basic methods for processing experimental data, methods for statistical evaluation and testing hypotheses.
Be able to apply applied statistical methods to analyze and model social phenomena and processes.
Mastering the skills of scientific analysis of social problems and processes, practical application of basic knowledge and methods of Applied Statistics.

Prerequisites

The research work of a student, including an internship and the implementation of a master s thesis I Research activities of students in computer science

Postrequisites

Practice research The research work of a student, including an internship and the implementation of a master s thesis III

Automation of scientific research

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

Short description of discipline

This discipline develops methodological and cultural skills for effective work in science and teaches those who are engaged in solving certain scientific problems in theory and practice, the skills necessary for scientific research and the maximum reduction of unproductive searches and mistakes. The defining element of this culture is the formation of dialectical- materialistic concepts. Therefore, this discipline helps a master`s student write the theoretical and practical sections of their dissertation competently, in accordance with the requirements.

Purpose of studying of the discipline

The purpose of this course is to inform the student of a known stock of information (definitions, formulas, theorems, relationships between them and methods for solving problems) to develop his logical thinking and achieve the mathematical culture that is necessary for studying other disciplines and subsequent work in the specialty, and also the formation of systematized knowledge in the field of propositional and predicate algebra, Boolean algebra, graph theory, summation theory, recurrent sequences, automata theory and coding.

Learning Outcomes

ON8 To develop educational and methodological materials on the subjects taught, taking into account the integration of education, science and innovation.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.

Learning outcomes by discipline

Possess in-depth scientific knowledge in the field of software
Recognize the essence and significance of information in the development of modern society
Own the main methods, methods and means of obtaining, storing, processing information
- use a computer to solve general tasks;
- formulate the result;
- work with the database management system and spreadsheets;
- competently use the language of the subject area;

Prerequisites

The research work of a student, including an internship and the implementation of a master s thesis I Research activities of students in computer science

Postrequisites

The research work of a student, including an internship and the implementation of a master s thesis II Practice research

Methods of creating electronic textbooks

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

Short description of discipline

In the study of the discipline, the methodology of using information and communication technologies in the educational field and the development of computer learning tools is considered. At the same time, the problems of preparing electronic textbooks, their effectiveness, requirements for electronic textbooks, the structure of an electronic textbook and the features of using electronic textbooks in the classroom are studied. As well as reviews of programs for creating electronic textbooks, they will learn how to determine their effectiveness.

Purpose of studying of the discipline

The purpose of studying the discipline is to prepare undergraduates for the use in their professional activities of basic data and skills formed in the field of information technology. Formation of methodological skills and abilities of future teachers through new information and communication technologies. To deepen the professional and pedagogical training of future teachers of computer science, to expand the range of theoretical and practical knowledge gained.

Learning Outcomes

ON7 Recognize the essence and significance of information in the development of modern society.
ON8 To develop educational and methodological materials on the subjects taught, taking into account the integration of education, science and innovation.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.

Learning outcomes by discipline

Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program
Possess in-depth scientific knowledge in the field of software
Recognize the essence and significance of information in the development of modern society
Mastering deep scientific knowledge in the field of software. Understanding the essence and importance of information in the development of modern society. Master the main methods, methods and means of obtaining, storing, and processing information

Prerequisites

Workshop on the development of digital educational resources using artificial intelligence

Postrequisites

Mobile learning and virtual reality

Cloud computing

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

Short description of discipline

In the teaching of the discipline, "Cloud" computing, scaling, prerequisites for "Cloud" transition, overview of "Cloud" architecture, virtualization models are considered. We also consider the advantages and application areas associated with IaaS, as well as software-as-a-service (SaaS) solutions, benefits and application areas. Get acquainted with the main platforms: Amazon EC2, Google Apps, Windows Azure. Other platforms: SAP Cloud Computing, IBM Cloud Computing get acquainted with the application area and network models of "Cloud" services.

Purpose of studying of the discipline

Provide undergraduates with the opportunity to gain knowledge and practical experience in the field of current cloud computing technologies

Learning Outcomes

ON8 To develop educational and methodological materials on the subjects taught, taking into account the integration of education, science and innovation.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.

Learning outcomes by discipline

Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program
Possess in-depth scientific knowledge in the field of software
Recognize the essence and significance of information in the development of modern society
Have the ability to summarize and critically evaluate the results of domestic and foreign researchers, identify promising areas, and develop a research program
Mastering deep scientific knowledge in the field of software. Understanding the essence and importance of information in the development of modern society

Prerequisites

Workshop on the development of digital educational resources using artificial intelligence

Postrequisites

Automation of scientific research

Means media, scientific visualization and virtual realities

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

Short description of discipline

This discipline studies the technology of digital video and video cameras, the resolution and image quality of video cameras, video cameras for automatic adjustment. It provides methods of recovery and machine learning on three-dimensional image and segmentation in the image, object recognition in the image, filtering and video quality improvement. He gets acquainted with the three-dimensional user interface, with the possibility of lossless and lossless video data compression, with video codec processing, with video codec matching, with photorealistic image synthesis.

Purpose of studying of the discipline

Purpose of studying of the discipline:The purpose of discipline is to develop understanding of the various means of scientific research.

Learning Outcomes

ON8 To develop educational and methodological materials on the subjects taught, taking into account the integration of education, science and innovation.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.

ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.

Learning outcomes by discipline

Possess in-depth scientific knowledge in the field of software
Recognize the essence and significance of information in the development of modern society
Own the main methods, methods and means of obtaining, storing, processing information
Possess in- depth scientific knowledge in the field of software. Be aware of the essence and significance of information in the development of modern society. Master the main methods, methods and means of obtaining, storing, and processing information.

Prerequisites

Workshop on the development of digital educational resources using artificial intelligence

Postrequisites

Applied methods of analysis and processing of information in research

Administrative information and education networks

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

Short description of discipline

This subject forms the special knowledge of undergraduates in the field of modern systems management, installation and configuration of modern software equipment to perform tasks on network administration and the use of modern information tools, generalization of theoretical knowledge on specific examples of system tools and services, the formation of knowledge that allows the use of modern technologies in information systems at the stages from design to operation.

Purpose of studying of the discipline

The objectives of mastering the discipline are: to ensure the security and reliability of computers integrated into local networks, to acquire practical skills in the administration of servers and workstations, to acquire knowledge and application: about the capabilities of modern information systems, the functions and tests they solve; about the basics of organizing network interaction of high- level applications; about services and services involved in the process of managing information systems, their configuration and management.

Learning Outcomes

ON8 To develop educational and methodological materials on the subjects taught, taking into account the integration of education, science and innovation.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.

Learning outcomes by discipline

Possess in-depth scientific knowledge in the field of software
Be aware of the essence and importance of information in the development of modern society
Possess the basic methods, methods and means of obtaining, storing, processing information
The results of mastering the discipline will allow the master student to possess the skills of: independent design, deployment and administration of information systems; analysis, management, and monitoring of the state of operating information systems; development of their own methods of solving in the field of information systems and network communications.

Prerequisites

Methodological training of Informatics teacher at the University

Postrequisites

Pedagogical practice

Knowledge Engineering

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

Short description of discipline

A logical model for displaying knowledge. Network model: semantic network, functional network, frame representations. A productive model. Demonstration of unrealistic knowledge. The concept of linguistic variables. Unreal polynomials and relations. Using fuzzy logic of knowledge-based systems. Visual demonstration of knowledge. Introduction to expert systems, comment system, knowledge base creation. Methods of obtaining knowledge the course being studied is about technologies for processing expert systems.

Purpose of studying of the discipline

The purpose of discipline is to develop an integrated approach undergraduates in the formation of knowledge and skills in the use of integrated information systems in solving the problems of economics and management, including understanding of basic business processes of industrial enterprises, the role, challenges and opportunities of information technology and systems in modern infrastructure companies, especially implementation and use of integrated information systems.

Learning Outcomes

ON8 To develop educational and methodological materials on the subjects taught, taking into account the integration of education, science and innovation.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information

necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.

Learning outcomes by discipline

Possess in-depth scientific knowledge in the field of software
Recognize the essence and significance of information in the development of modern society
Own the main methods, methods and means of obtaining, storing, processing information
Possess in-depth scientific knowledge in the field of software
Recognize the essence and significance of information in the development of modern society
Own the main methods, methods and means of obtaining, storing, processing information

Prerequisites

Methodological training of Informatics teacher at the University

Postrequisites

Pedagogical practice

Mobile learning and virtual reality

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

Short description of discipline

The discipline deals with working with the main virtual reality applications, mobile devices, classification, new applications and trends for smartphones, operating systems, GPS. Teaches the introduction of mobile devices into the educational process, as well as the system of multidimensional representation of the subject area in education and the safety of using "virtual reality", adaptation of a set of technical devices, content creation and coordination of educational and research projects with licensed or free software equipment.

Purpose of studying of the discipline

to form a system of competencies of the Master of Education in the field of modern learning technologies for solving pedagogical tasks of professional activity

Learning Outcomes

ON8 To develop educational and methodological materials on the subjects taught, taking into account the integration of education, science and innovation.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.

Learning outcomes by discipline

Possess in-depth scientific knowledge in the field of software;
Recognize the essence and significance of information in the development of modern society;
Own the main methods, methods and means of obtaining, storing, processing information;
Possess in- depth scientific knowledge in the field of software, Be aware of the essence and importance of information in the development of modern society. Possess the basic methods, methods and means of obtaining, storing, processing information

Prerequisites

Methodological training of Informatics teacher at the University

Postrequisites

Pedagogical practice

Legal issues of Informatization

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

Short description of discipline

The discipline instills in undergraduates the skills of searching, processing, receiving, storing, distributing and systematizing legal information in the field of using new computer information technologies to gain knowledge. Teaches familiarity and expertise of regulatory legal acts of state authorities and local self-government bodies related to the field of education, organization and effective use of information resources when writing master`s theses. Teaches the rules of compliance with rights when using information.

Purpose of studying of the discipline

The purpose of studying the discipline is the formation of general cultural and professional competencies among undergraduates, necessary and sufficient for the use of modern information technologies in the implementation of standard-setting, law enforcement and law enforcement professional activities.

Learning Outcomes

ON5 Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program.
ON6 Possess in-depth scientific knowledge in the field of software.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.

Learning outcomes by discipline

Possess in-depth scientific knowledge in the field of software
Recognize the essence and significance of information in the development of modern society
Own the main methods, methods and means of obtaining, storing, processing information
Mastering deep scientific knowledge in the field of software
Understanding the essence and importance of information in the development of modern society
Master the main methods, methods and means of obtaining, storing, and processing information

Prerequisites

Methodological training of Informatics teacher at the University

Postrequisites

Practice research

Social and humanitarian aspects of Informatization

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

Short description of discipline

Development of undergraduates ` understanding of innovative processes taking place in the field of education in the study of the discipline and disclosure of the importance of basic concepts of innovative methods used in the field of education, training strategies for its implementation, their classification, familiarization with various innovations and innovative practices introduced in schools, improving the skills and qualifications of their application in the field of Education.

Purpose of studying of the discipline

The purpose of studying the discipline is to form students` understanding of the features of the development of the social and humanitarian sphere of the information society, the skills to analyze and predict trends in modern society and informatization processes.

Learning Outcomes

ON8 To develop educational and methodological materials on the subjects taught, taking into account the integration of education, science and innovation.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.

Learning outcomes by discipline

Possess in-depth scientific knowledge in the field of software
Recognize the essence and significance of information in the development of modern society
Own the main methods, methods and means of obtaining, storing, processing information
know: basic terminology related to the study of society and its structural components; basic concepts and properties of information; basic patterns of information society development; current state and directions of computer technology development;
be able to: analyze and evaluate the processes taking place in society; navigate modern social, cultural and personal processes; acquire new knowledge using modern information and educational technologies; operate modern electronic equipment and information and communication technologies;
possess: methods of analysis of the subject area; culture of thinking, ways of processing results using the possibilities of information technologies, the basics of working with methodological, scientific and technical literature.

Prerequisites

Automation of scientific research

Postrequisites

Pedagogical practice

Social Media for Flexible Online Learning

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

Short description of discipline

In the study of the discipline, social media, socio-cultural trends and socialization, emotional development and opportunities, limitations, threats of social media are considered. Social media - as a basis for creating a community of students and teachers, teaches how to work with the sociogram of social network communities. Social media as a means of self-knowledge and self-presentation, involves the use of social media in the process of group interaction and learning.

Purpose of studying of the discipline

The process of studying the discipline is aimed at the formation and development of competencies for the use of social media in education through social interaction between students and teachers. to enhance the exchange of experience between teachers; to use social media in the organization and conduct of dissertation pedagogical research; knowledge of the theory, technology and practice of didactic social media systems for flexible online learning

Learning Outcomes

ON8 To develop educational and methodological materials on the subjects taught, taking into account the integration of education, science and innovation.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.

Learning outcomes by discipline
Possess in-depth scientific knowledge in the field of software;
Recognize the essence and significance of information in the development of modern society;
Own the main methods, methods and means of obtaining, storing, processing information.
Possess in-depth scientific knowledge in the field of software
Be aware of the essence and importance of information in the development of modern society
Possess the basic methods, methods and means of obtaining, storing, processing information
Prerequisites
Means media, scientific visualization and virtual realities
Postrequisites
Pedagogical practice

Competence-based learning in higher education

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

Short description of discipline
Formation of educational content and assessment of teaching quality. Object of assessment and its criteria. Integrative model of competence assessment and the level of formation of IT competencies of undergraduates. Innovative assessment tools. Project method. Procedure for development and examination of assessment tools. Descriptors of the level of competence. Methods of assessing the competence of students in e-learning. Criteria-based assessment system in the classroom. The course forms a special knowledge of undergraduates on these topics.
Purpose of studying of the discipline
The purpose of this subject is to form the content of education and assess the quality of training. Competencies. The object of evaluation and its criteria. Certifications. Integrative model of competence assessment. Assessment of competencies, the level of formation of IT competencies of undergraduates. Innovative evaluation tools. Portfolio. Method of developing cooperation. project method. The procedure for the development and examination of evaluation tools. Descriptors of the level of mastering the competence. Methods for assessing students` competencies in e-learning systems.
Learning Outcomes
ON5 Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program.
ON6 Possess in-depth scientific knowledge in the field of software.
ON7 Recognize the essence and significance of information in the development of modern society.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.
Learning outcomes by discipline
Apply knowledge of the theoretical foundations and technologies of teaching informatics and ICT
Provide methodological support for the educational process
Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program
Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information; scientifically argue and defend your scientific point of view
Organizes educational and research activities using mobile technologies. Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research
Apply knowledge of the theoretical foundations and technologies of teaching computer science and ICT.
To carry out methodological support of the educational process.
Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, and draw up a research program
Prerequisites
Methodological training of Informatics teacher at the University
Postrequisites
Practice research

Assessment of competency-based learning outcomes

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

Short description of discipline
The course raises the issue of methods and tools for assessing the quality of student learning outcomes in the implementation of a competency-based approach in accordance with the requirements of state educational standards. Forms and methods of assessment are proposed, allowing to combine competence and assessment methods. It is based on the need to use innovative assessment methods and techniques.
Purpose of studying of the discipline
the main goal of the master`s degree program is to obtain theoretical knowledge and practical skills in the field of electronic assessment of the level of competence and develop other competencies, such as creative, creative, critical, social, special, and communication. As

well as the theory, technology and practice of didactic systems for electronic assessment of the level of competence.

Learning Outcomes

ON5 Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program.
ON6 Possess in-depth scientific knowledge in the field of software.
ON7 Recognize the essence and significance of information in the development of modern society.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.

Learning outcomes by discipline

Apply knowledge of the theoretical foundations and technologies of teaching computer science and ICT
To carry out methodological support of the educational process
Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, and draw up a research program
To solve the tasks of their professional activity at the modern level, to demonstrate the ability to present information; to scientifically argue and defend their scientific point of view
Organizes educational and research activities using mobile technologies. Searches, analyzes and evaluates information necessary for setting and solving professional tasks in the field of education; owns planning technologies in professional activities in the field of scientific research
Application of knowledge of theoretical foundations and technologies of Computer Science and ICT teaching
Implementation of methodological support for the educational process
Have the ability to summarize and critically evaluate the results obtained both domestic and foreign
development of a research program, identification of promising areas, research
Solving the tasks of their professional activity at a modern level,
scientific proof and defense of one`s own scientific point of view
Organizes educational and research activities using mobile technologies.
Performs search, analysis and evaluation of information necessary for setting and solving professional tasks
has the technology of planning professional activities in the field of scientific research

Prerequisites

Methodological training of Informatics teacher at the University

Postrequisites

Practice research

System of electronic evaluation of the level of competence

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

Short description of discipline

This course is aimed at developing the ability of undergraduates to use different types of assessment of learning outcomes, using the capabilities of electronic educational resources in the application of modern educational technologies. The proposed course acquaints undergraduates with general methods of assessing the results of educational activities and individual types of assessment. Different ways of evaluating the results of educational activities are considered.

Purpose of studying of the discipline

The aim is to provide undergraduates with theoretical knowledge and practical skills in the field of electronic assessment of the level of competence and the development of other competencies: as creative, creative, critical, social, special, communication. As well as the theory, technology and practice of didactic systems of electronic assessment of the level of competence.

Learning Outcomes

ON5 Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program.
ON6 Possess in-depth scientific knowledge in the field of software.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.

Learning outcomes by discipline

Apply knowledge of the theoretical foundations and technologies of teaching informatics and ICT
Provide methodological support for the educational process; Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program;
Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information; scientifically argue and defend your scientific point of view; Organizes educational and research activities using mobile technologies. Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research
Solve the tasks of their professional activity at a modern level, prove their professional scientific point of view and defend their scientific point of view
Performs search, analysis and evaluation of information necessary for setting and solving professional tasks master the technologies for planning professional activities in the field of scientific research

Prerequisites

Methodological training of Informatics teacher at the University

Postrequisites
Practice research

Innovative interactive teaching methods

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

Short description of discipline
In addition to revealing the importance of the basic concepts of innovative methods used in the field of education in the study of the discipline, knowledge of strategies for the development and implementation of undergraduates ` understanding of innovative processes taking place in the field of education and their classification, familiarization with various innovations and innovative practices introduced into schools, improving the skills and qualifications of their application in the field of Education.

Purpose of studying of the discipline
To acquaint students with innovative interactive teaching methods, with the possibilities of their use in the educational process, with the role of innovative interactive methods in the development of creative thinking; to form students` understanding of the main trends in educational methods; to teach students to apply their knowledge in the process of practical work; to contribute to the formation of students` global thinking in the conditions of work in educational networks of the Internet and the culture of communication in the distance learning process.
Innovative interactive teaching methods are a special form of organizing cognitive activity. She has in mind quite specific and predictable goals:
improving the efficiency of the educational process, achieving high results;
strengthening motivation to study the discipline;
formation and development of professional skills of students;
formation of communication skills;
development of analytical skills and reflexive manifestations;
development of skills of possession of modern technical means and technologies of perception and processing of information;
formation and development of the ability to independently find information and determine its reliability;

Learning Outcomes
ON5 Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program.
ON6 Possess in-depth scientific knowledge in the field of software.
ON7 Recognize the essence and significance of information in the development of modern society.

Learning outcomes by discipline
Apply knowledge of the theoretical foundations and technologies of teaching informatics and ICT
Provide methodological support for the educational process
Possession of the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program
the main concepts and provisions of the course; the importance of innovative interactive teaching methods in the development of society at the present stage, their place and role in education; trends emerging in educational technologies; priority areas for the use of innovative interactive methods in education; apply the knowledge gained in solving practical professional tasks;
the main innovative interactive teaching methods; use the acquired knowledge in solving professional tasks; independently acquire with the help of information technology and put into practice new knowledge and skills, including in areas not directly related to the field of activity.

Prerequisites
Methodological training of Informatics teacher at the University

Postrequisites
Pedagogical practice

Information technology

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

Short description of discipline
Basic concepts in teaching the discipline: classification, stages of development, life cycle and consideration of information technologies as a system. Information technology software tools and database technology, knowledge base technology, features, importance, and convenience of using network technologies are explained. Fast application processing tools. Automated system design. Develops knowledge, skills and abilities in the use of information technologies in various subject areas.

Purpose of studying of the discipline
formation of knowledge on the theoretical foundations of information technologies and their application in the design and optimization of the functioning of modern information systems.

Learning Outcomes
ON8 To develop educational and methodological materials on the subjects taught, taking into account the integration of education, science and innovation.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.

Learning outcomes by discipline

Possess in-depth scientific knowledge in the field of software
Recognize the essence and significance of information in the development of modern society
Own the main methods, methods and means of obtaining, storing, processing information
Mastering deep scientific knowledge in the field of software
Understanding the essence and importance of information in the development of modern society
Master the main methods, methods and means of obtaining, storing, and processing information

Prerequisites

Automation of scientific research

Postrequisites

Creation of multimedia educational tools

Creation of multimedia educational tools

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

Short description of discipline

Forms professional working skills of using programs for creating virtual multimedia applications for the education system using multimedia technologies in teaching the discipline. Teaches methods and special techniques for creating reference, educational and methodological, virtual interactive research and advertising and artistic applications using multimedia technologies. And also organizes activities aimed at mastering the methods of computer processing of multimedia virtual products for the educational field.

Purpose of studying of the discipline

The purpose of this course is the formation of a system of knowledge in the field of multimedia technologies; the formation of skills of professional work in programs for creating virtual multimedia applications; the study of methods and special techniques for creating virtual interactive research, reference, educational and methodological, advertising and artistic applications (products) using multimedia technologies; organization of activities aimed at mastering the methods of computer development of multimedia virtual products dedicated to the theory, history and promotion of works of fine, decorative and applied arts and architecture.

Learning Outcomes

ON8 To develop educational and methodological materials on the subjects taught, taking into account the integration of education, science and innovation.
ON9 Solve the tasks of their professional activity at the modern level, demonstrate the ability to present information scientifically argue and defend your scientific point of view.
ON10 Organizes educational and research activities using mobile technologies.Carries out search, analysis and evaluation of information necessary for setting and solving professional problems in the field of education; owns planning technologies in professional activities in the field of scientific research.

Learning outcomes by discipline

Possess in-depth scientific knowledge in the field of software
Recognize the essence and significance of information in the development of modern society
Own the main methods, methods and means of obtaining, storing, processing information
Possess in- depth scientific knowledge in the field of software. Be aware of the essence and importance of information in the development of modern society. Possess the basic methods, methods and means of obtaining, storing, processing information.

Prerequisites

Automation of scientific research

Postrequisites

Creation of multimedia educational tools