

ABSTRACT OF SCIENTIFIC SPECIALTY

1.2.1. ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Provides studying materials By informational technologies, data storage and processing methods, principles of intelligent systems operation, knowledge engineering methods, machine learning models, artificial intelligence models, data mining tasks.

Includes the following areas of research: Natural science foundations and methods of artificial intelligence. Research in the field of assessing the quality and effectiveness of algorithmic and software solutions for artificial intelligence and machine learning systems. Methods of comparison and selection of algorithmic and software solutions under many criteria.

Methods and algorithms for modeling thought processes: reasoning, argumentation, recognition and classification, concept formation. Research in the field of neuromorphic methods of data analysis, simulation of the structure and functions of the brain, including using machine learning methods. Neuroinformatics and methods of modeling biological nervous systems.

Development of methods, algorithms and creation of artificial intelligence and machine learning systems for processing and analyzing texts in natural language, for images, speech, biomedicine and other special types of data.

Methods and technologies for searching, acquiring and using knowledge and patterns, including empirical ones, in artificial intelligence systems. Research in the field of joint application of machine learning methods and classical mathematical modeling. Methods and means of using expert knowledge.

Formalization and formulation of control and (support) decision-making problems based on artificial intelligence and machine learning systems. Development of control systems using artificial intelligence systems and machine learning methods, including control of robots, cars, UAVs, etc.

Development of specialized mathematical, algorithmic and software systems for artificial intelligence and machine learning. Methods and means of interaction of artificial intelligence systems with other systems and a human operator.

Multi-agent systems and distributed AI.

Methods and means of using parallel, quantum computing, etc. for solving problems of artificial intelligence and machine learning.

Research into the ethical issues associated with the creation and implementation of AI systems, including modeling the expected social and economic consequences.

Research in the field of "strong AI", including the formation of a conceptual framework and elements of mathematical formalism necessary to build an algorithmic apparatus.

Research in the field of "trusted" systems of the AI class, including the problems of forming test samples of precedents, reliability, stability, retraining, etc.

Methods and tools for generating data arrays and precedents, including "big data", necessary for solving problems of artificial intelligence and machine learning. Domain-specific data collections for important application areas.

Methods and means of forming arrays of conditionally real data and precedents necessary for solving problems of artificial intelligence and machine learning.

Mathematical research in statistics, logic, algebra, topology, function analysis and other areas focused on solving problems of artificial intelligence and machine learning.

Research in the field of special optimization methods, problems of complexity and elimination of enumeration, dimensionality reduction.

Research in the field of multilayer algorithmic structures, including multilayer neural networks.

ABSTRACT OF SCIENTIFIC SPECIALTY

1.2.2 MATHEMATICAL MODELING, NUMERICAL METHODS AND PROGRAM COMPLEXES

Provides studying materials By mathematical modeling, functional analysis, mathematical physics, probability theory, mathematical statistics, numerical methods and software packages.

Includes the following areas of research:

Development of new mathematical methods for modeling objects and phenomena.

Development, substantiation and testing of efficient computational methods using modern computer technologies.

Implementation of effective numerical methods and algorithms in the form of problem-oriented programs for conducting a computational experiment.

Development of new mathematical methods and algorithms for interpreting a full-scale experiment based on its mathematical model.

Development of new mathematical methods and algorithms for the validation of mathematical models of objects based on the data of a full-scale experiment.

Comprehensive research of scientific and technical problems using modern technology of mathematical modeling and computational experiment (technical sciences).

Development of computer and simulation modeling systems (technical sciences).

ABSTRACT OF SCIENTIFIC SPECIALTY

1.2.4. CYBER SECURITY

Problems of protection of information, telecommunications and computing systems, territorially distributed complexes for collecting, storing and processing information and systems with remote access to shared resources.

are being studied
Includes the following areas of research:

Analysis of known and newly discovered vulnerabilities, their systematization, development of methods for intelligent search for new classes of vulnerabilities.

Modeling of information security policies, threats and attacks, methodological foundations for the development of protection profiles.

Methods for designing, modeling, analyzing, transforming programs to identify potential vulnerabilities in software systems, taking into account the specifics of the phases of the life cycle: requirements development, architecture design, code development, testing, verification, certification and operation.

Methods, algorithms and tools for post-release deep analysis of software and hardware security.

Methods for integrating security tools at the hardware and software levels.

Methods, algorithms And facilities ensure sustainable functioning of software and hardware systems V conditions malicious impact, including methods of obfuscation and safe compilation of programs.

Intellectual scalable monitoring incidents security in distributed software and hardware systems, methods of rapid response to identified threats.

Scalable data and process mining tools in distributed systems, including social networks.

Development of methodological foundations for the creation and development of metrics for assessing security, the level of trust in computer systems and standards in the field of cybersecurity.

ABSTRACT OF SCIENTIFIC SPECIALTY

1.3.4. RADIO PHYSICS

It provides for the study of the physical foundations and special issues of radiophysics in such areas as the development and research of devices for spin-wave electronics and radio photonics. It also describes how to use devices for processing and generating microwave signals.

Includes the following areas of research:

Development of new instruments for generating, amplifying and converting oscillations and waves of various nature (electromagnetic, acoustic, plasma, mechanical), as well as for studying autowaves in non-equilibrium chemical and biological systems. Development of new highly efficient sources of coherent radiation in the millimeter, submillimeter and optical ranges, technical development of new frequency and power ranges.

Development of new instruments and methods for studying linear and nonlinear processes of radiation, propagation, diffraction, scattering, interaction and transformation of waves in natural and artificial media.

Development and creation of new electrodynamic systems and devices for generating and transmitting radio signals: resonators, waveguides, filters and antenna systems in the radio, optical and IR ranges.

Development of new methods and creation of new instruments for the analysis of fluctuations, noise, random processes and fields in lumped and distributed stochastic systems (statistical radiophysics). Creation of new methods and instruments for the analysis and statistical processing of signals under interference conditions. Development of statistical methods for information transfer. Development of research methods for nonlinear dynamics, space-time chaos and self-organization in non-equilibrium physical, biological, chemical and economic systems.

Development of new methods and principles of active and passive remote diagnostics of the environment, based on modern methods for solving inverse problems. Creation of systems for remote monitoring of the geo-, hydrosphere, ionosphere, magnetosphere and atmosphere. Development of new methods for radio astronomical research of near and far outer space.

Development of new methods and creation of new wave technologies for the modification and processing of materials.

Development of new methods for creating communication systems, navigation, active and passive location systems based on the use

radiation and reception of wave fields of various physical nature and the development of new frequency ranges.

Development of the physical foundations for the generation, amplification and transformation of oscillations and waves of various nature (electromagnetic, acoustic, plasma, mechanical), as well as autowaves in non-equilibrium chemical and biological systems. Search for ways to create highly efficient sources of coherent radiation in the millimeter, submillimeter and optical ranges, technical development of new frequency and power ranges.

Studying linear And non-linear processes radiation, propagation, diffraction, scattering, interaction and transformation of waves in natural and artificial media.

Development and research of new electrodynamic systems and devices for generating and transmitting radio signals: resonators, waveguides, filters and antenna systems in the radio, optical and IR ranges.

Study of fluctuations, noise, random processes and fields in concentrated and distributed stochastic systems (statistical radiophysics). Creation of new methods of analysis and statistical processing of signals under interference conditions. Development of statistical bases for information transfer. Study of nonlinear dynamics, space-time chaos and self-organization in non-equilibrium physical, biological, chemical and economic systems.

Development of scientific bases and principles of active and passive remote diagnostics of the environment based on modern methods for solving inverse problems, as well as methods for remote monitoring of the geo-, hydrosphere, ionosphere, magnetosphere and atmosphere. Radio astronomical investigations of near and far outer space.

Development physical fundamentals new wave technologies modification and processing of materials.

Development of theoretical foundations for new methods and communication systems, navigation, active and passive location systems based on the use of radiation and reception of wave fields of various physical nature and the development of new frequency ranges.

ABSTRACT OF SCIENTIFIC SPECIALTY

1.3.7 ACOUSTICS

The scientific specialty provides for the study of the physical foundations and special issues of acoustics in areas related to the design and

development of acoustic systems and means of control and measurement for the purposes of research of solid media and the World Ocean, and issues of quality management of industrial products and operated products of mechanical engineering, transport, etc. etc. and so on. It also describes how to build and use devices for processing and generating measuring acoustic signals.

Includes the following areas of research:

Study of elastic vibrations and waves, the processes of their generation, radiation and propagation in various media and structures.

Study of the interaction of elastic vibrations and waves with matter and waves of other physical nature.

Investigation of scattering and diffraction phenomena during the propagation of elastic oscillations and waves in various media and structures.

Study of acoustic phenomena of natural environments (atmosphere, earth's crust, ocean).

Study of the effects of sound, vibration, ultra- and infrasound on humans and the biosphere, psychoacoustics.

Study of the processes of generation and propagation of sound, vibration, ultra- and infrasound in various media. Creation of methods for their calculation and the basics of design, vibroacoustic control and diagnostics.

Development and research of features, elements, devices and systems for generating, amplifying, converting and synthesizing sound and vibration, including for solving problems of aero-, geo- and hydroacoustics, musical, architectural and building acoustics, electroacoustics, opto- and photoacoustics, acoustoelectronics and other applications.

Development and research of methods, devices and instruments for identification and measurement of sound, vibration, ultra- and infrasound, including quantitative assessment of sound and vibration sources, assessment of the quality of generated, transmitted and received information, including in the presence of masking interference from other sources, as well as technical implementation of the relevant methods, devices and devices.

Development and research of new methods and means of reducing noise, vibration, ultra- and infrasound, which improve the efficiency of reduction, as well as the technical implementation of the relevant methods and means.

Development and research of algorithms, including digital ones, for processing vibroacoustic signals with different characteristics, including synthesis and optimization of processing algorithms.

Development and research of methods for modeling and calculating the propagation of sound and vibration in various environments, mapping sound and vibration.

Development and research of new software tools, methods and algorithms of methods for ensuring the electromagnetic compatibility of radio engineering systems and devices, including radio television and communication systems, methods for destroying and protecting information in these systems.

Development of promising information technologies, new software tools, methods and algorithms that allow the study and calculation of the vibroacoustic characteristics of various sources of sound and vibration, the propagation of sound and vibration in various environments, the calculation and quantitative assessment of the effectiveness of various sound and vibration reduction devices.

As well as the development of the technical foundations of devices, tools, systems and methods of measurement in the following areas:

Acoustic processing of materials and products, acoustic technologies in industry;

Acoustic diagnostics and non-destructive testing in transport and construction; acoustic monitoring of buildings and structures;

Medical acoustics and acoustics of living systems;

acoustic electronics;

Aquatic acoustics environments; radiation, reception And treatment hydroacoustic signals, acoustic monitoring of reservoirs;

Acoustics of gas media, aeroacoustics, reception and processing of sound signals in the air, monitoring of sources of acoustic noise in the atmosphere, acoustic ecology;

Acoustics of structurally inhomogeneous media, geological acoustics;

Room acoustics, musical acoustics, speech acoustics; Acoustic

metrology and calibration of sources and receivers of acoustic waves.

ABSTRACT OF SCIENTIFIC SPECIALTY

1.3.11 PHYSICS OF SEMICONDUCTORS

The main goal of the discipline is the study by postgraduate students of the physical foundations and special issues of semiconductor physics. These include the following: the structure and symmetry of semiconductor crystals, methods for calculating the band structure of semiconductors, semiconductor nanoheterostructures, and methods for calculating and diagnosing their energy spectrum.

Includes the following areas of research: Physical foundations of technological methods for semiconductor materials, composite ~~positive~~ structures, low-dimensionality and semiconductor devices and ~~integrated~~ devices based on them.

Structural and morphological properties of semiconductor materials, composite structures and semiconductor devices and integrated devices based on them.

Impurities and defects in semiconductors, composite structures and semiconductor devices and integrated devices based on them.

Electronic transport in semiconductors, composite structures and semiconductor devices and integrated devices based on them.

Optical and photoelectric phenomena in semiconductors, composite semiconductor structures, and semiconductor devices and integrated devices based on them.

Spontaneous and stimulated luminescence in semiconductor materials and composite structures, semiconductor lasers and light-emitting devices.

Acoustic and mechanical properties of semiconductors, composite semiconductor structures and semiconductor devices and integrated devices based on them.

Spontaneous and stimulated luminescence in semiconductor materials and composite structures, semiconductor lasers and light-emitting devices.

Modeling of properties and physical phenomena in semiconductors and composite structures based on them, technological processes and semiconductor devices.

Development of physical principles of operation and creation of devices based on semiconductor materials and composite semiconductor structures.

Development of research methods for semiconductors and composite semiconductor structures.

Impurities and defects in semiconductors and composite structures.

Surface and interface of semiconductors, semiconductor heterostructures, contact phenomena.

Electronic spectra of semiconductor composite materials and compounds based on them. And

Electronic transport in semiconductors and composite semiconductor structures.

Optical and photoelectric phenomena in semiconductors and composite semiconductor structures.

Spontaneous and stimulated luminescence in semiconductor materials and composite structures, semiconductor lasers and light-emitting devices.

Non-equilibrium phenomena in semiconductors and structures. Electronic plasma.

Acoustic and mechanical properties of semiconductors and composite semiconductor structures.

Crystal Lattice Dynamics. interaction. Electron-phonon

Many-particle interactions in semiconductors and composite structures.

Transport and optical phenomena in low-dimensional structures.

Mesoscopic phenomena in semiconductors and composite structures.

noncrystalline semiconductors. organic semiconductors. Magnetic semiconductors.

ABSTRACT OF SCIENTIFIC SPECIALTY

2.2.1. VACUUM AND PLASMA ELECTRONICS

The main goal of the discipline is the study by graduate students of special issues of electronic technology in such areas as the development and production of electrovacuum, plasma and X-ray devices.

It also describes the features of the use of X-ray, vacuum and plasma technologies in instrumentation.

Includes the following areas of research:

Studies of the regularities of the interaction of free electrons and ions with electromagnetic fields created in the volumes of vacuum and gas-discharge devices and installations.

Methods and devices for obtaining and forming streams of charged particles (electrons and ions) for the purpose of generating and converting electromagnetic energy, including calculation methods.

Applied problems of the physics of discharges in gas and vacuum in relation to the creation of appropriate devices.

Creation of new and improvement of existing methods and devices for generating and converting electromagnetic energy using free electrons and ions, including the development of scientific foundations, physical and technical principles for the implementation and improvement of these devices and their main components.

Research and development of manufacturing technology for both devices in general and their main components, special equipment, systems for creating and maintaining vacuum, components and materials.

Theoretical and experimental research and development of methods for calculating various types of vacuum and gas-discharge devices and devices or their individual components and devices in order to improve the characteristics of devices.

Experimental and theoretical studies of the properties of new materials used in the manufacture of vacuum and gas-discharge devices, various physical and chemical processes and phenomena occurring in the manufacture and operation of vacuum and gas-discharge devices, and the creation of mathematical methods for optimizing the manufacturing technology of such devices.

Research and development of methods and techniques for monitoring and diagnosing vacuum and gas-discharge devices, new or improvement

existing
equipment.

measuring, training and testing

ABSTRACT OF SCIENTIFIC SPECIALTY

2.2.2. ELECTRONIC COMPONENT BASE OF MICRO- AND NANOELECTRONICS, QUANTUM DEVICES

The main goal of the discipline is the study by postgraduate students of special issues of quantum electronics in such areas as heterotransistors, elements with high mobility of charge carriers, nanoelectronic field-effect transistors, as well as promising elements and devices of nano-electronics. Fundamental restrictions on the density of placement of elements of micro- and nanoelectronics and optimization of the degree of integration are also considered.

Includes the following areas of research:

Development and research of the physical foundations for creating new and improving existing devices, integrated circuits, micro- and nanoelectronics, solid-state electronics, discrete radio-electronic components, microelectromechanical systems (MEMS), nanoelectromechanical systems (NEMS), quantum devices, including optoelectronic devices and physical quantity converters .

Research and development of physical and mathematical models of products, including those for computer-aided design systems.

Research and development of circuitry foundations for the creation, designs and methods for improving products according to clause 1.

Research, modeling and development of technological processes and manufacturing routes, methods for measuring characteristics and improving products according to clause 1.

Research, design and modeling of products, research of their functional and operational characteristics according to paragraph 1, including issues of quality, durability, reliability and resistance to external influencing factors, as well as issues of their effective application.

ABSTRACT OF SCIENTIFIC SPECIALTY

2.2.3. TECHNOLOGY AND EQUIPMENT FOR THE PRODUCTION OF MATERIALS AND ELECTRONIC DEVICES

The discipline forms knowledge in the field of methods of synthesis, structure and shaping when applying, removing and modifying materials of inorganic and organic nature with micro- and nanoscale resolution, including elements of instrumental, metrological and

information support of processes aimed at creating systems with predictable and new properties due to the manifestation of micro and nanoscale factors.

Includes the following areas of research:

Development of physico-technological and physico-chemical foundations for creating new and improving existing materials, including semiconductors, dielectrics, conductors, technological media.

Physical and physico-chemical studies of technological processes and routes for the production of materials and electronic devices, development of their physico-technological and physico-chemical models.

Study And development structures, models, methods design and manufacturing technologies of equipment for the study of the properties and production of materials and electronic devices.

Research and modeling of the functional and operational characteristics of equipment for the production of materials and electronic devices, including issues of quality, durability, reliability and resistance to external influencing factors, as well as issues of effective application.

ABSTRACT OF SCIENTIFIC SPECIALTY

2.2.6. OPTICAL AND OPTO-ELECTRONIC DEVICES AND COMPLEXES

It provides for the study of the physical foundations and principles of operation of optoelectronic devices and complexes. The role and prospects of using optical-electronic systems for various purposes are considered. The skills of designing and using radiometric, thermal imaging, lidar and other optoelectronic systems are being formed.

Includes the following areas of research:

Research and development of new methods and processes that can be used as the basis for the creation of optical and optoelectronic devices, systems and complexes for various purposes, operating in the optical range of the spectrum and the terahertz range.

Development of new optical information technologies, including technologies based on fiber, adaptive, integrated optics and waveguide optics.

Research of optical and optoelectronic devices and complexes by computer simulation methods.

Creation and research of methods for calculating and optimizing optical systems, methods for assessing the quality of an optical image, development

effective complexes for computer-aided design of optical systems.

Development of devices and complexes for remote sensing of the Earth and space objects in the optical range of the spectrum, including multispectral and hyperspectral equipment, devices for orientation and navigation of spacecraft.

Development of promising optoelectronic devices of complexes designed for obtaining geospatial information associated with global positioning systems, including ground-based, aviation and space-based scanners, geodetic instruments. And

Development of promising lidar technologies, lidars and lidar complexes.

Creation of optical and optoelectronic systems included in the structure of robotic complexes.

Creation of optical systems based on freeform surfaces, including for lighting systems, optical devices of medical equipment, photovoltaic concentrators.

Development of microminiature optical and optoelectronic systems, including those based on MEMS technologies and using the principles of facet vision.

Development and use of modern information technologies in the analysis and transformation of optical images, including images obtained by multispectral photomatrixes.

Development, improvement and research of the characteristics of devices, systems and complexes using electromagnetic radiation of the optical wave range, designed to solve problems:

- measurements of geometric and physical quantities;
- research and control of parameters of various environments and objects, including including when solving technological, environmental and biological problems;
- transmission, reception, processing and display of information;
- management of the operation of technological equipment and control production processes;
- creation of optical and optoelectronic devices and systems for medicine;
- creation of optical and optoelectronic equipment for scientific research in various fields of science and technology.

ABSTRACT OF SCIENTIFIC SPECIALTY

2.2.7. PHOTONICS

The course "Photonics" considers in detail the main physical processes that occur during the interaction of electromagnetic radiation with

matter, as well as a review of the main photonic devices. The first part of the course provides basic ideas about the optical properties of semiconductor materials and structures that are used to create optoelectronic devices. Particular attention is paid to the properties of heterostructures, including quantum-well ones. One of the most important and voluminous parts of the course is a description of the principles of operation and characteristics of semiconductor injection lasers. The main types of heterolasers are considered: DHS, RO DHS, stripe and DFB lasers. The most important characteristics of lasers are studied in detail, and the threshold pump current, laser power, and beam pattern are calculated. Also considered are all the most important semiconductor photodetectors - photoresistors, photodiodes, phototransistors, solar cells.

Includes the following areas of research:

New laser and laser-information technologies, including technologies based on fiber, adaptive and integrated optics, micro- and nanophotonics, subwavelength and waveguide optics

Quantum infocommunication technologies, including quantum informatics and quantum cryptography, optical systems of memory, recording and storage of information, as well as technologies based on modern semiconductor and organic photonics and optoelectronics.

Creation of highly efficient photovoltaic cells for solar energy and energy-saving lighting sources, including light-emitting semiconductor, organic and hybrid LEDs and transistors, as well as flexible displays.

Technologies for creating microdisplays and devices based on them: communication switches with wavelength selection; spatial light modulators, including phase ones, for holography, adaptive optics and phase antenna arrays; helmet-mounted and near-eye displays, devices for input and processing of optical information.

Development of new principles of functioning in the creation of quantum computers and nanophotonic integrated circuits.

Development and creation of new materials, as well as micro- and nanostructures with controlled spectral and nonlinear optical properties.

Development of fundamentally new methods and technologies for creating micro- and nanostructures by optical methods, including new vacuum-free and universal technologies for creating optical materials and devices based on them by 3D additive layer-by-layer printing.

Creation of state standards and measuring instruments based on quantum technologies and development of a set of national standardizing documents.

Creation of new sources of coherent radiation, including laser sources operating in unexplored or poorly mastered earlier spectral ranges, including X-ray, vacuum-ultraviolet, infrared and terahertz ranges.

Creation of light-emitting devices based on new principles of operation with lower energy consumption and higher efficiency compared to existing analogues, as well as significantly superior consumer properties

Creation of qualitatively new devices for diagnosing the early stages of socially significant diseases, non-invasive or minimally invasive therapy, as well as the development and production of medicines, including personalized ones.

Development of highly sensitive biosensors.

SUMMARY OF THE SCIENTIFIC SPECIALTY 2.2.8.

METHODS AND INSTRUMENTS FOR CONTROL AND DIAGNOSIS OF MATERIALS, PRODUCTS, SUBSTANCES AND NATURAL ENVIRONMENT

Gives information about the main methods and means of environmental control. New, innovative technologies used in the conduct of control, the basic principles of constructing technical means that implement these technologies are outlined. Existing methods for determining the concentration of individual physical and chemical components of environmental objects and assessing the integral characteristics of ecological systems are considered. Modern methods for obtaining experimental data on the spatial and temporal characteristics of environmental parameters, principles for processing an array of experimental environmental data are outlined. The analysis of current trends in the development of new methods and means of environmental monitoring has been carried out.

Includes the following areas of research:

Scientific substantiation of new and improvement of existing methods, hardware and technologies for monitoring, diagnosing materials, products, substances and the natural environment, which contributes to improving the reliability of products and the environmental safety of the environment.

Development of methodologies for predicting the performance and residual life of products that guide the optimization of methods, instruments, control systems and diagnostics of products, increasing the reliability of products and the environmental safety of the environment.

Development, implementation, testing of methods and instruments for monitoring, diagnosing materials, products, substances and the natural environment, which contribute to improving the reliability of products and the environmental safety of the environment.

Development methodical, mathematical, software, technical, instrumental support for systems of technical control and diagnostics of materials, products, substances and the natural environment, environmental monitoring of natural and man-made objects, contributing to an increase in the operational life of products and an increase in the environmental safety of the environment.

Development of metrological support for methods and metrological characteristics of devices for monitoring and diagnosing materials, products, substances and the natural environment, contributing to an increase in the reliability of the assessment of the operational life of products and an increase in the level of environmental safety of the environment.

Development of mathematical models, algorithmic and software and hardware support for processing the results of signal registration in instruments and means of control and diagnostics in order to automate control and diagnostics, preparing them for implementation in digital information technologies

Technology Automation, appliances control And funds diagnostics, contributing to a reduction in labor intensity, an increase in the efficiency and reliability of assessing the operational life of products, and an increase in the level of environmental safety of the environment.

Scientific substantiation of methods for improving the reliability of instruments, control and diagnostic tools in the process of design, manufacture and operation based on data mining.

ABSTRACT OF SCIENTIFIC SPECIALTY

2.2.9. DESIGN AND TECHNOLOGY OF INSTRUMENT MAKING AND RADIO ELECTRONIC EQUIPMENT

Within the framework of the scientific specialty, the issues of designing devices and radio-electronic equipment of a wide functional purpose are considered, taking into account operational requirements. Industrial technologies for the manufacture of elements and assemblies of electronic equipment, their assembly, adjustment, and various types of tests are being studied. Attention is paid to modern CAD tools for design and technological purposes. A systematic analysis of the design and production cycle for the creation of electronic equipment is being carried out, taking into account modeling and field tests.

Scientific substantiation of new and improvement of existing methods for designing and manufacturing information-measuring instruments, monitoring and diagnostic systems, radio-electronic equipment and their elements on the basis of solving problems of ensuring the reliability of their work and the environmental safety of the environment.

Includes the following areas of research:

Development of new and improvement of existing functional, physical, physico-technological, physico-chemical, mathematical models of materials, devices, control and diagnostic systems, radio-electronic equipment, technological processes for their manufacture, corresponding technological equipment based on new physical, physico-technological and physico-chemical principles, with taking into account the solution of issues of ensuring their effective use, reliability, resistance to external influencing factors and environmental safety of the environment, capable of becoming the basis of algorithmic and software and hardware support for design, the possibility of its automation and implementation in digital information technologies.

Development, implementation, research of new, improvement of traditional materials and technological processes for their production for information-measuring instruments, control and diagnostic systems, radio-electronic equipment and their elements, ensuring efficient use, reliability, resistance to external influencing factors and environmental safety of the environment at stages design, manufacture and operation.

Development, research and implementation of new types of technological equipment for the manufacture of parts, assembly, adjustment, control and testing of devices, taking into account the solution of issues of ensuring their reliability, environmental safety and the possibility of implementation in digital information technologies.

Development and implementation of computer-aided design systems for technological processes and technological equipment for instrument-making production, taking into account the solution of issues of ensuring their effective use, reliability, resistance to external influencing factors and environmental safety, the possibility of implementation in digital information technologies.

Development and implementation of new methods and means of mechanization, automation, robotization and digitalization of instrument-making production, providing increased productivity, reduced labor intensity and increased production efficiency, taking into account the solution of issues of ensuring reliability, environmental safety of the environment and the possibility of implementation in digital information technologies.

Development of methods and equipment for technical diagnostics, performance prediction, resource assessment of devices and technological systems, taking into account the solution of issues of ensuring their effective use, environmental safety and the possibility of implementation in digital information technologies.

Development and research of methods and means of quality management and certification of instrument-making production, elements of quality systems, models and methods for ensuring quality management, taking into account the solution of issues of ensuring their effective application, reliability,

ecological safety of the environment and the possibility of implementation in digital information technologies.

ABSTRACT OF SCIENTIFIC SPECIALTY

2.2.11. INFORMATION-MEASURING AND CONTROL SYSTEMS

Scientific specialty includes the following directions research:

Scientific substantiation of advanced information-measuring and control systems, systems for their control, testing and metrological support, improving the efficiency of existing systems.

Study of possibilities and ways to improve existing and create new elements of the structure and samples of information-measuring and control systems, improve their technical, operational, economic and ergonomic characteristics, develop new principles of construction and technical solutions.

Mathematical, algorithmic, information, software and hardware of information-measuring and control systems.

Extension functional opportunities information and measuring and control systems based on the application of methods for measuring the controlled parameters of objects for various subject areas of research.

Scientific research on the use of new physical principles that provide the creation of promising methods and tools used in information-measuring and control systems.

Methods of analysis, diagnostics, identification and management of the technical condition of information-measuring and control systems, including using artificial intelligence technologies.

Methods and systems of software and information support for the processes of research and testing of samples of information-measuring and control systems, including using artificial intelligence technologies.

New methods and technical means of monitoring and testing samples of information-measuring and control systems.

Methods and technical means of metrological support for information-measuring and control systems, metrological support for testing and control, metrological support and metrological examination of information-measuring and control systems, methods for their metrological certification.

Airborne information-measuring and control systems of aircraft.

Measuring and computing aerospace complexes systems management aircraft.

Information-measuring complexes for testing rocket and space technology.

Optical and optoelectronic information-measuring and control systems and complexes.

Virtual and distributed information-measuring systems of technical control and diagnostics.

Information-measuring and control systems for unmanned vehicles, robots and robotic complexes.

Information-measuring and control television, radar and radio systems navigation systems.

ABSTRACT OF SCIENTIFIC SPECIALTY

2.2.13. RADIO ENGINEERING, INCLUDING SYSTEMS AND TV DEVICES

The scientific specialty covers the following areas of knowledge: radio circuits and signals; electrodynamics and propagation of radio waves; circuitry of analog electronic devices; digital devices and microprocessors; microwave devices and antennas; electronics; devices for generating and forming signals; devices for receiving and converting signals; computing devices and systems; radio engineering systems; statistical theory of radio engineering systems.

Includes the following areas of research:

Investigation of new processes and phenomena in radio engineering, which make it possible to increase the efficiency of radio engineering devices and systems.

Investigation of the phenomena of the passage of electromagnetic waves of various ranges through media, their scattering and reflection.

Development and research of new radio engineering devices and systems that improve the characteristics of accuracy, speed, noise immunity.

Development and research of devices for generating, amplifying, converting and synthesizing radio signals, image and sound signals in radio engineering devices and systems for various purposes, including television systems and devices. Creation of methods for their calculation and design principles.

Development and research of algorithms, including digital ones, for processing signals and information in radio engineering devices and systems for various purposes, including the synthesis and optimization of processing algorithms.

Development and research of methods and algorithms for processing signals and information in radio engineering devices and systems for various purposes, including radio television and communication systems, in the presence of interference in order to increase noise immunity.

Development and research of methods for ensuring electromagnetic compatibility of radio engineering systems and devices, including radio television and communication systems, methods for destroying and protecting information in these systems.

Development and research of radio engineering devices and information transmission systems, including radio relay and telemetry, including space ones, in order to increase their throughput, noise immunity and noise immunity.

Research and development of new television systems and devices, including television cameras, including those with IP interfaces, digital codecs, modems and other devices for transmitting and reproducing images and sound, as well as methods and algorithms for modulation, demodulation, encoding, decoding and restoration of images, including in photodetectors, and sound, in order to improve the quality of transmitted information and noise immunity.

Development and research of methods and devices for transmitting, receiving, processing, displaying, storing and distributing information, including space, on-air, cable and mobile video communications.

Development of promising information technologies, including digital ones, as well as using neural networks, for signal, image and speech recognition in intelligent radio engineering, robotic and other vision systems.

Development of methods for improving the clarity, color reproduction quality, absolute and contrast sensitivity of images generated and used in television systems.

Creation of the theory of synthesis, analysis and adaptation of radio engineering devices and systems, signal processing algorithms and information in these systems.

Development and research of modeling methods for radio engineering devices and systems, including high-definition, ultra-high-definition, ultra-high-definition digital television systems and other formats, for television broadcasting and special applications.

Development and research of physical, mathematical and hybrid simulation models of radio engineering devices and systems, including systems and devices of analog and digital television and optoelectronic devices.

Development of scientific And technical fundamentals design, design, production technology, testing, and certification of radio engineering devices and systems, including black-and-white, color, spectral-zonal, infrared, terahertz and multi-angle

television systems, passive and active surround television systems, including holographic ones.

Development of methods and devices for television measurements, including colorimetry, quantitative assessment of the quality of generated, transmitted and received information.

Development of radio engineering and television devices for use in industry, robotics, cosmonautics, astronomy, metrology, information and measurement technology, as well as for underground, underwater and other applications.

ABSTRACT OF SCIENTIFIC SPECIALTY

2.2.14. ANTENNAS, MW DEVICES AND THEIR TECHNOLOGIES

Within the framework of the scientific specialty, questions of the mathematical description of antennas and antenna arrays, phased array, microstrip antennas and a number of others, computer electrodynamic modeling of antennas are considered. Graduate students gain practical skills in designing microstrip and vibrator antennas with the help of professional application packages.

Includes the following areas of research:

Solving external and internal problems of electrodynamics for the analysis and synthesis of high-performance antennas and microwave devices, determining their maximum achievable characteristics, possible ways of construction, etc.

Study of the characteristics of antennas and microwave devices for their optimization and modernization, which makes it possible to master new frequency ranges, ensure electromagnetic compatibility, create highly efficient technology, etc.

Research and development of new antenna systems, active and passive microwave devices, including control, phasing, shielding and others, with significantly improved parameters.

Study of electrodynamic characteristics and dispersion properties of periodic and irregular structures, slow-wave systems, metamaterials, elements of radio photonics, development of antennas and microwave devices based on them with significantly improved parameters.

Research and development of microwave integrated circuits of new generations.

Finding rational ways to build antennas or antenna systems for new areas of radio emission use (production technologies, biology, medicine, etc.).

Development and research of new technologies for the production, tuning and operation of antenna systems.

Research and Development metrological ensure
design, production and operation of antenna systems and microwave
devices.

Research and development of adaptive and low-noise antenna systems, large high-gain antennas, active phased array antennas with ultra-high radiation powers, radio-optical antenna systems and antennas with unique characteristics.

Development of computer-aided design methods for optimization And of antenna systems and microwave devices of wide application.

Studies of the propagation of radio waves on various paths in natural and artificial environments and the influence of propagation conditions and the type of underlying surface on the characteristics of antennas.

Research and development of antenna systems and microwave devices for digital and intelligent wireless data transmission technologies associated with the support of high-speed mobile and mobile devices.

ABSTRACT OF SCIENTIFIC SPECIALTY

2.2.15. SYSTEMS, NETWORKS AND DEVICES OF TELECOMMUNICATIONS

Within the framework of scientific specialties, the fundamentals of the statistical theory of communication, the issues of coding sources and communication channels, the principles of multichannel communication, as well as the principles of building systems and telecommunications networks are studied.

Includes the following areas of research:

Development and improvement of modeling methods	And network design, systems	research, and devices
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telecommunications.

The study of new technical, technological and software solutions that improve the efficiency of the development of digital networks, systems and telecommunications devices.

Study of the processes of presentation, transmission, storage and display of analog, digital, video, audio, holographic and multimedia information; development and improvement of appropriate algorithms and procedures.

Development of effective ways to develop and improve the structure, architecture of networks and telecommunications systems, including their constituent elements.

Study of ways to improve the management of information flows.

Development and development of new methods of subscribers' access to the resources of telecommunications networks, systems and devices.

Study of the problems of building, planning and designing networks of the fifth and subsequent generations as the basis for creating an effective digital economy and the development of telecommunication systems and devices for these networks.

Study of the problems of building, planning and designing high-density and super-dense networks to ensure the implementation of Internet of Things applications and the development of telecommunication systems and devices for these networks.

Study of the problems of building, planning and designing networks and systems with ultra-low latency to ensure the implementation of applications of the Tactile Internet and the development of systems and telecommunications devices for these networks.

Study of the problems of building, planning and designing software-defined networks and the development of telecommunication systems and devices for these networks.

Study of the problems of building and planning networks for unmanned vehicles, including for unmanned aerial vehicles and unmanned vehicles, and the development of telecommunication systems and devices for these networks.

Investigation of communication resource distribution methods for edge and fog computing, as well as for traffic offloading to ensure the efficient functioning of modern telecommunications networks.

Research on effective ways to support and apply blockchain technology in modern telecommunications networks. Development of telecommunication systems and devices for its implementation on these networks. Study of ways to improve the management of information flows.

Study of the influence of the ballistic configuration of satellite communication systems on the performance indicators of telecommunications, improvement of the space-time distribution of satellites in orbits.

Research and development of new signals, as well as corresponding modems, codecs, multiplexers and selectors, providing high reliability and quality of information exchange under the influence of external and internal interference.

Research, improvement and development of new principles for the organization of databases and knowledge, as well as methods for their design in networks, systems and telecommunications devices.

Research and development of new methods for protecting information and ensuring information security in networks, systems and telecommunications devices.

Development of scientific and technical foundations for creating telecommunications networks, systems and devices and ensuring their effective functioning.

Development of methods for the effective use of telecommunications networks, systems and devices in various sectors of the national economy in a digital economy.

Development of methods combining telecommunications, measuring and control systems.

ABSTRACT OF SCIENTIFIC SPECIALTY

2.2.16. RADIOLOCATION AND RADIONAVIGATION

Within the framework of the scientific specialty, methods of statistical theory of signal processing in radio systems and radio devices are studied, as well as methods for synthesizing optimal algorithms and signal processing structures, as a theoretical basis for studying all radio engineering systems and devices. Radio engineering systems for various purposes are also considered.

Includes the following areas of research:

Investigation of new phenomena and processes in radio electronics and radio physics, allowing to increase the efficiency of systems and devices of radar and radio navigation.

Investigation of scattering and reflection by objects of radio waves of various ranges.

Development and research of new methods and principles of radar and radio navigation, allowing to increase the efficiency of radar and radio navigation systems.

Development and research of radar and radio synthesis and analysis navigation systems and devices.

Synthesis and analysis of signal and information processing algorithms in radar and radio navigation systems and devices.

Development and research of devices for generating, amplifying, converting radio signals and processing radio signals and information in radar and radio navigation systems and devices. Creation of methods for their calculation and design principles.

Development and research of new radar systems and devices in order to increase the range, accuracy and resolution, increase noise immunity and noise immunity, increase speed.

Development and research of radio navigation systems and devices, including space ones, in order to improve the accuracy of location and angular orientation of objects in space, noise immunity and noise immunity, the efficiency of object management and the widespread use of radio navigation devices in the national economy.

Development and research of methods and algorithms for complex processing of signals and information of radar, radio navigation, radio communication systems, radio control systems and other systems.

Development and research of methods for integrating systems and devices of radar and radio navigation with other signal and information sensors, as well as signal and information processing algorithms in integrated systems.

Development and research of new information technologies, including digital ones, for detecting, recognizing and tracking objects in radar systems and devices using pattern recognition methods, including artificial neural networks.

Development and research of promising information technologies, including digital ones, as well as using neural networks for processing signals and information in radio navigation systems, including space ones.

Development and research of methods and algorithms for processing radio signals and extracting information from them when exposed to interference.

Development and research of noise-immune systems and devices in radar and radio navigation systems.

Development and research of methods for protecting and destroying information in radar and radio navigation systems.

Development and research of radio engineering systems and devices for special purposes, including for radio monitoring and electronic warfare.

Development and research of information transmission channels in multi-position radar and radio navigation systems.

Development and research of radio electronic devices for displaying and storing information.

Development and research of methods of mathematical and computer modeling of radar and radio navigation systems.

Development and research of physical, mathematical and hybrid simulation models of radar and radio navigation systems and devices.

Development scientific And technical fundamentals design, design, production technology, testing and certification of radar and radio navigation devices and systems.

ABSTRACT OF SCIENTIFIC SPECIALTY

2.3.1. SYSTEM ANALYSIS, MANAGEMENT AND PROCESSING INFORMATION

Provides for the study of the problems of development and application of methods of system analysis of complex applied research objects; information processing; modeling, optimization, improvement of management and decision-making, in order to increase the efficiency of the functioning of research objects. The principles of human impact on the objects of research, human management of objects of research using modern methods of information processing are also considered.

Includes the following areas of research

Theoretical foundations and methods of system analysis, optimization, management, decision making, information processing and artificial intelligence.

Formalization and problem setting of system analysis, optimization, management, decision making, information processing and artificial intelligence.

Development of criteria and models for describing and evaluating the effectiveness of solving problems of system analysis, optimization, management, decision making, information processing and artificial intelligence.

Development of methods and algorithms for solving problems of system analysis, optimization, control, decision making, information processing and artificial intelligence.

Development of special mathematical and algorithmic support for systems of analysis, optimization, control, decision making, information processing and artificial intelligence.

Methods for identifying control systems based on retrospective, current and expert information.

Methods and algorithms for structural-parametric synthesis and identification of complex systems.

Set-theoretic and information-theoretic analysis of complex systems.

Development of problem-oriented control systems, decision-making and optimization of technical objects.

Methods and algorithms for intellectual support in making managerial decisions in technical systems.

Methods and algorithms for forecasting and evaluating the efficiency, quality, and reliability of complex control systems and their elements.

Visualization, transformation and analysis of information based on computer methods of information processing.

Methods for obtaining, analyzing and processing expert information.

Development of fundamentally new methods of analysis and synthesis of elements of control systems in order to improve their technical characteristics.

Theoretical analysis and experimental study of the functioning of elements of control systems in normal and special conditions in order to improve the technical, economic and operational characteristics.

ABSTRACT OF SCIENTIFIC SPECIALTY

2.3.5. MATHEMATICAL AND SOFTWARE FOR COMPUTING SYSTEMS, COMPLEXES AND COMPUTER NETWORKS

Provides for the study of materials on the mathematical foundations of programming; computing systems, systems and networks; programming languages and systems; software development technologies; operating systems; methods of data storage and access, organization of databases and knowledge; protection of data and software systems.

Includes the following areas of research:

Models, methods and algorithms for designing and analyzing programs and software systems, their equivalent transformations, verification and testing.

Programming languages and programming systems, program semantics.

Models, methods, algorithms, languages and software tools for organizing the interaction of programs and software systems.

Database and knowledge management systems. Symbolic computing software systems. OS.

Human-machine interfaces; models, methods, algorithms and software for computer graphics, visualization, image processing, virtual reality systems, multimedia communication.

Models and methods for creating programs and software systems for parallel and distributed data processing, languages and tools for parallel programming.

Models, methods, algorithms and software infrastructure for organizing globally distributed data processing.

Quality assessment, standardization and maintenance of software systems

ABSTRACT OF SCIENTIFIC SPECIALTY

2.3.7. COMPUTER SIMULATION AND AUTOMATION DESIGN

The discipline provides for the study of the evolution of ideas about the processes of modeling and computer-aided design of complex technical objects and technologies that make up the core of the scientific and technological base of a post-industrial society. The methodology of research design of science-intensive products and a set of tools used in the life cycle of the development of artificial objects, united by a cognitive approach to the creation, are described.

not yet existing product with properties partially unknown at the time of development.

Includes the following areas of research

Methodology of computer modeling and computer-aided design in engineering and technology, including the formulation, formalization and typification of design and technological procedures, algorithms and design processes.

Development of scientific fundamentals of creation of architectural systems automated design (CAD) and automation of technological preparation of production (ASTPP.)

Development of scientific foundations for building a complex of CAD tools, including information, mathematical, linguistic, methodological, technical, software for continuous information support of the life cycle of designed objects.

Development of fundamentally new and improving the efficiency of existing methods and means of interaction between the designer and the system, including computer models and artificial intelligence technologies.

Development of scientific, competence-oriented foundations for teaching automated design of technical objects as part of project engineering teams.

Development of computer models, algorithms, software systems for the optimal design of technical products and processes.

Development of methods and computer models for processing and forming design solutions, including recognition of textual and graphic information using modern technical support tools (3D scanners, 3D printers, additive technologies).

Development of simulation computer models for evaluation and testing of technical, economic, environmental characteristics of technical design objects.

Development and implementation of new methods and computer models for the synthesis of analysis and graphic visualization of complex technical design objects, including virtual (VR) and augmented reality systems.

Development of scientific fundamentals of implementation of vital cycle design - production - operation - disposal, building integrated tools for managing design work and unifying application protocols for information support.

ABSTRACT OF SCIENTIFIC SPECIALTY

2.3.8. COMPUTER SCIENCE AND INFORMATION PROCESSES

Provides for the study of basic and applied information technologies, processes, their characteristics and models. It also describes how to present data, information, knowledge; general information about bases

data: data classification, data management; methodology and implementation of data warehouses.

Includes the following areas of research:

Development of computer methods and models for describing, evaluating and optimizing information processes and resources, as well as tools for analyzing and identifying patterns based on the exchange of information by users and the capabilities of the software and hardware used.

Technical support of information systems and processes, including new technical means of collecting, storing, transmitting and presenting information. Complexes of technical means that ensure the functioning of information systems and processes, the accumulation and optimal use of information resources.

Development of methods and algorithms for coding, compression and placement of information to improve the efficiency and reliability of the functioning of infocommunication systems during its storage and transmission.

Development of methods and technologies for digital processing of audiovisual information in order to detect patterns in data, including the processing of text and other images, video content. Development of methods and models for recognition, understanding and synthesis of speech, principles and methods for extracting the required information from texts.

Linguistic support of information systems and processes. Methods and tools for designing data dictionaries, indexing and information retrieval dictionaries, thesauri and other lexical complexes. Methods of semantic, syntactic and pragmatic analysis of textual information for presentation in databases and organization of interfaces of information systems with users.

Provision of information systems and processes, applications information technologies and systems in decision-making at various levels of management. General principles and foundations for organizing information services and electronic libraries.

Development of methods for processing, grouping and annotating information, including information extracted from the Internet, for decision support systems, intelligent search, and analysis.

Development of decision-making systems based on databases and knowledge that implement simulation models for predicting changes in material processes and events.

Development of architectures for software and hardware systems supporting digital technologies for collecting, storing and transmitting information in infocommunication systems, including using "cloud" Internet technologies and evaluating their effectiveness.

Research and development of requirements for software and hardware of modern telecommunication systems based on computer technology.

Development of organization principles and technologies for the implementation of database and knowledge management systems, creation of specialized

information systems for managing text, graphic and multimedia databases. Creation of data description languages, data manipulation languages, query languages.

Development of technologies for extracting and analyzing information in large databases, including using the concept of multidimensional representation (OLAP) and data mining (Data Mining) of static and real time, implementation of knowledge base models. Development and application of methods for pattern recognition, cluster analysis, neural network and fuzzy technologies, decision rules, soft calculations in the analysis of heterogeneous information in databases. Development and research of the principles of organization and functioning of distributed information systems and databases, application protocols of information networks, data presentation formats and information retrieval languages in distributed information resources.

Development of new Internet technologies, including tools for searching, analyzing and filtering information, including methods and technologies that ensure a safe Internet.

Automated information systems, resources and technologies by areas of application (scientific, technical, economic, educational, humanitarian fields of activity), formats of processed, stored information. Systems for making group decisions, systems for designing objects and processes, expert systems, etc.

Development of methods for ensuring reliable processing of information and ensuring the noise immunity of information communications for the purposes of transmission, storage and protection of information; development of the foundations of the theory of reliability and safety of the use of information technologies. Development of infocommunication technologies for the implementation of the concept of the Internet of things.

ABSTRACT OF SCIENTIFIC SPECIALTY

2.5.22. PRODUCT QUALITY MANAGEMENT.

STANDARDIZATION.

ORGANIZATION OF PRODUCTION

The objectives of mastering the discipline "Management of product quality. Standardization. Organization of production" are the formation of knowledge about the scientific, methodological and organizational and technical foundations of standardization and quality management of products and services, training in the development and application of regulatory documents to ensure the quality of processes, products and services.

Includes the following areas of research:

Methods of analysis, synthesis and optimization, mathematical and information models of the state and dynamics of quality management and production organization processes.

Scientific and practical foundations technical regulation, standardization, typification, cataloging, metrological support, quality management and conformity assessment.

Scientific bases and improvement of methods of standardization and quality management (control, management, provision, improvement, quality planning) of objects and services at various stages of the product life cycle.

Innovation at development, development, digitalization of systems quality management (QMS) of enterprises and organizations.

Methods for assessing the quality of objects, standardization and quality management processes.

Methods of standardization and quality management in CALS-technologies, automated, digital production systems.

Scientific basis of risk management and prevention of inconsistencies in technical and organizational systems.

Development of scientific and practical statistical tools for quality management.

Development and improvement of scientific tools for assessing, monitoring and predicting the quality of products and processes.

Scientific and practical development of methods for consumer assessment of the quality of products and services for high-tech industries of production and service.

Creation and development of management systems, including integrated ones (IMS) based on ISO 9001, ISO 14001, ISO 45001 and related industry international and domestic standards.

Scientific and practical improvement of directions for confirming the conformity of products (services), quality systems, industries.

Scientific foundations of digital, automated integrated systems for managing production and quality of work based on technical regulations and standards.

Development of the main provisions and content of Total Quality Management (TQM), and other concepts of quality management.

Scientific and practical development of engineering management tools, organization of production systems, as well as knowledge bases.

Modeling and optimization of organizational structures and production processes, auxiliary and service industries. Expert systems in the organization of production processes.

Development and scientific and practical development of tools for lean production, synchronization in production systems, optimization of processes and jobs.

Development of scientific, methodological and system engineering principles for improving the efficiency of functioning and the quality of organization of production systems.

Development and implementation of the principles of production management, including the preparation and improvement of forms of management and organization of production.

Analysis And synthesis organizational and technical solutions. Standardization, unification and typification of production processes and their elements.

Development theoretical fundamentals And practical applications organizational and technological reliability of production processes. Assessment of the level of reliability, adaptability and sustainability of production.

Development of methods and means of organizing production under the conditions of organizational, managerial, technological and technical risks.

Development and improvement of methods and means of planning and managing production processes and their results.

Development and improvement of methods and models of organization of production to solve the problems of fire, industrial and environmental safety.

Development of description models, methods and algorithms for solving problems of designing production systems, organizing production and making managerial decisions in the digital economy.

ABSTRACT OF SCIENTIFIC SPECIALTY

2.6.6. NANOTECHNOLOGIES AND NANOMATERIALS

Discipline "Nanotechnologies and nanomaterials" theoretical and practical aspects of obtaining, processing and application of nanoparticles, nanosystems, nanostructures and nanomaterials

Includes the following areas of research: Technological methods for obtaining nanomaterials, composite structures, low-dimensional structures, devices and integrated devices based on them.

Structural, morphological And mechanical properties nanomaterials and composite structures based on them.

Atomic-molecular construction, self-organization, topologically oriented, biofunctionalized, (self-adapting) biomimetic, nanostructures and nanomaterials energy harvesting and adaptive

Atomic clusters and nanostructures on the surface. Interfaces in nanomaterials and composite structures.

Electronic transport in nanomaterials and composite structures.

Optical and photoelectric phenomena in nanomaterials and composite structures.

Magnetic properties of nanomaterials and composite structures.
Superconducting properties of nanomaterials and composite nanostructures.

Modeling of properties, physical phenomena and technological processes in nanomaterials and composite structures.

Development and research of the physical principles of operation, creation of new and improvement of traditional devices and devices of solid-state electronics, micro- and nanoelectronics products, devices and devices based on quantum effects, based on nanomaterials and nanostructures.

Diagnostics of nanomaterials and nanostructures.

Methods for studying nanomaterials and composite structures. Atomic and molecular nanostructures with controlled charge transfer.

ABSTRACT OF SCIENTIFIC SPECIALTY

5.2.2. MATHEMATICAL, STATISTICAL AND INSTRUMENTAL METHODS IN ECONOMY

The discipline "Mathematical, Statistical and Instrumental Methods in Economics" is devoted to the study of the theoretical and practical foundations of methods and models for processing economic information in relation to the tasks of informatization of corporate resource management. The study of the discipline will allow organizing the process of building modern means of support and decision-making on the effectiveness of the enterprise.

As a result of studying the discipline, students acquire knowledge in the field of analysis and prediction of the behavior of complex dynamic objects of various corporate architectures using the process management principle and parallel resource engineering.

Directions of research: Theoretical and
methodological mathematical, statistical and questions applications
instrumental economic research. methods in

Development and development of mathematical models for the analysis and forecasting of economic processes.

Development and evaluation of calculation models of general economic equilibrium.

Input-output models.

Game-theoretic models in economic research. Development and development of mathematical methods and models of the global economy, intersectoral, interregional and intercountry socio-economic analysis.

Computer methods and programs for modeling economic processes. Simulation modeling.

Development and evaluation of simulation models of economic processes. Econometric and Statistical Methods of Data Analysis and Hypothesis Testing in Economics.

Big Data Analysis Methods in Economic Research. Experimental methods in economic science. Laboratory and "field" experiments, interpretation of their results.

Development and application of tools for developing decision support systems in the field of economic policy and ensuring national interests.

Development and application of tools for designing, developing and maintaining information systems in the interests of economic entities.

ABSTRACT OF SCIENTIFIC SPECIALTY

5.2.3. REGIONAL AND SECTORAL ECONOMY

Scientific specialty includes the following directions research (by specialization):

Regional economy

Theories of spatial and regional economics. Spatial distribution of economic resources. Spatial organization of the national economy. Economic zoning.

Regional economic development.

Problems of regional socio-economic differentiation. Regional and local markets.

Regional economic policy.

Economics of federal relations. budgetary federalism. Special economic and legal regimes of regional and local development.

Evaluation of the effectiveness of regional economic policy in the Russian Federation, federal districts, subjects of the federation and municipalities.

Tools and methods for assessing the prospects for the development of regional economic systems.

Economics of industry.

Theoretical and methodological foundations for the analysis of industrial development problems.

Resource base for industrial development. Regularities of functioning of the industry. And development industries

Formation and functioning of markets for industrial products.

Competitiveness of manufacturers of industrial products.

ABSTRACT OF SCIENTIFIC SPECIALTY

5.2.4. FINANCE

The scientific specialty covers a range of basic theoretical and practical issues in the field of the modern financial system, the management of state and municipal finances, the finances of business entities and households, the functioning of the securities market and the foreign exchange market, and relations arising in the financial and credit sphere.

Includes the following areas of research:

Theoretical and methodological foundations of financial research.

Financial services: types, specifics, functions in the economic system.

Credit and its role in the economic system. Banks and banking activity. Banking system.

Banking supervision system and its elements. Methods for the implementation of banking supervision.

non-banking financial institutions.

Valuation of financial assets. Portfolio management of financial assets. Investment decisions in the financial sector.

Public finances and their levels (national, regional, municipal).

Conceptual bases of interbudgetary relations and budgetary regulation.

Government revenue and spending.

Treasury and treasury system of budget execution. Functional and economic structure of the budget classification. Tax administration and budgetary control.

Evaluation of the effectiveness of public spending. Tax potential of regions and municipalities. Corporate Finance.

Financial strategy of corporations. Financial management.

The system of financial control in corporations: content, forms, methods and tools for implementation.

Household finances.

financial literacy.

Financial instruments and operations with them.

Financial markets: typology, specifics, features of functioning.

Crises in financial markets, their causes, consequences and possibilities for prevention.

Regulation of financial markets.

Monetary and financial operations. Currency markets, their functioning and regulation.

The market of insurance services and its regulation. The role and functions of money in the economic system. Monetary system and mechanisms of monetary circulation. Money supply and demand. Money issue. Inflation. Monetary policy in the Russian Federation and abroad. Criteria and methods for improving the effectiveness of monetary policy.

Forecasting the development of financial and currency markets. New technologies in the financial sector, their impact on the state of the financial services markets.

ABSTRACT OF SCIENTIFIC SPECIALTY

5.2.6. MANAGEMENT

The scientific specialty covers the range of basic theoretical and practical issues of management for the analysis and reasonable solution of modern socio-economic problems of society, effective management of organizations in various industry sectors, taking into account international experience.

Includes the following areas of research:

The science of management and its development. Modern directions of theoretical and methodological developments in the field of management. Theory of management.

History of managerial thought.

Historical development of control systems. Comparative analysis of control systems in various socio-cultural and political environments.

The essence, structure and distinctive features of the system of public (state and municipal) management, the main trends and directions of its development.

State policy, mechanisms, methods and technologies for its development and implementation. Features of the development and implementation of state policy in the economic and social spheres.

Results management. System and mechanisms of responsibility in the field of public administration.

Management of economic systems, principles, forms and methods of its implementation.

Organization as an object of management. Theoretical and methodological foundations of organization management. Functional content of management. Organization management structures.

Organizational behavior, socio-psychological aspects of management. Leadership in the organization. Conflict Management. Organizational culture.

Corporate Governance. Forms and methods of corporate control. Company value management.

Corporate social environmental responsibility. Social And responsibility of business.

Strategic management, methods and forms of its implementation.

Management of the organization in the context of international business.

Organization and management of an international company. International business strategies.

Human resource management. The essence of economic and social tasks of personnel management of enterprises and organizations.

International aspects in the field of personnel management.

Problems of cross-cultural interaction and management of cross-cultural teams.

Management consulting: content, forms and methods. Theory and practice of management of non-profit organizations. Theory and practice of anti-crisis management of the organization. Development of anti-crisis management models.

Formation, training and development of management personnel.

Management of career and professional promotion of managerial personnel.

Stimulation of the work of managerial personnel.

ABSTRACT OF SCIENTIFIC SPECIALTY

5.4.4. SOCIAL STRUCTURE, SOCIAL INSTITUTIONS AND PROCESSES

Discipline considers scientific schools, theoretical methodological foundations in the field of social phenomena and processes in the context of a holistic view of society and correlates them with a broad picture of historical development. The features of modern theoretical sociological knowledge, the content of the general sociological theory are discussed, and possible prospects for scientific research are determined.

Includes the following areas of research:

Social structure and social stratification. Criteria of social stratification.

Methodological approaches to the study of social structure. One-dimensionality and multidimensionality of stratification.

Factors of change in social stratification Processes of layerstructures. formation, their objective and subjective definition. Group social distance.

Theories of social differentiation/integration. Criteria of social differentiation. New grounds for the segmentation of the social structure.

Formation of civil society in Russia, its elements and structure.

Social inequality, main indicators, factors and trends. Formation of new social - group communities, their interaction and hierarchy.

Dynamics and adaptation social groups And layers V transforming society.

Middle class and problems of its formation. Rich and poor groups of the population.

Features of the formation and dynamics of socio-demographic, socio-ethnic, gender groups of the population.

Age cohorts in the system of social and structural relations. Youth as a social group. Features of the social status, consciousness and behavior of different groups of young people. Problems of social development of youth.

Children as a social group. Social problems of childhood. Social institutions, their types, functions and dysfunctions. The role of social institutions in the transformation of the social structure.

Health and a healthy lifestyle in changing the social structure. Factors of health and ill health of different social groups.

Social processes in a changing social reality. Social mobility, its main directions and types. Social mobility as a factor in changing the social structure. Processes of social organization and self-organization of various population groups.

The processes of digitalization, virtualization, networking in modern society.

Processes of socialization and education.

social identification. Types of identification behavior. Social factors and mechanisms of spatial transformations. Territorial communities in the social structure.

The main procedures for the study of the socio-stratification structure:

- analysis of state statistics materials;
- use of historiographic methods;
- secondary analysis of sociological research materials;
- questionnaire survey of the population;
- survey of experts;
- multidimensional analysis of sociological information;
- theoretical analysis of empirical information.

ABSTRACT OF SCIENTIFIC SPECIALTY

5.2.2. POLITICAL INSTITUTIONS, PROCESSES, TECHNOLOGIES

The purpose of the discipline is the comprehensive preparation of graduates who have fundamental knowledge in the field of political science and regional studies, who have universal, general professional and professional competencies of a researcher and teacher to pass a candidate exam on the subject and content of the research work prepared during the training.

Includes the following areas of research:

Politics as a sphere of public life: the structure and functions of politics.

Ontological, morphological and procedural parameters of politics, current trends in its evolution.

Political power: nature, essence and functions, legitimacy. Power process and political institutions.

Mechanisms and technologies of traditional and digital politics: forms and levels of organization.

Political behavior and participation: articulation, aggregation of interests, forms of mobilization.

Political system and political regimes: structure, functions, types and varieties.

Civil Society: Trends in Evolution, Prospects for Development and National Models.

Political institutions: formation, development and modern transformations.

State as a political institution: structure, functions, types and varieties.

Territorial and political forms of organization of the state. Regional dimension of politics and political management. The evolution of party and electoral systems: modern models of political representation.

Election campaigns, electoral cycles and electoral technologies.

Political process: essence, sources, structure, social foundations and environmental factors.

Psychological aspects of political processes.

Processes and mechanisms of political perception. political consciousness.

Political change and development. Political reforms and revolutions.

Models of political modernization.

Globalization, networkization and digitalization: political aspects.

Mechanisms and technologies for managing political changes.

Ethnopolitical processes And conflicts. National state, national-territorial, national-cultural self-determination.

Political class and political elite: structure, properties, functions and dynamics.

The role and functions of political leadership. Psychological profiles of leaders.

Political archetypes, symbols and myths. National mentality and political culture.

Political socialization: institutions, factors and agents. Social and political conflicts: causes, factors, types and technologies of regulation.

Directions and forms of transformation of political ideologies.

Political identity: essence, types, structure. Mechanisms of political identification of the individual and social groups.

Information processes and communications political management: traditional media, social media and networks.

Political technologies and the specifics of their application.

Stages, mechanisms and technologies for making political decisions, criteria for their effectiveness.

Political risks: models and technologies of management.

Strategic management, political forecasting design of political And institutions and processes.

ABSTRACT OF SCIENTIFIC SPECIALTY

5.7.1. ONTOLOGY AND THEORY OF KNOWLEDGE

The discipline contains an analysis of problems relevant to ontology and the theory of knowledge, a review of modern ontological and epistemological concepts and approaches in the focus of philosophical reflection. The problematic approach and emphasis on topical issues forms a system of knowledge in the field of ontology and epistemology among students and shows the prospects for their influence on social structures, the natural environment surrounding a person and the person himself.

Includes the following areas of research: Patterns of formation and development of ontology and theory of knowledge.

Methodological functions of ontology and theory of knowledge in the development of modern science and technology, in the processes of creativity in various fields of activity.

Changing the ratio of ontology, epistemology (epistemology) and methodology of knowledge with the progress of scientific and philosophical worldview and

development of philosophical, methodological and social foundations of modern science and technology.

The structure of being, reality, existence and its ontological criteria; correlation of objective, subjective, actual and virtual reality.

Modern understanding of substantiality; substance and its attributes (accidents), systemic and structural organization of substance, forms of movement and energy in the world, abstract entities and real objects.

Various interpretations of being and being in philosophy Material, spiritual and ideal in natural and social phenomena; forms of idealization and abstraction in the sciences and computer representation of idealized models. Features of the activity approach to cognition.

Modern understanding of the substantial organization of the world. The relationship of the structural levels of substance in the micro-, macro- and mega-world, the laws of system organization at different levels.

Modern methods of theoretical substantiation of the concept of infinity of the world.

Ontology of space and time, their universal and local properties, as well as modifications of these properties in the microcosm and megaworld, in biological and social systems.

Forms of self-organization and development of a substance, the emergence of life in the Universe, taking into account the achievements of astrophysics, synergetics, systems theory, biochemical evolution and the concept of extraterrestrial civilizations, the development of the biosphere and the formation of the noosphere.

The systemic nature of various forms of development in the world, their specific laws in inorganic and living nature, as well as in society, the features and results of development at different structural levels.

The ratio of ascending and descending forms of development in the world, their various directions, internal laws, driving factors and external conditions for their implementation.

Basic forms and laws of determination in the development of systems; the relationship of causal, structural, systemic, functional, informational and other forms of determination, dynamic and probabilistic-statistical laws.

Patterns of formation and renewal of philosophical categories and general scientific concepts in the field of ontology and epistemology, in the processes of differentiation and integration of fundamental and applied sciences.

The problem of unification of the categorical language and the meaning of general scientific concepts in connection with the integration and differentiation of sciences, the computerization of research and the formation of new artificial languages and program orientations.

The methodological role of scientific ontology and epistemology in the development of the philosophical foundations of modern science, engineering and technology, as well as in the integration of various philosophical disciplines and trends.

Theoretical analysis of new ontological and epistemological concepts in modernized theology, existential philosophy, in variations of teleology and eschatology.

New approaches to solving the problems of the cognizability of the world, its accessible and inaccessible areas, in the implementation of the continuity, objectivity and adequacy of knowledge, its expanding practical applications and used cognitive practices.

Levels of information activities brain, consciousness And
cognitive-regulatory systems of man, their ontogeny, phylogenesis and changes in life cycles.

Ontology of consciousness. The mind-body problem.

Ontology of the spiritual world.

Consciousness, language and things.

The problem of the unconscious and subconscious in cognition in relation to conscious thinking, operational and potential memory, verbal and non-verbal forms of thinking.

Modern understanding of intuition and its connection with formalized types of evidence, types of intuitive creativity and productive imagination.

epistemological And technical Problems development
artificial intelligence, improvement information and
intelligent systems on a local and global scale.

Scientific criteria of rationality in opposition to irrational and irrational-mystical concepts; historical evolution of forms and reality and their prospects.

Modern understanding of the relationship between the empirical and theoretical levels of knowledge, their mutual influence, the theoretical justification of complex experiments and observations, as well as the explanation of empirical factors.

Patterns and stages of the formation of scientific theories, their substantiation and expansion of areas of applicability; changing the criteria of truth, adequacy and practical effectiveness of theories, their continuity in a consistent approximation to reality.

Skepticism and the knowability of the world, the problem of relativism in modern epistemology.

Ontological status of philosophical and scientific faith. Modern
epistemology of humanitarian knowledge. Modern forms of
observational, experimental production and technical research And
based on computer simulation in successive approximations to the
solution of theoretical and practical problems.

The relationship of old and new theories in development, the degree of their continuity and correspondence, consistent generalization and justification in evolutionary development and in the content of scientific revolutions. 29. Patterns, driving forces and possible limits of differentiation and integration of sciences; prospects for methodological integration through the development of ontological and epistemological foundations of sciences, the development of information social systems.

Problems of selecting objectively valuable and obsolete information, increasing the information capacity of theories, consistent substantiation and functional generalization of their laws and principles.

The specificity of the criteria for the truth of knowledge in the natural, humanitarian, social and technical sciences, the correlation of truth, value and practical effectiveness of knowledge, a plausible, probable and reliable explanation of complex processes and systems.

Mechanisms and successive stages of creativity in achieving fundamentally new solutions in science, technology and art; the ratio of artistic creativity in literature and various genres of art.

Methodology for forecasting unknown and future phenomena, developing step-by-step forecasts, plans and programs through the selection of alternative and most optimal development options.

The ratio of philosophical, general scientific and practical methods of cognition and creativity, their progress and integration into system-structural studies.

The specifics of individual, collective and social cognition and creativity in the modern era; a change in the subject of cognition in relation to increasingly complex objects and processes.

Theoretical analysis of modern foreign concepts of epistemology.

prospects development And mutual enrichment ontology,
epistemology and methodology of knowledge in the progress of science and technology, as well as means of information support.

Social ontology of historical development and social functioning.
Ontological foundations of social determinations and transformations.

Dialogue of cognitive practices.

ABSTRACT OF SCIENTIFIC SPECIALTY

5.7.6. PHILOSOPHY OF SCIENCE AND TECHNOLOGY»

The discipline contains an analysis of problems relevant to the philosophy of science and technology, an overview of modern concepts of the philosophy of science and the philosophy of technology, and reveals the concepts of science and technology as a special object for philosophical reflection. Problematic approach and emphasis on

topical problems forms a system of knowledge in the field of philosophy of science and technology and shows the prospects for their influence on social structures, the natural environment surrounding a person and the person himself.

Includes the following areas of research: Worldview and methodological role of philosophy in the formation and development of science, engineering and technology.

The relationship of philosophy, science, engineering and technology in the process of historical development of scientific and technological progress in modern conditions in the context of the relationship of scientism and anti-scientism.

Basic concepts of modern philosophy of science.

The significance of social factors for the progress of science, engineering and technology in terms of the relationship between externalism and internalism.

Epistemological prerequisites for the emergence of trends and concepts and paradigms in modern science, engineering and technology.

The role and importance of modern science, engineering and technology for the development of society and the human personality.

The significance of the achievements of individual sciences, techniques and technologies for the formation of new ideas and teachings in philosophy.

The role of technology, technology and technical knowledge in the development of science.

The role of scientific achievements in the formation of various types of scientific pictures of the world at different stages of the historical development of society.

Analysis of the main trends in the development of modern science and technology.

Philosophy and style of thinking of a scientist.

Dynamics of relationships between different fields of science at different stages of its development in modern conditions.

The problem of leadership in modern science. Science as a social institution.

Logic, driving factors and models of science development. Continuity and innovation in the development of science, engineering and technology.

Scientific schools and their role in the development of science.

The essence and causes of scientific revolutions and their role in the development of science and technology. Classical and non-classical science. Scientific rationality and features of its evolution.

The role of individual philosophical trends, schools and philosophers in the development of scientific knowledge.

Significance of the discoveries of outstanding scientists for the development of philosophy. The relationship of the humanities, natural sciences and technical sciences in the history of society and in modern conditions.

Humanization and humanitarization of modern science and technology. Trends in the development of modern science and technology as a direct productive force of society.

Analysis of the relationship between "scientism" and "anti-scientism" and the role of science in the life of modern society and the individual.

The specificity of the subject of the philosophy of science and technology as a special section of philosophy.

Philosophy of technology as a philosophical understanding of engineering and technical knowledge.

Convergence of natural-science, scientific-technical and social-humanitarian knowledge in the light of NBICS-technologies.

Scientific picture of the world as a value-worldview form of knowledge. The logic of scientific discoveries and their reception.

Analysis of the specifics and relationships of scientific and extra-scientific knowledge in the history of knowledge and in modern conditions. Features of the scientific criterion.

Philosophical aspects of the relationship between mathematics, science and technology. Philosophical and methodological aspects of informatics and informatization of society. Philosophical problems of artificial intelligence.

Philosophical analysis of contemporary ecological situations. The relationship of the sociosphere, technosphere and biosphere.

Philosophical meanings in probabilistic-statistical regularities in the structure of scientific knowledge.

System approach and philosophy.

Philosophy and modern cognitive research. Philosophy, synergetics and the concept of global evolutionism. Valuable aspects of scientific knowledge.

The nature and structure of scientific discussions. Ethos of scientific activity. The role of methodological concepts in understanding the main stages of the history of science.

Dialectics of fundamental and applied scientific research.

ABSTRACT OF SCIENTIFIC SPECIALTY

5.7.7. SOCIAL AND POLITICAL PHILOSOPHY

The purpose of the study is the knowledge and use of the basic laws of the development of society. The content of the discipline includes: A. Toynbee's civilizational concept of the development of history. The formational concept of the development of society by K. Marx. Concepts of V. McNeil and V. Green. Structuring the world system according to Wilkinson, Frank, Gills and Modelski. I. Wallerstein's concept of historical time-space. Concepts of growth stages by V. Rostow, D. Bell, E. Toffler

Includes the following areas of research: Conceptual status of social philosophy. The subject and structure of social philosophy.

The problem of method in social philosophy. Methodological functions of social philosophy in the system of modern social science. "Crisis of fragmentation" of modern social science and ways to overcome it.

The main stages in the development of socio-philosophical thought. Social philosophy in the modern world. Incentives for Philosophical Reflection at the Beginning of the 20th Century.

Essence and existence are the subject of forming reality. How problem of social philosophy.

Socio-philosophical theory of activity. Activity as a substantial basis of people's social life.

The problem of subject and object of modern social philosophy. The controversy between "methodological collectivism" and "methodological individualism" around the problem of an integrative subject of social life.

Socio-philosophical interpretation needs And interests active subject.

Problems of modern philosophy of consciousness in their socio-philosophical interpretation. The phenomenon of "free will", the role of consciousness in the praxeological attitude of man to the world. Conscious, unconscious and subconscious in the activities of people.

Goal setting and goal realization as operational subsystems of activity. Socio-philosophical interpretation of the problem of correlation between goals and means of activity.

Incentives and mechanisms for the formation of man and society. Socio-philosophical problems of anthroposociogenesis.

Socio-philosophical analysis of culture as interrelated symbolic programs of thinking, feeling and behavior of people.

Modern concepts of "social action" in their philosophical interpretation.

Forms and mechanisms of social determination. sociocultural causation. Necessity, randomness in human activity. The problem of dominants and determinants of social life.

Space and time as factors and forms of the socio-cultural process.

Modern concepts of society as an organizational form of joint activity of people.

Socio-philosophical foundations of "social statics". Analysis of subsystems, components and elements of social life in their subordination and coordination dependence.

The process of social reproduction, its types and mechanisms.

Material and spiritual production: the nature and historical forms of interaction.

Philosophical problems of social management. Social law as a problem of social philosophy. Labor as a problem of social philosophy.

The problem of alienation in social philosophy.

Public relations as a problem of socio-philosophical analysis

Socio-philosophical Aspects analysis differentiation And stratification of social groups.

Solidarity and conflict as problems of social philosophy. Conflict as a social phenomenon. The origins of conflicts, types and ways of conflict resolution. Conflictology in a philosophical context.

Sources and mechanisms of sociocultural change. Forms of social dynamics. Evolutionary and revolutionary changes in history.

Philosophy of history. History as an eventful life of people in time and space. Correlation between "events" and "structures" in their socio-philosophical interpretation.

Methodological problems of historical knowledge in modern socio-philosophical interpretations.

Socio-philosophical problems of ethnogenesis.

Problems of the typology of history: correlation of civilizational and formational paradigms.

Power and property as factors of historical evolution. The problem of the direction of history: the hypothesis of social progress. Criteria of social progress.

Man as a problem of social philosophy. Human and society. The concept and types of human personality.

Global problems of modern civilization. Perspectives of humanity in the context of social philosophy. The historical fate of Russia, the prospects for its development in the twentieth century. Socio-philosophical problems of the development of the information society.

Socio-philosophical aspects of the development of artificial intelligence. Metatheoretical studies of politics.

The concept of the political, the possibility and conditions for the emergence and self-realization of politics, the rational and irrational principles of politics.

Theoretical models political development, changes modernization, transit, progress and regression in politics.

Chronopolitical and topological properties of the world of politics.

Legitimization of politics, political values and ideals. The ratio of goals and means in politics, the interaction of politics and morality, politics and law, politics and economics.

Man as an object and subject in politics. The nature of power and the state.

Philosophical studies of political dynamics. Features of the development of individual scientific schools and directions of world and domestic political philosophy.

ABSTRACT OF SCIENTIFIC SPECIALTY

5.7.8. PHILOSOPHICAL ANTHROPOLOGY, PHILOSOPHY CULTURES

The course involves the study of the main philosophical-anthropological and philosophical-culturological concepts in the historical-philosophical and historical-cultural contexts, as well as the fundamental provisions of modern philosophical anthropology and the philosophy of culture.

Includes the following areas of research:

Philosophical anthropology in the system of knowledge, its subject field and methods.

History of philosophical anthropology. Origins and causes of anthropological and anti-anthropological tendencies in philosophy. Man as a special kind of being. Philosophical problems of the study of anthropogenesis. Man as microcosm and macrocosm. Philosophical problems of thanatology. Philosophy of personality and the problem of identity. Phenomena of human subjectivity. The concept of man in various philosophical systems. Anthropological configurations of philosophy in an intercultural perspective. Philosophy of man in antiquity. Philosophy of man in the Middle Ages. Philosophy of man in modern and contemporary times. Existential anthropology. Philosophical foundations of scientific concepts of man. Man as a subject of philosophy. Classical anthropology and non-classical anthropology. Philosophical and biological anthropology. Cultural and philosophical anthropology. Psychoanalytic Anthropology. Singular Anthropology. Structural anthropology.

Philosophical-religious anthropology. Ways of representing a person in the philosophy of China. Ways of representing a person in Indian philosophy.

Ways of representing a person in the culture of the Far East (Confucianism, Taoism, Buddhism, Shinto). Ways of representing a person in the culture of India (Hinduism, Buddhism, Jainism). Ways of representing a person in the culture of the Arab-Muslim East. Ways of representing a person in Russian culture and philosophy. Man in the concepts of cosmism. Archeoavant-garde philosophy in the study of the human phenomenon. Modern and postmodern in the study of the human phenomenon. State and prospects for the development of philosophical anthropology. Philosophical problems of symbolic theories of consciousness. Philosophical and anthropological aspects of the development of the information society. Philosophical and anthropological aspects of the development of artificial intelligence and the development of cyber systems.

Philosophy of culture in the system of knowledge. Philosophy of culture and cultural studies. Methods of Philosophy of Culture and Culturology. Problems

cultures in various philosophical directions. Categorical apparatus of cultural studies. History of cultural science. Schools in the study of culture. Cultural genesis. Correlation and forms of interaction of the philosophy of culture and cultural studies with other scientific disciplines. Culture and civilization. Problems of typology of cultures. Universe of culture. Trends in the dynamics of culture. Problems of cultural anthropology. General patterns of culture. Stages of cultural development. Philosophy of culture and history of culture. Cultures of ancient civilizations as a prototype of further cultural construction. Similarities and differences between Western and non-Western civilizational models. Problems of cultural comparative studies. Antique cultures as the basic model of Western civilization.

Theoretical models of the culture of Christianity. Theoretical models of the culture of the Arab-Muslim world. Theoretical models of the culture of ancient and medieval India. Theoretical models of the culture of ancient and medieval Japan. Theoretical models of the culture of ancient and medieval China. Theoretical model of the culture of pre-Columbian America. Regional non-local cultures. Their interaction with world culture. Universal and local values in the philosophy of culture. Traditions and innovations in the philosophy of culture. Culture and cult. Culture and art. Culture and science. Norm and pattern in culture. Culture and the individual. Culture and society. Basic mechanisms of culture translation. Semiotics of culture. Axiology of culture. Hermeneutic problems of culture research, hermeneutic problems of research of foreign cultural traditions.

The study of specific cultural phenomena in the context of the general patterns of the existence of culture. Cultural conflicts and ways to overcome them. The culture of the digital society. Technical aspects of culture. Virtual and real in culture. Symbolic in culture.

ABSTRACT OF SCIENTIFIC SPECIALTY

5.9.6. GERMANIC LANGUAGES

It provides for the study of the theoretical foundations and special issues of German studies in such areas as general linguistics, the history of linguistic teachings, phonetics, lexicology, grammar, stylistics, and sociolinguistics. It also explores how to apply various linguistic methods to the study of Germanic material.

Includes the following areas of research:

The main stages and directions of the formation and development of a particular language or language family;

Historical features of the development of dialects of a particular language or language family;

Features of the formation and functioning of a particular language or language family;

General and individual trends in the development of a language or a language family;

Phonetic structure of a language or language family (classification of phonemes, phoneme and sound, phonosemantics and phono-stylistics, phonetic categories, phonetic specificity of speech, stress and intonation);

The lexical structure of a language or a language family (a word as the basic unit of a language, lexical semantics, types of lexical units and categories, vocabulary structure, functioning of lexical units, development and replenishment of vocabulary, vocabulary and phraseology and their relationship with extralinguistic reality);

Word-building system language or language families
(classification of word-formation units and categories, word-formation models, word-formation series);

The grammatical structure of a language or language family (morphology, syntax, units and categories, their classification, formation, development; semantics and functional specificity of grammatical units and categories, grammatical models of meaning transfer, structural and content specificity of text and discourse);

Research methods of linguistic units and categories: structural and functional studies of a specific language or language family, corpus studies of a language or language family, cognitive, communicative-pragmatic and stylistic studies of a language or language family; issues of translation of various units of lexical, grammatical, stylistic levels from one language to another;

The study of level and culturally (or nationally) determined specificity in the representation of knowledge, including in different linguistic communities of representatives of a particular language or language family.

ABSTRACT OF SCIENTIFIC SPECIALTY

5.9.6. ROMAN LANGUAGES

It provides for the study of the theoretical foundations and special issues of novelistics in such areas as general linguistics, the history of linguistic teachings, phonetics, lexicology, grammar, stylistics, and sociolinguistics. It also explores ways to apply various linguistic methods to the study of Romance material.

Includes the following areas of research:

The main stages and directions of the formation and development of a particular language or language family;

Historical features of the development of dialects of a particular language or language family;

Features of the formation and functioning of a particular language or language family;

General and individual trends in the development of a language or a language family;

Phonetic structure of a language or language family (classification of phonemes, phoneme and sound, phonosemantics and phono-stylistics, phonetic categories, phonetic specificity of speech, stress and intonation);

The lexical structure of a language or a language family (a word as the basic unit of a language, lexical semantics, types of lexical units and categories, vocabulary structure, functioning of lexical units, development and replenishment of vocabulary, vocabulary and phraseology and their relationship with extralinguistic reality);

Word-building system language or language families
(classification of word-formation units and categories, word-formation models, word-formation series);

The grammatical structure of a language or language family (morphology, syntax, units and categories, their classification, formation, development; semantics and functional specificity of grammatical units and categories, grammatical models of meaning transfer, structural and content specificity of text and discourse);

Research methods of linguistic units and categories: structural and functional studies of a specific language or language family, corpus studies of a language or language family, cognitive, communicative-pragmatic and stylistic studies of a language or language family; issues of translation of various units of lexical, grammatical, stylistic levels from one language to another;

The study of level and culturally (or nationally) determined specificity in the representation of knowledge, including in different linguistic communities of representatives of a particular language or language family.