ANNOTATION

Part 1. AUTOMATED DESIGN OF OBJECTS

1.1. Liubov Bovnegra, Viktor Strelbitskyi. FEATURES OF APPLICATION OF THE MATHEMATICAL PACKAGE SMATH STUDIO IN TEACHING NUMERICAL METHODS. At present, numerical methods are one of the most demanded, an important role in the teaching of which is played by the choice of software, since the complexity and type of tasks to be solved largely depends on the functionality of the selected mathematical package. Engineering studies of the dynamics of processes occurring in mechanisms, reactors, local systems for stabilizing the parameters of technological processes, pipelines, heat transfer processes and other chemical objects lead to differential equations, i.e. equations containing derivatives. The paper gives examples of the application of the program for solving second-order differential equations by numerical methods using built-in functions implemented in Smath Studio

All this contributes to the successful application of the mathematical package SMath Studio in teaching the discipline "Numerical Methods".

1.2. Volodymyr Tigariev, Vira Salii, Yuliia Barchanova. ANALYSIS OF GEOMETRIC SHAPES FOR THE CONSTRUCTION OF TILE TILES AND THEIR METHODS OF FORMATION IN 2D AND 3D WITH THE USE OF MODERN CAD. The article determines the urgency of using pavement tiles as opposed to asphalt. A detailed analysis of the geometric shapes of pavement tiles, formed in CAD Autodesk AutoCAD two-dimensional and three-dimensional blocks of paving slabs. For each block, several layout types are offered in 2D and 3D models. In total, 74 blocks of two-dimensional components and 74 three-dimensional components were created that meet the requirements of the standards. An Autodesk AutoCAD built-in component library is also available that speeds up the block selection and layout process, as well as editing elements and adding new components. That is, the multi-stage process of counting and selecting tiles is reduced by several times. The structure and interface of the subroutine were developed in Borland Delphi 7. The use of the subroutine for the automated layout of pavement tiles on the playground was demonstrated.

1.3. Yuliia Babych, Mykola Babych, Olga Rybak. WAYS OF THE PROFESSIONAL READINESS ASSESSMENT OF THE CRITICAL ERGATIC SYSTEM OPERATOR. Generally, the activity of the operator in critical ergatic system is defined as follows: a person must perceive and evaluate the information received, make timely and correct decisions, perform the necessary control and enforcement activities, while operating with the relevant management bodies. The operator is deprived of the ability to directly observe the objects that he manages and is forced to use the information coming to him communication channels, that is, the person is not dealing with real objects of management, but with their display or information models. The information model is divided into such systems into two components – the object model and the operator model. An object information model is a set of information about the state and functioning of a management object and the environment, that is, it is the source of information, on the basis of which the operator forms an image of a real situation, analyzes and evaluates it and makes the decision that ensures the proper functioning of critical ergatic system.

1.4. Andrii Pavlyshko, Olena Pavlyshko, Anastasiia Lisovykova. AUTOMATED NORMALS METHOD FOR FORMING CONJUGATED NON-RULED SURFACES WITHOUT INTERFERENCE. As a result of the application of the subprograms developed and described in this paper, helical curved surfaces are formed according to the predetermined parameters. When setting parameters, the phenomenon of interference is excluded, which allows us to design technological surfaces at the design stage that can be machined with worm mills. One of these surfaces are curved screw surfaces, since they have a curved and directing, and forming.

1.5. Inna Sinko, Yuliia Barchanova, Daria Gurina. CAD SUB-SYSTEM OF CALCULATION OF PROTECTION AGAINST NOISE IN URBAN PLANNING. The paper considers the main problems of environmental noise pollution by transport, determines the relevance and

necessity of researching this problem in modern cities, as well as how to solve it by creating a CAD subsystem, taking into account building codes and design rules for the protection of noise from city territories. A model has been developed for calculating the effectiveness of noise reduction by a strip of noise-protective green spaces.

1.6. Volodymyr Litvinov, Alexander Litvinov. IMPLEMENTATION PROJECT RISK MANAGEMENT. The phased structure of the project for introducing a typical production management program with improvements is considered. The most common risks and uncertainties of individual stages are highlighted. An expert assessment of risks and uncertainties was made, on its basis a risk ranking matrix was built taking into account the tolerance of the project team. The ways of using network planning methods to allocate the resources necessary to overcome threats to the project are shown.

1.7. Irina Borysenko. EFFICIENCY IMPROVING METHODS OF TRANSMISSION OF CONFIDENTIAL INFORMATION BY PUBLIC CHANNELS. The work is devoted to solving the problem of improving the efficiency of transmission of confidential information by public channels by way developing new and modifying existing steganographic methods and algorithms that are resistant to perturbation by reducing the sensitivity of the task of creating stego. The new steganographic method that provides complete recovery of confidential information in the presence of significant perturbation, which is based on the principle of expanding the spectrum of additional information to the cover data spectrum is developed. Further development got the method of reducing of sensitivity of stego, which created by existing steganographic methods, at the expense of decreasing conditionality number of a task of decoding of confidential information. Its application allowed to increase efficiency of decoding steganographic methods based on use of least significant bit of the cover on the average on 35%. Further development got the general approach to the analysis of a state and technology of functioning of information systems that gave the chance to increase stability of some existing steganographic algorithms by their modification and to carry out the analysis of their stability. Stability to perturbations of new modifications exceeds stability of basic algorithm on the average on 30%.

1.8. Alexey Lopakov, Volodymyr Kosmachevski, Karina Migorenko. USE OF MODERN SEMICONDUCTOR SENSORS FOR THE DESIGN OF TEMPERATURE CONTROLLERS. This paper substantiates the choice of type of sensor-sensitive sensor based on semiconductor components and integrated circuits, as well as considers the microprocessor system that allows to receive data from heat-sensitive sensors, send information to indicators, transmit information to COM-port, and control devices.

The system is based on the microcontroller PIC16F84A (Microchip) and provides definition of the most important parameters: temperature, current, voltage, and also generates signals for switching on power installations. Low power consumption of the system allows it to be powered by solar panels.

Part 2. IMPROVEMENT OF ACCURACY AND ECONOMY OF INDUSTRIAL TECHNOLOGIES AND EQUIPMENT

2.1. Alexander Orgiyan, Gennadiy Oborskyi, Anna Balaniuk. DEVELOPMENT OF THE ACCURACY FOR FINE BORING. On the basis of the accuracy of the theory proposed method of calculating the static and dynamic errors in cross-sectional shape of openings in fine boring smooth and stepped holes. We consider particular cross-sectional shape error caused by such factors: the displacement axis of the hole in the workpiece relative to the spindle axis of the oval hole in the workpiece, the unevenness of the radial compliance in the tool spindle to the angle of rotation. The results of calculations and experiments total error depending on the change of the lengths of the steps of the boring bar, the diameter and cutting process parameters. It is found that the feature of change of total errors deviation from circularity of the cross section at multi-cutting boring is the alternation of high and low values in accordance with the alternation amplitude of forced oscillations.

2.2. Volodymyr Tonkonogyi, Alexey Yakimov, Julia Shichireva. ENSURING A UNIFORM DISTRIBUTION OF THE ALLOWANCE ON THE FLANKS OF THE TEETH DURING GEAR GRINDING OPERATIONS. Stabilization of parameters and increasing the efficiency of the technological process for manufacturing high-precision parts, as well as the development of new processing methods that provide the required accuracy and quality in previous and final operations, and the design of high-performance cutting tools is an important engineering problem.

Stabilization of the quality and accuracy of the manufacture of parts is of particular relevance in finishing operations having a long grinding cycle. These operations include gear grinding and thread grinding. In this regard, a further analysis of the technological parameters was carried out on the gear grinding operation.

Based on the establishment of patterns of technological stabilization of the parameters of the gear grinding process, it is necessary to develop methods that increase the resistance and cutting ability of abrasive tools and improve the quality of the machined surfaces while increasing the rate of material removal.

2.3. Victor Kurgan, Ihor Prokopovich, Ihor Sydorenko. MATHEMATICAL MODELING OF STARTING A MECHANICAL TRANSMISSION WITH A NONLINEAR ELASTIC COUPLING. The most difficult moment in the work with an asynchronous motor is the launch. And the more powerful drive is the more difficult launch. This is due to certain features of the asynchronous motors: a limited starting torque and starting throws of the current of the stator motor chain. The mathematical modeling of oscillating process of actuation of the actuator with an asynchronous motor, which includes an elastic coupling with nonlinear mechanical feedback, is carried out. The influence of the type of elastic characteristics of the coupling on the magnitude of the amplitude and frequency of the oscillation process and its time was studied. A single-mass rotational system model was used for the studies. According to the Runge-Kutta method, the oscillation processes of starting the transmission of a machine unit with an induction motor were investigated. To determine the coefficient of vibration isolation, a system with an elastic coupling having a linear elastic characteristic was calculated. A study was also conducted in the case where the coupling determines the elastic characteristics of the Duffing type "soft" and "hard" type. The results of the calculations show that it is advisable to use a nonlinear coupling with a combined characteristic. On the basis of this, a synthesis of the target elastic characteristic and the study of the oscillatory process in the application of the proposed elastic coupling.

2.4. Anatolii Tkachov, Oleksii Tkachov, Ihor Sydorenko. IMPROVEMENT OF THE DEFORMED STATE OF FLIGHT BEAMS OF BRIDGE CRANES. Issues related to increasing the bearing capacity of the span beams of bridge-type cranes by the prestressing method are considered. A new constructive solution is proposed for unloading the main beams of the crane and studying their static stiffness at various places of temporary load position. An appropriate mathematical model of a bridge crane with prestressed beams has been developed, which is based

on the general theory of stability of elastic systems. The equations of the curve of the beam deflections are obtained, on the basis of which the static stiffness of the main beam is studied, depending on the nature of the external temporary load. It has been established that the use of the proposed constructive solution allows to minimize curvature of the span when the cargo trolley is located above the support. The results of the work can be used to modernize cranes in order to increase their load capacity, extend their service life without dismantling, as well as to improve existing structures and engineering methods for their calculation.

2.5. Oleksandr Lymarenko, Vadym Khamray, Oleksandr Romanov. CALCULATIONS OF KINEMATIC AND STATIC PARAMETERS OF STRUCTURAL ELEMENTS OF A FORMULA RACING CAR. Computer simulation and calculation of the frame of a sports car. The article presents a computer simulation of the frame of a sports car of the SAE Formula class and calculates the stress-strain state based on the finite element method. Based on the results obtained, the car body is simulated. The article presents a computer simulation of the frame of a sports car of the SAE Formula class and calculates the stress-strain state based on the finite element method. Based on the results obtained, the car body is simulated. In this work, the choice of the optimal size ratio of a simplified piston rod model of an automobile engine was made in order to reduce the volume of the structure with acceptable voltage values. The study showed that rational design using modern software systems reduces the time, as well as the physical and financial costs of manufacturing or modifying a particular part of the engine and the car as a whole.

2.6. Aleksey Komarnitskii, Liudmyla Kolmakova. THE FACTORIZATION METHOD IN THE ABSTRACT RIEMANN PROBLEM**.** The previously considered schemes for solving the abstract Riemann problem generalize not only the Riemann boundary value problems in Holder space and L_p, but and some integral convolution type equations (with two kernels, Wiener–Hopf, pair ones) in the space $L_2(\square)$ and in wider spaces generalized functions. The corresponding Riemann problem is no longer a boundary problem for analytic functions. However, despite on the whole generality, the matrix Riemann boundary-value problem on a closed contour does not obey to the considered schemes. In this paper, for solving the Riemann problem, an abstact scheme with another axiomatic is proposed, which eliminates this disadvantage.

1.7. Sergey Uminsky, Svetlana Dmitrieva, Mariya Korolkova. ENERGY BALANCE OF WORKS AT INTERFERING GRINDING. A comparative analysis is carried out and analytical dependencies are derived for calculating indicators characterizing the cutting ability of intermittent and continuous grinding wheels. It has been established that the stability of the grinding process in broken circles is determined by the presence of frontal surfaces on the cutting protrusions, the operation of which ensures uniform self-sharpening of abrasive grains along the entire profile of the cutting protrusion, while maintaining the optimal angle of attack to the cutting plane. The stabilization of the grinding process from the standpoint of maximum performance, optimal heat stress and minimal wear is ensured by automatic self-regulation of the angle of attack.

2.8. Kyryll Kreitser, Evgeny Kozishkurt, Maxim Tur. USE OF SURFACE TENSION EFFECT TO PROTECT MAGNESIUM ALLOY FROM FIRE. In this article, considerable attention is paid to methods of fire protection during the melting of magnesium alloys, and a new flux-free method of melting is proposed. The main task of the work is to investigate the possibility of protecting a magnesium alloy from fire by applying a grid to the surface of the melt, which splits the surface of the melt into limited areas of a small area, which in turn will reduce the cost of protective gases. The proposed method requires further development.

2.9. Oleksandr Levynskyi, Yurii Eputatov, Liubov Timoshevska. REMOTE TEMPERATURE MEASUREMENT WITH INFRARED THERMOMETRY WITH UNKNOWN EMISSIVITY OF THE SURFACE OF MATERIALS. The issues of improving the accuracy of temperature measurement using infrared devices are considered. An urgent issue is the remote measurement of the actual temperature at an unknown emissivity of the test body. The analysis of the main factors affecting the accuracy of temperature measurement is carried out. A study of the influence of the observation angle on the emissivity coefficient is presented.

Part 3. THEORY AND PRACTICE OF TEACHING PAINTING AND DESIGN

3.1. Yevgen Antonovych, Svitlana Pryshchenko, Mikhailo Pryshchenko. EUROPEAN VECTOR OF DEVELOPMENT THE INTEGRATED DISCIPLINE «DESIGN OF ADVERTISING» IN UKRAINE. The authors note that Design of Advertising takes into account the socio-cultural and marketing aspects. Visual designing the original and effective advertising products is difficult even for professionals, as the advertisement has to be the end product of complex researches. Base components of the competencies for designer in Advertising have been selected taking into account the requirements of the modern European market. Besides, stylistics and art-aesthetic problems of modern Advertising as the communicative sphere, including displays of Kitsch and Eclecticism are analyzed. Recently, the searches for creative advertising ideas are actively continuing because of the monotony and primitivism of images, so-called visual standards overload huge ads in Media.

3.2. Tetiana Uvarova, Galina Stepanova, Tetiana Stas. EDUCATION IN THE CONTEXT OF VISUALIZATION OF CONTEMPORARY CULTURE. The study focuses on key aspects of education in the context of total visualization of contemporary culture. The article defines the concept of «visual culture», its essential features. The basic trends of education in relation to visual rotation in culture are outlined. It is determined that education should be based on the young generation, formed by the visual culture. The predominance of visual information, the cliche of thinking, the speed of obtaining information, the lack of its critical analysis are highlighted. It is determined that the priority areas of modern education should be visual literacy, aimed at overcoming visual and aesthetic incompetence and forming a critical perception and creature of the visual in culture.

3.3. Svitlana Donchenko, Serhii Mojseyenko, Hanna Omelchenko. FORECASTING THERMAL PROTECTION PROPERTIES AS A STAGE OF ITS ERGONOMIC DESIGN. The article analyzes the process of designing clothes in industry of Ukraine and proposes measures for its improvement. It has been stated that introducing the process of designing such ergonomic design tools as “design research” and “design concept” into the standard scheme will allow manufacturers to increase their products competitiveness. The article covers the results of a design study on the compliance of existing thermal protective clothing at Ukrainian market with consumer requirements. In order to improve the ergonomics of such clothing, the authors propose to predict its thermal insulation properties at the initial stages of design. The existing methods and technologies of forecasting have been analyzed, their disadvantages have been described and the human torso simulation stand (HTSS) developed by the authors has been described, with the discussion of the conducted researches results as for establishing thermal resistance of textile materials and clothing in general.

3.4. Tatiana Bulgakova. CHARACTERISTICS OF EXISTING APPROACHES TO THE COMPOSITIONAL ANALYSIS OF THE BUILT ENVIRONMENT. This article identifies and analyzes the existing approaches to composite analysis of the built environment using the example of a city. The article helps to understand the effectiveness of using this or that approach in the practice of design. The problem of inefficiency of existing methods of analysis and professional assessment of the built environment in forming the surroundings of designers and architects in the framework of modern ideas about the material world as an environment is outlined in the work. We are still trying to use the methods of analysis that have emerged in the earlier stages when the idea was different, because the new methods are still raw and difficult to use in practice.

3.5. Oleksandra Kolisnyk. GRAPHIC DESIGN AS A SIGN OF COOPARATION. The features of graphic design as a significant component of visual communication in a modern society, which is focused on expressiveness, persuasiveness, speed of transmission of a certain pragmatic attitude, emotionality for possible transformations of perception and behavioral orientations, are analyzed in the article. Also, the stylistic features of the contemporary graphic design and its connection with previous European art traditions are considered; also further innovative trends in the design of this area are predicted due to the social challenges of the postmodern.

3.6. Olga Poliakova. FEATURES OF INNOVATIVE TECHNOLOGIES APPLICATION IN THE MODERN HOUSING DESIGN. In the context of the actual trend of the housing environment individualization and adaptability, intelligent devices for managing various housing parameters were considered. The paper analyzes the current state of the studied subject matter. The study describes concepts and definitions for a research topic. Based on the analysis of literary sources, the author revealed the existence of disparate points of view on the interpretation the "smart home" concept, which necessitated the introducing of the definition – "Intelligently Managed Environment" (IME). All services providing by the system IME of housing were classified into six groups according to the types of services that provide the comfort of the dwelling: microclimate control; lighting control; housing security; management of multimedia systems; power management; health care service. The study generalized ways of managing the IME housing system.

3.7. Solomiya Hovhannisyan. DESIGN AND SYMBOL: ASPECTS OF INTERACTIONS. The article deals with the results of investigation about the role of the sign and symbol in graphic design is examined as a way of modern communication in the information society, in which the visual language actively realizes itself in the media of communication, becoming not only the main channel for obtaining information, but also a method of attracting people about an important factors in the total impact on transformation value components of society. The phenomenon of design is analyzed as a formative factor in the worldview preferences of society, which transforms the entire system of spiritual production. The media create the global infosphere as a fundamentally new living environment for modern man, whose distinctive features are the power of manipulative mass influence on people's behavioral reactions, universality and mass distribution.

3.8. Galyna Buchkivska, Valentyna Baranovska. USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES TO ENHANCE PROJECT ACTIVITY OF FUTURE PRIMARY SCHOOL TEACHERS. It is advisable to carry out the process of training future primary school teachers today in a systematic, pedagogically balanced and methodical use of information and communication technologies.

The use of traditional and modern forms of organization of teaching process, its methods and means allows the teacher not only to draw students' attention to the educational problem, to achieve a deep disclosure of the content of information and cognitive material, but also to increase their motivation to study folk decorative and applied art and use its potential in the future profession activities.

3.9. Galyna Buchkivska, Valentyna Greskova, Kateryna Binytska. CONCEPTION OF VOCATIONAL TRAINING OF FUTURE PRIMARY SCHOOL TEACHERS ON THE PRINCIPLES OF ETHNODESIG. In the publication the concept of professional training of future primary school teachers was developed on the principles of ethnodesign (folk decorative and applied art) at different levels of generalization and concretization – at methodological level (synthesis of cultural, philosophical, general scientific and branch-specific approaches), theoretical level (complex of original concepts and categories, definitions and theories), and technological level (applied component of the system that ensures its efficiency in the current situation in compliance with the concept of New Ukrainian School in primary school of general secondary education).

3.10. Volodymyr Khalaitsan. COMPOSITION OF THE ESTATE PARKS OF PODILLIA REGION THROUGH THE SECTION OF CULTURAL LIFE OF THE LATE XVIII – EARLY XX CENTURY. This article highlights the peculiarities of forming park compositions in Podillia region at the end of the XVIII – beginning of the XX centuries. In the research, the composition is treated as a culturological section, in which various factors of material and mental origin have been materialized. Fashion trends, geographical location, climate, relief, personal preferences of those days have been considered.

3.11. Mozoliuk Olena. EVALUATION OF INVESTMENT ATTRACTIVENESS OF INNOVATION PROJECTS. The role of the academic discipline "Painting" in the process of training of the future teachers of fine arts has been considered in the article; the peculiarities of

acquaintance of students with the basic law of painting – the law of tonal and color relations have been revealed; the main tasks that are solved during the practical training in painting have been covered; the sequence of depicting objects from nature (schematization, typification, individualization, generalization) has been described; the purpose of independent work of students has been revealed.

3.12. Larysa Kornytska. THEORETICAL BASIS OF TEACHING ACADEMIC DISCIPLINE "PAINTING" IN INSTITUTIONS OF HIGHER PEDAGOGICAL EDUCATION. The problem of an artist's personal identity development on the cultural basis of ethnic design has been highlighted in accordance with the needs and demands of modern society focused on the preservation of national cultures in a globalized world. The key factors of the national culture preservation and joining the global society on the basis of cultural community have been considered as a result of analysis and generalization series of theoretical papers and practical experience. It has been emphasized that those tasks are solved by education and culture, which are considered to be the foundations of spirituality and professionalism, the basics of intelligence, outlook, values, morals and culture. In this context, ethno art education is regarded as a condition for an artist's (painter, designer) personality development through the acquisition of the most prominent cultural achievements of ethno cultural identity.

3.13. Olha Bilych. **MANUFACTURING ACTIVITY OF LEATHER PROCESSING CRAFT GUILDS IN WESTERN PODILLIA REGION.** The study highlights the guild handicraft of Podillia artistic leather processing master craftsmen (curring furs, bootmaker's, tanning, leather-dressing) in Khmelnytskyi region. The activity of craftsmen authorities of Podillia province and life of Podillia craftsmen of 19^{th} – beginning of the 20^{th} century are described. It is identified that craft guilds became widespread craftsmen schools. Based on the archival cases, facts about the number of craftsmen and manufacturing activity of Podillia craft guilds are presented. The existence of a guild life pattern in Podillya, particularly, in its western territory, is proved.

3.14. Alla Hryhorieva, Yaroslav Nahornyi. PROCEDURAL-ACTIVITY COMPONENT OF THE MODEL OF ARTISTIC-LABOUR TRAINING OF PRIMARY SCHOOL TEACHERS UNDER THE CONDITIONS OF CREATIVE DEVELOPMENT. The article focuses on redefining the paradigm of education. It is noted that the new Ukrainian school should ensure the comprehensive development of the individuality of person as a personality and the highest value of society on the basis of identifying his or her inclinations, abilities, gifts and talents. The central figure in the modernization of the educational process is the teacher of the new formation – the researcher-pedagogue, a creative personality, a professional whose characteristic features are modern scientific and pedagogical thinking, high spirituality, intelligence, optimism, constant readiness for self-education, self-development. Therefore, special attention requires the formation of the creative personality of the teacher, his or her professionalism. It is mentioned that a special place in the formation of the creative personality of the future teacher of primary classes belongs to the disciplines of artistic and labor orientation, the purpose of which is: development of the ability of students to fully perceive the phenomena of art, social life, nature; formation of creative thinking, aesthetic tastes, expansion of world outlook in the field of artistic and folk culture, knowledge deepening; development of interest to the beauty in the environment; perfection of moral, aesthetic needs and interests of youth, their aesthetic orientations, analysis of artistic works; development of emotionality, sensory-ideological attitude of students to the environment in all its manifestations; activating creative self-expression of students.

The essence of the concept «model of development of creative abilities of the future teachers of primary classes in the process of artistic-labor training» has been highlighted. The attention is focused on the main blocks of the model: target, theoretical-methodological, content, organizational-procedural, evaluation-diagnostic, effective. The pedagogical conditions of development of creative abilities of the future teachers of primary school in the process of artistic-labor training have been determined, among them: creation of problem-solving situations and creative tasks; use of project technology training; optimal combination of educational and extra-curricular work on the basis of creative interaction. It is noted that pedagogical conditions are

effectively realized through the following methods, forms, means of development of creative abilities: integrated lectures, seminars-discussions, role games, project activity of students (creative projects and their demonstration, drawing up of a portfolio), competition-exhibition work (festivals, exhibitions, contests, installations, social projects), reflexive exercises (compositions-reflections, reflexive essays, sketches), independent research activity of students (analysis of scientific sources, analysis of practical experience, reviews). The conclusion is made on the integrity, step-by-step and dynamism of the author's model; the possibility of integrating the developed system into existing conditions of higher education.