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## АННОТАЦИИ

### Abstracts

#### **Software Implementation of an Information-Analytical System for Processing Large Data Arrays**

*O.D. Bondarev*

*South-Russian State Polytechnic University (NPI) named after M.I. Platov, Novocherkassk*

*Key words and phrases:* analytical system; information system; data arrays; DBMS; MS SQL.

*Abstract:* This article proposes a software implementation of an information-analytical system capable of processing large amounts of data. The system is designed to collect and analyze data from various sources such as sensors, databases and social networks in order to provide information for decision making. The software uses advanced machine learning algorithms and techniques to process big data and extract meaningful information. The system includes a user-friendly interface that allows you to visualize data and create reports.

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#### **Modern Approaches to the Study of Radio Emission Scintillations of Cosmic Sources**

*Wang Yuhan*

*National Research Tomsk State University, Tomsk*

*Key words and phrases:* interplanetary scintillations; decameter range; sunny wind; streaming structure of the solar wind; coronal mass ejection.

*Abstract:* The article presents an overview of studies of scintillations of radio emission from cosmic sources on inhomogeneities of the interplanetary plasma. The author studied the main parameters of interplanetary scintillations in the decameter range of radio waves, the characteristics of the solar wind and its structure, carried out a comprehensive analysis of new means of receiving cosmic radio emission. The novelty of this study: the importance of this issue for world science is noted.

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#### **Conceptual Description of a Portable Device for the Diagnosis of Fungal Diseases of Cultivated Plants**

*M.K. Gavrish*

*Novosibirsk State Technical University, Novosibirsk*

*Key words and phrases:* plant diseases; diagnosis of plant diseases; fungal disease of plants; methods for determining plant diseases.

*Abstract:* The study aims to determine the possibility of creating a portable device for detecting such diseases of garden strawberries as white, brown and angular spotting. The research tasks are to determine the input data and the method of their collection, the necessary conditions for the functioning of the system and its conceptual model. The research hypothesis is based on the assumption that the data processing algorithm of the system contains elements of fuzzy set theory. The research methods are a fuzzy set theory, peer review methods. As a result of the study, a conceptual model of the system was created.

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## **Problems and Prospects of Using Artificial Intelligence Technologies for Industrial Production Automation**

*A.S. Ermakov*

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*Key words and phrases:* artificial intelligence; computers; problems; perspectives; digital technologies; industry digitalization; competitiveness.

*Abstract:* The purpose of the article is to study the use of advanced technologies for the automation of production processes at Russian enterprises in modern conditions. The paper deals with artificial intelligence technologies, and general scientific and special research methods are used to study them. The result of the study is the conclusion that it is necessary to accelerate the introduction and integration of artificial intelligence technologies to ensure the breakthrough development of the digital economy and overcome the dependence of Russian enterprises on imports of IT products.

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## **An Algorithm for Software Operation of the Device to Measure and Monitor Temperature Conditions of Technical Devices**

*S.I. Zaitov*

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*Key words and phrases:* algorithm; measurement; temperature; technical devices.

*Abstract:* When designing modern temperature monitoring systems, it is worth considering the development of IT technologies. The goal is to develop an algorithm for the operation of the software for the device for measuring and monitoring the temperature conditions of technical devices. A block diagram and an algorithm for the operation of the program have been developed. The results obtained can be used and implemented in the emergency warning systems of various automated process control systems.

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## **Development of Automated Information Systems Based on Low-Code Platforms**

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*Siberian State University of Telecommunications and Informatics, Novosibirsk*

*Key words and phrases:* automated information system; methodology for developing an information system; low-code platform.

*Abstract:* The purpose of the article is to consider the development of information systems using various methodologies, in particular, based on low-code platforms. The study evaluates the domestic platform "Accent" according to the criteria specified in the ranking of the leading low-code platforms in Russia, and evaluates their effectiveness for the development of information systems.

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## **Development of a Mobile Application for Innovative Tourism in the Regions of St. Petersburg**

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*Key words and phrases:* information technologies in tourism; regional tourism; optimization.

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*Abstract:* The world is witnessing a steady increase in the number of tourists, both individual and in groups. But along with the increase in the share of tourists, the load on visiting the city's attractions increases, which causes a number of problems. In addition, the trend towards the individualization of tourism leads to the need to take into account the specifics of user preferences, and the tourist opportunities of the city - to diversify to the level of regional tourism. This article presents a model for issuing recommendations based on taking into account the ranking of regional attractiveness through the characteristics of its thematic focus, formulated in an optimization formulation. The conducted studies show the effectiveness and validity of the proposed decision-making model, including based on the results of user testing.

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### **Building an Intelligent Database Orchestrator Architecture for Web Service Applications**

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*Key words and phrases:* web service applications; architecture; intelligent orchestrator; creation; design; programming.

*Abstract:* The article deals with the subject of the architecture of an intelligent database orchestrator for web service applications. The purpose of the article is to study the creation and design of the architecture of an intelligent database orchestrator for web service applications. A bicycle rental database was used to conduct experiments to create an intelligent database orchestrator for web service applications for efficient data processing. It is established that the architecture of Microsoft Azure provides a flexible, loosely coupled service discovery mechanism. The architecture of an intelligent database orchestrator for web-service applications for bicycle rental was designed.

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### **Modeling a Second-Order Butterworth Low-Pass Filter for a Digital Low-Pass Generator**

*R.S. Polyakov*  
*South-Russian State Polytechnic University (NPI) named after M.I. Platov, Novocherkassk*

*Key words and phrases:* low-pass filter; Butterworth filter; low-pass generator; Micro-Cap; modeling; error.

*Abstract:* This article provides a detailed analysis of a second-order Butterworth low-pass filter that is commonly used in digital signal processing applications. Also, the development of a mathematical model of the filter, which can be used to design a digital low-pass generator, is presented. In addition, the influence of filter parameters on its performance is analyzed. The effect of changing the cutoff frequency and adjusting the filter Q-factor on the frequency response of the filter is studied, which gives an idea of the behavior of the filter under various conditions. The simulation results show that the designed filter accurately reproduces the frequency response of the Butterworth filter, providing an effective tool for filtering high frequency noise from digital signals.

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### **Operation Algorithm of the Device Software for Setting up and Diagnosing Electronic Components**

*M.G. Popov*  
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*Key words and phrases:* measurement; control; diagnostics; electronic components; MicroCap; Statistica.

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*Abstract:* The purpose of the paper was to develop an algorithm for the operation of the device software for setting up and diagnosing electronic components of printed circuit boards using the example of voltage stabilizers TEPLOCOM ST-222, ST-555, ST-888. Software for the microcontroller was created. The stand provides the possibility of quick software reconfiguration for adjusting and checking other types of control boards.

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### **A Study of the Impact of Violations of Safety Requirements on Industrial Injuries in the Oil and Gas Industry**

*L.K. Ilyashenko, S.V. Apaev  
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*Key words and phrases:* oil and gas industry; industrial injuries; injuries in the oil and gas industry; injuries at enterprises.

*Abstract:* The paper deals with the issue of the impact of violations of safety requirements on industrial injuries in the oil and gas industry. The aim of the study was to investigate the impact of violations of labor safety requirements on occupational injuries in the oil and gas industry. Methods were used to study the work of specialists in the field of labor safety in the oil and gas industry, analysis and generalization of information on industrial injuries at oil and gas industry facilities based on data from Russian federal authorities. The study resulted in the identified causes of industrial injuries in the oil and gas industry – a low level of knowledge of labor safety requirements (40 %) and violations of labor discipline and work schedule (27 %).

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### **Experimental Studies of the Functional Blocks of the Device for Measuring and Monitoring Temperature Conditions in the Proteus Software Environment**

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*Key words and phrases:* measurement; control; monitoring; temperature; electrical devices; Proteus.

*Abstract:* The goal is to develop a device for measuring and monitoring the temperature conditions of technical devices with synchronization of the received data to the server via the Ethernet protocol, creating a prototype. Simulation of work in the package of computer-aided design of electronic circuits Proteus is made. A working prototype of the device was assembled. The results obtained can be used and implemented in the emergency warning systems of various automated process control systems.

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### **Development of a Functional Telegram Bot in C#**

*A.V. Bakshevnikov, V.Yu. Belash  
Kaluga State University named after K.E. Tsiolkovsky, Kaluga*

*Key words and phrases:* bot; information technology; application; recognition; telegrams.

*Abstract:* Information technologies have penetrated into all spheres of human life. They are actively used in education, medicine, science and technology, business, as well as in everyday life. Even ordinary communication under the influence of information technology has undergone a significant change.

The article is devoted to the description of the process of creating a bot in Telegram. The purpose of the study is to create a working bot. The hypothesis of the study is the popularity of the developed software product among users. Research methods - analysis of literature on application development, idealization and formalization of ideas about the implementation of software products, testing and

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analysis of statistical data. The results are as follows: the developed software product – the bot “Task Manager” is an independent service that helps the user in planning and solving daily tasks.

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### **Numerical Studies of a Non-Stationary System of Integral-Differential Equations of Radioactive Transfer and Statistical Equilibrium in the Diffusion Approximation**

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*Key words and phrases:* kinetic approximation; diffusion approximation; statistical equilibrium equations; simple iteration method.

*Abstract:* The object of research is a linearizing iterative algorithm for solving an initial-boundary value problem for a system of integro-differential equations of radiative transfer and statistical equilibrium in the diffusion approximation. The purpose of this work is to explore the applicability and efficiency of the proposed iterative algorithm. The paper presents the derivation of the diffusion approximation and a comparative analysis of the results of calculations for the kinetic and diffusion approximations depending on the optical properties of the medium. Research methods: methods of algorithmization and programming, theory of numerical methods and equations of mathematical physics. The results obtained in the course of the work: the iterative process is convergent, the numerical solutions obtained in the diffusion and kinetic approximations are in good agreement with each other for the considered media.

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### **Application of the Duncan-Chang Mathematical Model for Modeling Fractured Rocky Soils**

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*Key words and phrases:* mathematical modeling; finite element method; hardening soil model; rock mass; cracks.

*Abstract:* The article considers the Duncan-Chang model from the family of hardening soils (Hardening Soil). The purpose of the study: to substantiate the use of the Duncan-Chang model in modeling a fractured rock mass. The objectives of the study are theoretical studies on the mathematical description of the model and their verification on a computer model. Research hypothesis: Duncan-Chang model can simulate tectonic and dynamic phenomena in a fractured rock mass. Research method: analytical and numerical modeling by the finite element method. The results are as follows: the possibility of using the Duncan-Chang model for modeling fractured rock masses was determined analytically and with the help of a numerical experiment.

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### **Mathematical Modeling of a DC/DC Buck Converter in NI Multisim**

*D.A. Myslimov*

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*Key words and phrases:* simulation; measurement; electric field; ionosphere; intensity; Multisim.

*Abstract:* In the course of a scientific study, the operation of a DC/DC converter was simulated in the NI Multisim software package, and the noise power spectral density at the output of the converter was determined. The results obtained can be used in the design of new systems for detecting and registering weather anomalies based on an intelligent analysis of the atmospheric electric field strength.

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## **Modeling the Differential Amplifier and Measurement Shunt Circuit of an AC Calibrator**

*E.A. Rudik*

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*Key words and phrases:* simulation; calibrator; alternating current; error; circuit; Micro-Cap; differential amplifier.

*Abstract:* The article describes the process of modeling a differential amplifier and a measuring shunt circuit of an AC calibrator in the Micro-Cap software package. The circuit was designed and modeled on the basis of SPICE models, and its characteristics were analyzed in relation to various input voltages and resistances. The shunt circuit was then connected to a differential amplifier to measure its output voltage and current. The results showed that the differential amplifier performed well, with high gain and low distortion, and the shunt circuit provided accurate measurement of its output.

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## **Mathematical Modeling of an Instantaneous Velocity Measurement Device Using the LL-type Coordinate Function and Automatic Continuous Determination of the Scaling Factor**

*M.S. Chumakov*

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*Key words and phrases:* railgun; speed measurement; signal; circuits; simulation; Micro-Cap; transients.

*Abstract:* In the presented article, mathematical modeling of the device for measuring instantaneous speed is performed using the LL-type coordinate function and automatic continuous determination of the scaling factor. To build a mathematical model of the device, the Micro-Cap circuit modeling package was used. The initial coordinate and the instantaneous velocity of the plasma are determined, corresponding to real values.

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## **Fire Safety of Ventilated Facade Systems**

*N.L. Galaeva, D.O. Weber*

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*Key words and phrases:* ventilated facade; fire; facing layer; enclosing structures; fire safety; insulation; facade system.

*Abstract:* The purpose of this article is to consider the issue of fire safety of hinged ventilated facade systems. The main tasks are to identify the causes and features of the spread of fire during the ignition of hinged ventilated facade systems. The hypothesis is based on the assumption that the introduction of increased requirements for fire safety of hinged ventilated facade systems can become additional safety and protection of buildings and structures from fires. The research methods are scientific literature analysis; generalization; comparative analysis. The results are as follows: when developing fire safety requirements for hinged ventilated facade systems, it is necessary to work out the current regulatory documentation and ensure strict control over the implementation of these requirements by building supervisory authorities.

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## **Plaster System Based on Composite Binder**

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*Key words and phrases:* volcanic tuff; pozzolanic activity; hydraulic binder; plaster system.

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*Abstract:* Creating comfortable conditions in the premises is one of the main tasks of modern construction. In this regard, they can be considered as lightweight and thermally insulating plaster coatings or façade plaster systems and light fillers. The purpose of the research was to develop model warm plaster coatings that have standard performance characteristics. To achieve the goal, the following tasks were set: the analysis of facade insulation systems was carried out; the expediency of using light seamless insulating coatings is substantiated. The research is based on the hypothesis of the possibility of using crushed and fractionated volcanic tuff as filler for light plaster coatings. The methodology of the research was to study the regularities of the formation of thermal fields when using light plaster coatings based on crushed volcanic tuff in various temperature conditions. As a result of the research, the hypothesis was substantiated and recommendations for the formation of a seamless plaster coating based on crushed volcanic tuff, non-combustible, having a relatively low density and stable thermal conductivity and having good adhesion to base materials were developed. The visualization of temperature fields in the plaster coating, carried out using the TERM computer program, made it possible to substantiate the possibility of using this coating in various temperature conditions.

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### **Problems of Winter Concreting and Solutions**

*M.A. Fakhratov, I. Sultanov*

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*Key words and phrases:* concreting at negative temperatures; concrete heating methods; antifreeze additives.

*Abstract:* Construction is considered one of the developing areas both in Russia and in other countries. The characteristic weather conditions of Russia, due to its geographical location, have a significant impact on construction work in the winter season. According to SP 70.13330, if the average daily temperature is below 5 °C or the minimum daily temperature is below 0 °C, winter concreting is considered. The duration of the winter period for the climatic conditions of the central part of Russia is about 5–6 months. Through the introduction of research, technology and technological advances based on practical experience, and the promotion of modern materials in the construction industry, the construction of buildings and structures in general has changed from a seasonal to a year-round process that speeds up the commissioning of construction projects. The purpose of the article is to study the problem of winter concreting and methods of solution. The tasks are to consider the features of winter concreting; comparison of winter concreting methods. The scientific hypothesis consists in the assumption of the possibility of solving the problem of winter concreting through the application of a certain method. The methods are comparison, analysis, synthesis. The results are as follows: problems were identified and the main methods of winter concreting were considered.

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### **Economic and Technical Aspects of the Use of Renewable Energy Sources**

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*Key words and phrases:* renewable energy sources; economic aspects; finance; ecology; technical aspects; energy shortage; electricity; Russia; EU countries; geothermal sources; heat supply systems; solar stations.

*Abstract:* The paper studied the economic and technical aspects of the use of renewable energy sources. The purpose of the article was to conduct a literature review on modern research on the use of renewable energy sources. The prospects for the use of renewable energy sources in Russia and abroad are analyzed. The analysis of studies of the economics and finance of renewable energy

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sources is presented on the example of the EU countries in the articles by P. Kanygin, G.S. Aslanyan and S.D. Molodtsov. The use of geothermal sources and solar stations according to B.V. Lukutin was substantiated.

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### **The Analysis of Using Renewable Energy Sources**

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*3 Peoples' Friendship University of Russia, Moscow*

*Key words and phrases:* renewable energy sources; wind generators; heat supply; wave generators; combined solar system; energy shortage.

*Abstract:* The paper studied the relevance of the use of renewable energy sources. The purpose of the article was to conduct a literature review on modern research on renewable energy sources. The study reviewed the work of B.V. Lukutin on the principles of operation of wind generators with a description of the Weibull distribution. The study by T.D. Komarov about wave generators based on a hydraulic drive was analyzed. The use of a combined solar heat supply system by D.R. Absalyamov, R.R. Khalmetov and D.V. Shapovalov was reviewed. The prospects for the use of renewable energy sources in Russia and abroad are analyzed.

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### **The Development of Tools for the Implementation of Information Modeling Technologies in the Implementation of Construction Projects**

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*Key words and phrases:* information modeling technologies, system and robust approaches.

*Abstract:* The purpose of the study is to develop mechanisms for the application of systematic and robust (robust) approaches in the implementation of projects in the construction industry. The use of modern computers allows the widespread use of information technology in construction projects. They can be effectively applied throughout the life cycle of projects. A systematic approach integrates physical, computational and management processes in construction and gives a great synergistic effect. To ensure the stability of the building system, it is possible to apply the apparatus of the theory of reliability, simulation methods. When processing information within the system, it is necessary to use "robust" technologies that allow the system to maintain a given safety margin when its parameters vary.

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### **The Study of the Problem of Accidents at Production Facilities of the Oil and Gas Complex of the Russian Federation from 2017 to 2022**

*N.V. Kamenets, S.V. Apaev, U.N. Fedorova, F.F. Mukhametshina*

*Tyumen Industrial University, Tyumen*

*Key words and phrases:* accidents; oil and gas industry; accidents in the oil and gas industry; accidents at oil and gas industry facilities.

*Abstract:* The paper considers the problem of accidents at hazardous production facilities of the oil and gas complex of the Russian Federation in the period from 2017 to 2022. Methods: study of the works of specialists who reveal the problem of accidents in the oil and gas industry, analysis and generalization of information about accidents at hazardous production facilities in the oil and gas industry based on data from Russian federal authorities. The purpose of the study is to study the problem of accidents in the oil

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and gas complex of the Russian Federation over a certain period of time. Results of the study: the total number of accidents by 2022 is gradually decreasing, while most of them are characterized by a low degree of danger and the absence of human casualties and environmental damage, the economic consequences of accidents vary widely, the causes of accidents are mainly of a technical nature.

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### **The Factor of Psychological Safety in the Oil and Gas Industry**

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*Key words and phrases:* human factor; emergency situation; psychological safety; oil and gas industry; mental state; education; advanced training.

*Abstract:* The article deals with the search for psychological safety factors in the oil and gas industry. Questionnaires were used as research methods to collect biographical information about the employee and identify the features of his work activity. Statistical methods of analysis were mainly used for the calculations. The object of the study was the most sought-after employees of the oil and gas industry directly involved in the production process – these are the main specialists and technical workers serving the main production. The study revealed a high level of psychological safety among key industry professionals and personnel involved in direct maintenance.

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### **Actual Problems of the Formation of General Competencies in the System of Secondary Vocational Education**

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*Key words and phrases:* competence; standard; training programs; professional modules; disciplines; curriculum.

*Abstract:* The article is devoted to topical issues of the formation of general competencies in the system of secondary vocational education. The purpose of the article is to consider the problem in terms of the content in the federal state educational standards and the structure of training programs for mid-level specialists and training programs for skilled workers and employees. The research objectives are to study the literature on the research topic, analyze the legal documentation, draw conclusions and formulate options for solving the existing problem. The hypothesis of the study is as follows: the system of formation of general competencies in the system of secondary vocational education is presented as a complex, the components of which are included in academic subjects, disciplines and professional modules, the content of which is the reason for the low level of formation of general competencies. The result of this study was to identify the factors and causes of the identified problem and suggest possible ways to solve it.

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### **The Analysis of Cyber Risks and Cyber Threats as a Way to Enhance the Safety of Minors in the Information World**

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*Key words and phrases:* protection of children in cyberspace; information security; cyber risks; cyber threats; cyber homelessness; digital world.

*Abstract:* The purpose of the study is to analyze cyber risks and cyber threats for minors in the information space. It is suggested that cyber risks and cyber threats affect minors in the Internet space.

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The tasks are solved: to describe the risks associated with mental violence, criminalization, digital exploitation of children and adolescents; characterize the risks of information pressure and the formation of dependence on the Internet network in minors; reveal the problems of cyber homelessness of children and adolescents. Methods: analysis of literary sources on the research problem, analysis, synthesis, generalization, abstraction. The indisputable relevance of the problem related to the cybersecurity of minors in the online space is indicated, modern statistics are given. The characteristics of the cyber risks and cyber threats existing today are given, their influence on the personality, health and life of children and adolescents is shown. The problem of cyber homelessness and its relationship with online threats are outlined.

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### **The Improvement of Power Endurance and Realization of the Power Potential of 13–14 Year Old Swimmers Given the Peculiarities of the Swimming Technique Using the Front Crawl Method**

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*Key words and phrases:* strength endurance; swimmers aged 13–14; realization of strength potential; front crawl.

*Abstract:* The article presents the results of a study of the strength endurance of swimmers aged 13–14, who specialize in front crawl swimming. The purpose of the study was to substantiate the methodology for improving the special strength qualities of swimmers based on the implementation of the strength potential and taking into account the peculiarities of swimming technique in the crawl on the chest. The objectives are to study the features of the implementation of the power potential in freestyle swimmers aged 13–14; to develop a methodology for improving the special strength qualities of swimmers based on the implementation of the strength potential; to identify the effectiveness of the developed methodology. The hypothesis suggested that the methodology for improving strength qualities, based on the targeted selection of means for improving special strength endurance, taking into account the age of swimmers, the features of swimming technique in the crawl on the chest and the emphasis on the realization of strength potential, will help to increase the level of strength fitness of swimmers aged 13–14. The research methods included the analysis and generalization of literature; pedagogical testing, pedagogical experiment; tensodynamometry; chronometry; mathematical statistics. It was revealed that the developed complexes of training exercises, based on the fact that without changing the total volume of swimming, by supplementing training tasks with elements aimed at developing special strength endurance, realizing strength potential, including through the use of rowing blades and accentuated swimming by elements, there is an effective improvement of the special power qualities of swimmers. This is confirmed by the achieved pedagogical effect, which was expressed in a statistically significant increase in the level of traction force in water, traction force on land in the position of the middle of the stroke and the coefficient of coordination among swimmers. A positive dynamics of the indicators characterizing the realization of the power potential (the coefficient of the use of power capabilities and the coefficient of strength endurance) and indicators reflecting the efficiency of the swimming technique (the efficiency coefficient of the technique and the efficiency coefficient of rowing efforts) was revealed.

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### **The Development of Basic Physical Qualities in College Students Using Special Simulators without Inertia**

*Sh.R. Zainullin, K.B. Tumarov, R.A. Aidarov, O.N. Galliamova*  
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*Key words and phrases:* speed; force; physical qualities; simulator without inertia.

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*Abstract:* The purpose of the study is to theoretically substantiate and experimentally prove the feasibility of using inertialess speed-strength simulators in the educational and training process of college students as an effective means of developing strength and speed-strength qualities. The research objectives are to conduct an analysis of the scientific literature on this topic; to develop an experimental methodology for training college students using simulators that do not have inertia; to experimentally substantiate the effectiveness of the use of this technique in physical education lessons. The research hypothesis is based on the assumption that the methodology developed by us will be an effective additional tool for the development of physical qualities “Strength” and “Speediness”. Methodology and organization of the study were as follows. For the experiment, two groups were formed – the control group (CG), which goes in for physical culture 2 times a week using simulators with a conventional loader in the form of a load, and the experimental group (EG), which also goes in for physical culture 2 times a week, but with the use of inertialess speed-strength simulators. Each group consisted of 25 people – 10 girls and 15 boys. The experiment took place within the framework of the 2021–2022 academic year on the basis of the Engineering and Economics College of Kazan Federal University.

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### **Methodology for the Development of Strength Endurance in Cross-Country Skiers Based on the Use of Isometric Exercises**

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*Key words and phrases:* training process of skiers; special training; strength endurance; isometric exercises.

*Abstract:* The article is devoted to the problem of special training of cross-country skiers. The aim of the study was the theoretical and experimental substantiation of the use of isometric and dynamic exercises in increasing the level of special training of cross-country skiers. The analysis of literature sources on the physiological substantiation of isometric loads, planning of special training means in different periods of the training process was carried out. The means of special training based on isometric exercises have been selected and introduced into the training process of skiers. The results of the experiment confirm the effectiveness of the proposed means.

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### **Modern Approaches and Methods of Teaching Foreign Languages in Higher Educational Institutions**

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*Key words and phrases:* approaches and methods of teaching a foreign language; competence-based approach; project method; case study; role-playing game.

*Abstract:* At present, the question of what approaches and methods should be used when teaching foreign languages at a university seems to be very relevant. The purpose of the study is to identify the most effective modern approaches and methods of language teaching in higher education institutions. To achieve this goal, the tasks were set to analyze the approaches adopted to date and identify those methods that have proven their effectiveness and are popular among students and teachers. The hypothesis of the study is that the traditional (lexico-grammatical) approach, which for many years has been predominant in teaching foreign languages, is gradually being replaced by more modern approaches: competence-based, student-oriented and activity-based. By analyzing the approaches and methods of teaching adopted at the Department of English No. 3 of MGIMO of the Ministry of Foreign Affairs of Russia, the author obtained the following results: the traditional approach can still be useful

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in solving a number of problems of teaching a foreign language, but today it should be used only in combination with more innovative approaches ( the predominant of which is competence-based), within which it is possible to use a number of effective teaching methods.

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### **The Effects of Mass Communication: Psychological Impact of Advertising on Student Youth**

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*Key words and phrases:* mass communication; mass media; advertising; students; outlook.

*Abstract:* In the article, through theoretical, empirical analysis and generalization, issues related to the problem of the psychological influence of mass media, in particular advertising, on student youth are studied. The relevance of the material lies in the consideration of the main functions of advertising in a sociological and psychological way. The novelty of the study lies in an attempt to identify the influence of advertising on the worldview of student youth. The materials and methods of the research consist in the fact that a theoretical basis and empirical data on the nature of advertising and its impact on young people are given. The results of the study made it possible to explain the influencing mechanism of advertising, its influence on a young person.

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### **The Introduction of Self-Control Diaries into the Educational Process in Physical Culture as a Tool for Increasing the Level of Physical Self-Education of Schoolchildren**

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*Key words and phrases:* physical self-education; physical culture; educational process; physical fitness.

*Abstract:* The paper presents the experience of introducing the developed physical culture self-control diaries into the educational process of seventh grade schoolchildren. The purpose of the study was to determine the impact of this campaign on the level of physical self-education and the level of physical fitness of schoolchildren. The results of the experiment showed that in the experimental group there was a transition of schoolchildren from the situational level of self-education to the stimulated and motivated one, while there was a statistically significant increase in physical fitness indicators compared to the control group. Thus, the introduction of planning, reflection, correction, motivation through self-control diaries into the educational process in physical culture increases the effectiveness of training.

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### **The History of Mass Sports Work among Schoolchildren in the 1950s**

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*Key words and phrases:* winter holidays; competitions; history; pioneers; sports and athletics; championship; school.

*Abstract:* This article analyzes the history of physical culture and mass sports work in the union of the Soviet Socialist Republic (USSR) and in the Karelian-Finnish Soviet Socialist Republic (KFSSR) among pioneers and schoolchildren during the winter holidays in the 1950s. The purpose of the article is to analyze the activities of the Petrozavodsk Committee for Physical Culture and Sports of the KFSSR on mass sports work among pioneers and schoolchildren during the winter holidays in the 50s. The main objective of this research is to study the history of physical culture and mass sports work in the KFSSR,

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pay attention to interesting facts of the past, in the future to compare with the modern organization of similar sports events in the Republic of Karelia. The main research methods are theoretical analysis and generalization of scientific and methodological literature, research of archival materials. The results of the study, based on the results of the study of archival data, allow us to draw the appropriate conclusions that in the 1950s, physical culture and mass sports work in the Republic of Karelia was more massive and effective than at present.

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### **The Use of Mini-Trampolines as a Means of Improving Students' Physical**

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*Key words and phrases:* mini-trampolines; physical education at the university; students; physical fitness; health.

*Abstract:* The article is devoted to the advantage of mini-trampoline classes as an effective means of increasing physical fitness in physical education classes at a university. The historical aspects of the development of jumping on mini-trampolines as a health-improving technology, the impact of jumping on mini-trampolines on the indicators of physical development and physical performance of those involved are presented. Examples of jumping exercises on mini-trampolines used in the educational process at the university, aimed at developing balance, strength abilities of the press and lower limbs of students, are given.

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### **Traditions and Innovations in the Training of Graphic Designers in Russian Universities**

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*Key words and phrases:* professional motivation; professional education; content of graphic education; traditional and innovative educational technologies.

*Abstract:* The purpose of the article is an experimental study of Russian universities on the traditional and innovative training of graphic designers in higher educational institutions, identifying early historical traditions and modern innovative prospects. The research tasks are to consider the main trends in the training of graphic designers; to study innovative methods of training graphic designers in higher educational institutions of Russia; to form the need for the application of an interdisciplinary approach and the relationship with other sciences in the learning process. The research hypothesis is as follows: the process of training graphic designers in higher educational institutions is better and more effective if the field of graphic design will not be a separate field, but will be closely related to various other types of design work, such as architecture, landscape design, etc.; if the level of knowledge of graphic designers will be improving; if vocational training programs is updated.

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### **Principles of Formation of Professional Meta-Subject Competencies among Students of Pedagogical Areas of Training**

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*Key words and phrases:* professional meta-subject competencies; students of a pedagogical university.

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*Abstract:* A modern teacher must possess professional competencies to form meta-subject educational results in students. Teacher's professional meta-subject competencies are understood as the ability to implement the meta-subject component of the content of education in a subject-oriented educational process. The leading principles for the construction and implementation of the content of education relevant for the development of meta-subject competencies among students of a pedagogical university are the principle of integrity, subjectivity and cultural conformity. The foundation that serves as the basis for the formation of meta-subject competencies of the future teacher is the universal concepts, concepts, theories and models of worldviews that underlie the system-holistic view of the world and man and methods of action, skills and abilities to implement the meta-subject component in a subject-oriented educational process.

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### **Features of Educational Work in a Military University**

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*Key words and phrases:* educational work; educational environment; military university; cadet; personal development.

*Abstract:* The article discusses the features of educational work in a military university, highlights the main areas of activity of a teacher in the education of future officers. The purpose of the article is to identify the features of the education of cadets in the conditions of restrictions associated with the specifics of a higher military educational institution. The hypothesis is as follows: the education of moral and combat qualities and the maintenance of the spiritual and emotional state of future officers will be effective, taking into account the characteristics of the educational environment of a military university. The research methods are interdisciplinary analysis of the problem and subject of research; comparative analysis. The results of the study are as follows: the education of moral and combat qualities and the maintenance of the spiritual and emotional state of future officers is provided by a set of measures of an organizational, legal, social, psychological and pedagogical nature.

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### **Physical Development of 7–8 Year Old Children**

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*Key words and phrases:* children, movement; games; exercises; warm-up; strength; subject dexterity; physical development.

*Abstract:* The article reveals the importance of the general physical fitness of young athletes 7–8 years old, the features of their formation at this age, where the base is being created on the basic skills, which is especially appropriate and relevant. Our goal is to start early general physical preparation of children to choose their sport. We set the task to identify the effectiveness of our exercises and test the developed tests. We assume that early classes with children of primary school age to master the technique of movement will create a platform for future speed and strength training. To determine the correctness of movement, to identify the development of strength, for object dexterity, tests have been developed that have been well tested. They revealed good work of the feet during the movement, the work of the hands during the movement, improved coordination abilities, increased leg strength and starting speed, increased interest in the original games that were offered to children 7–8 years old.



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## **Features of the Application of Professional and Ethical Dilemmas in the English Language Classes for Future Engineers**

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*Key words and phrases:* professional and ethical dilemmas; methods of application of professional and ethical dilemmas; professional and ethical values; future engineers; English language; teachers.

*Abstract:* The purpose of the article is to identify the features of the application of professional and ethical dilemmas in English classes; tasks - familiarization with the main stages of the application of professional and ethical dilemmas in the classroom, determining the organizational and pedagogical conditions for the successful application of dilemmas, familiarization with the content of professional and ethical dilemmas. The following methods were used in the study: theoretical (comparative analysis of sources, generalization of experience), empirical (survey, self-assessment). The research results are: the use of professional and ethical dilemmas in English classes is an important means of forming professional and ethical values, improving the quality of knowledge of future engineers and developing critical thinking.

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## **Relationship between Character Accentuations and Machiavellianism among Students**

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*Key words and phrases:* Machiavellianism; manipulation; character accentuations; character.

*Abstract:* The purpose of this article is to consider manifestations of character accentuations in students with different levels of Machiavellianism. The results of methods aimed at identifying the level of Machiavellianism and character accentuations are presented. The research hypothesis is as follows: there is a connection between character accentuations and the level of Machiavellianism in the student environment. To achieve the goal and prove the hypothesis, the following psychodiagnostic methods were used in the study: “Machiavellian Personality Scale” (Richard Christie, Florence Geis, adaptation by V.V. Znakov); “Methodology for studying the personality accentuations of K. Leonhard” (modified by S. Shmishek). The data obtained were subjected to mathematical and statistical analysis using the Spearman rank correlation method.

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## **Aspects of Employees' Competence of the Federal Penitentiary Service of Russia in the Issues of Intra-Group Factors of Conflicts with the Participation of Those Convicted of Terrorism**

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*Key words and phrases:* competence; staff training; conflict; intra-group factors; convicts for terrorism; groups of convicts; pre-conflict situations.

*Abstract:* The purpose of the article is to determine the main aspects of the competence of employees of the Federal Penitentiary Service of Russia, including employees of the psychological service, in matters of intra-group factors of conflicts involving those convicted of terrorism. In accordance with the goal, the tasks are defined: disclosure of the typology of conflict situations that develop with the participation of those convicted of terrorism; identification of factors contributing to the escalation of a pre-conflict situation into a conflict; disclosure of intra-group factors that ensure the implementation of conflicts. The study used the methods of observation, analysis of the available

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scientific and methodological literature on the issue under consideration. As a result of the study, a list of aspects is proposed that determines the competence of the employees of the Federal Penitentiary Service of Russia in matters of intra-group factors of conflicts involving those convicted of terrorism.

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### **Competitiveness and Professional Readiness of a Teacher for Certification**

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*Key words and phrases:* professional certification; teacher's professional certification; teacher certification; professional readiness; teacher's professional readiness; teacher's readiness for certification; teacher's competitiveness; professional standard.

*Abstract:* The purpose of the article is to consider the characteristics of the competitiveness and professional readiness of a teacher for certification. In this article, we consider the importance of developing five components of a teacher's competitiveness – possession of a complex of psychological and pedagogical knowledge, a systematic view of pedagogical activity, a motivational and personal component, a willingness to apply modern pedagogical technologies, and the development of creativity and creative abilities. Compliance with the professional standard and regular certification of teachers helps to maintain the competitiveness of the teacher. To successfully pass the certification, a teacher must be characterized by high professional readiness, which is an indicator of competitiveness.

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### **Psychological and Pedagogical Features of the Development of Conflict Management Technologies in the Youth Environment**

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*Key words and phrases:* conflict; conflict situations; group; youth; youth environment; management; management technology.

*Abstract:* The purpose of the article is to consider the features of conflicts in the youth sphere, as well as to develop technologies for managing conflict situations based on a socio-dynamic approach. The priority tasks of the study were: a detailed analysis of conflict situations among young people, the identification and analysis of sources and sites of possible conflicts, the identification of psychological and pedagogical ways to develop management technologies aimed at preventing and overcoming the consequences of conflicts among young people. The methodological apparatus of the research is represented by general scientific methods: analysis, synthesis, abstraction, comparison, deduction, induction. The results of the work were: the identification of communicative sources of conflicts among the youth, as well as the implementation of socio -dynamic in the development of technologies for managing conflict situations among the youth.

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### **Volunteering: Studying the Phenomenon from the Standpoint of Pedagogical Science**

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*Key words and phrases:* volunteerism; volunteer movement; pedagogy; educational work; correction; self-education.

*Abstract:* The purpose of this article is to determine the possibilities of using volunteerism in educational work with convicts. The solution of the problem is carried out on the basis of general scientific methods of analysis. Modern scientific researches on the problems of volunteering are

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analyzed. It is concluded that it is necessary and promising to study the phenomenon of volunteering from the standpoint of pedagogical science in order to understand the potential for the participation of convicts in volunteering as one of the non-trivial means of organizing educational work that triggers the mechanisms of self-education.

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### **Evaluation of the Effectiveness of the Use of the Educational and Methodological Complex**

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*Key words and phrases:* educational and methodical complex; general and inorganic chemistry; entrance control; boundary control; test tasks; reports; independent work; examination.

*Abstract:* The article discusses the evaluation of the effectiveness of the educational and methodological complex developed at the Department of Microbiology and Biotechnology for first-year students of the direction of preparation 19.03.01 Biotechnology in the discipline "General and Inorganic Chemistry". The purpose of the article is to use this complex to study the above discipline, which enhances educational motivation, improves the efficiency of the educational process. The relevance of the study is due to the search for ways to improve the efficiency of the educational process. The article presents the input control of knowledge and skills in general and inorganic chemistry in the form of a test. The results of the study made it possible to determine the share of chemical knowledge of first-year students.

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### **Innovative Activity of a University Teacher in Modern Higher Education**

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*Key words and phrases:* innovative educational activity; university teachers; personal and professional development; innovative changes in university practice.

*Abstract:* The purpose of the study is to study the activities of higher education teachers in the context of innovative changes in the university, since their efforts to introduce innovations into the educational process of the university make it possible to modernize professional education as a whole. The research objectives are to identify the relationship between the development of the innovative educational process at the university and the possibility of professional and personal development of teachers in the study, development and implementation of innovations in pedagogical practice. The research methods are theoretical analysis, synthesis and generalization. The results of the study complement pedagogical research in the field of organization and functioning of innovative educational processes at the university, the activation of the teaching staff of the university in the study, development and testing of educational innovations in their work, the search for ways to meet the needs of university teachers in immersion in innovative educational activities.

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### **Pedagogical Conditions for the Development of the Interest of University Students in Research Work**

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*Key words and phrases:* science; research activity; pedagogical conditions for the development of students' interest.

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*Abstract:* The purpose of the study is to identify pedagogical conditions that contribute to the development of the interest of university students in research activities. To achieve this goal, the following tasks were solved: legal documents on the research problem were studied; the directions of work, analysis of topics and a variety of forms of scientific events, of the Scientific Society of Students of the Lipetsk State Pedagogical P. Semenov-Tyan-Shansky University on the development of interest in research activities; a conversation was held with the chairman of the Scientific Society of Students and a survey of students of 1–3 courses of the Institute of History, Law and Social Sciences through Google.forms; proposed pedagogical conditions for the development of the interest of university students in research activities. The research hypothesis is as follows: the implementation of pedagogical conditions will be effective in developing the interest of university students in research activities. The methods used include the study of various sources of information, analysis, synthesis, and a survey of respondents. Based on the results of the study, the following results were obtained: the pedagogical conditions for the development of the interest of university students in research activities were identified, which contribute to the development of personal and professional qualities of future specialists.

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### **Revolution in Olympiad Mathematics and a New Approach to Teaching in Technical Universities**

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*Key words and phrases:* Olympiad mathematics; technical universities; teaching methods; innovative approach; ability to solve problems.

*Abstract:* The article discusses various aspects of holding student olympiads in mathematics, including the goals and objectives of these olympiads, methods of preparation, as well as existing publications that emphasize the importance of these olympiads. The article also describes well-known teaching methods such as the lecture approach and the problem-based approach, as well as the advantages and limitations of each. Finally, the article proposes a new approach that combines the positive aspects of existing methods and emphasizes problem solving, critical thinking and creativity to provide a more effective approach to teaching Olympiad mathematics in technical universities.

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### **Factors of Social and Professional Self-Development of Engineering Students in the Process of Foreign Language training**

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*Key words and phrases:* foreign language training; engineering university; social and professional self-development; factors.

*Abstract:* The purpose of the study is to identify factors that contribute to the social and professional self-development of students of an engineering university in the process of foreign language training. The research objectives are to study the existing classifications of factors of self-development of students at the university, to identify and characterize the factors of socio-professional self-development of engineering university students in the process of foreign language training. The research hypothesis is as follows: the versatility, diversity of foreign language training of students at the university requires consideration of factors that contribute to the effective support of their socio-professional self-development. The research methods are theoretical analysis, generalization of scientific pedagogical and psychological literature. The results of the study are as follows: groups of factors of socio-professional self-development of students of an engineering university in the process of foreign language training were identified; the factors included in these groups were identified and characterized.

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## **Professional Training of a Graduate-Creator: The Needs and Challenges of Modern Society**

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*Key words and phrases:* creative industries; creative specialist; promotion; art product; professional training.

*Abstract:* The purpose of this article is to discuss the phenomenon of the rapid development of creative industries, as well as the problem of the lack of professional creators who meet the needs of modern society. To achieve this goal, the following tasks were completed: the analysis of the problems of the current state of society, in which certain contradictions arose between the need and need for professional creators, as well as the lack of modules or disciplines that form creative abilities in the content of professional training for future graduates. The hypothesis of the study is the following: the introduction of the modules presented in this article into the content of vocational training will make it possible to fill the shortage of specialist creators. As a result of the study, modules were proposed that contribute to the formation of the necessary competencies for a modern graduate.

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## **Interdisciplinary Adaptability of Educational Programs in the Russian Language and Culture of Speech in a Technological University**

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*Key words and phrases:* adaptability; adaptation; interdisciplinary adaptability; Russian language and culture of speech; technological university.

*Abstract:* The purpose of the article is to study the influence of vertical and horizontal interdisciplinary relationships on the adaptability of programs in the Russian language and culture of speech in a technological university. The study is based on the hypothesis that the formation of professional and communicative skills of students in the course of mastering the discipline “Russian Language and Culture of Speech” will be effective if interdisciplinary adaptability is introduced into the program of the discipline. In accordance with the hypothesis and purpose of the study, the following tasks were set in the study: the problem of adaptability and adaptation in the context of the state educational policy of the Russian Federation was analyzed; the concept of interdisciplinary adaptability was defined; the characteristics of horizontal and vertical interdisciplinary adaptability were given; specific examples of the implementation of interdisciplinary adaptability within the program of the Russian language and culture of speech in a technological university were given. The methods of pedagogical observation, survey and analysis of scientific and methodological literature on the research problem were used in the paper.