

ABSTRACTS

OCTOBER RESEARCH CONFERENCE IN SILISTRA

FRI-110-2-KS(S)

FRI-110-2-KS(S)-01

**INFLUENCE OF THE UNIVERSITY OF RUSE
IN THE DANUBE REGION**

COR MEM Prof. Hristo Beloev, DTSc DHC mult.

Rector of University of Ruse

E-mail: hbeloev@uni-ruse.bg

Abstract: The text outlines the role of the University and its strong influence on the regional innovation and regional development, its impact on enhancing knowledge and human capital, the importance of transfer of know-how and technology, maintenance of scientific infrastructure, project investments and regional leadership. Five models of university are presented, which combine criteria such as: interaction of the universities with their partners, mechanisms of commitment of the universities for the development of the regional innovation system, regional influence. The role of the University of Ruse and its capacity for influence in the Danube region is presented.

Keywords: Danube region, innovation system, transfer of know-how

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FRI-110-2-KS(S)-02

NEW GENERATIONS AND THE EDUCATION SYSTEM

Milena Damyanova

Chairperson of the Committee on Education and Science
in the 44th National Assembly of the Republic of Bulgaria

Abstract: *Congratulations to the teachers and students from Silistra Branch! Today you celebrate! I decided to share with you my thoughts about the young people of the 3rd generation. Young people do not know a world without the INTERNET. Technologies are a key feature of Generation Z. Generation Z students learn best by doing. creativity will play the biggest role in the future success of Generation Z. You are the creators of this generation.*

Keywords: *education system, 3rd generation, young people, Generation Z*

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**FUNCTIONAL METATHESIS IN THE ORAL PRACTICE OF THE
FRENCH AND BULGARIAN LANGUAGES**

Assoc. Prof. Kirilova Veska, PhD

Faculty of Modern Languages

St. Cyril and Methodius University of Veliko Turnovo

Phone: 062 618 283

E-mail: v.dimitrova@ts.uni-vt.bg

Abstract: This report analyzes some cases of contact and distant metathesis in the oral practice of French and Bulgarian languages. The purpose of the study is to determine which groups of sound segments are subject to contact metathesis, which sound segments interact during distant metathesis, as well as the reasons that determine them. In contact metathesis, the process in question is established in three types of two-segment groups in both languages: 1) vocal-consonant, 2) consonant-vocal and 3) two-segment consonant group. The reasons causing the metathesis process are of a different nature - phonetic factors acting at subsegmental, segmental and syllabic level, etymological factors, poorly learned pronunciation of words of foreign origin, lapsus linguae, wrong phonetic sequence, wrong analogy, semantic factor, discourse use frequency of the word form affected by the metathesis.

Keywords: contact metathesis, distant metathesis, oral practice, French language, Bulgarian language

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FRI-110-2 H(S)-02

THE SYSTEM OF PERSONAL PRONOUNS IN THE ROMANI DIALECT IN AND AROUND KÂRDZHALI

Assoc. Prof. Ivan G. Iliev, Ph. D.

Department of Humanities

Plovdiv University, Kardzhali branch

Tel.: 0886787696

E-mail: ivan_iliev20002000@yahoo.com

Inan Ârmak (student)

Plovdiv University, Kardzhali branch

Phone: 0884977996

Abstract: *The article deals with the personal pronouns in the Romani dialect, spoken in Kârdzhali and several villages around it. The authors show the pronominal case forms, give example sentences and point the differences between the dialect in research, on the one hand, and some other Romani dialects in Bulgaria, on the other hand.*

Keywords: *Personal pronouns, Romani dialects, Kardzhali, Bulgaria.*

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FRI-110-2 H(S)-03

ACTIVENESS AND ASPECTS OF IMPLEMENTATION OF THE LITERARY-POLITICAL MYTHOLOGY OF "GOLDEN DOBRUDZHA"

Assoc. Prof. Rumyana Lebedova, MA, PhD

Department of Philological and Natural Science

University of Ruse - Silistra Branch

mobile: +359887632741

E: mail: rlebedova@uni-ruse.bg

Abstract: The paper provides information about certain factors that create the literary-political mythology of "Golden Dobrudzha", about the different variations of its existence, the different aspects of its implementation and about its functions. The features and suggestions it evokes socially and intimately are highlighted. Texts with different genre specifics, created in different historical periods, ensuring the popularization of the above-mentioned myth, as well as the time of its highest activity, were observed. A comparison has been made with the presence of the topic of Dobrudzha in Romanian literature.

Keywords: myth, functions, aspects, realization, literature

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FRI-110-2 H(S)-04

TOUCHES ON SATIRICAL WORK OF STOYAN MIHAYLOVSKI

Elitsa Raynova

Teacher at Peyo K. Yavorov Language High School

Tel.: +359876879301

E-mail: raynovaelitsa@gmail.com

Abstract: This paper aims to present the satirical creativity of Stoyan Mihaylovski. He is a realist, a denunciator of social and human shortcomings, who is not afraid to tell the truth and to expose the moral corruption in the power. He fights for morality, high spirit and lofty ideals in the politic, for order, justice and solidarity in society. His work has great cultural and historical significance for Bulgaria. His satirical works perfectly characterize the vicious system and political manipulations.

Keywords: new Bulgarian literature, satire, power, politics, corruption.

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FRI-110-2 H(S)-05

ON THE ORIGIN OF SEVERAL PERSONAL PRONOUNS IN BULGARIAN LANGUAGE - FROM A BALKAN POINT OF VIEW

Assoc. Prof. Ivan G. Iliev, Ph. D.

Department of Humanities

Plovdiv University, Kardzhali branch

Tel.: 0886787696

E-mail: ivan_iliev20002000@yahoo.com

Abstract: The article deals, from a Balkanistic point of view, with the origin of several forms of the Bulgarian personal pronouns. Some of them have been studied before, the others not. The author suggests a new hypothesis about how these forms appeared in the Bulgarian language.

Key words: personal pronouns, Bulgarian language, Balkan languages.

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FRI-110-2 H(S)-06

THE TRANSFORMATIONS OF THE PEDAGOGICAL SCHOOL IN SILISTRA 1890 – 1913 /1941 – 1944/ 1945 – 1962

Natalia Mincheva, PhD

Regional museum of history – Silistra

Phone: 086/820 388

E-mail: natali@gbg.bg

Abstract: The transformations of the Pedagogical school in Silistra during the above-mentioned periods is closely connected with the socially-economical development of the country – the internal political system, the status of society and the historical developments of South Dobrudja. In this context the most important segments of the development of the Pedagogical school in Silistra are illustrated as follows: Government 4th Grade Pedagogical School formation (1890–1913), The Institute for Primary School Teachers (1941–1950) and Government School for Pedagogy (1951–1962).

Keywords: Education, Pedagogical school, The Institute for Primary School Teachers, Silistra

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FRI-110-2 H(S)-07

RATIONALITY IN POLITICS IS A MIRAGE

Stanislav Todorov – PhD Student

Faculty of Philosophy, Political sciences,

Sofia University “St.Kliment Ohridski”

Tel.: 0897345513

E-mail: stanislav.todorov1984@abv.bg

Abstract: In this publication, I will defend the thesis contained in the title of the publication. I will provide a dispute with literature pieces on the subject: Can uninformed voters participate rationally in the political life? I will propose three examples from the Bulgarian reality: two from the conventional participation and one from the unconventional one. With these examples, I will show that modern life increasingly provides us with facts about the lack of rationality in political life.

Keywords: informed/rational choice, heuristics, retrospective assessment.

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FRI-110-2 H(S)-08

PARTY IN THE BALKANS

Alina Costea, assistant professor PhD

Department of Modern Languages for Specific Purposes,
Faculty of Letters, Ovidius University of Constanta

Abstract: Our research on identity issues and patterns has drawn us towards the metaphor of the carnival which has been analyzed by many well-established critics such as Mikhail Bakhtin in *Rabelais and his world* or by Jean Rousset in *Baroque literature in France*, to mention just a few. We have connected the above studies to two sample texts by a Romanian writer, Vasile Voiculescu, who has a name in the field of traditional writing with a special interest for our folktales and rituals, along with Nikos Kazantzakis' novel, *Zorba the Greek*, putting focus on the main character and emphasizing his joy for life.

The purpose of such a quest is to set the type of behaviour typical to the populations living in the Balkan Peninsula. We could have not been successful in this journey of knowledge and of reflecting our image in the mirror, without the help of another core study, *Imagining the Balkans*, belonging to a Bulgarian scholar, Maria Todorova.

Homo Balkanicus, as the forehand researcher names it, describes the quintessential features of a man that only lives for indulging in the pleasures of life, but not for the sheer feeling of pleasure, as more for the philosophy behind the Epicurean slogan of seizing the day. The theatrical setting for the *Homo Balkanicus* to unfold all his personality finds an excellent home in the carnival. Undoubtedly, the texts selected from Vasile Voiculescu and from Nikos Kazantzakis can provide a better understanding of the metaphor, of the characters involved in the plot, and not in the least, of the space that generated them all, the Balkans.

Keywords: Balkans, party, life, joy, carnival

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FRI-110-2 H(S)-09

“SEPTEMBER” BY GEO MILEV – AN ASPECT OF IMPLEMENTATION OF THE BIBLICAL CODE

Vladislav Dimitrov – a school teacher

“N. Y. Vaptsarov” secondary school, Silistra

Tel.: +359899040012

E-mail: vladoyd@abv.bg

Abstract: The paper reviews two different approaches in order to understand better the sub-textual meaning of the poem “September” by Geo Milev and tries to look closer the reasons of writing this literary work. First one is a look from the Bible and Cristianity's point of view and the second is from the psychoanalysis' point of view. This paper aims to show us how these two different approaches could reveal some of the author's internal intents and hidden desires. The report also provides some theories in the field of psychoanalysis, using ideas taken from Sigmund Freud and Carl Jung, which gives an international outlook to the topic.

Keywords: Freedom, Bible, God, Satanail, Rebellion, Dystopia, Freudina theory, Personality

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FRI-110-2 H(S)-10

FEATURES OF THE SUBORDINATE CIRCUMSTANTIAL SENTENCES FOR A DISCOUNT IN THE STORY “UNHAPPY FAMILY” BY VASIL DRUMEV

Donka Radeva Ilieva

Senior teacher in philosophy, history, bulgarian language and literature-
first professional qualification

“Vasil Levski” secondary school, Dulovo, Silistra Region

Phone: 0886368008

E-mail: ilieva_d@mail.bg

Abstract: The article presents the era in which Vasil Drumev works, which is characterized by the diversity and dynamics of socio-historical processes. Attention is drawn to the fact that the new economic conditions changed the thinking of the Revival man and gradually imposed a tendency towards secular education.

The object of study is the specifics of the language of Vasil Drumev - emphasis is placed on the retreat sentences as part of the syntax of "Unhappy Family". The use of the subordinate circumstantial sentences for a discount, their function and their position in the composition of the complex sentence are traced. The research goes in several directions: the types of subordinate clauses are classified, the allied relations that introduce the subordinate clauses are analyzed, and the position of the subordinate clauses in relation to the main one is traced

Keywords: syntax, Bulgarian language, sentence, difficult sentence, depreciatory references

JEL Codes: L10, L11

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FRI-110-2 H(S)-11

ON THE CULT OF LIGHT AND ITS INFLUENCE ON THE CHRISTIAN RELIGION

Ivelin Atanasov Iliev

Senior teacher in philosophy, history, bulgarian language and literature-
first professional qualification

“Vasil Levski” secondary school, Dulovo, Silistra Region

Phone: 0893698841

E-mail: makei@mail.bg

Abstract: The cult of light originated in the Ancient East and spread to the West, through Christianity. Here it evolved into a complex dogmatic concept. Light determines the religious, philosophical and semiotic understanding of the meaning of life and builds the spiritual development along the vertical Man - God and the horizontal Man - Man. The existence of medieval man is made meaningful through this pyramidal arrangement of light, on top of which stands God.

It presents the creation of the world, its ontology and its transition to deontology. The main pillar in this structure is the Logos. He is the logical connection between the heavenly and the earthly, he himself is an expression of the divine and the light. Light is represented in Christianity through various forms and intensities, and its main meaning is related to the metaphorical understanding of the good and the divine. This Christian concept of light is the basis of modern axiology.

Keywords: Christian religion, light, cult

JEL Codes: L10, L11

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CLERGY AND LITERATURE IN THE MIDDLE AGES

Maria Tomova-Mihneva, PhD

Department of Philological and Natural Science

University of Ruse, Silistra Branch

Phone: +359 086 821 521

E-mail: mtomova@uni-ruse.bg

Abstract: *The organization of spiritual and educational life in the Middle Ages was based on a well-developed state policy aimed at an independent Bulgarian Church and education which later became a model for the development of the Slavic Orthodox civilization.*

Key words: *clergy, education, literature, Middle Ages*

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FOR RHYTHMICALLY ORGANIZED TOPOSES IN THE NAMELESS VITA OF JOHN OF RILA

Assoc. Prof. Todorka Georgieva, DcS

Department of Technical and Natural Sciences, Silistra Branch,
University of Ruse

Phone: 086-821 521

E-mail: tgeorgieva@uni-ruse.bg

Abstract: In the 20th century in the field of Bulgarian medieval studies was formed a notion stating that the oldest vita of St. John of Rila was "domestic Bulgarian folk vita". It was considered that it was "folk in its content and style". However, subsequent studies strongly reject this opinion, showing a connection between The Nameless Vita of John of Rila and written monuments from the Old Bulgarian era. Today it is considered that the text was a result from a nameless composition and some personal creativity. The observations made over the rhythmically organized toposes in the vita confirm the conclusion that its author was a highly educated and talented writer. Moreover he was familiar with the work of Cyril and Methodius and the old Bulgarian Glagolitic tradition.

Keywords: Old Bulgarian literature, The Nameless Life of St. John of Rila

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METHODOLOGICAL ASPECTS OF ACQUIRING PRACTICAL SKILLS IN DEVELOPMENT AND MANAGEMENT OF SOCIAL PROJECT

Chief assistant Prof. Daniela Yordanova, PhD

Department Business and Management,

University of Ruse

Phone: 082-888 520

E-mail: dyordanova@uni-ruse.bg

Abstract: The object of this paper is a research on methodologies that have practical skills gaining effect during the training in topic Social projects development and management. Social projects are specific share of public projects bringing sustainable benefits for different vulnerable groups. Key knowledge elements in project management includes identification of project ideas and potential funding, development of project proposal as well as management, monitoring, control and reporting. Results during the training may be provided by combination of two main approaches – PMBOK (Project management body of knowledge) of PMI (Project management institute) and PCM (Project cycle management) of European Commission. This training can be implemented by use of many published books and manuals. However, the challenge faced by trainers is development of practical skills in parallel with theoretical knowledge acquiring.

Keywords: social projects, project management and development, methodology of training

JEL Codes: A2, O10

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DISTANCE LEARNING IN PHYSICAL EDUCATION AND SPORTS

Prof. Antoaneta Momchilova, DcS

University of Ruse

Phone: 0885-905- 425

E-mail: aim@uni-ruse.bg

Abstract: Distance learning in physical education and sports helps students to acquire new knowledge, motor skills and habits, to strengthen old ones. It is a great option for counteracting the negative consequences of stagnant life such as: spinal deformities, low physical capacity, rapidly occurring mental and physical fatigue, insufficient body resistance and susceptibility to disease and others. The challenge is to make distance learning interesting and attractive so that students can participate actively.

Keywords: distance learning, physical education and sports, health, physical capacity.

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PROBLEMS OF ECOLOGICAL EDUCATION OF STUDENTS OF THE DAGESTAN BASIC SCHOOL IN THE CONTEXT OF THE IMPLEMENTATION OF NEW STANDARDS

Nedyurmagomedov Georgy Gadzhimirzoevich,

Candidate of Pedagogy,

Associate Professor of the Department of Pedagogy, Dagestan State

Pedagogical University, Russia, Makhachkala,

E-mail: mgeorg@mail.ru;

Magomedova Manadi Akhmednabievna,

candidate of biological sciences,

Associate Professor at the Department of Biology, Ecology and Teaching Methods,

Dagestan State Pedagogical University, Russia, Makhachkala,

E-mail: mgeorg@mail.ru

Abstract: *The article discusses the problems of environmental education of students of the Dagestan basic school in the context of the implementation of new standards, the relevance of which stems from the growing global environmental crisis. The reasons for the emergence of a new goal of school environmental education are revealed, due to modern approaches in education and the requirements of new school standards. The definition of environmental education is clarified, its features and essence are revealed at the present stage, the approaches of specialists to its implementation are considered, through the implementation of the main models of school environmental education and the reasons for their low efficiency.*

Based on the analysis of teachers' experience and their own practice in secondary schools, the authors state the pedagogical conditions that have proven their effectiveness in the Dagestan basic school in the context of the implementation of environmental education.

Keywords: *global environmental crisis, environmental education, environmental culture.*

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THE LITERARY EDUCATION AND E-LEARNING

Assoc. prof. (Lina) Galina Lecheva, PhD

Department of Philological and Natural Science

University of Ruse - Silistra Branch

Phone: +359 88 540 0647

E-mail: glecheva@uni-ruse.bg

Abstract: *E-learning, which differs significantly from traditional classroom education, has become a widely acceptable and commonly used means for education nowadays (in any types of educational organizations). This paper will focus on e-literature as it is used in and for the e-learning process; e-literature is not exclusively used in e-learning process as it is also used to complement traditional literature (e.g., hard copy book) in the traditional education process. A great proportion of literature on e-literature mainly deals with issues about its preparation, content, and dissemination. However, an often-neglected view is the readiness of e-learning participants to use e-literature. As such, the current paper seeks to provide an insight into the issues related to participants' readiness to use e-literature in e-learning process. To this end, the main objective of this paper is to specify and provide and insight into participant's readiness to use e-literature in e-learning process. For the purpose of our paper we did a survey among undergraduate students involved in web-supported e-learning process (sample from Slovenia) and undergraduate students involved in fully-online e-learning process (sample from Romania). The paper also lays an important ground work for future research of participant's attitudes towards using e-literature in the frame of e-learning.*

Keywords: *E-Learning, IT technologies, literature, Education*

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THE LEADERSHIP STATUS OF THE GUIDE IN THE TOUR GROUP

Assoc. Prof. Zahariy Dechev, PhD

Department: Marketing and Tourism

Assen Zlatarov University – Burgas

Tel. +359 892 284 206

E-mail: prkrai_bs@abv.bg

Abstract: The current status of the tourism guide is discussed in this text. A generalized structure of the guide as a manager and leader of the guide group is presented. The quality of the guide service depends on various circumstances, but also on some typical features in terms of the guide-leader-group relationship. The professional service provided by the guide increases his responsibility as a leader of the tour group. In practice, the underlying attitude and position for the hidden leadership presence and status of the guide in the group is observed.

Keywords: tourism, guide, manager, leader, status, guide group.

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COMPETENCE APPROACH IN FOREIGN LANGUAGE TEACHING WITHIN EDUCATION 4.0

Assoc. Prof. Diana Zhelezova-Mindizova, PhD

Department of Philological and Natural Sciences, Silistra Branch,
University of Ruse

Phone: 086-821 521

E-mail: dmindizova@uni-ruse.bg

Abstract: The paper reviews the implementation of competence approach in foreign language teaching and skills based learning. It is presented not as abstract learning rather it is a concrete skill. It is also described as a type of education that creates competencies needed for improved productivity and focuses on outcomes as well as the learners' real-world performance. The paper presents general conceptualization of competency-based foreign language learning and describes this education as an ongoing sequence of particular interactions that are systematically designed to approach and approximate performance standards. Competency-based foreign language education differs from other non-related approaches in that the unit of learning is extremely fine-grained. Rather than a course or a module, every individual skill or learning outcome (known as a competency) is one single unit. Learners work on one competency at a time, which is likely a small component of a larger learning goal. The foreign language student is evaluated on the individual competency and can only move on to other competencies after they have mastered the current skill being learned. Thus competence approach to foreign language teaching focuses on learning on the critical competencies needed for success in the job and organization. The paper presents the idea of Education 4.0 as a school of thought that encourages non-traditional thinking when it comes to imparting education. Foreign language teaching and learning within Education 4.0 essentially uses technology-based tools and resources to drive education in non-traditional ways.

Keywords: Competence, approach and method, foreign language teaching and learning. Education 4.0

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LANGUAGE – CULTURE RELATION AND INTERCULTURAL COMPETENCE

Principal Assist. Prof. Diana Bebenova-Nikolova, PhD

Department of Philology and Natural Sciences,

University of Ruse , Silistra Branch

Phone: 0888494077

E-mail: dbebenova@uni-ruse.bg

Abstract: *The paper embarks on the discussion of the relation between language and culture as fundamental not only for anthropological research projects, but also for the development of educational programs and language education policies. The priority given to the study of culture, as a vital component in language learning, shows the extent to which education is oriented towards the challenges of frequent intercultural encounters and communication. At the same time, defining the relationship between culture and language leads to conclusions about the specific competencies of language teachers and their students in multicultural and multilingual communication environment. In this aspect it can be argued that the discussion on the theoretical aspects of the language-culture relation and the related concept of competence, in all its manifestations described below, can highlight the triangulation: language-culture relation – teacher's competence – learners' competence. Grounded on that, the paper states the importance of teacher's intercultural competence for language teaching and suggests the application of the Integrated Process Model as a useful tool for understanding the processes.*

Keywords: Intercultural Competence, Integrated Process Model, Language, Culture, Relation

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CREATION OF ELECTRONIC TESTS FOR CHECKING COMPETENCIES IN DISTANCE LEARNING IN INFORMATION TECHNOLOGIES

Principal Assist. Prof. Evgenia Goranova, PhD

Department of Philological and Natural Sciences, Silistra Branch,
University of Ruse 'Angel Kanchev'

Phone: 086-821 521

E-mail: egoranova@uni-ruse.bg

Abstract: Training in the subject of information technologies is fundamental for the acquisition of digital competence of school students. That is why the creation of electronic didactic materials for both the formation and testing of digital competencies in e-learning is an essential task of the teaching community. We have established the applicability of two types of electronic tests, which can be used in distance learning and in traditional form. The first type is created with the Kahoot platform, the second type - with the Adobe Captivate application program. Their combined application in distance learning in information technologies is related to the need to check competencies for a specific situation - frontal-individual or frontal-group. The differences in the degrees of interactivity provide the user with different advantages. But both types of tests optimize the teaching work in the field of verification and evaluation.

Keywords: Digital competence, Electronic tests, Distance learning

JEL Codes: I20, I21

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FRI-227-2-PPTM(S)-08

HEALTH AND HEALTH EDUCATION IN SCHOOL

Prof. Antoaneta Momchilova, DcS

University of Ruse

Phone: 0885-905- 425

E-mail: aim@uni-ruse.bg

Abstract: *The goal of Valeology in primary school is to form an internal need among young students for knowledge regarding a healthy way of life, and the development of their motor and intellectual skills. The contemporary structure of physical education activities creates the opportunity for broadening the creative abilities of sports educators. It allows for the diversification of the means and methods for physical activity, rational nutrition, and the use of nature for strengthening health, and more.*

Keywords: *valeology, health, physical education and sports, healthy way of life*

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FRI-227-2-PPTM(S)-09

THE FLIPPED CLASSROOM - BENEFITS AND CHALLENGES

Milena Dimova Tsaneva

Otets Paisiy Primary School

Silistra, Bulgaria

Tel.: + 359 878783434

E-mail: milena.tsaneva@opsilistra.bg

Abstract: Over the last few years, the flipped classroom has rapidly gained popularity among teachers and school administrators. Vanderbilt Quote - Panopto Flipped Classroom Video Platform According to recent studies, 1 in 5 teachers are considering flipping their classrooms, with 1 in 4 school administrators are interested in implementing this trend. And according to the THE Journal, the number of active members on the Flipped Learning Network's Ning site has grown from just 2,500 to more than 15,000 since January 2012. But what is a flipped classroom, exactly? In flipped classrooms, also known as inverted classrooms, students review lecture materials before class as homework. In-class time is dedicated to discussions, interactive exercises, and independent work that would have previously been completed at home — all under the guidance of the teacher, who is present and available to respond to any questions that may arise.

Keywords- Flipped classroom, Active learning, Tehnology integration, E-learning

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FRI-227-2-PPTM(S)-10

PSYCHOLOGICAL ACCENTS FOR THE GUIDE'S LEADERSHIP IN THE TOURIST GUIDE

Assoc. Prof. Zahariy Dechev, Phd
Department: Marketing and Tourism
Assen Zlatarov University – Burgas
Tel. +359 892 284 206
E-mail: prkrai_bs@abv.bg

Abstract: In the present text an attempt is made to derive some psychological accents for the leadership of the guide in providing tour guide services to tourists. In its essence, leadership is a dynamic phenomenon. Those typical characteristics of a good leader-guide are highlighted, which have an impact on the guide activity performed by him. The professional activity of the tourist guide focuses on several current ideas about the integrative models of leadership, which distinguish him in the tour guide practice. Leadership issues in its various dimensions are an important part of modern tourist guidance.

Keywords: tourism, guide, service, personality, leader, leadership, dynamics.

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FRI-227-2-PPTM(S)-11

WHAT DIFFICULTIES ARE THERE IN TEACHER'S WORK WHEN USING MULTIMEDIA IN THE PROCESS OF TEACHING STUDENTS

Vladislav Dimitrov – a secondary school teacher

“N. Y. Vaptsarov” secondary school, Silistra

Tel.: +359899040012

E-mail: vladoyd@abv.bg

Abstract: The paper reviews the problems primary teachers faced by during the process of teaching pupils at an early stage using multimedia. A major problem is the number of hours they spend preparing every lesson to be passed on through multimedia because there is still no bank with pre-prepared teaching materials in all school subjects and for all classes that teachers have free access to.

Key words: primary teachers, multimedia, working hours, teaching methods

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FRI-227-2-PPTM(S)-12

LET'S ASK THE TEXT - A POSSIBLE STRATEGY FOR COMPETENCE DEVELOPMENT

Vanya Ignatova

Regional Department of Education, Silistra

Tel: 0888 298 280

email: v.ignatova66@gmail.com

Abstract: The application of the competence approach in the teaching of Bulgarian language and literature presupposes the development of strategies to motivate students to build skills for lifelong learning. By mastering the technology for formulating questions to the artistic text studied in school, the students acquire skills for information extraction and learning, for analysis, they learn to draw conclusions, to apply knowledge, to create. The technology was developed based on Bloom's taxonomy and has been applied in high school literature lessons. It develops key competencies in adolescents - language literacy, communicative competence, competence for cultural awareness and expression.

Keywords: communication skills, question technology, Bloom's taxonomy, competencies, text communication, method, approach.

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FRI-116-2-TS(S)

FRI-116-2-TS(S)-01

**INVESTIGATION THE ENERGY EFFICIENCY OF INDUSTRIAL
MELTING ELECTRIC FURNACES FOR FERROUS METALS**

Assoc. Prof. Konstantin Koev, PhD

Department of Electric Power Supply and Electrical Equipment,
Department of Philological and Natural Sciences, Silistra Branch,
University of Ruse
Phone: +359 82 888/ 201, 661
E-mail: kkoev@uni-ruse.bg

Assist. Svetlozar Grigorov, M.Sc.Eng.

Department of Philological and Natural Sciences, Silistra Branch,
University of Ruse
E-mail: sgrigorov@uni-ruse.bg

Abstract: The paper analyses energy efficiency performances of industrial melting electric furnaces for ferrous metals. The values of consumed electric energy are measured. The values of specific energy consumption are calculated for measured consumed electric energy and mass of melted material. The specific energy consumption is (1,337...2,568) MWh/t according to (316,9...262,5) t melting material for an year. The results are analysed.

Keywords: industrial melting electric furnaces, ferrous metals, electric energy, energy efficiency, specific energy consumption.

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FRI-116-2-TS(S)-02

INVESTIGATION THE ENERGY EFFICIENCY OF INDUSTRIAL MELTING ELECTRIC FURNACES FOR NON FERROUS METALS

Assist. Svetlozar Grigorov, M.Sc.Eng.

Department of Philological and Natural Sciences, Silistra Branch,
University of Ruse
E-mail: sgrigorov@uni-ruse.bg

Assoc. Prof. Konstantin Koev, PhD

Department of Electric Power Supply and Electrical Equipment,
Department of Philological and Natural Sciences, Silistra Branch,
University of Ruse
Phone: +359 82 888/ 201, 661
E-mail: kkoev@uni-ruse.bg

Abstract: The paper analyses energy efficiency performances of industrial melting electric furnaces for non ferrous metals. The values of consumed electric energy are measured. The values of specific energy consumption are calculated for measured consumed electric energy and mass of melted material. The specific energy consumption is (0,717...1,559) MWh/t according to (4,350...2,169) t melting material. The results are analysed.

Keywords: industrial melting electric furnaces, non ferrous metals, electric energy, energy efficiency, specific energy consumption.

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FRI-116-2-TS(S)-03

INFLUENCE OF THE STROKE OF THE SOLENOID VALVE ON THE HYDRAULIC CHARACTERISTICS OF ELECTROMAGNETIC INJECTORS COMMON RAIL

Principal Assist. Prof. Valentin Manev, PhD

Department of Philological and Natural Sciences, Silistra Branch,
University of Ruse
E-mail: vmanev@mail.bg

Principal Assist. Prof. Milen Sapundzhiev, PhD

Department of Philological and Natural Sciences, Silistra Branch,
University of Ruse
E-mail: milenvs@abv.bg

Abstract: *The report describes an experiment investigating the effect of the solenoid valve stroke on the hydraulic characteristics of electromagnetic injectors Common Rail. The tests were made on a universal test bench for CMX6000X diesel fuel systems. The first generation I electromagnetic injectors - BOSCH CRI1 was selected as the study object.*

Keywords: *Common Rail, electromagnetic injectors, hydraulic characteristics*

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FRI-116-2-TS(S)-04

EU STRATEGY TO REDUCE CO₂ EMISSION FROM ROAD TRANSPORT AND APPROACHES TO ITS IMPLEMENTATION BY MEMBER STATES AND VEHICLES MANUFACTURES

Principal Assist. Prof. Milen Sapundzhiev, PhD

Department of Philological and Natural Sciences, Silistra Branch,
University of Ruse
E-mail: milenvs@abv.bg

Principal Assist. Prof. Valentin Manev, PhD

Department of Philological and Natural Sciences, Silistra Branch,
University of Ruse
E-mail: vmanev@mail.bg

Abstract: *In this report are considered any of the measures of EU on reduction CO₂ from vehicles transport, approaches and guidelines, which countries and vehicles manufacturers have accepted or it is possible to take.*

Keywords: *CO₂ emission, emission from transport, electric vehicles, vehicles*

JEL Codes:

REFERENCES

Reducing CO₂ emissions from passenger cars - before 2020, available in: https://ec.europa.eu/clima/policies/transport/vehicles/cars_bg

Greenhouse gas emission statistics – emission inventories

CO₂ emissions from cars: the facts

Global Warming on the Road

Passenger cars in the EU

Battery Electric Vehicles vs. Internal Combustion Engine Vehicles

AutoSmart - Learn the facts: Fuel consumption and CO₂

CO₂ emissions are increasing

Relative quantities of CO₂/g/kwh equivalent in the atmosphere from the generation of electricity for the movement of electric vehicles within the EU

NOVEMBER RESEARCH CONFERENCE IN RUSE

THURS-ONLINE-FS

THURS-ONLINE-FS-01

**TILOS, AN AUTONOMOUS GREEK ISLAND THANKS TO A
PV/WIND/ZEBRA BATTERY PLANT AND A SMART ENERGY
MANAGEMENT SYSTEM**

Gilles Notton, PhD

Senior researcher

University of Corsica Pasquale Paoli, France

E-mail: notton_g@univ-corse.fr

Abstract: *The Tilos project is presented; the objectives are to maximize photovoltaic and wind production to supply electricity to the Tilos island in Greece while maintaining a total electricity supply security. a smart grid coupled to a hybrid PV/Wind/Zebra batteries system was implemented and makes this green island partially autonomous thanks to renewable energy. The objectives of this European Horizon 2020 project are detailed and a summation of the main results of this international collaboration is presented.*

Keywords: *hybrid battery, PV battery, zebra battery, smart energy, tilos, photovoltaic, electricity*

THURS-ONLINE-FS-02

**EXPERIMENTAL STUDY ON THE PERFORMANCE OF SMALL-SCALE
WIND TURBINE ROTORS**

Gabriela Cîrciumaru, PhD

Development in Electrical Engineering ICPE-CA Bucharest, Romania

National Institute for Research

E-mail: gabriela.circiumaru@icpe-ca.ro

Abstract: *The paper presents the results of the research regarding the development and testing of small-scale wind turbine rotors, as well as aspects regarding their integration in power systems. Different wind rotors with diameters ranging from 524 mm to 620 mm have been designed in order to study the influence of the main parameters such as rotor diameter, blade chord length and pitch angle on the power output. The models have been made by 3D printing and were characterized by testing performed in an open circuit wind tunnel. for 10 m/s wind velocity, the maximum power output of the developed rotors is in the range of 34...48 W. The experimental results revealed that the lower the pitch angle, the higher the starting velocity, turbine power, rotational speed and power coefficient.*

Keywords: *wind turbine, small-scale, rotor, power systems*

THURS-ONLINE-FS-03

IoT IN AGRICULTURE: IRRIGATION MONITORING AND CONTROL SYSTEM EXAMPLE

Assoc. Prof. Radosveta Sokullu, PhD
Head of the Telecommunications Branch
Ege University, Turkey
E-mail: radosveta.sokullu@ege.edu.tr

Abstract: In the last decade wireless technologies have become an ubiquitous part of our lives due to their increased functional features and low cost. Driven by this the Internet of Things (IoT) has penetrated into various areas of our life, one of which is modern agriculture. IoT is already deeply incorporated in most of the environmental monitoring applications and its roles are further increasing to ensure more efficient identification of problems, managing facilities and resources and provision of precise agriculture. "Precision agriculture" is a newly defined term which implies the use of modern technologies to boost up both the yields and the profits in farming and cattle breeding while reducing the required inputs like water, fertilizers, feeds, herbicides, insecticides and land as well. It incorporates various aspects including management, data analysis and processing combining it with other available information and new communication technologies including IoT and Cloud based services to make smarter decisions and improve efficiency, productivity and quality. This paper deliberates on the IoT technology in light of various agricultural applications, the various communication protocols involved and focuses on an IoT based water pipeline monitoring and management system prototype developed in Usak, Turkey.

Keywords: IoT, Internet of Things, modern agriculture, precise agriculture, modern technologies, cloud service, monitoring, management system

THURS-ONLINE-FS-04

APPLICATION OF RENEWABLE ENERGY SOURCES FOR IRRIGATION POWER SUPPLY IN BULGARIA

Assoc. Prof. Ludmil Stoyanov, PhD
Vice-dean of R&D and International Cooperation, French Faculty of Electrical Engineering
Technical University of Sofia, Bulgaria
E-mail: ludiss@tu-sofia.bg

Abstract: The presentation presents the possibilities to use renewable energy sources, such a photovoltaic and wind generators, for feeding of irrigation systems. a methodology is developed that uses statistical meteorological data for the considered site and is based on operation simulation for one year period. The meteorological data are converted according to the wind generator hub height and then converted in produced energy using the wind turbine power curve and interpolation method. The methodology is applied to 7 different sites in Bulgaria. The considered agricultural crop is grapevines. Different configurations of wind generator rated power and water tank capacity are considered. The results allow the estimation of the feasibility of this power supply.

Keywords: renewable energy, photovoltaic, wind generators, wind turbine, power supply

FRI-ONLINE-1-AMT&ASVM

FRI-ONLINE-1-AMT&ASVM-01

OVERVIEW OF CONTACTLESS SENSORS APPLIED IN PRECISION AGRICULTURE

Assist. Prof. Asparuh Atanasov

Department of Mechanics and Masine Elements,
Technical University of Varna, Bulgaria
Mobile Phone: 0899-809 331
E-mail: asparuh.atanasov@tu-varna.bg

Assoc. Prof. Radko Mihajlov, PhD

Department of Mechanics and Masine Elements,
Technical University of Varna, Bulgaria
Mobile Phone: 0899-904 980
E-mail: rmihajlov@tu-varna.bg

Abstract: an overview of different types of contactless sensors used in precision agriculture is made. The most common applications are for: establishing the course of vegetation, the development of diseases, the amount of water reserves, weeding, pests, biomass, yield planning and other agronomic characteristics. The review shows that there are many opportunities and technical solutions for automated, objective and reproducible assessment of agronomic characteristics through sensors. The features of sensors based on micro-electromechanical (MEMS) and nano-electromechanical systems (NEMS) for remote, spectral examination, electrical and electromagnetic, electrochemical, optical and radiometric, sensors for thermography and chlorophyll fluorescence are considered. Conclusions are made about their qualities.

Keywords: sensors, precision agriculture, non-contact measurement, spectral research, fluorescence.

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AGRO-ENGINEERING: WAYS TO SOLVE ENVIRONMENTAL AND ENERGY PROBLEMS IN AGRICULTURE

Kravchuk Volodymyr Ivanovych, PhD

Member of the Academy of Sciences of Ukraine

Leading Researcher of the SSI "L. Pogorilyy UkrNDIPVT", Ukraine

ORCID: 0000-0003-2196-4960

Targonya Vasylii Serhiyovych, Doctor of Agricultural Sciences

Leading Researcher of the SSI "L. Pogorilyy UkrNDIPVT", Ukraine

ORCID: 0000-0002-1353-9182

Prof. Nicolay Mihailov, PhD

University of Ruse, Bulgaria

E-mail: mihailov@uni-ruse.bg

Gaidai Tatiana Viktorivna

Leading Researcher of the SSI "L. Pogorilyy UkrNDIPVT", Ukraine

ORCID: 0000-0001-9141-4820

Abstract: In this study is proposed a methodology for environmental and economic management of agricultural technologies. It not only complies with the dominant concept in different countries to minimize the intensification of production processes, but also provides a forecast for multifactor development to increase productivity and further improve the environmental characteristics of products. The approach integrates several components: information and forecast systems for remote aerospace sensing; advanced information ergatic-resolving systems of precise farming; biotechnological alternatives; methodologies for selection of scientifically based rational agricultural technologies.

Keywords: Biosphere, Agrotechnology, Agricultural engineering, Ecological and economic management systems.

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STUDY OF THE PRODUCTIVE POSSIBILITIES OF SPRING PEAS INCLUDED AS A GREEN MANURE CROP IN THE CROP ROTATION OF CEREALS-LEGUMES-CEREALS AND CHANGES IN SOIL FERTILITY

Prof. Todor Kertikov, DSc

Institute of Forage Crops, 5800 Pleven, Bulgaria

Phone: 0878 123 563

E-mail: t.kertikov@abv.bg

Assoc. Prof. Atanas Atanasov, PhD

Department of Agricultural Machinery,

University of Ruse

Phone: 0885497406

E-mail: aatanasov@uni-ruse.bg

Abstract: In 2010, the institute of Forage Crops started the construction of a biological crop rotation of the grain-legume-wheat type (barley-spring peas-wheat). The field is in conversion. The traditional technology of growing crops without the application of fertilizers and preparations for chemical protection of plants and soil has been applied. The aim is to establish the productive potential of spring fodder peas included as a green manure crop in the crop rotation, as well as the changes in soil fertility during the application of green manure. It was found that the plowed green manure mass (peas + weeds) is 2249.02 kg / da, which is equivalent to imported 10.33 kg / da of pure organic nitrogen. The sideration applied in the crop rotation has a positive effect on the observed agrochemical parameters of the soil.

Keywords: Crop rotation, Spring peas, Productivity, Sideration.

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A STUDY ON THE SELECTIVITY AND EFFICIENCY OF A GROUP OF HERBICIDES IN “VENKA 1” WHEAT VARIETY

Assist. Prof. Svetlana Stoyanova, PhD

Institute of Agriculture and Seed Science “Obraztsov Chiflik” – Ruse, Bulgaria

Tel.: 082 - 820 801

E-mail: sv_stoianova@mail.bg

Assoc. Prof. Veselin Dochev, PhD

Agricultural Institute - Shumen

Phone: 054 - 992 973

E-mail: vdotchev@abv.bg

Assoc. Prof. Atanas Atanasov, PhD

Department of Agricultural Machinery,

University of Ruse

Phone: 0885497406

E-mail: aatanasov@uni-ruse.bg

Abstract: In the experimental field of the institute of Agriculture and Seed Science "Obraztsov Chiflik", Ruse, in 2017 - 2018, a study was conducted to determine the reaction of "Venka 1" wheat variety, treated with herbicides for foliar fertilization at optimal and double doses - Akurat 60VG (metasulfuron - methyl 600 g/kg), Fokstrot 69 VG (fenoxaprop-P-ethyl 69 g/l+antidote), Aminopielik 600 SL (2.4 amine salt 600 g/l). The experiment was based after block method in four replications, with the size of the harvesting plot - 50m² and a randomized design of the variants.

Akurat 60VG, Fokstrot 69EV and Aminopielik 600SL, applied at optimal and increased doses were highly selective to "Venka 1" wheat variety and did not have negative effects on the plants. Regarding destroyed weeds, all the three tested vegetation herbicides (Akurat 60VG, Fokstrot 69EV and Aminopielik 600SL), applied at optimal and increased doses, showed high herbicidal efficiency against annual cereal and deciduous weeds. The use of Akurat 60VG, Fokstrot 69EV and Aminopielik 600SL herbicides led to higher grain yield, compared to the untreated control.

Keywords: wheat, herbicides, selectivity, productivity

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A STUDY ON COMBINATIONS OF VARIETY ROOTSTOCKS ON THE AGROBIOLOGICAL PARAMETERS OF ZORNITSA VINE VARIETY

Assoc. Prof. Galina Dyakova, PhD

Institute of Agriculture and Seed Science "Obraztsov Chiflik" – Ruse

University of Ruse, Bulgaria

Tel.: 082 - 820 801

E-mail: djakovaRousse@abv.bg

Assist. Prof. Ralitsa Mincheva

Institute of Agriculture and Seed Science

"Obraztsov Chiflik" – Ruse, Bulgaria

Tel.: 082 - 820 801

E-mail: ralica_m@mail.bg

Assist. Prof. Svetlana Stoyanova, PhD

Institute of Agriculture and Seed Science "Obraztsov Chiflik" – Ruse, Bulgaria

Tel.: 082 - 820 801

E-mail: sv_stoianova@mail.bg

Abstract: During the period 2018 - 2019 in IASS "Obraztsov Chiflik", Ruse, the agrobiological parameters of Zornitsa vine variety grafted on three rootstocks with different disposal of the root system, inducing different growth power - Berlandieri x Riparia SO4 (control), Rupestris du Lo (Monticola) and Chaslaux x Berlandieri 41B were followed. It was found that the rootstocks Monticola and Chaslaux 41B showed high sensitivity to the specific soil and climatic conditions in the region of the study. The biological characteristics of the rootstock played a significant role in the formation of the percentage of first-class rooted vines - the highest percentage of first-class vines were obtained from cuttings, grafted on a rootstock with a deep root system. The type, number and disposal of the roots depended to the greatest extent on the rootstock used. The diameter of the internodes of the shoots did not differ significantly in the individual variety rootstock combinations, and their length did not exceed that of the control.

Keywords: pendimethalin, rootstocks, vine planting material, rooted vines.

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THEORETICAL AND EXPERIMENTAL RESEARCH OF TECHNOLOGICAL PROPERTIES OF THE AGRICULTURAL BRIDGE AGGREGATES

Prof. Dr. Volodymyr Bulgakov

National University of Life and Environmental Sciences of Ukraine
Kiev, Ukraine
E-mail: vbulgakov@meta.ua

Prof. Dr. Stanislav Nikolaenko

National University of Life and Environmental Sciences of Ukraine
Kiev, Ukraine

Prof. Dr. Hristo Beloev

University of Ruse “Angel Kanchev”
Ruse, Bulgaria

Dr. Volodymyr Kuvachov

Dmytro Motornyi Tavria State Agrotechnological University
Melitopol, Ukraine

Prof. Dr. Valerii Adamchuk

National Scientific Centre “Institute for Agricultural Engineering and Electrification”
Kiev, Ukraine

Dr. Zinoviy Ruzhylo

National University of Life and Environmental Sciences of Ukraine
Kiev, Ukraine

Dr. Semjons Ivanovs

Latvia University of Life Sciences and Technologies
Jelgava, Latvia

Abstract: *The physical objects of the study were an agricultural bridge tool, a structure developed by us with a track gauge of 3.5 m, and the aggregated agricultural implements, used for surface tillage: a tooth harrow, a rotary harrow and an S-shaped spring loosener. The experiments proved good adaptability to work of the aggregate of controlled traffic and bridge farming, and high quality of the technological soil tillage processes in the agrotechnical area of the field. The variation coefficient of fluctuations in the resistance of agricultural implements on the hook of the agricultural bridge tool was no more than 10%.*

Keywords: *Bridge aggregate, soil irregularities, profile, traction resistance.*

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FRI-ONLINE-1-MR

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**ANALYSIS OF THE INFLUENCE OF BASIC STRUCTURAL
PARAMETERS ON THE CHANGE OF THE TECHNICAL AND
ECONOMIC CHARACTERISTICS OF INTERNAL COMBUSTION
ENGINES**

Assis. Prof. Evgeni Enchev, PhD

Department of Agricultural Machinery,

University of Ruse, Bulgaria

Tel: 082-888 325

E-mail: eenchev@uni-ruse.bg

Assoc. Prof. Todor Delikostov, PhD

Department of Repair, Reliability, Mechanisms, Machines, Logistic and Chemical
Technology

University of Ruse, Bulgaria

Tel.: 082-888 701

E-mail: delikostov@uni-ruse.bg

Abstract: *The evaluation of the hourly and specific fuel consumption and the main components of the exhaust gas composition in case of internal combustion engine failures are examined. a structural investigation scheme was developed to determine the impact of the structural parameters of the main subsystems on the change of the main components of the exhaust gases.*

Keywords: *Diagnostic, Fuel Consumption. Compositions Exhaust Gases, internal Combustion Engine*

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PHYSICO-MECHANICAL AND OPERATING PROPERTIES AND INDICATORS OF RESTORATION COATINGS

Prof. Plamen Kangalov, PhD

Department of Repair, Reliability, Mechanisms, Machines, Logistics and Chemical Technologies

University of Ruse, Bulgaria

Tel.: +359 82 888 457

E-mail: kangalov@uni-ruse.bg

Assoc. Prof. Mitko Nikolov, DSc

Department of Repair, Reliability, Mechanisms, Machines, Logistics and Chemical Technologies

University of Ruse, Bulgaria

Tel.: +359 82 888 458

E-mail: mnikolov@uni-ruse.bg

Eng. Jordan Valchev, PhD stud.

Department of Repair, Reliability, Mechanisms, Machines, Logistics and Chemical Technologies,

University of Ruse, Bulgaria

Abstract: In this article the main physico-mechanical and operational properties and indicators of the restorative coatings obtained with the most common methods in maintenance practice were analyzed. When choosing a method for restoration of machine parts, it is essential to regard the different properties, indicators and characteristics of the coatings obtained by different methods among which are types of surfacing and welding, gas-thermal, electrolytic, electro-physical methods.

Keywords: restorative coatings, coating properties, restoration of details

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PRODUCTION - TECHNOLOGICAL INDEX AND CHARACTERISTICS OF RESTORATION OF WORN-OUT MACHINE PARTS

Prof. Plamen Kangalov, PhD

Department of Repair, Reliability, Mechanisms, Machines, Logistics and Chemical Technologies

University of Ruse, Bulgaria

Tel.: +359 82 888 457

E-mail: kangalov@uni-ruse.bg

Assoc. Prof. Mitko Nikolov, DSc

Department of Repair, Reliability, Mechanisms, Machines, Logistics and Chemical Technologies

University of Ruse, Bulgaria

Tel.: +359 82 888 458

E-mail: mnikolov@uni-ruse.bg

Eng. Vladislav Stoyanov, PhD stud.

Department of Repair, Reliability, Mechanisms, Machines, Logistics and Chemical Technologies

University of Ruse, Bulgaria

Tel.: +359 82 888 458

Abstract: In this article technical and technical – economic indicator of restoration of worn out machine parts are analyzed. Ten types of restoration coating divided in four groups are considered, they are as followed: surfacing (submerged arc, shielding gas (CO₂) and liquid), gas thermal layering (electric arc and gas flame), electrolyte coatings (Chrome plating, Iron and Nickel plating). More than 80% of worn out parts are restored with the last group of methods.

Keywords: restoration coatings, technological indicators, technical and economic indicators, restoration of details

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ANALYSIS FOR THE MACHINERY MAINTENANCE DEVELOPMENT IN INDUSTRY 4.0

Assoc. Prof. Daniel Leekasa Bekana PhD

Department of Repair, Reliability, Mechanisms, Machines, Logistic and Chemical
Technology

University of Ruse, Bulgaria

Tel: +359 82 888 701

E-mail: dbekana@uni-ruse.bg

Eng. Kaloyan Nikolaev, PhD Student

University of Ruse, Bulgaria

E-mail: kaloqn.nikolaev@abv.bg

Abstract: Nowadays there is a specific change undergoing in the development of agro-industrial equipment. This change was dictated by the fourth industrial revolution called INDUSTRY 4.0. This article analyses maintenance of machinery and INDUSTRY 4.0. The peculiarities of the new generations of machines and their connection with the modern development trend are given.

Keywords: Maintenance, E-Maintenance, industry 4.0, Cyber Physical Systems, Internet of Things.

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SPARE PARTS PLANNING ANALYSIS REQUIRED FOR MAINTENANCE OF MACHINES

Assoc. Prof. Daniel Leekasa Bekana, PhD

Department of Repair, Reliability, Mechanisms, Machines, Logistic and Chemical
Technology

University of Ruse, Bulgaria

Tel: +359 82 888 701

E-mail: dbekana@uni-ruse.bg

Eng. Krasimir Radev, PhD Student

University of Ruse, Bulgaria

Tel: +359 82 888 701

E-mail: kaloqn.nikolaev@abv.bg

Abstract: This article discusses issues related to the planning of spare parts consumption for maintenance of agricultural machinery. Maintenance activities are related to the prevention of failures related to wear that occurs gradually or suddenly. Therefore, the process is scholastic and must be solved with the apparatus of mathematical statistics. The maintenance process needs spare parts and consumables. Delivering spare parts and consumables at the last moment is associated with losses which are expressed in downtime of machines and manpower, production delays, additional logistics costs, etc. This paper discusses the various methods for forecasting spare parts. Planning of spare parts in maintenance activities of machines in the field of agricultural production is analysed.

Keywords: Maintenance, E-Maintenance, industry 4.0, Cyber Physical Systems, Internet of Things, System of Systems, Smart Products

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RAIL DEFECT ANALYSIS FOR NORTHERN BULGARIA

Assoc. Prof. Daniel Leekasa Bekana, PhD

Department of Repair, Reliability, Mechanisms, Machines, Logistic and Chemical Technology

University of Ruse, Bulgaria

Tel: +359 82 888 701

E-mail: dbekana@uni-ruse.bg

Eng. Borislav Valchev, PhD Student

University of Ruse, Bulgaria

Tel: +359 82 888 701

E-mail: kaloqn.nikolaev@abv.bg

Abstract: Railway transport turns out to be the backbone of passengers and freight. from environmental protection point of view and access to natural resource, it is an important factor in reconsidering some of the important issues for human existence. The railway is the basis for this type of transport. in Bulgaria, the railway network is well developed. Therefore preservation of this network is related to its maintenance and renewal. Non distractive testing of rails is a main activity, which is regulated by regulations. It is used for safety of Bulgarian State Railway (BDJ) passengers, cargo and staff.

This article analyse frequently encountered defects and the reasons for their occurrence and the possibilities of improving rails performances. Conclusions are given.

Keywords: Rails, Railway, Non Distractive Testing (NDT), methods of NDT

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MODELING THE CHARACTERISTICS OF CENTRIFUGAL PUMPS

Eng. Salaf Ibrahim, PhD Student

Department of Heat, hydraulics and environmental engineering,

University of Ruse

Tel.: +359 82 888 766

E-mail: salaf_1992@abv.bg

Abstract: This work represents an overview and analysis of various methods for modeling the characteristics of centrifugal pumps, under standard and specific operating conditions: when working with clean water and two-phase mixtures, or if it is used to transport different hydromixtures, as well as in case of working with a trimmed impeller. It has been studied the impact of the pump front seal clearance on the machine volume losses. In addition to that, it has also been analyzed the applying of modern methods for modeling the characteristics of centrifugal pumps by using CFD software products.

Keywords: Centrifugal pump, Performance characteristics modelling, Specific speed.

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**DESIGN AND CONSTRUCTION OF SEMI-ANECHOIC CHAMBER FOR
NOISE ANALYZES**

Assist. Prof. Nikolay Kovachev, PhD

Department of Heat, Hydraulics and Environmental Engineering
University of Ruse, Bulgaria
Phone: +359 82 888 498
E-mail: nkovachev@uni-ruse.bg

Assos. Prof. Plamen Manev, PhD

Department of Heat, Hidraulic and Environmental Engineering,
University of Ruse, Bulgaria
Tel.: +359 82 888 485
E-mail: pmanev@uni-ruse.bg

Abstract: In the paper, a study of the criteria and requirements for the design of chambers for noise measurement of devices and systems for environmental protection and management has been performed. Based on the obtained results, a similar chamber was designed for the needs of the Department of Heat, hydraulics and environmental engineering within the framework of an internal university project under the NSF. The guidelines for its construction in the next stage of the project are outlined. The semi-anechoic chamber designed in this way will be built on the basis of the Knauf Cubo system by using panels of the Vidiwall XL type, which are characterized by good indicators in terms of external noise insulation and high noise absorption coefficient. There is also a direct connection with an external shaft and an electric motor/s, allowing the transmission of torque and drive of the elements of the tested samples, which at the same time isolates them from background noise.

Keywords: Anechoic and Semi-anechoic room, Nois level, Sound power lewel, Sound presure Methods, Model.

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COMPARATIVE ANALYSIS OF THE SOUND ABSORPTION COEFFICIENTS OF DIFFERENT WALL COVERINGS

Assist. Prof. Nikolay Kovachev, PhD

Department of Heat, Hydraulics and Environmental Engineering

University of Ruse, Bulgaria

Phone: +359 82 888 498

E-mail: nkovachev@uni-ruse.bg

Assos. Prof. Plamen Manev, PhD

Department of Heat, Hydraulic and Environmental Engineering,

University of Ruse, Bulgaria

Tel.: +359 82 888 485

E-mail: pmanev@uni-ruse.bg

Abstract: In the paper, the efficiency of sound absorption for different types of wall coverings and facings is studied. The research was done under the design process of a semi-anechoic chamber for evaluation and analysis of the noise emitted by different hydraulic and thermodynamic systems. The approach is based on standardized methodologies for studying the sound absorption coefficients as a function of frequency divided into octave frequency bands. Based on the results of this study, a reasoned choice of material for interior cladding of the walls of a noise test room can be made and a predictive assessment of its effectiveness can be made.

Keywords: Sound absorption coefficients; Anechoic and Semi-anechoic room, Noise level, Sound power level, Sound pressure Methods, Model.

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TECHNOLOGY FOR CATCHING OF THE PLANTING MATERIAL AND SUBSEQUENTLY RESETTLEMENT OF BLACK SEA MUSSELS (*MYTILUS GALLOPROVINCIALIS*)

Assos. Prof. Plamen Manev, PhD

Department of Heat, Hydraulic and Environmental Engineering,
University of Ruse
Tel.: +359 82 888 485
E-mail: pmanev@uni-ruse.bg

Dimitar Germanov, Doctor of veterinary medicine

Trakia University - Stara Zagora
E-mail: drgermanov@abv.bg

Anton Antonov, manager and owner

AVAMAR LTD, Bulgaria,
Burgas region, Primorsko municipality,
Village of Yasna Polyana 8147,
18 Hadji Dimitar Street,
E-mail: morskiden@mail.bg

Abstract: In the present paper is presented an environmental initiative of the Municipality of Primorsko for restoration of the population of black mussels in its natural habitats from the adjacent waters of the municipality. The initiative is based on innovative environmentally friendly technology for initial catching of appropriate size and degree of planting material (young specimens of black mussel (*Mytilus galloprovincialis*)) and subsequent resettlement by positioning them to a potentially suitable places. The activities are carried out in a diving manner by providing an opportunity for permanent attachment and creating optimal conditions for growth and development of mussels in their natural environment.

Keywords: *Mytilus galloprovincialis*, growing of bivalves, biodiversity, aquaculture, bottom habitats.

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INFLUENCE OF RAPANA (*RAPANA VENOSA*) ON THE CONDITION OF THE MUSSEL POPULATIONS IN THE WATER AREA OF THE TOWN OF PRIMORSKO

Assos. Prof. Diyan Georgiev, PhD

Department of Biology and Aquaculture, Sub-department “Zoology and ecology”
Trakia University - Stara Zagora
Tel.: +359 42 699 322
E-mail: diyan.georgiev@trakia-uni.bg

Assos. Prof. Galin Nikolov, PhD

Department of Biology and Aquaculture, Sub-department “Aquaculture”
Trakia University - Stara Zagora
E-mail: galin@uni-sz.bg

Assist. Prof. Silviya Kalcheva, PhD

Department of Biology and Aquaculture, Sub-department “Zoology and ecology”
Trakia University - Stara Zagora
Tel.: +359 42 699 323
E-mail: silviya_kalcheva@uni-sz.bg

Dimitar Germanov, Doctor of veterinary medicine

Trakia University - Stara Zagora
E-mail: drgermanov@abv.bg

Abstract: In the present paper the influence of rapana (*rapana venosa*) on the condition of the natural mussel populations in the water area of the southern Bulgarian Black Sea coast and in particular - in the region of the town of Primorsko has been studied. a retrospective analysis of the appearance of representatives of this invasive species in the Black Sea was made and the processes of their subsequent distribution everywhere were reviewed. The adverse effects on the density and abundance of *Mytilus galloprovincialis*, *Donax trunculus*, *Chamelea gallina* and *Mya arenaria* have been reported as a result of their vital activity. in view of the significant economic potential of the species, alternative solutions for reducing the number and environmentally friendly recovery of primary treatment wastes have been proposed.

Keywords: *Rapana venosa*, Invasive alien species, adverse effects, natural habitats.

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ECOMETRY - SCIENTIFIC ORGANIZATION OF ECOLOGICAL EXPERTISE AND EXPERT SERVICES

Lyubomir Vladimirov¹, DSc, PhD

Department of Heat, Hydraulics and Environmental Engineering

University of Ruse, Bulgaria

Phone: +359 82 888 481

E-mail: lvvladimirov@uni-ruse.bg

Abstract: Ecological expertise is research on a specific object - the environment. in this sense, an environmentally oriented methodology should be applied. The methodology is presented as a generalized scientific organization of the ecological expert activity and the expert services. introducing such a definition, we have in mind four directions in environmental expertise. First, the definition, arrangement and coordination of autonomous and differentiated research methods and tools. Second, substantiation and adoption of a system of processes and operations, which determine the sequence, connections and interpretation of the final results of environmental research. Third, the methodology should integrate actors - experts, whose main task is to obtain results through research that objectively represent the state of the environment. At the same time, the methodology should help to acquire new knowledge and expand the competencies of experts. in this way, they can be expected to give accurate conclusions in forensic environmental expertise and environmental expertise in environmental management. Fourth, the methodology should encourage the study of the current state and achievements of expert research. It must demonstrate and provide experts with innovations in the theory and practice of expertise internationally.

Keywords: Environment, expertise, methodology, research, experts.

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¹ Professor of Administration and Management and Associate Professor of General Engineering

DISTRIBUTIONS OF THE TIME OF OCCURRENCE OF THE MAXIMUM AVERAGE-HOUR CONCENTRATIONS OF POLLUTANTS IN THE ATMOSPHERIC AIR

Lyubomir Vladimirov², DSc, PhD

Department of Heat, Hydraulics and Environmental Engineering

University of Ruse, Bulgaria

Phone: +359 82 888 481

E-mail: lvvladimirov@uni-ruse.bg

Abstract: The aim of the study is to establish the theoretical and empirical distributions of the occurrence of the maximum average hourly concentrations of pollutants in the air in Ruse. Three tasks are solved. Within the project for ecological cadastre of the Municipality of Rouse a database for pollution with sulfur dioxide, nitrogen dioxide, nitrogen oxide, fine particulate matter 2.5, ozone and carbon monoxide has been formed. The results of measurements in an automatic measuring station of the Executive Environment Agency were used. The database is processed with specialized software for statistical processing. Theoretical and empirical distributions are derived. The occurrence times of the maximum mean hourly concentrations are analyzed as discrete random variables. The hypotheses for distribution under five laws are tested - binomial distribution; Poisson distribution; hypergeometric distribution; invariant distribution and geometric distribution. Three groups of characteristics of the empirical distributions are defined - numerical characteristics, which determine the position of the random variables, numerical characteristics, which determine the scattering of the random variables and numerical characteristics of the form of the distribution. The functions of the probabilities of the times corresponding to their theoretical distributions are derived. The theoretical and empirical distributions are compared and their regularities are established.

Keywords: Empiric, distribution, concentration, pollutant, air.

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² Professor of Administration and Management and Associate Professor of General Engineering

DYNAMIC ROWS AND MODELS OF SULFUR DIOXIDE POLLUTION IN ATMOSPHERIC AIR

Lyubomir Vladimirov³, DSc, PhD

Department of Heat, Hydraulics and Environmental Engineering

University of Ruse, Bulgaria

Phone: +359 82 888 481

E-mail: lvvladimirov@uni-ruse.bg

Abstract: Seven main indicators of sulfur dioxide pollution were used - maximum average hourly concentrations; average - hour concentrations; the maximum average - daily concentrations; average - daily concentrations; average - monthly concentrations; average annual concentrations. Concentrations are analyzed as a function of time. Two time indicators are used. The first indicator is the time series, which reflect the change by hours, months and years. The second indicator of the change over time is the trend. It describes time series with regression models and illustrates general trends. Changes in pollutant concentrations were processed by dynamic analysis. Trend models are built, which are functions of time. They reflect the trends and patterns in changes in concentrations. Linear and nonlinear trend models are used. After the preliminary analysis, the emphasis is on six models - a linear model; logarithmic model; polynomial model; multiplicative model; exponential model; model of moving averages. The results are systematized and the obtained models are summarized.

Keywords: Sulfur dioxide, indicator, concentration, pollutant, air.

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³ Professor of Administration and Management and Associate Professor of General Engineering

STUDY OF THE POSSIBILITIES FOR RECYCLING AND UTILIZATION OF WOOD WASTE

Eng. Orlin Antonov, PhD Student

Department of Heat, Hydraulic and Environmental Engineering

University of Ruse, Bulgaria

Tel.: +359 82 888 418

E-mail: oantonov@uni-ruse.bg

Abstract: This report is a study of the possibilities for recycling and recovery of various wood waste obtained from the timber and wood processing industries. The interest in this study is caused by the problem of increasing waste streams and their impact from an environmental point of view. Existing waste end criteria are considered.

The application of these criteria aims to increase the opportunities for treating wood waste as raw material and reinvesting it in the production cycle in order to save resources, energy and reduce pollution. The direction is to reduce the share of landfilled waste and as a result, reduce the negative impact on the environment.

Keywords: wood waste, recovery of wood waste, briquettes, pellets, flooring

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FRI-ONLINE-1-EC-09

SYSTEMS AND DEVICES FOR RECOVERY AND END OF CONSTRUCTION WASTE

Eng. Denitsa Hvarchilkova, PhD Student

Department of Heat, Hydraulic and Environmental Engineering

University of Ruse, Bulgaria

Tel.: +359 82 888 418

E-mail: dhvarchilkova@uni-ruse.bg

Abstract: *The professional dismantling and demolition of buildings creates a huge problem related to the generation of large amounts of waste. The optimal solution in this case is the recycling of construction waste directly on site with the help of specialized equipment for shredding and sorting. as a result, materials are obtained that are recyclable, and expensive loading, removal and storage operations are reduced or eliminated altogether. The product of such recycling is a secondary crushed stone with different fractions, which can be used as gravelAbstract, and as a raw material for the production of building materials, including as a filler for concrete.*

Keywords: *Construction waste from demolition, recycling, reuse, crushers.*

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National strategic plan for waste management from construction and destruction of the territory of the Republic of Bulgaria for the period 2011-2020 (*Оригинало заглавие: Национален стратегически план за управление на отпадъците от строителство и разрушаване на територията на Р. България за периода 2011-2020 г.*)

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FRI-ONLINE-1-ID-01

**RESEARCH OF CONTEMPORARY PRESENTATION TECHNOLOGIES
AND THE POSSIBILITIES FOR THEIR ADAPTATION TO ACADEMIC
ACTIVITIES**

Assoc. Prof. Yordan Doychinov, PhD

Department of Industrial Design,

University of Ruse

Phone: 088 727 3040

E-mail: doichinov@uni-ruse.bg

Abstract: *The paper reviews the main types of contemporary presentation technologies, process of selecting the most attractive ones and finding the possibilities for their adaptation to academic activities. The main activities are: research on the possibilities for enhancing the effect of the visual presentation of the electronic image; research of the possibilities for adaptation of the chosen presentation technology to the different types of academic activities; creation of a portable prototype, which is intended to be based on holographic fans.*

Keywords: *Design, Technologies, Presentations, Communications, Holograms, Holographic fans*

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FRI-ONLINE-1-ID-02

INFLUENCE OF THE DIAMETER OF THE TOBACCO CHAMBER IN THE SMOKING PIPE ON THE PRODUCED RESINOUS SUBSTANCES AND TARs

Sen. Assist. Desislav Gechev Ivanov, PhD

Department of Industrial Design,

University of Ruse

Phone: 359 82 888 845

E-mail: d_gechev@abv.bg

Abstract: *The influence of the diameter of the tobacco chamber on the quality of the smoke in the smoking pipe is a question that excites every smoker. The fact is that some smokers prefer a large chamber and others a small one]. It is logical that the strength of tobacco smoke is greater in a wide hearth, as the combustible area in this case produces more saturated smoke; this is confirmed by the consumers themselves, but the question remains: how much resinous substances and tars enter the human body in both types of pipes with absorbed smoke.*

Keywords: tar, tobacco chamber

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MODELS AND MOCK-UP IN DESIGN. CLASSIFICATION

Assoc. Prof. Cvetomir Konov, eng.-designer

Department of Industrial Design,

University of Ruse

Phone: +359 82 888 558

E-mail: cdkonov@uni-ruse.bg

Abstract: Modeling and mock-uping is widely used in various areas of our lives. in industrial design, architecture, spatial design, landscape design, material production, cinema, entertainment industry, advertising, hobbies, etc.

Every proposal, every idea, no matter how attractive at first sight, cannot be implemented as a construction and production equipment, if they have not previously been obtained as a material object in the form of a model, prototype or sample experience.

The creation of three-dimensional material images makes it possible to obtain a complete visual idea of the designed product from the various stages during design, its qualities and shortcomings.

Through modeling and mock-uping increase the possibilities for operational visualization.

In model - mock-uping practice there is a great variety of models created in different areas and for different purposes. often models made with the same techniques and with the same impact are called with different definitions and terms. The purpose of this article is to propose a classification of models and unification of definitions and terms related to models and models.

Keywords: Design, model, mock-upl, modeling, mock-uping, classification, terminology.

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FRI-ONLINE-1-ID-04

ACADEMIC DOCTRINE OF LIGHT. ESIAH CONCEPT

Assist. Prof. Teodor Kyuchukov, PhD

Department of Industrial Design

University of Ruse

Phone: 359 82 888 845

E-mail: tkyuchukov@uni-ruse.bg

Abstract: *Light is a herald of the beauty and the harmony. Contrary to this philosophy and the expectations of the majority, modern picture turns the night into a day. Moreover, the light "improvements" of the night vision in urban areas often happens to harm the natural rhythm - the starry sky disappear, the 24-hour circadian rhythm is disturbed. The level of intellectual development of the way the light is used dictates the course of human civilization.*

Keywords: *Academic Doctrine; Esiah concept; Light pollution; Light; Lighting; Environment; Obtrusive light, Automotive Lighting Metasculpture; Mtemob (Metamobile); Light information Field; Semantic Fractal; Visual Glare; Light Pollution; Management of light pollution; ΦEEARA Mm concept; Zet-model; Generalized Hexagonale Model of Lighting.*

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LIGHT POLLUTION. LIGHT AND ENERGY CULTURE OF LIGHTING AND LIGHTING DESIGN

Assist. Prof. Teodor Kyuchukov, PhD

Department of Industrial Design

University of Ruse

Phone: 359 82 888 845

E-mail: tkyuchukov@uni-ruse.bg

Abstract: *The quantification of the impact of light pollution is presented by a 10 point scale (incl. 5 impact groups and 11 impact subgroups). It is proposed to evaluate the light pollution by 3 groups of outdoor lighting systems: street, architectural and advertising lighting. The energy aspect of the light pollution is represented by: obtrusive light (directed and reflected to the sky); energy losses by obtrusive light; carbon dioxide emission. Light pollution is evaluated on the basis of the actual amount of energy used for outdoor artificial lighting. a methodological approach for the management of light pollution has been developed.*

Keywords: *Light pollution; Light; Lighting; Luminaire; Environment; Obtrusive light, Directed and reflected light, Street lighting; Architectural lighting; Advertising lighting, Methodological approach; Management of light pollution.*

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**NUMERICAL SIMULATION OF LASER BEAM WELDING APPLIED TO
POLYMERS**

Assist. Prof. Ivo Draganov, PhD

Department of Technical Mechanics,

University of Ruse, Bulgaria

Phone: 082 888 224

E-mail: iivanov@uni-ruse.bg

Abstract: a numerical model of laser welding of a polymer joint has been created. The nonlinear properties of the material are taken into account. The model includes convective and radiative heat transfer. The heat flux generated by the laser source is defined as volume-distributed by a Goldac function, which is a double ellipsoid. Results were obtained for the temperature field, displacements, strains and stresses, under different welding modes. a study was performed for convergence of the obtained results.

Keywords: Laser beam welding, Numerical modelling, FEM, Polymer, Goldac function

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SIMULATION DRIVEN DESIGN OF PLASTIC WATER TANK

Prof. Ivelin V. Ivanov, PhD

Department of Engineering Mechanics,
University of Ruse
Tel.: 082-888 472
E-mail: ivivanov@uni-ruse.bg

Assoc. Prof. Danail Gospodinov, PhD

Department of Material Science and Technology,
University of Ruse
Phone: 082-888 205
E-mail: dgospodinov@uni-ruse.bg

Assist. Prof. Dimitar Velchev, PhD

Department of Engineering Mechanics,
University of Ruse
Tel.: 082-888 224
E-mail: dvelchev@uni-ruse.bg

Abstract: a plastic water tank of tamping machine is reported by many costumers as oftenly failing part. The reason of that failure has been investigated by testing samples taken from the wall of the tank. Some of the samples include the joint between both parts welded by melting the edges at high temperature and pressing them each other. The weak connection between the parts is the main reason for the failure. a new design of the tank is suggested, which is based on plastic blowing technology and the tank body consists of only one part. The new design should be checked by finite element simulations for damages obtained after free falling on the ground and received under the vibrations of the machine. The filled by water tank has higher loading in free falling impact than empty one however fluid-structure interaction is a problem in the simulations. The shell element model of the tank has great leakage of the fluid when water is modelled by Lagrangian finite elements. The smoot partical hydrodynamic method gives quite better results in the simulations of the tank impact. The successful simulations show that the impact on the bottom and on the bottom vertex of the tank could cause sagging of the tank wall which remain permanent ant this is unacceptable. Then another design of the tank is suggested, avoiding the projective shapes of some tank areas. The second version of tank design has no permanent deformation in the impact simulations and the stress level caused by the vibrations is low, so it is acceptable. The successful simulation driven design of plastic water tank is saving the expenses of manufacturing the prototypes and testing them in order to reveal unwanted features.

Keywords: Finite Element Simulations, Fluid-Structure interaction, Smoot Particle Hydrodynamics

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DETERMINATION OF RESIDUAL STRAIN IN MAG WELDING OF A LARGE STRUCTURE

Eng. Stiliyana Mileva

Department of Technical Mechanics,
University of Ruse, Bulgaria
Phone: 082 888 513
E-mail: smileva@uni-ruse.bg

Assoc. Prof. Yulian Angelov, PhD

Department of Technical Mechanics,
University of Ruse, Bulgaria
Phone: 082 888 313
E-mail: julian@uni-ruse.bg

Assist. Prof. Ivo Draganov, PhD

Department of Technical Mechanics,
University of Ruse, Bulgaria
Phone: 082 888 224
E-mail: iivanov@uni-ruse.bg

Abstract: In the considered work the displacements and the residual strains after MAG welding of a complex steel structure are determined. For this purpose, a series of experiments and measurements were carried out in industrial conditions. A numerical model of the welding process has been created, taking into account the addition of material to the weld seam. The heat flow distribution function is set as volume distribution. The nonlinear material and physical characteristics of the material and the heat dissipation as a result of convection and radiation are taken into account. The results of the experiment and the numerical simulation were compared and analysed.

Keywords: Finite element method, Welding, MAG, Residual strains

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DEVELOPMENT OF A MATURITY INVESTIGATION SYSTEM FOR STUDY OF WELDING PROCESSES

Assoc. Prof. Roussi Minev, MEng, PhD

Department of Material Science and Technology at University of Ruse, Bulgaria

Phone: 082-888-310

E-mail: rus@uni-ruse.bg

Sasho Iliev, MEng

Department of Material Science and Technology at University of Ruse, Bulgaria

Phone: 082-888-311

E-mail: siliev@uni-ruse.bg

Nikolay Ferdinandov, PhD, MEng

Department of Material Science and Technology at University of Ruse, Bulgaria

Phone: 082-888-311

E-mail: nferdinandov@uni-ruse.bg

Abstract: *The present work aims to develop and adapt the Capability Maturity Model (CMM), so that it can be used for comparative analysis of modern welding technologies (e.g welding in a protective gas environment, pulse welding, etc.). The indicators to be examined as well as the assessment levels have been determined. The weights of the individual indicators are determined, as well as the methods for data collection and summarization in order to arrive at an integrated assessment of the maturity of a given technology. The system must serve the users of a technology by helping them in the selection and investment process.*

Keywords: *Welding Equipment, Modern Technologies, Welding in a Protective Gas Environment, Technology Maturity*

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ON THE CHOICE OF A STRUCTURAL - LAYOUT VARIANT OF A ROBOTIC TECHNOLOGICAL MODULE

Assoc. Prof. Ivanka Peeva, PhD

Department of Manufacturing engineering

University of Ruse

Phone: 082-888 712

E-mail: ipeeva@uni-ruse.bg

Assist. Prof. Chavdar Kostadinov, PhD

Department of Communication and Information systems,

“G. S. Rakovski” National Defence College, Sofia, Bulgaria

Tel.: 02 9226596

E-mail: chkostadinov@abv.bg

Abstract: *The correct choice of structural-layout scheme is a key point in the design of robotic technological modules, determining both the technical and economic feasibility of using this type of automation tools. The wide range of variation of basic technical and operational parameters of the technological and auxiliary units, structured in a module, determines the wide variety of technically possible component variants of equipment for realization of a certain technological process. Production modules with different number of parallel operating technological machines, serviced by one robot, are considered. The influence of the number of technological machines and the scenario of their service by one robot on the estimated productivity was studied by probabilistic modeling of the work of different variants. It is possible to achieve the set performance in variants with different number of machines and suitable service scenarios, due to the presence of different losses from waiting for service, which can be used in search of an optimal solution.*

Keywords: RTM, Probabilistic model, Performance of RTM, Line graph of states, Branched graph of states.

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AN INVESTIGATION OF SIMPLE PIEZOELECTRIC BEAMS

Assistant Prof. Svetlin Stoyanov, PhD

Department of Technical mechanics

University of Ruse

Phone: 088 754 9965

E-mail: SStoyanov@uni-ruse.bg

Abstract: This paper presents an investigation of vibrations of simple cantilever piezoelectric beams. The theoretical basis is described and applied on software system MATLAB to solve the free vibrations. for charging mobile devices the kinematic excitations are important, so the software system COMSOL is used to study the mechanical and electrical behavior in this case.

Keywords: Piezoelectric beam, Canteleaver beam, Vibrations, Kinematical excitation, MATLAB, COMSOL

JEL Codes: C63, C65, C32

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CURRENT PROBLEMS AND TRENDS RELATING TO ENSURING THE ACCURACY ON TURNING

Assist. Prof. Svetlana Koleva, PhD

Department of Technology of Machine tools and Manufacturing,

University of Ruse

Tel.: +359 082888653

E-mail: svetla@uni-ruse.bg

Abstract: The article analyses the current state of ensuring accuracy as one of the main technological activities. The technological tasks for achieving accuracy and the modern approaches for its achievement are determined. The need for automation of the functions performed by the operator, including operational control in order to increase the efficiency of technological processes is reasoned. The application of the variants for automatic dimensional re-setup of the technological system is also analysed.

Keywords: turning, accuracy, technological setup, technological process.

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DEFINITION OF THE TERMS AND REQUIREMENTS FOR EFFECTIVE MANAGEMENT OF ACCURACY ON TURNING

Assist. Prof. Svetlana Koleva, PhD

Department of Technology of Machine tools and Manufacturing,

University of Ruse

Tel.: +359 082888653

E-mail: svetla@uni-ruse.bg

Assoc. Prof. Milko Enchev, PhD

Department of Technology of Machine tools and Manufacturing,

University of Ruse

Tel.: +359 082888653

E-mail: menchev@uni-ruse.bg

Abstract: This article defines the conditions and requirements for wider application of automatic dimensional setup systems, as a modern solution for increasing the efficiency of technological processes. The prerequisites for the technical and economic expediency, the conditions (restrictions) for their application are determined. The problems related to the means and algorithms of the re-setup systems are analysed and the specific tasks for their solution are formulated.

Keywords: turning, accuracy, technological setup, re-setup algorithm.

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EXPERIMENTAL DETERMINATION OF THE AMPLITUDE-FREQUENCY CHARACTERISTICS OF THE MECHANICAL OSCILLATIONS DURING THE MILLING PROCESS

Assoc. Prof. Dimitar Dimitrov, PhD

Department of Manufacturing engineering

University of Ruse

Phone: 082-888 653

E-mail: ddimitrov@uni-ruse.bg

Abstract: It is known that when machining by mechanical cutting there are prerequisites for the occurrence of vibrations at low stability of the technological system. Such are the cases when processing thin-walled beams. a typical example is the columns of truck cranes. They are characterized by large length, thin walls and low stability. in series production, machining centers and special devices are used to establish the column to the working table of the machine. The device provides a certain oriented and constant position of the beam relative to the coordinate system of the machine. The effective use of additional supports and attachments requires them to be in the right places. for this purpose, the amplitude-frequency characteristics of the interfering force must also be known. The publication presents the results of experimental research for this purpose

Keywords: Metal cutting, vibrations.

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INVESTIGATION OF THE INFLUENCE OF TECHNOLOGICAL CONDITIONS AND ENVIRONMENT ON THE ACCURACY OF MEASUREMENT WITH 3D TOUCH TRIGGER PROBE ON A TOUCH SIGNAL

Assoc. Prof. Dimitar Dimitrov, PhD

Department of Manufacturing engineering

University of Ruse

Phone: 082-888 653

E-mail: ddimitrov@uni-ruse.bg

Abstract: *The use of a touch signal in coordinate measurements of machining centers provides measurements with less or zero systematic error than the three-coordinate measuring head. When closing the electrical circuit in the area of contact between the measuring tip and the measured object (detail) it is possible to influence the condition of its surface. Some of the possible parameters are the material of the part, the presence of lubricating and cooling liquid, the speed of the feed movement, etc. The publication presents the experiments performed and the experimental results obtained in the study of the listed factors.*

Keywords: RTM, Probabilistic model, Performance of RTM, Line graph of states, Branched graph of states.

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MULTI-OBJECTIVE SYNTHESIS OF MULTI-STAGE GRAVITATIONAL TRANSPORT

Assoc. Prof. Venko Vitliemov, PhD

Department of Technical Mechanics,
Univesity of Ruse, Bulgaria
Phone: 082 888 224
E-mail: venvit@uni-ruse.bg

Assoc. Prof. Velina Bozduganova, PhD

Department of Technical Mechanics,
Univesity of Ruse, Bulgaria
Phone: 82 888 572
E-mail: velina@uni-ruse.bg

Assoc. Prof. Julian Angelov, PhD

Department of Technical Mechanics,
Univesity of Ruse, Bulgaria
Phone: 82 888 247
E-mail: julian@uni-ruse.bg

Abstract: a multicriteria model problem for parametric synthesis of partially rectilinear longitudinal profile of a multistage gravitational chute has been formulated and solved. an evaluation system of criteria for mechanical perfection is selected, based on generalized dynamic characteristics (criterion actions) of analytical mechanics. an efficient computational procedure for multicriteria optimization by the PSI (Parameter Space investigation) method is proposed, supplemented by μ -selection of ranked Pareto-optimal subsets of compromise solutions. for some specific requirements to the gravity chute from a children's slide is determined Salukvadze optimal longitudinal profile.

Keywords: gravity chute, multicriteria parametric synthesis, PSI method, μ -selection, ranked Pareto subsets, Salukvadze optimum.

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THE IMPULSE OF A FORCE AS A HIGHLY INFORMATIVE METHOD AIMED AT ASSESSING THE VERTICAL MOTION

Assoc. Prof. Christo Kostov, PhD

Department of Physical Culture,
University of Ruse, Bulgaria
Phone: +359 886673318

Assoc. Prof. Ivan A. Loukanov, PhD

Department of Mechanical Engineering,
University of Botswana, Botswana
Phone: +359 896403311
E-mail: loukanovi@gmail.com

Assist. Prof. Pavel Petrov, PhD

Department of Technical Mechanics,
University of Ruse, Bulgaria
Phone: + 359 82 888 474

Abstract: This paper deals with the description of a newly proposed method for the assessment and measurements of vertical jumps from a place with two legs based upon the magnitude of the force impulse. The duration of time, the force magnitude and the impulse of the muscular force are registered on a UV-photographic paper by using a designed and constructed strain gauge measuring platform. An electronic amplifier and an oscillograph are also employed to complete the experimental setup. From the dynamo-graph of the force registered during the jump the time taken and the magnitude of the force are measured. Furthermore, the impulse of the force is estimated by measuring the area under the dynamo-graph by means of a surface measuring device, where the time is directly read from the record, while the time scale is provided automatically. By employing the principle of impulses and the kinetic energy the equations for the height of the vertical jump, the initial velocity of the sportsman when separated from the platform and the time taken for the jump are derived. It is stated that the proposed method of determining the vertical jump by using the impulse of the muscular force delivered by the sportsman is the most accurate and practically easy applicable in the sport training.

Keywords: Impulse of a force, height vertical jump, dynamo-graph, surface measuring unit.

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FRI-ONLINE-1-EEEE

FRI-ONLINE-1-EEEE-01

**INFLUENCE OF THE INPUT OFFSET VOLTAGE OF DIFFERENTIAL
AMPLIFIER IN THE STRUCTURE OF AN INTEGRATING MEASURING
STRAIN GAUGE BRIDGE**

Assoc. Prof. Svilen Stoyanov, PhD

Dobrudza Technological College, Dobrich

Technical University Varna

Phone: 058 604 712

E-mail: svilen.stoyanov@tu-varna.bg

Assist. Desislava Mihaylova, PhD

Dobrudza Technological College, Dobrich

Technical University Varna

Phone: 058 604 712

E-mail: desislava.mihaylova@tu-varna.bg

Assist. Snezhinka Zaharieva, PhD

Department of Electronics,

University of Ruse

Phone: 082-888 382

E-mail: szaharieva@uni-ruse.bg

Abstract: *offset voltage has a very strong effect on the operation of the measuring strain gauge bridge due to the low voltage values that come from both sides of the strain bridge circuit in case of imbalance. This voltage is inherent and cannot be compensated in any way. in the proposed design of strain gauge converter operational amplifier model OPA134PA is used, which allows additional adjustment of the offset voltage through a trimmer potentiometer. Experiments show the offset voltage influence in the measuring circuit and the need for precise preliminary setting. The obtained results are presented in tables and graphics herein, and corresponding conclusions are made.*

Keywords: *Converter, Measuring, offset voltage, Strain gauge bridge,*

JEL Codes: *L60*

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FRI-ONLINE-1-EEEE-02

DESIGN PARAMETERS OF MOSFET SOLID STATE RELAYS IN FOCUS

Main assistant Desislava Mihaylova, PhD eng.

Dobrudzha College of Technology

Technical University of Varna

Tel.: +359 893653012

E-mail: desislava.mihaylova@tu-varna.bg

Abstract: *The paper summarises the main design parameters of Solid State Relays and MOSFET SSR in particular. a number of technical papers and datasheets cover aspects of MOSFET SSR design theory and technical features of relevant commercial products. However, a detailed survey on the topic is not available, which is explained with the limited information provided by the production companies and the variety of devices. in this respect, the paper contributes with the proposed model of precise SSR specification and the review of main calculations and design considerations depending on the required electrical parameters and working conditions.*

Keywords: Solid State Relay, MOSFET SSR, Design

JEL Codes: L60

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ELECTROCARDIOGRAPHIC SIGNAL MODELING IN A LINEAR AND VECTOR PLANE

Aneliya Manukova, Assoc. Prof., PhD

Department of Electronics

University of Rousse, 8 Studentska Str. 7017 Rousse, Bulgaria,

E-mail: amanukova@uni-ruse.bg

Abstract: *The study presents algorithms for modeling the ECG signal and its phase portrait to ensure high recognition of individual fragments in the analysis of cardiac signals and their response to various conditions of healthy people and patients after cardiac diseases. a software system for modeling of electrocardiographic signal in linear and phase planes based on the proposed models and algorithms has been developed. The proposed algorithms and software system for modeling ECG signals provide quality analysis and justification for health prevention, as well as a theoretical learning environment to ensure a healthy lifestyle..*

Keywords: *electrocardiographic signal, algorithm, modeling, phase portrait*

JEL Codes: L65

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SMART HOME CONTROL ALGORITHM

Principal Assist. Nikolay Valov, PhD

Department of Automatics and Mechatronics

University of Ruse

Phone: 082 888 266

E-mail: npvalov@uni-ruse.bg

Abstract: *The paper presents the algorithm to working a system for house climate monitoring and control. Algorithms for controlling temperature and relative humidity inside a building are developed by monitoring parameters of the surroundings and changing the performing devices – open/close windows and turn on/off AC. Control of the lightning level is achieved by controlling the window blinds and lighting bodies for a smoother transfer between the light and dark part of the day. Different settings are planned based on whether or not there are residents inside the building. in addition, the optimal climate criteria are different for the four seasons and this has been accounted for in the system. The user can adjust each of the control parameters at any time as well as switch between manual and automatic mode on every performing device. The system is not closed and additional functionalities can be added by expanding the control algorithms and/or by adding more sensors and actuators. The collected data about these parameters can be used to predict control parameters in the future.*

Keywords: Home Climate Efficiency and Comfort, Raspberry Pi model 3B+, Sensors, Actuators

JEL Codes: L60

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Potts, J., & Sukittanon, S. (2012). *Exploiting Bluetooth on android mobile devices for home security application*. 2012 Proceedings of IEEE Southeastcon, 1-4.

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<https://www.comparitech.com/internet-providers/iot-statistics/>

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ONE APPROACH FOR SMART HOME REALISATION (HARDWARE PARTS)

Principal Assist. Nikolay Valov, PhD

Department of Automatics and Mechatronics

University of Ruse

Phone: 082 888 266

E-mail: npvalov@uni-ruse.bg

Abstract: This paper presents an example system for house climate monitoring and control. Using the system, the following parameters can be measured and monitored: temperature, relative humidity and atmospheric pressure for the whole building, as well as temperature, relative humidity, atmospheric pressure and lightning levels of the working area inside the building. The grading component of the system and the performing devices, that allow the user to change the parameters of the building's surrounding area are described. The developed home automatization system increases comfort and security inside the house. Energy and other resources are used more efficiently, making the household more economic. The system eases the resident's life which in turn suggests that it is suitable to help elderly people and people with special needs allowing supervision and control of household appliances. Raspberry Pi model 3B+ is used, which is a widely available and popular choice as it offers connection with additional sensors and devices, expanding the functionalities of the system.

Keywords: Home Climate Efficiency and Comfort, Raspberry Pi model 3B+, Sensors, Actuators

JEL Codes: L60

REFERENCES

Potts, J., & Sukittanon, S. (2012). *Exploiting Bluetooth on android mobile devices for home security application*. 2012 Proceedings of IEEE Southeastcon, 1-4.

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ENERGY LOSSES FROM SUPERCAPACITOR BANKS USED IN AUTONOMOUS PV POWERED IRRIGATION SYSTEMS

Assoc. Prof. Dr. Boris I. Evstatiev

Department of Electronics,
University of Ruse, Bulgaria
E-mail: bevstatiev@uni-ruse.bg

Assist. Prof. Dr. Katerina Gabrovska-Evstatieva

Department of Computer Science,
University of Ruse, Bulgaria
E-mail: kgg@ami.uni-ruse.bg

Abstract: In this paper are investigated through simulation the energy losses of a supercapacitor bank, used in an autonomous PV powered pumping installation. initially, a methodology of the investigation is created based on well-known electrical engineering dependencies and several approximations. Next, a testing scenario is selected with a 300 F/27 V supercapacitor bank, a 200 W PV module and 200 W/24 V pump. Furthermore, three typical weather conditions are selected – sunny day, partly cloudy day and cloudy day. for each of them is performed a simulation and the energy losses from charging/discharging are estimated. The obtained results show that the energy losses increase with the increase in the cloudiness, which is caused by the increased capacitor currents. Nevertheless, if low-resistance connections are ensured between the supercapacitors, the energy losses should not surpass 1%. Therefore, the results from this study show that a supercapacitor bank could be an extremely efficient and effective addition to a PV powered pumping station.

Keywords: Supercapacitors, PV, Irrigation system, Charge controller

JEL Codes: L60

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FRI-ONLINE-1-EEEE-07

OPTICAL TEST METHODS APPLICATION FOR DETERMINATION OF PHISICAL AND CHEMICAL PROPERTIES OF ENGINE OILS

Dipl. Eng. Albena Ivanova-Vasileva,

Department of Automatics and Mechatronics,

University of Ruse, Bulgaria

Tel.: +359 895 464 717

E-mail: avasileva@uni-ruse.bg

Abstract: The paper reviews existing and applicable spectral test methods for engine oils testing. Spectral technics of ultraviolet, infrared, atomabsorbtion spectroscopy and atomic emission spectroscopy with inductively coupled plasma and mass-spectrscopy are described with their advantages and disadvantages. The paper reviews and describe parameters used for motor oils viscosity classification and how they are related with the describe technics for testing and other optic technics from visual spectrum.

Keywords: Optical, Engine oils, Clasification, Test Methods, Spectral, Color

JEL Codes: L63; L 64

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FRI-ONLINE-1-EEEE-08

EVALUATION OF THE APPLICABILITY OF AN OPTICAL METHOD FOR MEASURING MAIN QUALITY PARAMETERS OF SOILS

Eng. Antonina Mihaylova – PhD Student

Department of Automatics and Mechatronics,

University of Ruse

Tel.: +359 82 888 676

E-mail: amihaylova@uni-ruse.bg

Assoc. prof. Tsvetelina Georgieva, PhD

Department of Automatics and Mechatronics,

University of Ruse

Tel.: +359 82 888 668

E-mail: cgeorgieva@uni-ruse.bg

Prof. Plamen Daskalov, PhD

Department of Automatics and Mechatronics,

University of Ruse

Tel.: +359 82 888 668

E-mail: daskalov@uni-ruse.bg

Abstract: *The paper presents the applicability of an optical method for remote measurement of basic parameters of soil quality in agriculture. a colorimeter was used to obtain visual information on 40 soil samples. The correlations between RGB and HSL color models of the samples and the acidity, electrical conductivity and soil moisture were obtained. The most informative components of the color spaces are determined and regression models are derived.*

Keywords: Soil Quality, Remote Measurement, in Situ Measurement, Optical Methods, Color Spaces

JEL Codes: L60

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STUDY OF SPECIFIC INDICATORS CHARACTERIZING THE CONSUMPTION OF ELECTRICITY IN SINGLE FAMILY HOUSES FOR A FIVE-YEAR PERIOD

Assoc. Prof. Vyara Sabova Ruseva, PhD

Department of Electrical engineering, electronics and automation,

University of Ruse, Bulgaria

Tel.: +359 882 123 300

E-mail: vruseva@uni-ruse.bg

Abstract: *The household sector is one of the largest users of electricity in Bulgaria. on the specific indicators characterizing domestic electricity consumption influence a number of factors that change over time. for this purpose, it is necessary to carry out periodic surveys of domestic electricity consumption. with the help of static electricity meters are obtained annual, monthly and 24-hour service schedules for a small settlement in the region of Varna. The specific indicators of domestic electricity consumption have been determined and a comparison has been made with similar indicators obtained for the region of Ruse. The results obtained can be used in the design and operation of low voltage networks, supplying small settlements.*

Keywords: household electricity consumption, specific Indicators of household electricity

JEL Codes: L60

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OPPORTUNITIES FOR APPLICATION OF PHOTOVOLTAICS OF TYPICAL RESIDENTIAL BUILDINGS IN THE CITY OF RUSE

Todor Yordanov, MSc. Eng.

Department of Electrical Power Engineering

University of Ruse, Bulgaria

Phone: 086-821 521

E-mail: tyordanov@uni-ruse.bg

Abstract: Electricity from photovoltaic sources is becoming cheaper at a rapid pace. The recent national and European regulatory documents (directives, laws, etc.) are aimed at stimulating the application of renewable energy sources. a significant part of the electrical energy consumption is caused by the domestic sector. in a number of European countries the share of renewable energy, produced by roof and façade mounted photovoltaic generators, reaches 40%. in this paper is analyzed the available experience and possibilities for application in Bulgaria. The solar energy potential is assessed for the region of Ruse and the expected photovoltaic energy production for a real object is simulated.

Keywords: photovoltaic systems, domestic sector

JEL Codes: L60

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REVIEW OF METHODS FOR EGGSHELL DEFECTS DETECTION AND QUALITY GRADING

Eng. Emil Stefanov – PhD Student

Department of Automatics and Mechatronics,
University of Ruse
Tel.: +359 82 888 676
E-mail: estefanov@uni-ruse.bg

Assoc. Prof. Tsvetelina Georgieva, PhD

Department of Automatics and Mechatronics,
University of Ruse
Tel.: +359 82 888 668
E-mail: cgeorgieva@uni-ruse.bg

Prof. Plamen Daskalov, PhD

Department of Automatics and Mechatronics,
University of Ruse
Tel.: +359 82 888 668
E-mail: daskalov@uni-ruse.bg

Abstract: *The paper reviews existing methods for eggshell defects detection and quality grading and the importance of the process itself. The count of broken eggs in a batch is directly dependent on the structural integrity and the quality of the eggshell. It is important to consider that there are multiple types of defects that can affect the quality of an egg. There are different types of shell defects for example color defects, cracks, texture defects, bloodstains and others. From an economical standpoint the downgrading of an egg represents a loss for the manufacturer. So it is crucial to have an adequate method for defect detection and grading of the eggs. The most common used methods for quality assessment and defect detection are visual methods. The purpose of the paper is to compare and review the different methods for egg quality grading.*

Keywords: Egg Quality, Egg Defects, Optical Methods, Color Spaces

JEL Codes: I23

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JUSTIFICATION OF THE EGG SORTING ALGORITHM BY CATEGORY BASED ON THE METHOD OF FUZZY SETS

Aidar Moldazhanov, PhD

Department of Energy Saving and Automation,
Kazakh National Agrarian Research University
Tel.: +7 7082760127
E-mail: Aidar.m.k@ya.ru

Prof. Jakhfer Alikhanov, candidate of technical sciences

Department of Energy Saving and Automation,
Kazakh National Agrarian Research University
Tel.: +7 7773156598
E-mail: alikhanov.d@list.ru

Akmaral Kulmakhambetova

Department of Energy Saving and Automation,
Kazakh National Agrarian Research University
Tel.: +7 7072760769
E-mail: Akmaral.t.k@ya.ru

Azimzhan Azizov

Department of Energy Saving and Automation,
Kazakh National Agrarian Research University
Tel.: +7 7081115163
E-mail: Azizov811@mail.ru

Zinchenko Dmitry

Department of Energy Saving and Automation,
Kazakh National Agrarian Research University
Tel.: +7 7071712212
E-mail: Bolweviak@gmail.com

Prof. Plamen Daskalov, PhD

Department of Automatics and Mechatronics,
“AngelKanchev” University of Ruse
Tel.: +359 82 888 668
E-mail: daskalov@uni-ruse.bg

Abstract: The article discusses the indicators of sorting eggs into categories by shape, density and weight and determined conditions for dividing eggs into categories based on methods of fuzzy logic. an algorithm was developed for sorting eggs into categories using the rules of fuzzy sets and the results of an experimental verification of the algorithm and is presented.

Keywords: egg, mass, density, shape, fuzzy logic, function, set, algorithm.

JEL Codes: I23.

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IMPLEMENTATION OF THE CSP SEMANTICS OF INTER-PROCESS COMMUNICATIONS USING THE C++11 STANDARD LIBRARY

Assoc. Prof. Milen Loukantchevsky, PhD, IEEE Member, ACM Member

Department of Computer Systems & Technologies,

University of Ruse

Phone: 0877 303 850

E-mail: mil@ieee.org

Abstract: The theory of Communicating Sequential Processes (CSP) is a basis for analysis and synthesis of concurrent computer systems. Its uniqueness is in its simultaneous manifestation as an abstract model, a parallel systems specification language and a parallel programming language. Over its long history, CSP has found numerous of successful implementations - from transputers and its OCCAM language to modern Go and Python languages. The constructive potential of this parallel computational model despite of that is far from being expended.

From engineering point of view CSP defines an abstract parallel machine, CSP machine. It consists of two subsystems: a set of computing nodes and a communicating environment. In each of the computing nodes are executed one or more concurrent asynchronous processes. The communicating environment consists of set of channels. The processes grouped by pairs could communicate only by message passing over a communication channel.

The CSP semantics of inter-process communications suggest the simplest possible kind of channels – unidirectional, one-to-one (1:1), unbuffered, with direct naming. Such channels do not actually imply flow control but required a special kind of bilateral synchronization known as “rendezvous”.

While `std::threads` could be regarded near close to `CSP::process` semantics, in C++ standard library there is not type even distant from `CSP::channel`. Hence the main goal set: proposal of suitable implementation of the CSP semantics of inter-process communications with C++11 standard library means. As result a `csp` namespace is defined. It includes the type `csp::chan`, nearly strong implementation of `CSP::channel` semantics, with two methods `csp::chan::send()` and `csp::chan::recv()` corresponding to CSP communications commands `!` and `?`. The alternative command for non-deterministic selection is implemented by the method `csp::alt()` using multiple wait on `std::condition_variable` and randomized choice between true guards.

Keywords: CSP, C++11, Multithreading, Concurrency, Non-deterministic Message Passing

ASJC Codes: 1701, 1712

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COMPARATIVE ANALYSIS OF TEST-DRIVEN DEVELOPMENT AND ACCEPTANCE TEST-DRIVEN DEVELOPMENT

Assist. Prof. Lachezar Yordanov, PhD

Department of Computer Systems and Technologies,

University of Ruse

Phone: +359 82 888 859

E-mail: Liordanov@ecs.uni-ruse.bg

M. Eng. Teodora Yordanova

Junior Software Developer

Parallel Bulgaria Ltd, Ruse

Phone: +359 882 820 695

E-mail: tyordanova@parallel-bg.com

Abstract: *The report represents a comparative analysis of two techniques for software development and the implementation of (automatic) tests – test-driven development and acceptance test-driven development. The first technique aims to check whether the code is valid (emphasis on functional tests), and the second one - whether the code is working as expected (non-functional tests). The report describes the main points in the development of the applications and the creation of the accompanying tests; the advantages and disadvantages of both techniques. Analyzed are the necessary resources (development time, number and type of specialists, knowledge in the field of the software product) and the saved losses from detected in time errors (in the presentation of information, in the main modules of the application, in the product specification, in the client's assignment). The formed conclusions provide guidelines in which situations test-driven development and acceptance test-driven development can be used and which of the two techniques is more suitable.*

Keywords: *Test-Driven Development, Acceptance Test-Driven Development, Automatic Testing, Product Specification*

JEL Codes: *I20, C88,*

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RESULTS OF DONE E-LEARNING IN THE CONDITIONS OF COVID

Assist. Prof. Lachezar Yordanov, PhD

Department of Computer Systems and Technologies,

University of Ruse

Phone: +359 82 888 859

E-mail: Liordanov@ecs.uni-ruse.bg

Abstract: *The report presents the work and results of done remote e-learning in the conditions of the COVID pandemic. Work in two video conferencing and four distance-learning environments (used as a virtual classroom) are described. The possibilities of the environments and the organization of the transmission of solutions of the set tasks during the present remote lesson are presented. During the training, tasks for independent solving are set, which are handed over to the teacher. The advantages and disadvantages in transferring of the solved tasks by the students, in the work with video conferencing communication are described. The formed conclusions provide guidelines for the development of remote e-learning environments in real-time.*

Keywords: e-learning, distance learning, virtual classroom, video conferencing

JEL Codes: I20, C88,

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<http://e-learning.uni-ruse.bg/>

A MOBILE APPLICATION FOR VISUALIZATION OF INTERACTIVE DIGITAL TEXTBOOKS

Principle Assistant Elitsa Ibryamova, PhD

Department of Computer Systems and Technologies,

University of Ruse

Phone: 082-888 827

E-mail: eibryamova@ecs.uni-ruse.bg

Abstract: *In the last years, computers, tablets, and smartphones have become an essential and undivided part of our lives, and one of the advantages of this situation is that digital technologies have become a significant and powerful assistant of educators. Once familiar with digital technologies, teachers have endless opportunities and means to attract students' attention. One of these tools is interactive electronic textbooks (e-textbooks). They are not only the digital version of the text but they can be enhanced with multimedia and animations. Thereby, e-textbooks are effective resource for teaching and learning. The paper reviews existing software products for creating, publishing, and presenting interactive e-textbooks and compare them to a developed and implemented authoring tool. The main purpose of this paper is to present the design of a mobile application that could display an interactive e-textbook. The report covers the development and implementation phases of the electronic reader.*

Keywords: *e-Reader; Interactive Digital Textbooks; E-Textbook; interactive Learning; E-Books; Visual Effects; Animation*

JEL Codes: *L10, L11*

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ANALYSIS OF STUDENTS' ATTITUDES TOWARDS DIFFERENT TYPES OF LEARNING

Asistant Prof. Tsvetelina Mladenova

Department of Computer Systems and Technologies,
University of Ruse
Tel.: 082-888 681
E-mail: jkalmukov@ecs.uni-ruse.bg

Asistant Prof. Yordan Kalmukov, PhD

Department of Computer Systems and Technologies,
University of Ruse
Tel.: 082-888 681
E-mail: jkalmukov@ecs.uni-ruse.bg

Assoc. Prof. Irena Valova, PhD

Department of Computer Systems and Technologies,
University of Ruse
Phone: 082-888 685
E-mail: ivalova@ecs.uni-ruse.bg

Abstract: Distance learning has been an area of interest to the scientific and educational community long before the Covid-19 pandemic. E-distance learning facilitates the learning process significantly and makes it more accessible. That is due to the extremely reduced time for communication between the participants; the ability to learn everywhere, regardless of the location and time; the added interactivity; the possibilities for self-control, and self-evaluation.

The purpose of this paper is to analyze the students' attitudes towards the possibility of traditional learning accompanied with distance learning (i.e. The so-called hybrid learning) and their need, willingness, and readiness to use electronic study materials, such as video lectures, audio lectures, interactive documents, etc. Additionally, the survey aims to give an insight into the lecturers' efforts for materials preparation. The analysis has been conducted after a survey among 200 students of all years majoring in the field of Computer Systems and Technologies, as well as pupils from twelve grade, participating in the Ministry of Education's program – IT career training. The questionnaire is held just before the global pandemic, in January, and reflects the students' attitude and their readiness and not their practical experience with the mandatory online education due to Covid-19.

Among the main goals of the survey are:

- To what extent the audio, video, and multimedia materials increase the students' motivation;
- Which are the most useful and suitable presentation means for visualization and effective mastering of the study material;
- What is the attitude and willingness of the students to prepare in advance (or to catch up) with the help of video lectures;
- How effective is asynchronous learning with video and audio lectures when learning new material versus face-to-face synchronous learning;
- What role does the social networks have in the learning process;

The results show that the respondents have managed to find the advantages and disadvantages of both learning methods and have assessed that the most effective, flexible, and motivating approach is in fact, the hybrid learning method, which is a combination of the traditional face-to-face education and the eLearning.

Keywords: e-learning, multimedia teaching materials, students' attitude

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RESEARCH OF SOME SPECIFICS OF MODERN ENVIRONMENTS FOR AUTOMATED SOFTWARE INSTALLATION AND IMPLEMENTATION

Eng. Vladislav Hinkov, PhD Student

Department of computing
University of Ruse
Phone: +359 884 260 685
E-mail: vhinkov@uni-ruse.bg

Prof. Georgi Krastev

Department of computing
University of Ruse
Phone: +359 82 888 672
E-mail: georg@uni-ruse.bg

Abstract: *The paper reviews the types of modern environments for automated software installation and implementation, their characteristics and their application according to their different specifics. Modern environments for automated software research are increasingly entering the work of both large and small organizations. Issues such as security, quick and easy access to users, optimization of resources - hardware, human and financial, are the basis of their application. Guidelines are given for future theoretical and practical research.*

Keywords: *Effectiveness, automated software installation, software mplementation, optimization of resource, cloud computing, docker, microseivices.*

JEL Codes: *L86*

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RESEARCH OF THE CREATIVE INTEL REALSENSE SR300 FOR HUMAN-MACHINE INTERACTION

Eng. Ivan Ralev, PhD Student

Department of Computer Systems and Technologies,

University of Ruse

Tel.: +359 897 552223

E-mail: iralev@uni-ruse.bg

Abstract: *The paper reviews specification of the creative intel realsense sr300 camera, usage of human computer interaction in computer system and presents computer application which use creative intel realsense sr300 camera. The purpose of the application is to demonstrate how hand gesture recognition can control it. for the develop of the application is use java programing language. The result of the research is that the camera successfully control the application, but the SDK is not java friendly.*

Keywords: human computer interaction, creative intel realsense sr300 camera, java programming language.

JEL Codes: L86

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COMPARATIVE ANALYSIS OF ACTIVATION FUNCTIONS USED IN DEEP NEURAL NETWORKS TRAINING

Martin Kaloiev, PhD Student

Department of EEA

University of Ruse

E-mail: kaloiev_92@mail.ru

Abstract: The article discusses the training of a neural network for curve recognition. Three popular activation functions are analyzed - logistic (sigmoid) function (Sigmoid), hyperbolic tangent (tanh) and corrective linear function (ReLU, Rectified linear unit)

The activation function is selected so that the input signal can accept arbitrary values and the output values are in a strictly limited range. However, although the input values can be arbitrary, a saturation effect occurs when the element is sensitive only to input values lying in a limited range. This condition is fulfilled by functions similar to the letter S (eg Sigmoid). For them, the output value is in the range (0,1), and the sensitivity range for the input is slightly wider than the range (-1, + 1). This function is smooth and its derivative is easy to calculate. This is important when training the network

The second activation function studied is the hyperbolic tangent, which is a traditional activation function, but which suffers from the problem of disappearing gradients.

The linear correction function (ReLU) has been used relatively recently. It is especially suitable for working with deep neural networks, as it does not suffer from the problem of disappearing gradients. However, ReLU also has drawbacks. The function is differentiable at 0 and in rare situations can lead to the fact that part of the network will "crash" and will not participate in the next iterations of training.

The results of this study will be useful in the design of Deep Neural Networks and in the selection of activation functions.

Keywords: gradient decent, tensorflow, keras, Relu, Sigmoid, Tanh, activation function analysis, activation function comparison, curve graphics in artificial neural network, model layers, architecture in deep artificial neural network, starved batch methods for neural network

JEL Codes: L10, L11

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AN ARCHITECTURAL SOLUTION FOR MEDIATION AND OPTIMIZING WORK EFFICIENCY BETWEEN THE ENTERPRISE RESOURCE PLANNING AND THE TRANSPORT CONTROL SYSTEMS

Iliya Draganov, PhD Student

Department of Computer Science,
University of Ruse
Tel.: +359 883 476542
E-mail: idraganov@uni-ruse.bg

Svetlana Stefanova, PhD

Department of Computer Science,
University of Ruse
Phone: +359 888 309579
E-mail: sstefanova@ecs.uni-ruse.bg

Abstract: Businesses that are using ERP (Enterprise Resource Planning) systems and such that control internal logistics are looking for compatible software solutions that make it easier to optimize and synchronize their work. This publication offers an architectural software solution to mediate between ERP and AGV (Automated Guided Vehicle) / TC (Transport control) system in order to optimize the process of executing transport orders. The presented solution describes not only the internal organization and structure, but also a certain functionality for external connectivity to other software, which makes it an optional, but increasing the efficiency of the mediator.

Keywords: AGV, ERP, Efficiency, Software Mediator

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ANALYSING THE IMPACT OF THE INTRODUCTION OF A VIRTUAL LEARNING ENVIRONMENT FOR MEASURING 3D INSTRUMENTS TO MECHANICAL ENGINEERING STUDENTS

Vasil Kozov, PhD Student

Department of Computer Systems and Technologies,
University of Ruse
Phone: +359 878 35 22 80
E-mail: vkozov@uni-ruse.bg

Assoc. Prof. Galina Ivanova, PhD

Department of Computer Systems and Technologies,
University of Ruse
Phone: +359 82 888 855
E-mail: giivanova@uni-ruse.bg

Assoc. Prof. Aleksandar Ivanov, PhD

Department of Machine tools and Manufacturing,
University of Ruse
Phone: +359 82 888 714
E-mail: akivanov@uni-ruse.bg

Abstract: *The paper describes and reviews the criteria for evaluating statistical data in the field of education. It contextualises the need for an educational and training tool on the subject of cutting tools, evaluating the influence of a virtual classroom web application, which allows the manipulation and workshop research of 3D tools for Mechanical Engineering. a description of the methodology for evaluating the data and its presentation is provided. The instrument used for formulating the basis of the research is shown and evaluated. an empirical analysis of the experimental data is made and presented. The results of the experiment are systematically ordered and analysed, and appropriate conclusions are derived about the viability of the usage of such a tool for the purpose of improving the education of students in this particular speciality.*

Keywords: 3D objects, Educational tools, Web application, Data analysis

JEL Codes: L86, I21

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WEB BASED LEARNING TOOL OF HAMMING CODE IN MATRIX FORM

Yuksel Aliev, PhD Student

Department of Computing,
University of Ruse, Bulgaria
E-mail: yaliev@uni-ruse.bg

Assoc. Prof. Galina Ivanova, PhD

Department of Computing,
University of Ruse, Bulgaria
Phone: 086-821 521
E-mail: giivanova@uni-ruse.bg

Abstract: This report presents a web-based application for studying Hemming code in matrix form. The proposed application can work with up to 26 bit information combination in encoding mode and up to 32 bit code combination in decoding mode. The software provides an opportunity to work with the so-called, Heming's extended code, which makes the code capable of detecting all double and corrects all single errors at the expense of an additional control bit. an interactive block diagram has been developed and it is integrated in the web-based application. The sequence of all steps for working with the environment is presented and students are informed at each stage with information about all the actions for the current stage. The application was created for educational purposes for students studying "Computer Systems and Technologies" at the University of Ruse "Angel Kanchev". Survey results with students will be presented and discussed.

Keywords: Hamming code, matrix, coding, decoding, error detecting, error correcting, learning tool, interactive model, javascript, konva, html5

JEL Codes: I23, D83, L86

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INVESTIGATION OF THE EFFICIENCY OF DIFFERENT METHODS FOR DATA STORAGE AND DATA PROCESSING IN THE JAVA PROGRAMMING LANGUAGE

Assoc. Prof. Georgi Georgiev, PhD

Dept. of Computer Systems and Technologies,

University of Ruse

Tel.: 082-888 744

E-mail: gtgeorgiev@ecs.uni-ruse.bg

Abstract: The paper investigates the efficiency in terms of speed and memory usage of various methods for storing large amounts of data in Java - arrays and different types of collections. Lambda expressions are an exciting new feature, introduced in Java 8, but there aren't many conclusive proofs whether there is any significant performance gain from using them. This paper attempts to provide an unbiased comparative analysis of the efficiency in terms of speed of data processing by different means - classical and lambda expressions. Tests have been performed on several computer systems providing different processing power in an attempt to eliminate the effect of the underlying platform on code efficiency. Conclusions are made regarding the most efficient means for data storage and data processing in Java, with an accent on Lambda expressions.

Keywords: Efficiency, Data Storage, Data Processing, Lambda Expressions, Java

JEL Codes: C80

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STEM AND ICT EDUCATION OUTSIDE THE CLASSROOM AND HOW TO FOSTER IT FOR BETTER STUDENT'S SKILLS

Assoc Prof. Nina Bencheva, PhD

Telecommunications Department,

University of Ruse

Phone: +359 887746257

E-mail: nina@uni-ruse.bg

Abstract: Our understanding of the world through science education is needed today more than ever in light of the current COVID-19 crisis. Education systems have been based on transferring knowledge based on industrial society and now on post-industrial society, seldom including hands-on, student-centered methodologies. Using technology as a practical and pragmatic approach, can deliver the values of transition and of community-living-with environment to new generations that must challenge transition and lead towards the post-transition world. together with environmental challenges, we are currently experiencing a significant industrial transformation, the fourth industrial revolution (Industry 4.0), where science along with the advancement of technology is evolving at an unprecedented speed. Education institutions are noted for being 'extremely slow in adopting the advancement of technology' in the classroom, together with the critical perspective to information and needs for digital solutions in education. to meet the challenges of rapidly evolving new technologies, STEM formal classroom education is not enough to acquire the necessary skills. The paper studies EU and Bulgarian policies for encouraging learning outside the classroom and specifically education in STEM and ICT field. Some of good practices of outside the classroom science education across Europe are identified. Teachers from Telecommunications department at University of Ruse implemented different projects for teaching students from Ruse schools in the field of ICT and STEM outside the formal education. Some of the experimental projects for teaching outside of the classroom by professionals from Telecommunications department are presented in the paper.

Keywords: STEAM, EU policies, ICT, learning outside the classroom

JEL Codes: D83

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A SURVEY OF METHODS FOR INCREASING THE ACCURACY OF DIGITAL ELEVATION MODELS, CREATED BY PROCESSING THE INFORMATION FROM UAVS

Eng. Monika Bedzheva, PhD

Department of Geodesy,
Konstantin Preslavsky University of Shumen, Bulgaria
Tel.: +359 889 096 039
E-mail: m.bedzheva@shu.bg

Dimitar Marinov, PhD Student

Department of Telecommunication,
University of Ruse
Phone: 082-888 673
E-mail: dmihajlov@uni-ruse.bg

Abstract: Today unmanned aerial vehicles (UAVs) are successfully used for mapping, because they allow fast gathering of spatial information. Accounting this situation, in the paper a survey of methods for increasing the accuracy of digital elevation models, created by processing the information from UAVs, is presented. Besides, a methodology for increasing the accuracy of digital elevation models is substantiated. This methodology can be used for improving the results from the spatial analysis.

Keywords: Unmanned aerial vehicles, Photogrammetry, Global navigation satellite system (GNSS)

JEL Codes: L96

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MODELING OF QUEUING SYSTEMS TO DETERMINE BASIC OPERATING PARAMETERS

Assist. Prof. Chavdar Kostadinov, PhD

Department of Communication and Information systems,

“G. S. Rakovski” National Defence College – Sofia

Phone: +359 292 26596

E-mail: ch.kostadinov@rndc.bg

Assist. Kristina Krumova

Department of Communication and Information systems,

“G. S. Rakovski” National Defence College – Sofia

Phone: +359 292 26660

E-mail: k.krumova@rndc.bg

Assoc. Prof. Veselina Aleksandrova, PhD

Department of Communication and Information systems,

“G. S. Rakovski” National Defence College – Sofia

Phone: +359 292 26660

E-mail: v.gagamova@rndc.bg

Assoc. Prof. Ivan Hristozov, PhD

Department of Communication and Information systems,

“G. S. Rakovski” National Defence College – Sofia

Phone: +359 292 26595

E-mail: ihristoz@rndc.bg

Abstract: *Queuing systems (QS) with failures are one of more a typical type of QS used to describe and study communication and information systems. Due to their importance for the functioning of such systems, the dependencies are summarized to determine their main parameters. an example of such a system is considered and an analysis of the work is made and sample recommendations are given for better operation of the system.*

Keywords: *modeling, queuing systems, queuing systems with failures*

JEL Codes: *L86*

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MODELS OF INFLUENCE OF INFORMATION SYSTEM ON MANAGEMENT SYSTEM

Prof. Kamen Kalchev, PhD

Department of Communication and Information systems,
“G. S. Rakovski” National Defence College – Sofia
Tel.: +359 292 26530
E-mail: k.kalchev@rndc.bg

Assoc. Prof. Krasimir Dimitrov, PhD

Department of Communication and Information systems,
“G. S. Rakovski” National Defence College – Sofia
Phone: +359 292 26599
E-mail: k.dimitrov@rndc.bg

Assoc. Prof. Ivan Chakarov, PhD

Department of Communication and Information systems,
“G. S. Rakovski” National Defence College – Sofia
Phone: +359 292 26599
E-mail: i.chakarov@rndc.bg

Dimitar Dimitrov, PhD Student

Department of Communication and Information systems,
“G. S. Rakovski” National Defence College – Sofia
Phone: +359 292 26596
E-mail: dim.dimitrov@rndc.bg

Abstract: Modern information systems are the basis of management in a number of areas of our economic and social life. Finding applicable models describing their interaction allows both designers and managers to find optimal solutions for the application of information systems and management structures. This report attempts to present appropriate solutions to this traditionally complex problem of analysis and solution.

Keywords: information systems, model, management structures.

JEL Codes: L86

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THEORETICAL BASIS OF A METHODOLOGY FOR CONDUCTING EMPIRICAL SOCIOLOGICAL STUDIES ON THE EFFICIENCY OF OPERATION OF THE CADASTRE INFORMATION SYSTEM

Petina Andreeva, PhD

South-West University "Neofit Rilski"

Blagoevgrad

E-mail: petiand@abv.bg

Mihail Iliev, DSc

University of Ruse "Amgel Kanchev"

E-mail: miliev@uni-ruse.bg

Abstract: *The paper reviews theoretical basis of a methodology for conducting empirical sociological surveys of the efficiency of operation of the cadastre information system. a proper assessment of the degree of importance of the individual criteria ensures a sufficient degree of objectivity of the entire assessment process of the information system for a cadastre. One of the most commonly used approaches for determining the weightings of indicators is the method of expert evaluation. It is based on surveying specialists in the given problem area (cadastre) and processing the results obtained. in addition to determining the degree of competence, the methodology also includes the processing of the results obtained from the survey of the experts. on the basis of the estimates obtained, the weightings of the criteria groups as well as the criteria themselves shall be calculated and the degree of consistency of opinion of the experts participating in the survey shall be determined.*

Keywords: *Cadastre, Methodology, Efficiency, Weightings, Effectiveness, Expert.*

JEL Codes: L86

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TECHNOLOGY FOR APPLYING A METHODOLOGY FOR CONDUCTING EMPIRICAL SOCIOLOGICAL SURVEYS OF THE EFFECTIVENESS OF THE CADASTRE INFORMATION SYSTEM

Petina Andreeva, PhD

South-West University "Neofit Rilski"

Blagoevgrad

E-mail: petiand@abv.bg

Abstract: The technology for applying the methodology aims to regulate and determine the study of the condition and degree of effectiveness of is for the cadaster in the Republic of Bulgaria: objectives and tasks of the assessment; subject matter and subject to assessment; types of assessment; periodicity; assessment criteria /scope/, indicators to the criteria; quantitative evaluation approaches; a scale with coefficients of severity of the criteria; resource assessment structures; disclosure and use of evaluation results for corrective actions; stakeholders' knowledge of the results of the studies and the degree of implementation of the corrective actions.

The analysis of the results of the empirical sociological surveys used to take management decisions and take corrective and preventive actions according to certain procedures.

Keywords: Cadastre, Technology, Methodology, Efficiency, Empirical sociological surveys, Effectiveness.

JEL Codes: L86

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A METHODOLOGY FOR ESTIMATING THE ACCURACY OF PRIMARY PHOTOGRAMMETRIC INFORMATION, OBTAINED BY UAVS

Eng. Monika Bedzheva, PhD

Department of Geodesy,
Konstantin Preslavsky University of Shumen, Bulgaria
Tel.: +359 889 096 039
E-mail: m.bedzheva@shu.bg

Teodora Ignatova, PhD Student

Department of Telecommunication,
University of Ruse
Phone: 082-888 673
E-mail: tignatova@uni-ruse.bg

Abstract: Today unmanned aerial vehicles (UAVs) are widely used in geodesy for mapping. Due to this reason the estimation of accuracy of primary photogrammetric information, obtained by UAVs, is an actual scientific problem, which is not studied in detail yet. Accounting this situation in the paper a methodology for estimating the accuracy of projective center coordinates of images from UAVs is developed. The methodology, substantiated in the paper, can be used for improvement of UAV mission planning and thus – the final result from image processing.

Keywords: Unmanned aerial vehicles, Photogrammetry, Global navigation satellite system (GNSS)

JEL Codes: L96

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EXPERIMENTAL EXPLORATION OF THE ACCURACY OF PRIMARY PHOTOGRAMMETRIC INFORMATION, OBTAINED BY UAVS

Eng. Monika Bedzheva, PhD

Department of Geodesy,
Konstantin Preslavsky University of Shumen, Bulgaria
Tel.: +359 889 096 039
E-mail: m.bedzheva@shu.bg

Eng. Stefan Dobrev, PhD Student

Department of Geodesy,
Konstantin Preslavsky University of Shumen, Bulgaria
Tel.: +359 883 414 556
E-mail: s.dobrev@shu.bg

Abstract: *The accuracy of primary photogrammetric information influences essentially on the quality of geospatial data models, prepared by the means of unmanned aerial vehicles (UAVs). Accounting this situation in the paper the results from practical exploration of the correlation interval of the pseudo stationary errors, accompanying the performance of UAV board global navigation satellite system receivers, are presented. These results can be used for improvement of UAV mission planning and thus – the final result from image processing.*

Keywords: Unmanned aerial vehicles, Photogrammetry, Global navigation satellite system (GNSS)

JEL Codes: L96

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VOICE CLASSIFICATION BY ARTIFICIAL NEURAL NETWORKS WITH LM AND SCG ALGORITHMS

Assoc. Prof. Ivelina Balabanova, PhD

Department of Communications Equipment and Technology,
Technical University of Gabrovo, Bulgaria
Phone: 0896 640 473
E-mail: ivstoeva@abv.bg

Chief Assist. Georgi Georgiev, PhD

Department of Communications Equipment and Technology,
Technical University of Gabrovo, Bulgaria
Phone: 0877 522 029
E-mail: givanow@abv.bg

Abstract: In this paper the applicability of artificial neural networks with combination of Levenberg-Marquardt (LM) and Scaled Conjugate Gradient (SCG) training algorithms for identification of speakers by speech analysis have been studied. The voice classification process of participants is based on neural learning procedures by individual sound characteristics registered in speech activity. According to the training algorithms, the following criteria groups "Accuracy and Mean Squared Error (MSE)" for LM algorithm and "Accuracy and Cross-Entropy" in SCG algorithm were evaluated. The presented results consists of performance analysis, correct classifications / misclassifications, ROC analysis, error levels between predicted and observed values.

Keywords: Speaker Identification, Sound Analysis, Artificial intelligence, LM and SCG Algorithms, Accuracy.

JEL Codes: L10, L11

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AN OVERVIEW OF THE RECENT STANDARDS AND SECURITY TECHNOLOGIES FOR WIRELESS LOCAL AREA NETWORKS

Eng. Petar Stoilov, PhD Student

Department of Telecommunications,

University of Ruse

Tel.: +359 88 797 9174

E-mail: pstoilov@uni-ruse.bg

Abstract: With the digital transformation of our society, the need to develop new information and communication technologies is imperative. The modern day applications rely on technologies that require higher bandwidths to answer the need for faster transmission and processing of the information. With the development of virtual and augmented reality products, cloud-based working spaces, new streaming technologies, and higher-resolution media, the need for advanced connectivity and mobility is as tangible and notable as never before. At the same time, the number of cybercrimes continues to grow with an unprecedented rate, which calls for the development of novel solutions and standards for confidentiality, integrity and accessibility of the data. To answer these issues, a new generation of standards for connectivity and security was developed and introduced in the wireless local area networks.

This paper reviews the emerging and the most recently adopted standards for connectivity and the evolution of the standards for providing security in the wireless local area networks. Different parameters, characteristics and specifications of the WiFi 4, WiFi 5 and WiFi 6 are investigated, compared and presented in the first chapter of the paper. A review on the methods for providing confidentiality and integrity in the wireless local area networks is also presented in the later part of the paper.

Keywords: IEEE 802.11n, IEEE 802.11ac, IEEE 802.11ax, wireless local area standards, WEP, WPA, WPA2, WPA3, WPS, wireless security standards

JEL Codes: L96

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A COMPARISON OF ACTIVE LEARNING METHODS WHEN INVESTIGATING AMPLITUDE MODULATION

Assist. Prof. Ivanka Tsvetkova, PhD

Department of Telecommunications,

University of Ruse, Bulgaria

Tel.: +359 82 888 836

E-mail: itsvetkova@uni-ruse.bg

Assist. Prof. Adriana Borodzhieva, PhD

Department of Telecommunications,

University of Ruse, Bulgaria

Tel.: +359 82 888 734

E-mail: aborodzhieva@uni-ruse.bg

Abstract: Active and interactive methods are used now to engage students in the learning process. These approaches give more flexibility to students and lecturers in the universities. Students are encouraged to learn in their speed and teachers can develop the courses according to students' needs. Some topics are discussed in different disciplines, because they are basic. Different lecturers can use different methods to attract students and help them to understand the material faster and for a longer period of time. This paper introduces a comparison between different approaches for studying the topic "Investigating Amplitude Modulation" in two disciplines "Communication Circuits" and "Radio Communication Technologies" for the bachelors of the specialty "Internet and Mobile Communications".

Keywords: Amplitude Modulation, Communication Circuits, Radio Communications, interactive Methods.

JEL Codes: L96

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IMPLEMENTATION OF A MAGNITUDE COMPARATOR USING COMPUTER-BASED TOOLS

Diego Fierro Álvarez

Erasmus Student at the Department of Telecommunications, University of Ruse
Universidad de Leon, Spain
E-mail: dfiere00@estudiantes.unileon.es

Assist. Prof. Adriana Borodzhieva, PhD

Department of Telecommunications,
University of Ruse, Bulgaria
Tel.: +359 82 888 734
E-mail: aborodzhieva@uni-ruse.bg

Abstract: *The paper presents an approach for designing a magnitude comparator comparing two four-bit binary numbers. The magnitude comparator is implemented in Logisim using integrated circuits (IC) from the library 74xx and tested for different input combinations. Then the circuit is built in the environment of ISE Project Navigator necessary for programming the FPGA-based laboratory board, developed at the University of Ruse and used in the educational process. The work is related with the project in the course "Digital Devices" for students-bachelors of the specialty "Electronics".*

Keywords: Magnitude Comparators, Digital Devices, Logisim, FPGA, Xilinx.

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ANALYSIS OF DIFFERENT TYPES OF NEURAL NETWORKS AND THEIR APPLICATION TO REAL-WORLD CHALLENGES

Eng. Georgi Georgiev, PhD Student

Department of Telecommunications,
University of Ruse
Tel.: 082 888 353
E-mail: gdgeorgiev@uni-ruse.bg

Assoc. Prof. Georgi Hristov, PhD

Department of Telecommunications,
University of Ruse
Tel.: 082 888 663
E-mail: ghristov@uni-ruse.bg

Assoc. Prof. Plamen Zahariev, PhD

Department of Telecommunications,
University of Ruse
Tel.: 082 888 663
E-mail: pzahariev@uni-ruse.bg

Assist. Prof. Diyana Kinaneva, PhD

Department of Telecommunications,
University of Ruse
Tel.: 082 888 353
E-mail: dkyuchukova@uni-ruse.bg

Abstract: Nowadays, there has been a great interest around the term “neural network” in the field of computer science. It attracts a lot of attention from many people. In this article, we will look through the most used variations of neural networks, introduce how they work in brief, along with their applications to real-world challenges.

When we are children, we learn the things with the help we get from the elders. Later by self-learning or practice we keep learning during our whole life. The artificial neural networks are inspired by this processes in the human brain. They learn by detecting patterns in huge amount of information. With the help of neural networks, we can provide solutions of problems for which there is no algorithmic method to be solved with. We don't need to program the neural networks explicitly, they learn how to solve problems by examples.

Neural networks are usually used for statistical analysis and data modelling, in which their role is to serve as an alternative to standard nonlinear regression or cluster analysis techniques. That's why, they are typically used in problems that may be formulated in terms of classification, or forecasting. Examples of their use include image and speech recognition, textual character recognition, and domains of human expertise such as medical diagnosis, geological survey for oil, and financial market indicator prediction.

Keywords: neural networks, deep learning, artificial intelligence

JEL Codes: C45

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**BUILDING A CENTRALIZED SMART CITY SYSTEM FOR URBAN
MOBILITY MANAGEMENT AND SOLVING PROBLEMS RELATED TO
PARKING AREAS, PUBLIC TRANSPORT AND ECO-TRANSPORT
PART 1 - SMART CITY INTELLIGENT SYSTEM IN THE BLUE AND
GREEN PARKING ZONE**

Eng. Ivan Kolev, PhD

Department of Telecommunications,
University of Ruse, Bulgaria
Tel.: +359 899 075 092
E-mail: ikolev@uni-ruse.bg

Assoc. Prof. Georgi Hristov, PhD

Department of Telecommunications,
University of Ruse, Bulgaria
Tel.: +359 82 888 353
E-mail: ghristov@uni-ruse.bg

Assoc. Prof. Plamen Zahariev, PhD

Department of Telecommunications,
University of Ruse, Bulgaria
Tel.: +359 82 888 353
E-mail: pzahariev@uni-ruse.bg

Abstract: *The focus of the article is to consider the principles and ideas for building a unified centralized system for urban mobility management and finding intelligent solutions to solve well-known problems in highly urbanized environments, such as parking problems in highly congested areas with existing Blue and Green areas or the construction of new ones, as well as finding innovative smart solutions to modernize and improve efficiency. The basis of this article is the need to create such a centralized system, which consists of many different software applications that communicate with each other via API (Application Programming interface), collecting data in a central database, performing the necessary computational actions on central servers. , such as fees, tariffs, subscriptions, fines, generation of QR codes for identification or validation, etc.*

Keywords: *Smart City, intelligent parking solutions, Public parking lots, Blue and green areas, Public transport, Eco transport, LoraWan network, API and central database, Smartphone app, android, iOS, Centralized system, Web applications, Servers, Efficiency , GPS*

JEL Codes: *L62, L96*

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**BUILDING A CENTRALIZED SMART CITY SYSTEM FOR URBAN
MOBILITY MANAGEMENT AND SOLVING PROBLEMS RELATED TO
PARKING AREAS, PUBLIC TRANSPORT AND ECO-TRANSPORT
PART 2 - SMART CITY INTELLIGENT SYSTEM IN PUBLIC TRANSPORT**

Eng. Ivan Kolev, PhD

Department of Telecommunications,
University of Ruse, Bulgaria
Tel.: +359 899 075 092
E-mail: ikolev@uni-ruse.bg

Assoc. Prof. Georgi Hristov, PhD

Department of Telecommunications,
University of Ruse, Bulgaria
Tel.: +359 82 888 353
E-mail: ghristov@uni-ruse.bg

Assoc. Prof. Plamen Zahariev, PhD

Department of Telecommunications,
University of Ruse, Bulgaria
Tel.: +359 82 888 353
E-mail: pzahariev@uni-ruse.bg

Abstract: *The focus of the article is to consider the principles and ideas for building a unified centralized system for urban mobility management and finding intelligent solutions to solve well-known problems in a highly urban environment and in particular problems in public urban transport, finding innovative intelligent solutions for modernization and improving its efficiency. The basis of this article is the need to create such a centralized system, which consists of many different software applications that communicate with each other via API (Application Programming interface), collecting data in a central database, performing the necessary computational actions on central servers. , such as fees, tariffs, subscriptions, fines, generation of QR codes for identification or validation, etc.*

Keywords: *Smart City, intelligent parking solutions, Public parking lots, Blue and green areas, Public transport, Eco transport, LoraWan network, API and central database, Smartphone app, android, iOS, Centralized system, Web applications, Servers, Efficiency , GPS*

JEL Codes: *L62, L96*

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**BUILDING A CENTRALIZED SMART CITY SYSTEM FOR URBAN
MOBILITY MANAGEMENT AND SOLVING PROBLEMS RELATED TO
PARKING AREAS, PUBLIC TRANSPORT AND ECO-TRANSPORT
PART 3 - SMART CITY INTELLIGENT SYSTEM FOR
ENVIRONMENTALLY FRIENDLY TRANSPORT**

Eng. Ivan Kolev, PhD

Department of Telecommunications,
University of Ruse, Bulgaria
Tel.: +359 899 075 092
E-mail: ikolev@uni-ruse.bg

Assoc. Prof. Georgi Hristov, PhD

Department of Telecommunications,
University of Ruse, Bulgaria
Tel.: +359 82 888 353
E-mail: ghristov@uni-ruse.bg

Assoc. Prof. Plamen Zahariev, PhD

Department of Telecommunications,
University of Ruse, Bulgaria
Tel.: +359 82 888 353
E-mail: pzahariev@uni-ruse.bg

Abstract: *The focus of the article is to consider the principles and ideas for building a unified centralized system for urban mobility management and finding intelligent solutions to solve well-known problems in a highly urban environment, building public eco-transport and state-subsidized infrastructure. The basis of this article is the need to create such a centralized system, which consists of many different software applications that communicate with each other via API (Application Programming interface), collecting data in a central database, performing the necessary computational actions on central servers, such as fees, tariffs, subscriptions, fines, generation of QR codes for identification or validation, etc.*

Keywords: *Smart City, intelligent parking solutions, Public parking lots, Blue and green areas, Public transport, Eco transport, LoraWan network, API and central database, Smartphone app, android, iOS, Centralized system, Web applications, Servers, Efficiency, GPS*

JEL Codes: L62, L96

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DIGITAL TRANSFORMATION DYNAMICS IN HIGHER EDUCATION

Prof. Antoaneta Dobрева, PhD

Department of Machine Science, Machine Elements, Engineering Graphics and Physics,
University of Ruse

Phone: +359887746311

E-mail: adobрева@uni-ruse.bg

Assoc. Prof. Vasko Dobrev, PhD

Department of Machine Science, Machine Elements, Engineering Graphics and Physics,
University of Ruse

Phone: 082888492

E-mail: vdobrev@uni-ruse.bg

Abstract: *The paper reviews important E-learning methods in digital environment applied in Machine Science and Machine Elements subjects. The objective of the research is to analyze and specify the dynamics of the digital transformation in Higher education. The interactive model of communication between lecturers and students and the group dynamics of teamwork on creative design case studies are considered. The authors' team analyzes the results of the applied adaptive educational methods in distance learning mode. Conclusions are made concerning the importance and the application options of blended teaching and learning in the area of engineering education and training.*

Keywords: Digital transformation, Communication models, Adaptive Training Method, Blended learning
JEL Codes: A30

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Dobрева, A., Dimitrov, Y., Dobrev, V., Pantileev, P., Ronkova, V., Kamenov, K. & Angelova, A. (2017). Professional Realization of Students – Problems and Solutions. IN: Proceedings of University of Ruse, Vol 56 (4), Ruse, University of Ruse Publishing Center, pp FRI-2.203-1-TMS-02.

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CASE STUDIES IN MACHINE DESIGN THEORY

Amalia Armas

Escuela Técnica Superior de Ingeniería Industrial,
Universidad de la Rioja
E-mail: amaliaarmasr@gmail.com

Daniel Blanco Cortés

Escuela Técnica Superior de Ingeniería Industrial,
Universidad de la Rioja
E-mail: danielblancocortes@gmail.com

Gergana Mollova – PhD Student

Department of Machine Science, Machine Elements, Engineering Graphics and Physics
University of Ruse
Tel.: +82 888 492
E-mail: gergana_mollova@yahoo.co.uk

Abstract: The paper reviews approaches in theory of machine design. The objective of the research is to evaluate and to compare the relevance of different methods elaborating complex, original and creative design tasks. The authors analyze the interactive models of communication between lecturers and students and the group dynamics of teamwork during the implementation of creative design case studies. The authors' team shows results of the applied theoretical methods in selecting appropriate procedures for calculation and design of mechanical components and units. Conclusions are made concerning the importance and the application options of machine design theory.

Keywords: Case Studies, Machine Design Theory, interactive models, Group Dynamics, Mechanical units

JEL Codes: Q49

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CAD SYSTEMS APPLICATIONS DEVELOPING GEAR DRIVES

Gergana Mollova – PhD Student

Department of Machine Science, Machine Elements, Engineering Graphics and Physics
University of Ruse
Tel.: +82 888 492
E-mail: gergana_mollova@yahoo.co.uk

Abstract: *The main characteristics of CAD systems are considered. the author emphasizes the application of these systems in the development of gear drives. the importance of simulation studies performed with the help of CAD systems during the creation of new products is underlined. Computer applications have been made for elements of drive systems aiming to be used in research and study process.*

Keywords: CAD systems, Gear trains, Symulations, Analysis of Theoretical Models, Computer Applications
JEL Codes: Q49

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TRAINING AND EVALUATION IN ENGINEERING GRAPHICS OF STUDENTS IN ELECTRONIC ENVIRONMENT

Assoc. Prof. Vyarka Ronkova, PhD

University of Ruse

Tel.: +359 82 888 461

E-mail: vronkova@uni-ruse.bg

Abstract: The paper presents a methodology for assessment in the subject of Engineering Graphics during distance learning of students. The need for the development of technology for training and assessment in an electronic environment is indicated. The tools for working in online learning mode are described based upon the presented methodology of assessing the knowledge of students in all activity forms. The advantages of distance learning are highlighted, as well as its disadvantages.

Keywords: Education, Training, Engineering Graphics, Evaluation Methodology

JEL Codes: a 30

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CAD SYSTEMS - FOR THE DIGITALIZATION OF THE STUDY MATERIAL FOR ENGINEERING SPECIALTIES IN HIGHER EDUCATION

Yordanka Dimitrova,

Department of Machine Science, Machine Elements, Engineering Graphics and Physics
University of Ruse, Bulgaria
Tel.: +82 888 492
E-mail: ydimitrova@uni-ruse.bg

Abstract: The paper reviews an the developed new model of engineering specialties training at the University of Ruse in the disciplines Machine elements and Fundamentals of design. The new training of mechanical engineers requires the skills and use of students of new mechanical engineering programs. The current practical business environment requires that students, after completing their higher education, freely use such special software to be able to enter the labor market. This necessitates increased training and use the most modern engineering programs (CAD systems) in the training process. Considering with the new requirements at the University of Ruse, an increase in the rate of digitization of information in the learning process is envisaged and reducing paper documents. for that reason in the Department of Machine science, Machine Elements, Engineering Graphics and Physics, a new model of coursework and course project development is being developed and implemented. Due to the full use of SolidWorks and Autodesk inventor systems, all coursework and course projects in the aforementioned disciplines are developed and presented in the form of computer files. All student work information is digitized and stored digitally. These actions help to carry out a normal process of student learning in distance learning during the COVID 19 crisis.

Keywords: digitalization, engineerin education, CAD system, project.

JEL Codes: I23

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ANALYSIS OF THE STATE AND DEVELOPMENT OF INTERMODAL TRANSPORT OF GOODS IN EUROPE

Yordanka Dimitrova,

Department of Machine Science, Machine Elements, Engineering Graphics and Physics
University of Ruse, Bulgaria
Tel.: +82 888 492
E-mail: ydimitrova@uni-ruse.bg

Mladen Kulev

Department of Machine Science, Machine Elements, Engineering Graphics and Physics
University of Ruse, Bulgaria
Tel.: +82 888 492
E-mail: theprofm1@gmail.com

Abstract: *The paper reviews an analysis of the development and application of intermodal transport of goods in Europe and the modes of transport combined in it. The development in recent years is followed and the standardization of the cargo units, in particular the containers, is considered. The peculiarities and positive aspects of intermodal transport are presented. Statistical data on the movement of goods are presented and an analysis is made of the importance and change of the different types of transport in the transport of goods.*

Keywords: Efficiency, intermodal transportation, Cargo

JEL Codes: L91

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STRENGTH RESEARCH OF A GEAR FROM A CAR GEARBOX

Yuliyán Dimitrov, PhD

Department of Machine Science, Machine Elements and Engineering graphics,
University of Ruse, Bulgaria
Tel.: +82 888 492
E-mail: ydimitrov@uni-ruse.bg

Petar Pavlov

Department of Machine Science, Machine Elements and Engineering graphics,
University of Ruse, Bulgaria
Tel.: +82 888 492
E-mail: petar.k.pavlov@gmail.com

Abstract: *The paper reviews strength examination of a gear from a gearbox of a modern car mass-produced by several modern design methods - conventional calculations by standard, automated design with CAD system and strength simulation by appropriate CAD system. The real geometric, mechanical parameters and the material of the gear are deciphered. The results of the different types of strength calculations are compared and conclusions are made.*

Keywords: gear, gearbox, CAD system

JEL Codes: L62

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**ANALYZIS METHODS FOR DETERMINATION OF BRAKING
DECELERATION**

Eng. Daniel Ivanov, PhD Student

Department of Transport Engineering and Technologies,
Technical University of Varna, Bulgaria
E-mail: d.ivanov8@yahoo.com

Assoc. Prof. Radostin Dimitrov, PhD

Department of Transport Engineering and Technologies,
Technical University of Varna, Bulgaria
Phone: +359 52 383 464
E-mail: r_dimitrov@tu-varna.bg

Abstract: *The paper shows an analysis of methods using from different type of devices for measure braking deceleration of vehicles. The various measurement methods for braking deceleration are described and analyzed. The analyzed methods are: measurement by 5th wheel, measurement by 3D position accelerometer and measurement by GPS tracker. in the report is made description, how various devices measure deceleration and the advantages and disadvantages of the different methods are shown. Two of the most commonly used methods were compared experimentally and the obtained results were analyzed.*

Keywords: Braking deceleration, GPS, Accelerometer, 5th wheel

JEL Codes: R40, R41

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FRI-2.209-2-TMS-02

STUDY OF WORKING PROCESS OF DIESEL ENGINE WHEN WORKING WITH ADDITION OF ALCOHOL

Eng. Velichka Georgieva, PhD Student

Department of Transport Engineering and Technologies,
Technical University of Varna, Bulgaria
Tel.: +359 52 383 464
E-mail: velichka.r.georgieva@abv.bg

Eng. Daniel Kostadinov, PhD Student

Department of Transport Engineering and Technologies,
Technical University of Varna, Bulgaria
Tel.: +359 52 383 464
E-mail: danny.kostadinov@gmail.com

Assoc. Prof., Krasimir Bogdanov, PhD

Department of Transport Engineering and Technologies,
Technical University of Varna, Bulgaria
Tel.: +359 52 383 321

Abstract: *The report presents a theoretical study, allowing the calculation and analysis of the parameters of the working process in diesel internal combustion engine with volumetric mixing when working with mixtures of diesel fuel and ethyl alcohols, and with i-propanol. The calculations used a mathematical model to calculate the basic parameters of the work process based on the change in pressure in the engine cylinder. Theoretical calculations have been made to optimize the combustion process for a specific engine under these conditions. an in-depth study has been done on the characteristics of different alcohols used in work process modelling.*

Keywords: *Mathematical model, diesel, alcohol, fuels*

JEL Codes: *L10, L11*

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HCCI COMBUSTION MODELING: DEFINING THE EFFECTIVE EGR OPERATING RANGE

Eng. Svetoslav Mihalkov

Department of Combustion engines, automobiles and transport,

Technical University of Sofia, Bulgaria

Phone: 02 965 35 85

E-mail: s.l.mihalkov@abv.bg

Assoc. Prof. Plamen Punov, PhD

Department of Combustion engines, automobiles and transport,

Technical University of Sofia, Bulgaria

Tel.: 02 965 35 85

E-mail: plamen_punov@tu-sofia.bg

Abstract: This study focuses on combustion modeling of HCCI combustion by means of single zone model using skeletal reaction mechanism of C₇H₁₆(n-heptane). Additionally to the main fuel, methane and hydrogen was added in small concentration. a direct injection engine is used for simulation which also allows mixture preparation in intake manifold leading to premixed combustion. The numerical analysis was conducted by means of an engine model developed in advanced simulation software AVL Boost. The combustion process was evaluated by means of heat release rate, pressure rise and IMEP. The effective EGR operating range was defined at several engine operating points with pure n-heptane and fuel blends with methane and hydrogen. It was observed that effective EGR rate highly depends of fuel blends and equivalence ratio.

Keywords: HCCI, Combustion, EGR, Modeling

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COMPARATIVE ANALYSIS OF THE NOISE LEVEL OF AN ELECTRIC VEHICLE ACCORDING TO THE ROAD SURFACE

Kamelia Dimitrova PhD Student

Department of Engines and Vehicles,
University of Ruse
Tel.: +359882923209
E-mail: kbdimitrova@uni-ruse.bg

Gergana Staneva Chief Assistant

Department of Engines and Vehicles,
University of Ruse
Phone: +35982888526
E-mail: glstaneva@uni-ruse.bg

Abstract: The paper reviews one of the methods for measuring external noise from vehicles. an electric vehicle Nissan Leaf 40 kW was used to perform the tests, and noise measurements were made at different speed and on two types of road surface (smooth and coarse-grained). The obtained data show the difference in the noise level in dBA and the results are shown in graphical and tabular form.

Keywords: vehicle noise, noise emission, external noise, road surface, dBA,

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- H. Harizanov, New Bulgarian University, Department of Earth and Environmental Sciences 21 Montevideo Str., Sofia 1618, Bulgaria Noise pollution of the atmospheric air and its impact on ecosystems and humans (**Оригинално заглавие:** Х. Харизанов, Нов Български Университет, департамент „Науки за Земята и околната среда“ ул. Монтевидео 21, София 1618, България Шумово замърсяване на атмосферния въздух и въздействието му върху екосистемите и човека)
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HYDROGEN AS AN ALTERNATIVE TO GASOLINE

Assoc. Prof. Atanas Iliev, PhD

Department of Engines and Vehicles

University of Ruse

Phone: 082-888-272

E-mail: ailiev@uni-ruse.bg

Assoc. Prof. Kiril Hadjiev, PhD

Department of Engines and Vehicles,

University of Ruse

Phone: 082-888 433

E-mail: khadjiev@uni-ruse.bg

Abstract: Transport vehicles have a significant role in the use of natural energy sources. They use about a third of the total amount of oil. Hydrocarbon fuels cause major air pollution. Road transport accounts for 39 to 63% of environmental pollution.

Recently, a large number of prototypes of electric vehicles have been created. The energy of electric vehicles is obtained from fuel cells that convert electricity directly from the fuel without intermediate stages. Hydrogen is used as the main source of energy. The main problem with its use is its storage in the car. of practical interest is the use of fuel cells with acid electrolyte, which use a mixture of gases as a working medium: hydrogen, methane, carbon monoxide and others.

Keywords: Hydrogen, internal Combustion Engines, Fuel Cells, Applications, System, Exhaust Gases.

JEL Codes: L10, L11

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PHYSICOCHEMICAL PROPERTIES OF ALCOHOLS, AS ALTERNATIVE FUELS FOR SI INTERNAL COMBUSTION ENGINES

Assoc. Prof. Kiril Hadjiev, PhD

Department of Engines and Vehicles,

University of Ruse

Phone: 082-888 332

E-mail: khadjiev@uni-ruse.bg

Assoc. Prof. Atanas Iliev, PhD

Department of Engines and Vehicles,

University of Ruse

Phone: 082-888-272

E-mail: ailiev@uni-ruse.bg

Abstract: *The paper reviews physicochemical properties of alcohols - methanol, ethanol, butanol and isopropanol, used as alternative fuels for SI ICE. In this work are described their composition (C, H, O), stoichiometric air/fuel ratio, lower heating value, laminar burning velocities, octane numbers, viscosity, specific gravity and others. It is established with alcohol, improve mixture properties with gasoline.*

Keywords: *Methanol, Ethanol, Isopropanol, Lower heating value, Stoichiometric air/fuel ratio, Laminar burning velocities*

JEL Codes: *L10, L11*

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THE ETHANOL AS AN ADDITIVE TO DIESEL FUEL

M. Eng. Emil Mitev, PhD Student

Department of Engines and Vehicles

University of Ruse

Tel.: +359 89 494 9777

E-mail: emitev@uni-ruse.bg

M. Eng. Dimitar Obretenov, PhD Student

Department of Engines and Vehicles

University of Ruse

Tel.: +359 88 353 3556

E-mail: dobretenov@uni-ruse.bg

Abstract: *The ethanol is a renewable fuel which is produced from plant, sugar and starchy biomass. It is an important additive to diesel fuel that can improve engine performance and reduce emissions. This is achieved due to the fact that ethanol has lower content than diesel fuel and it is also a good oxidizer. The main properties and characteristics of ethanol mixed with diesel fuel, as well as its impact on performance and emissions from the engine are considered.*

Keywords: *Ethanol, Diesel, Additive, Emissions, Biomass.*

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PERFORMANCE STUDY OF A INTERNAL COMBUSTION ENGINE WITH GASOLINE AND METHANE INJECTION

Assoc. Prof. Simeon Iliev, PhD

Department of Engines and Vehicles,

University of Ruse

Phone: +35982888331

E-mail: spi@uni-ruse.bg

M. Eng. Ivaylo Nikolaev Borisov, PhD Student,

Department of Engines and Vehicles,

University of Ruse

Tel.: +359 888 469866

E-mail: iborisov@uni-ruse.bg

Abstract: This study focuses on combustion modeling of GDI engine combustion by means of single zone model. Additionally to the main fuel, methane was injected in intake port. The numerical analysis was conducted by means of an engine model developed in advanced simulation software AVL Boost. The combustion process was evaluated by means of pressure rise, IMEP, and specific fuel consumption.

Keywords: CNG, Combustion, GDI, Modeling

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EMISSIONS IMPROVEMENT OF AN S.I. ENGINE FUELLED BY LPG AND GASOLINE

Assoc. Prof. Simeon Iliev, PhD

Department of Engines and Vehicles,

University of Ruse

Phone: +35982888331

E-mail: spi@uni-ruse.bg

M. Eng. Emil Mitev, PhD Student

Department of Engines and Vehicles

University of Ruse

Tel.: +359 89 494 9777

E-mail: emitev@uni-ruse.bg

Abstract: This study focuses on combustion modeling of GDI engine combustion by means of single zone model. Additionally to the main fuel, methane was injected in intake port. The numerical analysis was conducted by means of an engine model developed in advanced simulation software AVL Boost. The one-dimensional four-cylinder 1.6L turbocharged GDI engine is created. The results obtained show significant reductions of fuel consumption and HC emissions. The combustion process was evaluated by means of pressure rise, IMEP, and specific fuel consumption.

Keywords: CNG, Combustion, GDI, Modeling

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**PERSPECTIVES FOR THE DEVELOPMENT OF URBAN MOBILITY
AND LOGISTICS**

Assoc. Prof. Asen Asenov, PhD

Department of Transport,

University of Ruse

Phone: 082 888 605

E-mail: asasenov@uni-ruse.bg

Abstract: A review of proposals for future development of urban mobility and transport logistics has been made. as a result of the analysis of the state of transport in Bulgaria, a perspective for the development of mobility and logistics with a smaller number of cars and respectively less emission from road transport is presented. At the same time, the supply work in the logistics chain is not disrupted and the mobility of citizens is not restricted. The results make it possible to have cleaner air and fewer polluting cars in these populated areas.

Keywords: city mobility, logistics, transportation model, vehicle

JEL Codes:

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ROAD TRAFFIC PARAMETERS INVESTIGATION ON THE ROUTE IN THE CITY OF SOFIA USING THE MOBILE OBSERVER METHOD

Assoc. Prof. Durhan Saliev, PhD

Department of Combustion Engines, Automobile Engineering and Transport,
Technical University of Sofia, Bulgaria

Tel.: +359 (2) 965-2308

E-mail: durhan_saliev@tu-sofia.bg

Vladimir Madjarski, PhD Student

Department of Combustion Engines, Automobile Engineering and Transport,
Technical University of Sofia, Bulgaria

Tel.: +359 (2) 965-2308

E-mail: v.madjarski@tu-sofia.bg

Abstract: Parameters of the traffic study is an important and responsible task, which is related to the correct analysis of the existing conditions for its state. This results provide adequate solutions to improve the traffic organization, regulation and safety. in this regard, there are a number of methods for the traffic parameters studying. in modern conditions, these methods are improved with modern technical means, which partially replace the observers used to perform measurements. The present development presents an improved version of the traffic study by the mobile observer method with the use of a camera, which replaces one of the team members provided in the method. The conducted survey along the route in Sofia city and the obtained results can be used for further improvement of the traffic flow in the considered section.

Keywords: Traffic flows, Traffic study, Road safety, Traffic parameters, Mobile observer method.

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LOGISTICS APPROACH IN SHORT SUPPLY CHAINS

Assoc. Prof. Nikolina Dragneva, PhD

Center for Informatics and Technical Sciences

“San Stefano” Burgas Free University

Phone: 900 485

E-mail: dragneva@bfu.bg

Abstract: Consumer demand for food produced by small and medium-sized agricultural producers in recent years has emerged as a sustainable trend in Bulgaria. the supply of clean food by farmers who want to reach end users directly is Increasing and this requires a specific logistical approach. the use of short supply chains is becoming Increasingly relevant because they are a good solution for direct access to traditional and quality food. European and world practice implies a growing Interest in this type of supply due to the requirements of consumers to a fast, easy and efficient market at the local level.

Keywords: short supply chain, logistics.

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APPLICATION OF ANYLOGISTIX IN TRANSPORT CHAIN MANAGEMENT

Ass. Prof. Milena Mratsenkova, PhD

Department of Combustion Engines, Automobile Engineering and Transport,
Technical University of Sofia, Faculty of Transport

Tel.: +359 2 9653499

E-mail: savova@tu-sofia.bg

Katerina Vasileva, ME

Department of Combustion Engines, Automobile Engineering and Transport,
Technical University of Sofia, Faculty of Transport

Phone: +359 898964131

E-mail: katerina.blajeva@abv.bg

Abstract: In the conditions of constantly growing globalization in the field of production, logistics is developing dynamically and is becoming more and more widespread. The use of innovative approaches allows companies to make adequate management decisions and respond quickly to frequent changes in the market situation. In the present article, the authors offer an up-to-date scientific approach for task management optimization of the delivery and problems solving solutions connected with the Logistik chain through the implementation of a new instrument of AnyLogistix software, which combines options of projecting, optimization and simulation of the delivery process. With its implementation, different tasks can be solved such as optimal location (situation) of the different elements of the transport network, delivery network change, optimization of supply streams, choosing best supplier, type of warehouse keeping, transport costs minimization, risk minimization through the whole supply chain, as well as analysing warehouse needs etc.

Keywords: AnyLogistix software, supply chain, supplier, customer, distribution center, model, input and output parameters

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METHODS FOR RISK ASSESSMENT OF VESSELS VISITING DANUBE PORT TERMINALS

Capt. Kamen Ivanov

Head of Department „SAR Danube River”,

EA „Maritime Administration“

Phone: 0879-128-915

E-mail: kzivanov@uni-ruse.bg

Abstract: An overview of the risks that arise in the interaction between river vessels and port terminals on the Danube. Then the profile of the risk ships and the methodology for risk assessment are reviewed and analyzed. as a result of the study and research, the periods and vessels to be inspected during the calendar year have been determined. The envisaged measures allow to reduce the incidents with the transport of goods on the Danube River and in the port terminals..

Keywords: risk assessment, river vessels, port terminals, risk assessment methodology

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FEASIBILITY STUDY ON INLAND CONTAINER FREIGHT STATIONS FOR EMPTY CONTAINER HAULAGE OPTIMIZATION AND QUALITY IMPROVEMENT OF EXPORT AND IMPORT LOGISTICS IN BULGARIA

Eng. Boril Ivanov,
Department of Transport,
University of Ruse
Phone: 082-888-605
E-mail: ipetrov@uni-ruse.bg

Abstract: *The dry port concept provides an effective solution for preventing potential congestion in busy sea or river ports by shifting containerized cargo handling operations to container freight stations (CFS) located in the hinterland. The present feasibility study of the concept in Bulgaria is focused on the assessment of the potential of an inland container freight station, located close to an industrial and consumption centre, for optimization of the share of empty container haulage to its required minimum and quality improvement of logistics services related to export and import.*

Keywords: *Dry port, inland container terminal, container freight station, CFS, intermodal terminal, container depot, empty mileage optimization, empty container haulage*

JEL Codes:

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RESEARCH OF THE DEVELOPMENT OF LOGISTICS WAREHOUSES AND THEIR ROLE IN THE WORK OF THE 3PL OPERATOR

Eng. Ivan Petrov,
Department of Transport,
University of Ruse
Phone: 082-888-605
E-mail: ipetrov@uni-ruse.bg

Abstract: The article reviews the development of logistics warehouses. The advantages of the individual warehouses and their role in the logistics chain are determined. Their role in the work of 3PL operators in medium-sized cities was assessed. Based on processed data from the operation of a logistics warehouse in the city of Ruse, its place and importance in the supply chain of 3PL company Act Logistics have been determined. The efficiency of using the different types of warehouses and the need to develop the existing warehouse infrastructure have been studied.

Keywords: Warehouse, Logistics, 3PL, Outsourcing

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STUDY OF THE NOISE LEVEL FROM THE VEHICLES IN SOFIA

Asst.Prof. Georgi Mladenov, PhD

Department of Combustion Engines, Automobile Engineering and Transport,
Technical University of Sofia, Bulgaria
Tel.: +359 (2) 965-2308
E-mail: gmladenov@tu-sofia.bg

Asst.Prof. Iliyan Damyanov, PhD

Department of Combustion Engines, Automobile Engineering and Transport,
Technical University of Sofia, Bulgaria
Tel.: +359 (2) 965-2308
E-mail: idamyanov@tu-sofia.bg

Abstract: *The problem of transport noise has two sides: - so. external noise affecting the inhabitants of the settlement and noise in the vehicle where the driver's workplace and the seats of the passengers are. The object of study is the level of external noise emitted by vehicles in the city of Sofia. The values of the basic equivalent noise level emitted by the metro, automobile, tram and trolleybus traffic, as well as for single vehicles have been determined. A comparison was made of the emitted noise from cars on the street pavement with pavement and those with asphalt, the external noise from the passage of metro trains and tram trains after the reconstruction of the railway.*

Keywords: *external noise, noise level, vehicles, reconstruction of the railway*

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INFRASTRUCTURE SOLUTIONS FOR SUSTAINABLE DEVELOPMENT OF BICYCLE TRANSPORT

Assist. Prof. Toncho Balbuzanov, PhD

Department of Transport,

University of Ruse

Phone: (+359) 082 888 608

E-mail: tbalbuzanov@uni-ruse.bg

Abstract: *The article provides an overview of existing good practices for improving road safety for cyclists on the road. In addition to ensuring the safe and comfortable movement of cyclists, cycling infrastructure must be accessible to them at all times. Building traffic calming infrastructure and restricting access to vehicle parking in traffic and crossing areas can reduce road accidents with vulnerable road users. Some good practices for reducing accidents with cyclists are discussed. Building specialized facilities in cycling infrastructure can be a solution in some cases, limiting traffic and reducing speed in others. The combination of different measures usually gives the most effective results. The transition from individual road transport to the use of public transport, cycling and walking; the transport of environmentally friendly vehicles will reduce the dependence on the use of fossil fuels for transport needs in urban environments, which is essential for improving air quality and reducing car noise. Building a safe and convenient infrastructure for pedestrians and cyclists would change travel patterns and should not be neglected.*

Keywords: traffic safety, bicycle transport

JEL Codes: R41

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RESEARCH OF GOOD PRACTICES FOR IMPROVING THE CONDITION OF THE PEDESTRIAN INFRASTRUCTURE IN THE CITY OF RUSE

Assist. Prof. Toncho Balbuzanov, PhD

Department of Transport,

University of Ruse

Phone: (+359) 082 888 608

E-mail: tbalbuzanov@uni-ruse.bg

Abstract: *The article provides an overview of existing good practices for improving road safety of pedestrians on the road. Pedestrian infrastructure, in addition to ensuring the safe and convenient movement of pedestrians, must be accessible to them at all times. Building traffic calming infrastructure and restricting access to vehicle parking in traffic and crossing areas can reduce road accidents with vulnerable road users. Some good practices for reducing pedestrian accidents are discussed. Building specialized facilities in pedestrian infrastructure can be a solution in some cases, limiting traffic and reducing speed in others. The combination of different measures usually gives the most effective results. The transition from individual road transport to the use of public transport, cycling and walking, the transport of green energy will reduce the dependence on the use of fossil fuels for transport needs in urban environments, which is essential for improving air quality and reducing vehicle noise. Building a safe and convenient infrastructure for pedestrians and cyclists would change travel patterns and should not be neglected.*

Keywords: traffic safety, pedestrians

JEL Codes: R41

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A STUDY OF THE DYNAMIC PROPERTIES OF INDIVIDUAL ELECTRIC VEHICLE

Eng. Filip Kirilov, PhD Student

Department of Transport,

University of Ruse

Phone: 0885/004356

E-mail: fkirilov@uni-ruse

Assoc. Prof. Daniel Lyubenov, PhD

Department of Transport,

University of Ruse

Phone: (+359) 082 888 605

E-mail: dliubenov@uni-ruse.bg

Abstract: This paper presents brief data on the state of traffic safety in Bulgaria. The study of the dynamic properties of vehicles is an important stage in the expert accidents reconstruction. In the Bulgarian specialized literature there are no data on these parameters for electric vehicles. In this regard, an experimental study of the acceleration and the braking deceleration of an individual electric vehicle was carried out. The study was done with VBOX data logger equipment. The data obtained from this study can improve the quality of the expert examination of road accidents and the quality of justice.

Keywords: Individual Electric Vehicle, Braking Deceleration, Vehicle Accident Reconstruction

JEL Codes: L91

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THE POTENTIAL OF THE SHARED VEHICLE MODEL FOR SUSTAINABLE MOBILITY IN CITIES

Prof. Velizara Penèva, PhD

Department of Transport,

University of Ruse

Phone: 082 888 608

E-mail: vpencheva@uni-ruse.bg

Abstract: *The popularity of carsharing as part of urban mobility has increased over the last 10-15 years. This is especially true for major cities around the world. Research shows that car sharing is considered an innovative service and has great potential to address local issues such as: traffic congestion, air quality, reduction of carbon dioxide emissions from traffic, reduction of noise. Shared urban travel can make a significant contribution to ensuring sustainable mobility. At the same time, car sharing often encounters complex and interrelated barriers such as consumer ignorance, planning and implementation, lack of political support, insufficient research initiatives and more. This paper discusses the main issues related to the sustainable urban mobility in the regions of Bulgaria and defines four main tasks related to car sharing: planning; determining the characteristics of the business service and its models, determining the infrastructure and fleet management of the vehicles. Based on a review of the plans for sustainable urban mobility in the big cities of Bulgaria, the strategic planning at the local level for the use of car sharing is assessed..*

Keywords: sustainable mobility, carsharing, MaaS, vehicle

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ANALYSIS OF BICYCLE TRAVEL IN THE CITY OF RUSE

Assist. Prof. Pavel Stoyanov, PhD

Department of Transport,

Univesity of Ruse

Phone: 082 888 515

E-mail: pstoyanov@uni-ruse.bg

Assist. Prof. Toncho Balbuzanov, PhD

Department of Transport,

Univesity of Ruse

Phone: 082 888 608

E-mail: tbalbuzanov@uni-ruse.bg

Eng. Dimitar Georgiev, PhD Student

Department of Transport,

Univesity of Ruse

E-mail: dgdimitrov@uni-ruse.bg

Abstract: *The large number of cars used for urban mobility in urban areas leads to a number of problems such as congestion, air pollution with fine particulate matter PM10, noise, severe road accidents and more. The introduction of bicycle transport improves the vitality of a city and the health of citizens in several ways. The bicycle does not generate greenhouse gases and noise, unlike motorized traffic, which would contribute to their reduction and thus improve the state of the urban environment. in many European cities, support for public transport and cycling in daily mobility is considered an efficient means to reduce air pollution, traffic jams, and carbon emissions. Shared bicycle systems have turned out effective in increasing cycling in many urban areas, particularly when combined with public transportation. Bicycle paths are built for different reasons. A common reason is to mitigate vehicle congestion, reduce vehicle emissions and promote physical activity by increasing the share of trips made by bicycle. While there has been a large amount of behavioral and observational research on cyclist's route and infrastructure preferences as well as the traveling public's mode choice decisions there is surprisingly little evidence on the effectiveness of dedicated bicycle infrastructure at increasing the share of cycling relative to vehicle use. in this study, we make an analysis of bicycle travel in the city of Ruse.*

Keywords: *cycling; bicycle planning bicycle speed; separated bicycle facilities*

JEL Codes: *R41*

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STUDY OF THE CRITERIA ACCORDING TO WHICH THE WORK IN THE AUTOMOTIVE SERVICE IS DISTRIBUTED

Assist. Prof. Mihail Milchev, PhD

Department of Transport,

University of Rousse, Bulgaria

Tel.: +359 82 888 231

E-mail: mmilchev@uni-ruse.bg

Abstract: *The report examines the criteria according to which the workload is divided into individual workplaces and employees in the automotive service. The need to conduct such a study is due to the need to clarify the reasons why a job is assigned to a particular worker or workplace. This information would enable the service management to conduct a better personnel policy, to improve the distribution of workload in such a way, that all workers are evenly loaded. This would improve worker productivity, and reduce vehicle repair and maintenance times. The study was conducted using the "Delphi" method of expert evaluations, and the study involved both owners and managers of workshops, as well as such employees responsible for the distribution of work in the service.*

Keywords: *criteria, work load, distriburion, automotive service, expert evaluation.*

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STUDY OF THE RELIABILITY OF SPECIALIZED FIRE RESCUE EQUIPMENT

Assoc. Prof. Dimitar Grozev, PhD

Department of Transport,

University of Ruse

Phone: 082-888 231

E-mail: dgrozev@uni-ruse.bg

Abstract: *The report discusses the strategy for maintaining specialized equipment, and the exact implementation is difficult due to budgetary constraints and especially due to logistical reasons in the supply of spare parts. The new specialized equipment fails twice less than the old one. She spends less time out of order (up to 4 days) and the new equipment up to 25 days. The repair and maintenance of the new specialized equipment is complicated by the need to comply with the manufacturer's requirements for a particular maintenance technology. The busiest systems in specialized equipment are the braking system (21% of failures), transmission (17% of failures) and special equipment (28% of failures).*

Keywords: *Specialized equipment, Maintenance technology, Strategy for maintaining, Repair and maintenance*

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STUDY OF STATISTICAL CHARACTERISTICS OF THE LIGHT ABSORPTION COEFFICIENT OF THE EXHAUST GASES IN DIESEL ENGINES

Georgi Palagachev, eng.

Department of Combustion Engines, Automobile Engineering and Transport,
Technical University of Sofia, Faculty of Transport
Phone: +359 2 9653931
E-mail: gpalagachev@tu-sofia.bg

Assis. Prof. Tzanko Georgiev

Department of Industrial Automation
Technical University of Sofia, Faculty of Automatics
Phone: +359 965 2408
E-mail address: tzg@tu-sofia.bg

Assoc. Prof. Volodia Kirov, PhD

Department of Combustion Engines, Automobile Engineering and Transport,
Technical University of Sofia, Faculty of Transport
Phone: +359 2 9653931
E-mail: vkirov@tu-sofia.bg

Abstract: *The report deals with preliminary results of an investigation of statistical characteristics of the light absorption coefficient of the exhaust gases of diesel engines. for the purposes of the study, data from measurements of environmental parameters of cars in operation, powered by diesel engines were used. The measurements were performed in 15 consecutive years (2004 - 2018) throughout the country. by using the software product "Statgraphics" the distribution of the studied parameter was established both for each year separately and for the whole period of measurements. The aim of the study is to establish the possibility of performing a statistical analysis (Analysis of Variance (ANOVA), Regression analysis, Weibull analysis), which will give a possibility to reveal the correlation between the measured coefficient of light absorption of exhaust gases in diesel engines and other parameters and factors.*

Keywords: *Measurements, Light absorption coefficient, Diesel engines, Statistical Distributions*

JEL Codes:

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INFLUENCE OF CERTAIN PARAMETERS OF THE SOCIAL STATUS OF THE POPULATION ON THE SAFETY OF ROAD TRAFFIC

Vladimir Madjarski – PhD Student

Department of Combustion Engines, Automobile Engineering and Transport,
Technical University of Sofia, Bulgaria

Tel.: +359 (2) 965-2308

E-mail: v.madjarski@tu-sofia.bg

Assoc. Prof. Durhan Saliev, Phd

Department of Combustion Engines, Automobile Engineering and Transport,
Technical University of Sofia, Bulgaria

Tel.: +359 (2) 965-2308

E-mail: durhan_saliev@tu-sofia.bg

Abstract: In recent years, the Republic of Bulgaria ranks last in the EU in terms of the relative number of deaths per 1 million people. The application of this indicator shows significant differences by districts of the country and in some of them the value significantly exceeds the national average. The main cause of serious accidents with fatalities and injuries is the driver's violations. These actions of drivers can be due to various factors. The report assesses the impact of some parameters determining the socio-economic status of the people on road safety by district. The relationship between the relative indicators of employment and unemployment, education, average annual salary, etc. is shown and deaths in road accidents in districts equated to 100 000 people. The obtained results can be used in making a decision to improve the socio-economic status of the population.

Keywords: traffic safety, traffic accidents, social status.

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DIFFERENT APPROACHES IN DETERMINING THE VEHICLES SPEED IN ROAD ACCIDENTS

Assoc. Prof. Daniel Lyubenov, PhD

Department of Transport,

University of Ruse

Phone: (+359) 082 888 605

E-mail: dliubenov@uni-ruse.bg

Abstract: In this work is presented metematichen model to determine the vehicle speed based on the Law of conservation of momentum. Two different approaches to determining vehicle speeds at the beginning of an impact are presented. A real example from expert practice has shown that both approaches can be used, and it should be noted that each of them has advantages, which are expressed to different degrees depending on the specific accident.

Keywords: Momentum 360, Vehicle Accident Reconstruction, Collision Speed

JEL Codes: L91

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A STUDY OF THE CANDIDATES DRIVERS MISTAKES IN PRACTICAL TRAINING

Polina Atanasova, PhD Student

Department of Transport,

University of Ruse

Phone: (+359) 082 888 605

E-mail: patanasova@uni-ruse.bg

Assoc. Prof. Daniel Lyubenov, PhD

Department of Transport,

University of Ruse

Phone: (+359) 082 888 605

E-mail: dliubenov@uni-ruse.bg

Abstract: This study used a developed model to study the mistakes of candidates for drivers in practical training and application of the innovative approach "Driving Test". The methodology of this study includes checking the relationships and statistical hypotheses to study the sample. Using different types of statistical analysis (variation, comparison, graph, correlation) developed a model of the effectiveness of the innovative approach "DrivingTest". in accordance with the developed methodology, a study was conducted in 2019 in training centers for candidates for drivers of motor vehicles in the city of Ruse. The study included 80 applicants for driving (with motor vehicles of different ages, full and education. The applicant can be divided equally into two groups - experimental (EG) and control (CG). Each group of groups (EG and CG) was evaluated by training instructors by placing penalty points according to different criteria. in CG a traditional approach was used, through control cards. in EG a innovative approach was used - "Driving Ttest" system.

Keywords: Candidates for drivers, mistakes, Effectiveness, DrivingTest

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INVESTIGATION OF TRAFFIC LOAD OF CROSSROADS IN THE ROAD NETWORK THROUGH THE USE OF AERO MAPPING

Asst.Prof. Iliyan Damyanov, PhD

Department of Combustion Engines, Automobile Engineering and Transport,
Technical University of Sofia, Bulgaria
Tel.: +359 (2) 965-2308
E-mail: idamyanov@tu-sofia.bg

Asst.Prof. Georgi Mladenov, PhD

Department of Combustion Engines, Automobile Engineering and Transport,
Technical University of Sofia, Bulgaria
Tel.: +359 (2) 965-2308
E-mail: gmladevov@tu-sofia.bg

Abstract: *The object of study is the traffic load at the crossroads between the boulevards "Kliment Ohridski" and "GM Dimitrov" on the territory of Sofia. for the purpose of the study, a method was used to study the parameters of traffic by one observer. It allows their determination by aerial photography using an unmanned aerial vehicle of transport flows, and analysis of the results obtained. in addition, it is possible to obtain information on delays, throughput, determining the correspondence between the entrances and exits of the investigated intersection and other indicators of traffic. The main advantage of the ability to process video images taken by an unmanned aerial vehicle is that they are taken above the road instead of on the road. The successful implementation of such solutions for research and analysis of road traffic would only lead to better traffic organization, optimal traffic flow through intersections, which allows to significantly reduce the harmful effects of road use in cities.*

Keywords: *Unmanned aerial vehicle, Crossroads, Road traffic indicators*

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GIS BASED ANALYSIS OF PEDESTRIAN-VEHICLE CRASH HOTSPOTS AND IDENTIFYING UNSAFE TRANSIT ACCESS IN THE REGIONS OF MUNICIPALITY RUSE

Eng. Stanimir Penev,

Department of Transport,

University of Ruse

Phone: 0889658713

E-mail: spenev@uni-ruse.bg

Abstract: This paper presents a GIS approach to analyse spatial data of pedestrian-vehicle crash sites for identification and marking of unsafe bus stops. Crash sites data is implemented in a GPS platform along with locations of bus stops to build visual mapping of distribution of traffic accidents in the regions of transit areas used by pedestrians. as recent studies show a strong link between pedestrian accidents and transit access, the bus stops near the hotspots are marked and ranked based on the severity of the road accidents in the area. ArcGis tool is used to generate a pedestrian-vehicle crash hot spots map. The proposed approach uses data from 10 years (2010 - 2020) from available public sources on traffic accidents with pedestrians for the region of municipality of Ruse.

Keywords: GIS, Spatial Analysis, Hotspots, Map, Traffic Accidents, Transit Access

JEL Codes:

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INVESTIGATION OF THE INFLUENCE OF THE PRACTICAL TRAINING OF THE CANDIDATES FOR DRIVERS OF MOTOR VEHICLES CATEGORY "B" ON THE DEVELOPMENT OF THEIR INDIVIDUAL

Nikolay Paunov, PhD Student

Department Transport,

University of Ruse

Tel.: +359 878 628943

E-mail: npaunov@uni-ruse.bg

Abstract: *The report examines the development of the individual profile of the learner after a practical training of candidates for drivers category "B". The conducted research is related to the development of 12 qualities. They were conducted according to a methodology including the "OBSERVER" system, with learners from vocational high schools from two Bulgarian cities Chirpan and Maglizh, who are trained for category B drivers. These qualities are the basic skills for safe driving. The qualities are assessed with three levels: with above average level, as the average level and below the average level for the country. At the initial assessment of untrained candidates, 75% of the learners show qualities below and below average. After completing the training and re-evaluating these qualities, the results turn out to be the same as those before the training. as a result, the main reasons influencing the development of the individual profile of the learners are identified.*

Keywords: *Candidate driver, GDE matrix, Category B, candidates for drivers*

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OPPORTUNITIES FOR SIMULATION OF ROAD SITUATION IN THE CONDITIONS OF THE CITY OF RUSE

Assist. Prof. Pavel Stoyanov, PhD

Department of Transport,

Univesity of Ruse

Phone:082 888 515

E-mail: pstoyanov@uni-ruse.bg

Assist. Prof. Svilen Kostadinov, PhD

Department of Transport,

Univesity of Ruse

Phone:082 888 515

E-mail: skostadinov@uni-ruse.bg

Abstract: This study presents a calibration procedure between observed performances of a roundabout and performances obtained by the use of simulation software. Roundabouts have long been a staple as an intersection configuration in Europe. Roundabouts can provide increased safety and reduced delay to road users under suitable circumstances. One such activity is the selection of a suitable method or methods for evaluating the operational performance of roundabouts. A variety of methods are available, ranging from analytical/empirical to simulation. Two sets of scenarios different among them only for the traffic flow distribution were analyzed: Free Flow Condition, from which to derive the average speed profiles along a through movement; and Saturation Flow Condition, to determine the average stop-line delay along a branch.

Keywords: roundabouts, capacity, vissim, stop-line delay, microsimulation models

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EYE EXERCISES FOR PREVENTION THE VISUAL HEALTH OF DRIVERS

Iskra Ilieva, PhD

Chief Ass. Department of Physical Education and Sport

University of Ruse;

And Assoc. Prof. - Medical University - Pleven

E-mail: isilieva@uni-ruse.bg

Prof. Velizara Pentcheva, PhD

Department of Transport,

University of Ruse

Phone: 082-888 240

E-mail: vpencheva@uni-ruse.bg

Assoc. Prof. Asen Asenov, PhD

Department of Transport,

University of Ruse

Phone: 086-821 605

E-mail: asasenov@uni-ruse.bg

Abstract: Various methods for eye exercises related to the prevention of visual health have been developed. The road situation is characterized by variability and constantly changing environment. The performance of various in nature and speed movements in driving in dynamic conditions place great demands on human vision. This requires the development of innovative approaches, methodologies and systems for strengthening and maintaining visual health. The report reviews existing eye exercise methods related to visual health prevention and reveals innovative opportunities to strengthen and maintain the visual health of drivers. The purpose of the report is related to the development of a Visual Health Prevention System for drivers, which includes eye exercises and the development of a SMART device through which to implement the methodology. We expect the developed system to have a favorable impact on the vision characteristics of drivers.

Keywords: Traffic safety, Visual health, Eye exercises, Drivers, Smart device

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METHODOLOGY FOR MEASURING THE ENERGY OF A TROLLEYBUS IN OPERATING CONDITIONS

Prof. Velizara Pencheva, PhD

Department of Transport,

University of Ruse

Phone: 082-888 240

E-mail: vpencheva@uni-ruse.bg

Assoc. Prof. Asen Asenov, PhD

Department of Transport,

University of Ruse

Phone: 086-821 605

E-mail: asasenov@uni-ruse.bg

Abstract: The report presents a methodology and equipment for measuring the energy consumption of a trolleybus from public transport in operating conditions. The research was performed in the city of Ruse on one of the busiest and most used routes by citizens. During the study, the energy that is returned to the grid from the recovery process is also changed. for the purpose of measurement, a measuring system has been created, which records the data in digital form and allows the next processing, visualization and analysis. The results of the study are suitable for determining the necessary technical data for the selection of alternative sources for propulsion of trolleybuses, such as batteries, hydrogen fuel cells and hydrogen tank..

Keywords: city mobility, logistics, transportation model, trolleysbus, energy compumption measuring

JEL Codes:

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STUDY OF OPERATING MODES OF HYDROGEN FUEL CELL HORIZON XP 1000

Assoc. Prof. Dimitar Grozev, PhD

Department of Transport,
University of Ruse
Phone: 082-888 231
E-mail: dgrozev@uni-ruse.bg

Assist. Prof. Ivan Beloev, PhD

Department of Transport,
University of Ruse
Phone: 082-888 231
E-mail: ibeloev@uni-ruse.bg

Abstract: *The paper presents a study of the operating modes of the Horizon HP 1000 hydrogen fuel cell. A working model was built to evaluate the parameters for different operating modes. The results define the consumption of hydrogen when changing the values of the power required for the efficient operation of the hydrogen fuel cell. The conclusions and practical results will be used in assessing the characteristics of an urban concept car powered by a hydrogen fuel cell.*

Keywords: Parameters, Operating modes, working model, Hydrogen, Fuel cell, urban concept car

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REVIEW OF ENERGY MANAGEMENT SYSTEMS STRATEGIES FOR HYBRID VEHICLES

Prof. Velizara Pencheva, PhD

Department of Transport,
University of Ruse
Tel.: +359 82 888 588
E-mail: vpencheva@uni-ruse.bg

Assoc. prof. Tsvetelina Georgieva, PhD

Department of Automatics and Mechatronics,
University of Ruse
Tel.: +359 82 888 668
E-mail: cgeorgieva@uni-ruse.bg

Assoc. prof. Asen Asenov, PhD

Department of Transport,
University of Ruse
Tel.: +359 82 888 605
E-mail: asasenov@uni-ruse.bg

Eng. SechkinRemzi–PhD Student

Department of Automatics and Mechatronics,
“Angel Kanchev” University of Ruse
Tel.: +359 82 888 676
E-mail: sremzi@uni-ruse.bg

Prof. Plamen Daskalov, PhD

Department of Automatics and Mechatronics,
“Angel Kanchev” University of Ruse
Tel.: +359 82 888 668
E-mail: daskalov@uni-ruse.bg

Abstract: Environmental pollution and a serious shortage of fossil fuels are a prerequisite for the development of hybrid vehicles, which is the key to solving these problems. For optimal and normal operation of hybrid vehicles it is necessary to use an appropriate strategy for energy management of the system. The paper reviews the types of energy management strategies for hybrid vehicles, comparing their advantages and disadvantages. The main methods used in each strategy are presented, as well as its areas of application. The paper also reviews the software applications used for energy management of hybrid vehicles.

Keywords: Energy Management Systems, Hybrid Vehicles, Software Application

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THEORETICAL INVESTIGATIONS OF PARAMETERS OF URBAN PASSENGER TRANSPORT

Assist. Prof. Pavel Stoyanov, PhD

Department of Transport,

Univesity of Ruse

Phone:082 888 515

E-mail: pstoyanov@uni-ruse.bg

Abstract: Accessibility is one of the most important outcomes of the transportation system. Apart from the transport system itself, public transport accessibility has the considerable impact on life satisfaction in the form of perceived accessibility. This report examines theoretical investigations of parameters of urban passenger transport.

Keywords: public transport, vehicles, travel time, transport service

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MAIN ASPECTS OF THE DEVELOPMENT OF SCIENCE "QUALITY MANAGEMENT"

Assoc. Prof. KIRIL YANKOV KIROV, PhD

Department: Technology of Mechanical Engineering and Metal Cutting Machines,
Technical University of Varna
E-mail: kirov@tu-varna.bg

Eng. Kalin Yordanov Proinov

Department: Technology of Mechanical Engineering and Metal Cutting Machines,
Technical University of Varna
Phone: 0892-914 175
E-mail: kalin.proinov@abv.bg

Abstract: *The paper reviews the origins of "Quality Management" in the period from ancient times to the present day. The aim is to follow the formation and development of quality management methods. Presentation of the human-machine relationship, the impact of different levels of technology and their application in production. The development of the science "Quality Management".*

Keywords: Quality, quality management, quality management system.

JEL Codes: L10, L15

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ANALYSIS OF THE STAGES OF DEVELOPMENT OF QUALITY MANAGEMENT

Assoc. Prof. Kiril Yankov Kirov, PhD

Department: Technology of Mechanical Engineering and Metal Cutting Machines,
Technical University of Varna

E-mail: kirov@tu-varna.bg

Eng. Kalin Yordanov Proinov

Department: Technology of Mechanical Engineering and Metal Cutting Machines,
Technical University of Varna

Phone: 0892-914 175

E-mail: kalin.proinov@abv.bg

Abstract: *The paper reviews existing methods for quality management and their application in production. The purpose is to trace the formation and development of quality management methods from their inception to the present day. In chronological terms, several important stages that the system goes through are considered, presenting the contribution of each method.*

Keywords: Quality, quality management, quality management system.

JEL Codes: L10, L15

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LITERATURE REVIEW ON INTEGRATED SYSTEMS FOR QUALITY MANAGEMENT, ENVIRONMENT AND HEALTH AND SAFETY AT WORK IN THE MINING INDUSTRY

Neli Babekova, PhD Student

Department of Management and Business Development,
University of Ruse
Tel.: +359 82888617
E-mail: neli_babekova1975@abv.bg

Assoc. Prof. Pavel Vitliemov, PhD

Department of Management and Business Development,
University of Ruse
Phone: +359 888566362
E-mail: pvitliemov@uni-ruse.bg

Abstract: This paper reviews existing integrated systems for quality management, environment and health and safety at work aiming the company to be more competitive and describes why is necessary such system to be integrated within any industrial production system. The main principles of development of such system for a company in the mining industry are outlined and the advantages of such implementation are described and graded. as a future study, an analysis will be made to what extent the problems in the implementation of the integrated management system are due to absent of management skills and motivation.

Keywords: Integrated systems for quality management, environment and health; Mining Industry

JEL Codes: L10, L15

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PROCESS EFFECTIVENESS OR PROCESS EFFICIENCY: WHICH INDICATOR IS MORE IMPORTANT FOR ORGANIZATIONS?

Assoc. Prof. Dr. Anton Nedyalkov

Department of Management and Business Development,

University of Ruse

Tel.: +359886934819

E-mail: anedyalkov@uni-ruse.bg

Abstract: The purpose of this paper is to highlight issues on aspects of effectiveness and efficiency. Conclusions on the topic of system and process approach are accomplished. Definitions of process effectiveness and process efficiency are developed as well as the relationship between these two indicators. Outlines are made for measurement of effectiveness and efficiency that can be a clue for a matrix of correlation.

Keywords: Process Effectiveness, Process Efficiency.

JEL Codes: L23, L25, M11

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EFFICIENCY AND EFFECTIVENESS WITH LEAN TOOLBOX IN SERVICE PROVIDING COMPANIES

Adriana Simeonova, PhD Student

Department of Management and Business Development,

University of Ruse

Tel.: +359883437295

E-mail: asimeonova@uni-ruse.bg

Abstract: The paper reviews existing methods for efficiency and effectiveness in service providing companies. How Lean toolset could support the management of service providers in achieving better results and profitability. Dynamic analyses with expert group are explored with the purposes: (1) to demonstrate efficiency and effectiveness of the most applicable lean instruments in service providing companies. (2) to invest in this toolset, which have been proven by the experts' research aiming higher commercial benefits for the company. The research findings are introduced as a numerical real problem solution, i.e. a simplified model, which can be applied for this cluster. It covers all the aspects connected to the main research topics in the field of service management and Lean management. The report provides the practical examples and statistical examples in two different organizations before and after applying Lean toolbox. The conclusions drawn from the conducted research, the presented arguments, methodology, results and guidelines can be structured in the following main directions per the objective and tasks set: 1) theoretical features of Lean tools and service management are analysed; 2) opportunities to improve service providing companies are discussed; 3) some preliminary benefits for service management of Lean tools are demonstrated.

Keywords: Lean tools, Operations Management.

JEL Codes: L23, M11

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THEORETICAL ASPECTS OF PRODUCTION INFRASTRUCTURE AT INDUSTRIAL ENTERPRISES

Dipl. Eng. Vasil Tanev, PhD Student

Department of Management and Business Development,
University of Ruse
Tel.: +359899905945
E-mail: vtanev@uni-ruse.bg

Assoc. Prof. Dr. Anton Nedyalkov

Department of Management and Business Development,
University of Ruse
Tel.: +359886934819
E-mail: anedyalkov@uni-ruse.bg

Abstract: The purpose of this paper is to analyze the production infrastructure, and on this basis to recommend solutions for additional units, ensuring the normal functioning of the production process. Outlines are made for the production infrastructure. Features of key infrastructure units (repair, instrumental, energy, transportation and storage) are presented. It is recognized that in one hand production infrastructure of industrial enterprises must be cost-effective and on the other should lead to better results. It is spotlighted that new infrastructure elements such as quality management systems; environmental management systems; occupational health and safety management systems; information security management systems can improve the production process at industrial enterprises.

Keywords: Production Infrastructure, Industrial Enterprises.

JEL Codes: L23, L25, M11

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LITERATURE REVIEW ON BUSINESS INTELLIGENCE SYSTEMS FOR ANALYSIS OF MANUFACTURING PROCESS

Georgi Valeriev Georgiev, PhD Student

Department of Management and Business Development,

University of Ruse

Tel.: +359 899186959

E-mail: g_georgiev81@abv.bg

Assoc. Prof. Pavel Vitliemov, PhD

Department of Management and Business Development,

University of Ruse

Phone: +359 888566362

E-mail: pvitliemov@uni-ruse.bg

Abstract: As the volume of data in companies increases, it becomes impossible to collect important and comprehensive information by traditional means. Here, can help business analysis solutions, after collecting the required amount of data. /Business smart solution which we can, call a system/. This system will provide tools with appropriate technologies to support the collection, integration, storage, editing and analysis of existing and real-time data arrivals. While almost only the big companies were interested in this topic a few years ago, it in the meantime became necessary for all companies that want to make important decisions of the moment, for optimization, prevention and prediction of uncertainty in production. This article focuses on the general possibilities of using business intelligence systems (BIS) in manufacturing companies, what BIS techniques and methods will be used and what purpose the BIS has in the company. Finally, the success factors /KPIs/, which will be taken into account.

Keywords: Business intelligence, Business intelligence system, Analysis, Decision-Making, Management

JEL Codes: L10, L15

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THE USE OF SYSTEM DYNAMICS MODELLING FOR INNOVATION RISK MANAGEMENT

Ivelina Lyubenova, PhD Student

Department of Management and business development,

University of Ruse

Tel.: 0878-309-668

E-mail: ilyubenova@uni-ruse.bg

Assoc. Prof. Milena Kirova, PhD

Department of Management and business development,

University of Ruse

Tel.: 0878-925-268

E-mail: mkirova@uni-ruse.bg

Abstract: *The paper reviews existing methods of risk assessment and shows their weaknesses related to innovation risk evaluation. The authors identify two main limitations of the methods – the absence of cause-and-effect relations and good representation of the dynamics of the innovation. The aim of the authors in this paper is to prove the necessity to use dynamic method for assessing the innovation risks. System Dynamics as a dynamic modelling tool is presented. Having System Dynamics enabled to acknowledge the time-dependent behaviour of managed systems through qualitative and quantitative models. Describing the risks in non-linear feedback structures with delays allowed to deeply understand the cause and effect relations and the influence of the risks over the innovation system. The paper also presents the current state-of-the-art in the use of System Dynamics in the fields of Project Management, innovation Management and innovation Risk Management. At the end, the authors discuss two works related to using the method for assessing risks in innovation environment.*

Keywords: innovation risk, risk management, complexity, risk assessment, System Dynamics.

JEL Codes: L20, O30, D80

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BUSINESS MODELS AND MONETIZATION OF VIDEO GAMES

Assist. Prof. Elizar Stanev, PhD

Department of Economics

University of Ruse

Tel.: +359 082 888 703

E-mail: eastanev@uni-ruse.bg

Abstract: *The industry of video game entertainment has been out of the scope of economic academic studies up until the past two decades. Game publishing companies employ a variety of methods for the monetization of their products and the goal of this paper is to summarize and categorize said business models, drawing conclusions regarding their comparative advantages or disadvantages. In this paper we also discuss how fundamental, theoretical economic problems relate to the gaming industry and IP, in search of the best and most just financial model for realizing profits through gaming products*

Keywords: video games, video game monetization, video game business models

JEL Codes: L11, L21, L24,

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THE INFLUENCE OF INDIVIDUAL DIFFERENCES ON PERSONAL BEHAVIOUR IN ORGANIZATIONAL ENVIRONMENT

Chief Assist. Prof. Krasimira Zagorova PhD

Department "Industrial Management"

Technical University of Varna

Dobrudja College of Technology

Phone: +359 894642305

E-mail: kzagorova@tu-varna.bg

Abstract: In the variety of studies and classifications on individual differences and the typology of personality, the classifications related to the introversion (extroversion) of the individual and his temperament have gained the widest popularity. This study has the character of a theoretical study, the main purpose of which is to analyze the behavioural characteristics of employees and managers with different personal and psychological qualities, direction of thinking and behaviour, and on this basis to assess the possibility of combining these characteristics with their functional role and status in the activity and management of the organization.

Keywords: Personal behaviour, individual typology, introvert, Extrovert, Manager

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SOME CHALLENGES UPON HIGHER EDUCATION IN THE AUTUMN OF 2020

Assist. Prof. Miglena Pencheva, PhD

Department of Management and Business Development,

University of Ruse

Phone: +359 82 888 715

E-mail: mpencheva@uni-ruse.bg

Abstract: *The paper reveals the situation of higher education in COVID – 19 limitation environment. The article examines the opinion of students from the University of Ruse with regards to distance learning. Qualitative research methods are employed to capture students' attitudes. They are summarized into four groups, i.e.: 1.) what they associated distance learning with; 2) what are the pros and cons of distance learning; 3) how they envisioned proper lecture and seminar/lab. in distant environment; 4) what is their overall attitude towards COVID – 19 restrictions.*

Keywords: Higher education, distance learning, COVID - 19

JEL Codes: L20, L21

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ASPECTS OF MANAGEMENT OF CONSUMER BEHAVIOUR TOWARDS EDUCATIONAL PRODUCT

Assoc. Prof. Svilena Ruskova, PhD

Department of Management and Business Development,
University of Ruse
Tel.: +359 82 888-617
E-mail: svilena_ruskova@abv.bg

Chief assistant Prof. Svilen Kunev, PhD

Department of Management and business development,
University of Ruse
Phone: +359 82 888 617
E-mail: snkunev@uni-ruse.bg

Chief assistant Prof. Bozhana Stoycheva, PhD

Department of Management and business development,
University of Ruse
Phone: +359 82 888 617
E-mail: bstoycheva@uni-ruse.bg

Abstract: *The paper presents the methodological approach, results and findings from an empirical study among first year students in the bachelor's programs in Business Management and industrial Management at the Faculty of Business and Management of University of Ruse. The study is implemented in October 2020 with main focus to reveal and evaluate the following characteristics of the students in their role as consumers of an educational product: personal goals for enrolling in the university degree of study; significance of factors for selection of university as a preferred educational site; eventual options for financing the study; influencing factors for selecting a particular educational program; level of attractiveness of specific extracurricular activities; level of importance of most commonly used sources of information for consumers' opinion about a university or specialty. The approach is based on applying of a digital questionnaire with answering options by Likert scales, processed by calculation of average scores for each option and ranking those with the highest scores. The results from the study are important input for improvement of the communicational approaches within the university for establishment of strong and efficient connection with present and future consumers of the university's educational product, taking into consideration the fact that the educational product is jointly shaped by the mutual efforts of the supplier (the university) and the consumers (the students). The interested stakeholders that might benefit from the research are academics, researchers and practitioners from business, non-profit organisations, local and state institutions, and most importantly the young people that are graduates from the secondary schools, who may better adapt their consumer behaviour for achieving higher results in their future academic studies.*

Keywords: student-centred learning, Higher Education, quality of education

JEL Codes: A121, I230, M53, O31

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FOR MARKETING BOARD OF BEEKEEPING FROM RUSE REGION

Assoc. Prof. Lyubomir Lyubenov, PhD

Department of Economics,

University of Ruse

Phone: 082-888 347

E-mail: llyubenov@uni-ruse.bg

Abstract: The Bulgarian economy and its agricultural sector are characterized by a very low number of established and surviving marketing boards, as a result of a low degree of integration horizontally and vertically, low entrepreneurial culture and association, underdeveloped branch organizations and forms of cooperation. There are two unsuccessful attempts to build boards in Bulgarian agriculture, among which there is no such in the beekeeping sector, incl. and at the regional level. Unlike the national marketing boards, the regional marketing board of beekeeping from Ruse region cannot monopolize the national markets for bee products, respectively does not restrict free trade. The regional marketing board will ensure global competitiveness of the beekeeping farms in Ruse region, through regional integration in horizontal and vertical plan. It will allow the formation and establishment of a regional brand - Bee Ruse, and will promote the development of consumer and organizational markets

Keywords: Regional integration, Regional brand, Competitiveness.

JEL Codes: M31, Q13

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RESEARCH OF THE INTERCONNECTION BETWEEN: SOCIAL CLASS BELONGING AND ORGANIC FOOD CONSUMPTION

Svilena Ruskova, PhD

Department of Management and Business Development

Faculty of Business and Management

University of Ruse

E-mail: sruskova@uni-ruse.bg

Bozhana Stoycheva, PhD

Department of Management and Business Development

Faculty of Business and Management

University of Ruse

E-mail: bstoycheva@uni-ruse.bg

Abstract: This paper concentrates on the implications of social classes' belonging of different customers on their decisions about making various purchases. The report shows some of the latest trends in consumption of bio foods on Bulgarian and international market. It also clarifies the essence of the methodology for conducting an empirical research related to finding the implications of the social class factor on the behaviour of Bulgarian customers on the scene of the bio food market.

Keywords: consumer behavior; social class; organic food market.

JEL Codes: D11, D74, M10, M31

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CLUSTER RESEARCH ON THE INFLUENCE OF SOCIAL CLASSES TO THE BULGARIAN ORGANIC FOOD MARKET

Svilena Ruskova, PhD

Department of Management and Business Development

Faculty of Business and Management

University of Ruse

E-mail: sruskova@uni-ruse.bg

Bozhana Stoycheva, PhD

Department of Management and Business Development

Faculty of Business and Management

University of Ruse

E-mail: bstoycheva@uni-ruse.bg

Abstract: This report demonstrates the results of an empirical study conducted on territory of Ruse and the surrounding area. The research concerns the influence of the social class belonging of the Bulgarian customers on bio food purchases. Based on the conducted analysis of the primary data, different customer group profiles are outlined. These profiles are differentiated by the social classes of the groups. Based on this we have give, recommendations on how organisations, operating in the spheres of production and retail of bio foods, can improve their work..

Keywords: consumer behavior; social class; organic food market

JEL Codes: D12, D74, M10, M31

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METHODOLOGY FOR THE STUDY OF BURNOUT SYNDROME IN THE FIELD OF HEALTHCARE

Svilena Ruskova, PhD

Department of Management and Business Development

Faculty of Business and Management

University of Ruse

E-mail: sruskova@uni-ruse.bg

Ivalina Ruseva, PhD Student

Department of Management and Business Development

Faculty of Business and Management

University of Ruse

E-mail: iruseva@uni-ruse.bg

Abstract: The purpose of this report is to present the methodology for conducting a study of burnout syndrome in physiotherapists. There is a number of studies in the scientific literature on its influence among doctors and nurses, and it seems that the profession of the physiotherapist is underestimated. However, physiotherapists are no less vulnerable to the appearance of burnout syndrome due to the nature of their activities, which require close interaction with the patient. This determines the need to study the phenomenon in this area in order to ensure adequate prevention.

Keywords: Burnout; Physiotherapists; Stress; Health Workforce; Research method; Human Resources for Health;

JEL Codes: I1, I11, M54

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EMPIRICAL STUDY OF BURNOUT SYNDROME IN THE FIELD OF HEALTHCARE

Svilena Ruskova, PhD

Department of Management and Business Development
Faculty of Business and Management
University of Ruse
E-mail: sruskova@uni-ruse.bg

Ivalina Ruseva, PhD Student

Department of Management and Business Development
Faculty of Business and Management
University of Ruse
E-mail: iruseva@uni-ruse.bg

Abstract: This report presents the results of an empirical study on the presence of occupational exhaustion in physiotherapists working in the public and private health care sectors. The aim of the article is to analyze and summarize the main stressors that create a prerequisite for the appearance of the syndrome and to indicate ways to manage stress and prevent occupational exhaustion.

Keywords: Burnout; Physiotherapists; Stress; Health Workforce; Empirical study; Recession.

JEL Codes: I1, I11, M54

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ENVIRONMENT PROTECTION AS A MANIFESTATION OF CORPORATE RESPONSIBILITY OF “KOZLODUY” NPP EAD

Chief assistant Prof. Irina Kostadinova, PhD

Department of Management and business development,

University of Ruse

Phone: +359 885382300

E-mail: ikostadinova@uni-ruse.bg

Abstract: In the modern world, the energy sector occupies a key place. It is the basis of overall economic development. Without it, life is practically unthinkable. 16% of the world's electricity is produced by nuclear means. At the same time, it is the most significant direct consumer of non-renewable natural resources and a source of damage to nature and the environment. Last but not least, there are serious financial interests related to the energy sector, which influence the direction of its development. Nuclear energy is something we cannot give up, just as we cannot give up electricity, cars, ships and transport and industry in general, because this energy improves the quality of life.

In this paper environmental protection as a manifestation of corporate responsibility of the only nuclear power plant in Bulgaria will be presented. The main goal of the paper is to present the results from an empirical study, aimed to identify specific needs of employees of “KOZLODUY” NPP EAD towards environmental protection as a manifestation of corporate responsibility if an industrial enterprise.

Keywords: Environment protection, Corporate Social Responsibility, Green practices

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TOOLS REPRESENTING THE RELATIONSHIP BETWEEN ANXIETY, CREATIVITY, INNOVATION: METADATA ANALYSIS

Silvia Beloeva, PhD Student

Department of Management and Business Development,
University of Ruse
E-mail: sbeloeva@uni-ruse.bg

Prof. Diana Antonova, PhD

Department of Management and Business Development,
University of Ruse
E-mail: dantonova@uni-ruse.bg

Abstract: So far, there is no one-sided answer in theory to the question of the impact of positive anxiety on creativity and organizational innovation. The present meta-analysis of the English-language literature with experimental studies aims to clarify this connection and to identify the factors that may explain the differences in the views of the authors. as a result of the review, it was hypothesized that the impact of anxiety on the creative processes and innovation of the organization depends on the extent to which each of these two categories induces anxiety, as well as the type of anxiety. a curvilinear relationship was found between positive anxiety and creativity, so that with a low degree of assessment context, creativity increases compared to control conditions, while a high degree of assessment leads to a decrease in creative capacity. a negative linear relationship between the lack of control and the creative process has also been found, so that greater lack of control reduces creative expression. The results suggest that the impact of anxiety on creativity is more complex than expected and emphasize the need to understand the boundary conditions that shed light on the contradictory findings in the analyzed literature.

Keywords: Anxiety, Creative processes, Organizational Innovation

JEL Codes: O14, O32

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**COVIDIZATION OF THE ECONOMY: POSSIBLE STRATEGIES
OF THE COMPANIES IN DECREASING MARKET DEMAND
INFLUENCED BY COVID-19**

Assoc. Prof. Radko Radev, PhD

Department of Industrial Business, Business Faculty,

University of National and World Economy

Phone: (02) 8195 412

E-mail: r.radev@unwe.bg

Assis. Simeon Kolyandov, PhD

Department of Industrial Business, Business Faculty,

University of National and World Economy

Tel.: (02) 8195 412

E-mail: simeon.kolyandov@unwe.bg

Yasen Deyanov, PhD Student

Department of Industrial Business, Business Faculty,

University of National and World Economy

Tel.: (02) 8195 412

E-mail: y.deyanov@gmail.com

Abstract: *We use the term “COVIDization” to express our understanding that the strategic and economic impact during the first wave of COVID-19 will remain in the future. The purpose of this report is to present all possible alternatives that companies face in the context of declining demand in specific sectors caused by the pandemic effect of COVID-19. Based on the initial research, it was found that the impact on demand in individual sectors can be positive, negative, or neutral. This report presents possible alternatives for action in the face of declining demand in the sector. The primary thesis we try to prove is that companies can go through the demand crisis caused by COVID-19 with improved market positions. The report does not go into great detail about the actions that can be taken, but presents the main possible options, focusing on those that help to improve market positions. When all competitors are exposed to the same negative impact coming from the declining demand, there is an opportunity to overcome the demand crises better than its competitors. If it happens, it enables successful companies to improve their competitive position by custom and tailored product offerings and delivering more to exceed market expectations and fill the gap. There are two main circumstances: the first one is the condition of the company before the crisis and the second - advocacy of the company management of the concept of crisis as an opportunity. Presented results are based on research conducted by SRC "Innovation and competitiveness" during April 2020. The research sample includes 155 companies from different business sectors. We found that the impact on the demand in individual sectors was predominantly negative. There were also cases with positive and neutral influence on sectoral demand. This report examines only the generic alternatives for action in the face of declining demand in the sector and pessimistic expectations.*

Keywords: COVID-19, COVIDization, Demand decline, strategies

JEL Codes: D04, D40, I21, I25

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COVIDIZATION OF THE ECONOMY: INFLUENCE OF COVID-19 ON COMPANIES' MARKET POTENTIAL

Assoc. Prof. Radko Radev, PhD

Department of Industrial Business, Business Faculty,
University of National and World Economy
Phone: (02) 8195 412
E-mail: r.radev@unwe.bg

Assis. Simeon Kolyandov, PhD

Department of Industrial Business, Business Faculty,
University of National and World Economy
Phone: (02) 8195 412
E-mail: simeon.kolyandov@unwe.bg

Yasen Deyanov, PhD Student

Department of Industrial Business, Business Faculty,
University of National and World Economy
Tel.: (02) 8195 412
E-mail: y.deyanov@gmail.com

Abstract: This report illustrates the impact of COVID-19 on the market growth potential of the companies. in this regard, the concepts of market demand, market forecast, and market potential are studied from a theoretical point of view. for each of these concepts, the given (specific) environment is considered "critical." This is determined both by the influence of external factors and internal characteristics of the companies. We identify two potential market opportunities: the first one is sectoral determination; the second one is companies operating within the sector. At the beginning of the COVID-19 Crisis, the subject of interest was inspired by the professional interest to understand the market, economic and strategic after-effects for companies operating in different sectors. I initiated the research as director of the SRC "Innovation and Competitiveness" Center at (U2B). There were 155 companies from different industries. Through this research, the impact of COVID-19 on the demand and market potential was established. It shows that the impact of the COVIDizations can be positive, negative, or neutral. We accept to use the term "COVIDization" because we consider the short-term and the long-term effects which the COVID-19 pandemic will have over the companies and their market potential. in terms of its content, the market potential is understood as: first, the maximum upper limit of the increase in the value of specific market indicators (sales, revenue, market share), which can be achieved under certain conditions; second - a set of means, sources, and circumstances to achieve a specific goal; third - the potential is considered in dynamics, which is expressed in the ability to improve the means and sources in changing circumstances.

Keywords: COVID-19, COVIDization, Market demand, Market potential

JEL Codes: L10, L11

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EFFECTS OF COVID-19 ON THE BANKING SECTOR – EVIDENCE FOR BULGARIA

Assoc. Prof. Kamelia Assenova

Department of Economics

University of Ruse

E-mail: kassenova@uni-ruse.bg

Abstract: *The COVID 19 pandemic influences seriously all people around the world and disrupts the daily life. It is having the impact on the global economy. The pandemic affects on every sectors of economy. as a result of this virus, the world economy is weakening and this is also in Bulgaria.*

The banks have a fundamental role to play as provider of payment services, liquidity and funding to the business and individuals in the time of COVID- 19 crises. from one side, most of the governments realized schemes for recovery, based on easy access to the credit for business and households, state guarantees of them, low interest. It has made to be easy passed through the crises. from other side, banking sector will play important role by the recovery of economy. It is tough more for small and open economy as Bulgarian.

This paper aims to evaluate the monetary measures during the crises and counteracts the economic losses after this period.

During the crises the bulgarian banks lose the part of their disposal funds due to withdraw of deposits. At the same time, they implemented relief measures such as suspension of loan repayments for affected customers or some other forms of moratorium on payment of credit obligations as well as actions to ensure companies continue to have access to credit in exceptional circumstances. The firms need the usage of lending to cover inequity between in- and outflows, decide their liquidity problems and ensure the working capital for restarting of business.

The main goal of economic policy after pandemic of COVID 2019 aims the recovery of economy. It requires to be found all instruments for influencing on the aggregate supply. This purpose could be realized with monetary and fiscal instruments. The current research investigates the changes in banking sector. for the first months of lockdown in Bulgaria the monetary instruments have used actively for the quick recovery of economy to pre-crisis level.

Keywords: COVID-19, monetary policy, banking sector, credit, deposits

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COVID-19 AND THE RISK OF DEFLATION FOR THE BULGARIAN ECONOMY

Assoc. Prof. Emil Trifonov, PhD

Department of Econimics

University of Ruse

Phone: 082-888 703

E-mail: etrifonov@uni-ruse.bg

Georgi Georgiev, PhD Student

Department of Economics

University of Ruse

E-mail: gmgeorgiev@uni-ruse.bg

Abstract: The specter of deflation is rising in recent years and nowadays the topic is again a central subject for most researchers in the field of economics, because of the world-wide spread of the new virus COVID-19. The aim of this study is to answer the question which phenomenon – inflation or deflation is more likely to appear in the Bulgarian economy during the period of massive lockdowns and after that. A detailed analysis of both demand- and supply-side shocks is performed. Also, for the empirical research special attention is paid to the analysis of the values for the period from March to September of the main commodity groups of the Consumer Price index, Harmonized indices of Consumer Prices and Price indices of a Small Basket. Furthermore, an integral part of the current paper is the data from several conducted surveys by the National Statistical institute about the impact of the COVID-19 crises on the Bulgarian economy. Conclusions from both theoretical and empirical research are presented.

Keywords: COVID-19, Deflation, Bulgarian economy

JEL Codes: A10, E31, E60

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COVID-19 AND DIGITALISATION – SOME CHALLENGE AND OPPORTUNITY FOR THE EUROPEAN ECONOMY

Assoc. Prof. Alexander Petkov, PhD, p.m.a.

Director of Education sector
Faculty of Business and Management
University of Ruse

Monika Ivaylova Varbanova, PhD Student

Department of Management and Business Development
University of Ruse
Tel.: +359888411788
E-mail: mvarbanova@uni-ruse.bg

Abstract: Europe is as strong as its regions are. The level of smart specialization in the European regions is not satisfactory enough for reaching the full potential of competitiveness. The paper reviews existing research of the impact of COVID-19 on the European economy, while adding regional analysis of one of the poorest and most vulnerable regions. The authors suggest digitalisation as a tool to overcome the negative effects of the pandemic.

Keywords: COVID-19, digitalization, smart specialization, regional development, European economy, competitiveness

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RESEARCH ON THE ATTITUDES TOWARDS EDUCATION IN CRISES MANAGEMENT IN ERA OF DIGITAL ECONOMY

Assoc. Prof. Daniel Pavlov, PhD

Department of Management and Business Development

University of Ruse

Tel.: +359-88-4343132

E-mail: dpavlov@uni-ruse.bg

Principal Assist. Prof. Miroslava Boneva, PhD

Department of Management and Business Development

University of Ruse

Phone: 082888776

E-mail: mboneva@uni-ruse.bg

Abstract: *The modern world is a complicate system and each element is exposed to a risk situation. The environment adds new risk events to every digital entrepreneur, too. In a period of crises these managers could survive in case of preliminary appropriate education. Thus we face one of the main questions – shall the Bulgarian educational sector introduce adequate education in crises management. The aim of this report is to present results from a scientific research among 774 Bulgarian respondents about their attitude towards the need for education in crises management in the era of digital economy.*

Keywords: Crisis management, Digital education, Entrepreneurship

JEL Codes: H12, L26

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FRI-2G.404-1-EM2-07

EXPOSURE OF EUROPEAN COUNTRIES TO CONTEMPORARY ASYMMETRIC SHOCKS

Assist. Prof. Petar Penchev, PhD

Department of Economics

University of Ruse

Tel.: 082 888 557

Email: ppenchev@uni-ruse.bg

Abstract: This paper is attempting to investigate supply and demand shocks in the EU and the ways they can be smoothed. This is of particular importance to European countries that need to make decisions whether to join the European Monetary Union as well as for those for which the participation in the EMU is already negotiated in order to find out if it the right decisions were made. The COVID-19 outbreak causes a macroeconomic impact by influencing the supply and demand of labour and thus contributing to further asymmetric shocks.

Keywords: asymmetric shocks, supply and demand

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DIFFERENCES BETWEEN COUNTRIES WHICH CAN BE CORRECTED WITH AN INDEPENDENT MONETARY POLICY

Assist. Prof. Petar Penchev, PhD

Department of Economics

University of Ruse

Tel.: 082 888 557

Email: ppenchev@uni-ruse.bg

Abstract: *The shift of demand between countries and the different approach of each country to inflation and unemployment, as well as the country specific legal systems trigger processes unique for each of the countries. The difference in growth rates stimulates some countries to depreciate their currencies. The goal of this paper is to find out which cross national differences can be corrected with an independent monetary policy and if there is a necessity to join a monetary union.*

Keywords: *independent monetary policy, common monetary policy*

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FRI-ONLINE-1-EM2-09

NEW TRENDS IN NATURAL RESOURCES PRODUCTIVITY IN BULGARIA

Assoc. Prof. , Dafina Doneva, PhD

Department of Economics

University of Ruse

Phone: 082-888-703

E-mail: dgdoneva@uni-ruse.bg

Abstract: *The paper examines new natural resource use trends in Bulgaria. The material mix of the country's economy is analysed and the importance of types of materials and changes in their consumption is considered. The driving forces and the results in the field of resource productivity are revealed. The study identifies existing opportunities for the country to develop more sustainably by increasing resource productivity.*

Keywords: Resource Productivity, Sustainable Resource Consumption Efficiency.

JEL Codes: Q01, Q20, Q31, Q50

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THE BULGARIAN LABOUR MARKET – REGIONAL DIFFERENCES DURING THE PERIOD 2013-2018

Assist. Prof. Aleksandar Kosuliev, PhD

Department of Economics,

University of Ruse

Tel.: +359 82 888 557

E-mail: akosuliev@uni-ruse.bg

Abstract: a characteristic feature of the labour market is that it is fragmented. The paper uses monthly data from the National Employment Agency about vacancies, unemployment and new employment for the period 2013-2018 to examine the regional aspects of the fragmentation of the labour market in Bulgaria. There is a significant variation in the market clearing rate and the speed with which vacancies are matched with prospective candidates.

Keywords: labour, labour market, matching function, Beveridge curve, Bulgarian regions

JEL Codes: J21, J31, J42, J64

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FRI-ONLINE-1-EM2-11

THE MINIMUM WAGE AND MINIMUM WAGE EMPLOYMENT IN THE RUSE DISTRICT DURING THE PERIOD 2007-2017

Assist. Prof. Aleksandar Kosuliev, PhD

Department of Economics,

University of Ruse

Tel.: +359 82 888 557

E-mail: akosuliev@uni-ruse.bg

Abstract: Estimating the effects of minimum wage changes on employment in Bulgaria is difficult, because the National Statistical institute in principle does not officially publish data on the number of the people, who are employed at the minimum wage and researchers have to resort to indirect measures. The paper uses a unique database, assembled from press releases of the Statistical institute's territorial bureau in Ruse, who as an exception included unofficially that indicator in the labour survey during the period 2007-2017. The data is examined using autoregressive distributed lag models.

Keywords: labour, labour market, employment, minimum wage, wages

JEL Codes: J21, J31, J42

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FRI-ONLINE-1-EM2-12

OPPORTUNITIES FOR OPTIMIZATION OF THE TERRITORIAL ORGANIZATION OF BULGARIA AS A FACTOR FOR REGIONAL DEVELOPMENT

Assoc. Prof. Kamen Petrov

Department of Management and Administration

University of National and World Economy

E-mail: kpetrov@unwe.bg

Abstract: This article is devoted to the consideration of some territorial problems in the Republic of Bulgaria. The exhibition analyzes some of the author's views on spatial planning policies, as well as the possibility to take steps to introduce a new level of regional governance. Proposals have been made for a new structuring of the regions for planning and change in the functional structure of the settlements and respectively the Bulgarian village. Some new trends in regional development related to the spatial development of our national territory have been captured.

Keywords: regional development, space, territory, structure, economy, management

JEL Codes: R10, R15

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MODEL OF GROWTH OF SMALL FIRMS WITH TRADEMARK PROPERTY RIGHTS

Neli Rasheva, PhD Student

Department of Management and Business Development

Faculty Business and Management

University of Ruse

Tel: +359888860759

E-mail: nrasheva@uni-ruse.bg

Abstract: There is no unified theoretical model on small firm growth. Most of scholars have concentrated on research of fast-growing firms in high-tech industries. The importance of small manufacturing companies is also essential for regional development and employment. In this paper we present a model of small firm growth through trademark rights considering trademark as a key factor in achieving growth and expanding market positions for small companies in low-tech industries in Bulgaria.

Keywords: Growth, small firms, trademark, model

JEL Codes: M10, O34

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OPPORTUNITIES FOR INTERACTION AMONG INTRAPRENEURS IN A SMALL INDUSTRIAL COMPANY

Denitsa Fileva, PhD Student

Department of Management and Business Development

University of Ruse

Tel.: 0878947135

E-mail: romanova.fileva@abv.bg

Assoc. Prof. Daniel Pavlov, PhD

Department of Management and Business Development,

University of Ruse

Phone: 0884343132

E-mail: dpavlov@uni-ruse.bg

Abstract: This report presents the horizontal linkages among intrapreneurs in a small and medium sized company in the machine building sector. The leading idea is to show in a table format what kind of information is exchanged among them. Thus it is possible to have further analyses how to increase the quality in the management processes in the firm on the base of improvements of these linkages. The proposed table could be useful, from one hand, to top managers who would try to encourage the intrapreneurs in their firms to have better communication among them, and from the other hand, this table could facilitate the efforts of some intrapreneurs to get better orientation for their horizontal interactions.

Keywords: intrapreneur, Machine building company

JEL Codes: L26, M13

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COMPLEXITY AND CONTRADICTIONS OF RADICALIZATION

Prof. Vladimir Chukov, DcS

Department of European Studies and International Security

University of Ruse

E-mail: vlachu1@gmail.com

Abstract: The paper argues, that the process of radicalization has been subject of in-depth scientific research for more than half a century although for the first time the word "radical" has been used in the 18th century. international organizations, states, NGOs and individual researchers view the notion from a theoretical point of view. There is no unified definition of the concept. However, it is agreed, that it is noted that it is a socio-psychological concept and a political construct that has been put on the agenda of academic and public opinion by national security institution, which have been opposing political Islam in recent years and in particular the Salafi jihadism.

Keywords: Radicalization, Middle East, marginalization, terrorism

JEL Code: F51

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SOFT POWER OF STATES IN TIMES OF CRISIS. THE CASE OF COVID-19 PANDEMIC

Krasimir Koev, PhD

Department of European Studies
and International Security

University of Ruse

E-mail: kgkoev@uni-ruse.bg

Abstract: *The paper examines the impact of COVID-19 global pandemic on the soft power of the states and their efforts to overcome the negative pandemic consequences. Global indicators for the application of “soft power” in the international relations are presented and discussed.*

Keywords: hard power, soft power, international relations, COVID-19.

JEL Code: F50

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LOBBYING AND NATIONAL SECURITY: RETHINKING THE NON-LEGITIMIZED COMMUNICATION PRACTICES AND THEIR IMPACT ON NATIONAL SECURITY

Pr. Assist. Prof. Nataliya Venelinova, PhD

Department of European Studies

and International Security

University of Ruse

E-mail: nvenelinova@uni-ruse.bg

Abstract: The paper reviews the existing non-legitimized and semi-legitimized lobbying tactics as communication practices, and provides a systematization of their potential impact on national security. Core discussed issue refers to the conversion of the communication practice into semi-legal or criminal actions leading directly to corruption, trade with political influence and suspicious or doubtful decision-making which affects public interests. The lack of appropriate special legislation for the lobbyists' business has been identified as one of the key corruption-prone factors in post-communist countries. European regulatory framework and its transposition and implementation in national legislation are also commented as a necessary precondition to strengthen the efforts for transparent and legal negotiating between private and public objectives as part of the process of combatting corruption. The research methods applied are comparative analysis, gap and conceptual content-analyses. The paper redefines the traditional understanding of the lobbying process as communication aiming to influence the decision-makers and shows its crucial potential as a tool affecting national security.

Keywords: lobbying, communication, corruption, decision-making, national security

JEL Codes: O17, O38, D73

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IRAQI KURDISTAN AFTER THE REFERENDUM FOR INDEPENDENCE

Jacoub Al Ateeqi, PhD

Ambassador of Kuwait in Bulgaria

E-mail: yacoub@hotmail.com

Abstract: *The referendum of 2017 is a further step of Iraqi Kurds to win independence. It represents the eighth attempt of the Kurdish people to claim their right to self-determination in the context of constraining factors such as the neighboring countries and the international community. The paper argues, that this referendum is to be considered the most significant activity in the centuries-long aspirations of the Kurdish people for freedom and a sovereign state.*

Keywords: *Kurds, Iraq, separatism, referendum, independence*

JEL Code: H77

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NATURAL GAS BATTLE FOR ENERGY LEADERSHIP IN THE CURRENT CONTEXT OF COLD PEACE

Blagovest Nikolov, PhD Student

Department of European Studies
and International Security

University of Ruse

E-mail: blagovestnikolov03@gmail.com

Abstract: Over the past decade relations between the West and Russia are very similar to those during the Cold War. Preservation of unipolarity, occurred after the collapse of the USSR turned into the most important task for the US. The dependence of most Western countries on energy supplies and Russia's dependence on energy sells put energy geopolitics in the center of this conflict. The paper argues, that natural gas can be considered as the fuel of the near future with an important impact on this conflict.

Keywords: Energy geopolitics, USA, Russia, Cold peace, Natural gas, Shale gas, LNG

JEL Code: F51

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United States now holds more oil reserves than Saudi Arabia <http://www.rystadenergy.com/NewsEvents/PressReleases/united-states-now-holds-more-oil-reserves-than-saudi-arabia> By Per Magnus Nysveen, Head of Analysis, Rystad Energy 04 July 2016 г.

RUSSIAN GEOPOLITICAL VIEWS AND THEIR IMPACT ON RUSSIAN FOREIGN POLICY TODAY

Valentin Popov, PhD Student

Department of European Studies
and International Security

University of Ruse

E-mail: valentin123@mail.bg

Abstract: *The paper discusses Russian geopolitical concepts and their impact on Russian foreign policy today. An analysis of the origins of political geography and geopolitics, and of the Russian ideas from the 15th century is being made. The concept „Moscow – third Rome“ till New Eurasian paradigm is taken into consideration as well.*

Keywords: Geopolitics, Russia, Eurasia, West, East.

JEL Code: F50

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EUROPEAN UNION FOREIGN POLICY REGARDING THE CRISIS IN UKRAINE

Valentin Popov, PhD Student

Department of European Studies
and International Security
University of Ruse
E-mail: valentin123@mail.bg

Abstract: The paper discusses EU foreign policy related to the crisis in Ukraine and the role of Russia. The analysis is focused on the EU sanctions imposed on Moscow. The paper argues, that when shaping its attitude to Russia EU should consider long-term European interests and the interests of its member states.

Keywords: EU, Ukraine, foreign policy, crisis, geopolitics

JEL Code: F51

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EU COURT OF JUSTICE IN A POLITICAL ROLE. ANALYSIS OF JUDGEMENTS ON REFUGEE CASES

Milena Dimitrova, PhD Student

Department of European Studies

and International Security

University of Ruse, Bulgaria

E-mail: milena_koleva@abv.bg

Abstract: The paper discusses main aspects of EU refugee policy in the context of the judgment of the Court of Justice of the EU in Joined Cases C 643/15 and C 647/15. By their applications, the Slovak Republic (C 643/15) and Hungary (C 647/15) seek annulment of Council Decision (EU) 2015/1601 of 22 September 2015 establishing provisional measures in the area of international protection for the benefit of Italy and Greece. The contested decision provides for the relocation from those two Member States to the other Member States, over a period of two years, of 120 000 persons in clear need of international protection. EU Court of Justice has entirely rejected the complaints. The paper argues, that the Court in so deciding, reinforces European integration and its values to protect human rights and help those in need of humanitarian aid.

Keywords: Refugee crisis, EU Court of Justice, Council Decision (EU) 2015/1601.

JEL Code: F50

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DILEMMAS OF THE NEW EU MIGRATION POLICY

Krasimir Kornazhev, PhD Student

Department of European Studies
and International Security
University of Ruse, Bulgaria
E-mail: kornazhev@mail.bg

Milena Dimitrova, PhD Student

Department of European Studies
and International Security
University of Ruse, Bulgaria
E-mail: milena_koleva@abv.bg

Abstract: *The paper discusses migration as a phenomenon, related to Europe's colonial legacy, and to the ongoing process of integration. It focusses on events that have shaped European migration policy, i.e. free movement of people within the Schengen Agreement, EU Enlargement, EU neighbourhood policy and EU foreign and security policy. It explores September 2020 EU official documents and comments on the policy dilemmas in terms of their impact on migrants, member states, and migrant-sending countries. On the basis of the undertaken desk research, the paper concludes, that EU is becoming an important actor in defining problems and devising solutions in the realm of this increasingly prevalent global phenomenon.*

Keywords: EU Migration Policy, EU asylum policy, EU border security governance

JEL Code: F53

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RESULTS OF BULGARIAN PRESIDENCY OF EUROPEAN UNION STRATEGY FOR THE DANUBE REGION

Ina Kirilova, PhD Student
Diplomatic Institute
at the Minister for Foreign Affairs
Sofia, Bulgaria
E-mail: Ina.Kirilova@mfa.bg

Abstract: *This paper explores the Bulgarian Presidency of the EU Strategy for the Danube Region, which coincided with the Bulgarian Presidency of the Council of the EU (October 2017 - October 2018). It discusses the synergy thus provided for the Bulgarian government and civil society to strengthen EU cooperation partnerships with the Western Balkans and the Danube region stakeholders. The findings of the paper refer to the main results of the Presidency, namely the debate on the Strategy for the 2021-2027 programming period, the consensus among the Danube countries on the need for a new structure to support the implementation of the Strategy, the promotion of tourism and culture as drivers of economic growth, employment and connectivity between the countries and regions along the Danube.*

Keywords: EUSDR, EU, Bulgarian presidency, policy making, programming

JEL Code: F53

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EUROPEAN-ISRAELI POLITICAL RELATIONS BY THE END OF THE COLD WAR

Mahmoud Zahra, PhD

Lecturer in Ancient World Civilizations

Al Quds University, Jerusalem

E-mail: msafadi44@gmail.com

Abstract: The goal of the paper is to focus on the political, rather than the military/security or economic relationship, between the European states and Israel. Descriptive method is used to identify various circumstances and factors that surrounded, influenced and impacted European-Israeli relations. The author argues, that European-Israeli political relations have strengthened and deepened despite occasional obstacles and difficulties. This relationship is characterized by long-term stability in the context of shared strategic objectives as well as more transient volatility around tactical and situational changes.

Keywords: Europe, Israel, Palestine, international relations

JEL Code: F50

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BORDER SECURITY GOVERNANCE. DIACHRONIC AND SYNCHRONIC ANALYSIS

Krasimir Kornazhev, PhD Student

Department of European Studies

and International Security

University of Ruse, Bulgaria

E-mail: kornazhev@mail.bg

Abstract: The paper analyzes the three approaches in the history of border security governance, i.e. The traditional, the integrated and the most recent one, known as smart borders. The third approach complements integrated management practices with new tools, approaches and actions through large-scale digitalisation. It is argued, that the changes that have taken place are of a fundamental nature - border security is becoming identity management. It collects and analyzes biometric data for persons wishing to visit the territory of a country. Biometric characteristics, and in particular fingerprints, are unique in their physical nature to each individual, they allow automated recognition and are therefore reliable as carriers of specific information, they are virtually impossible to falsify. At the same time such a massive collection of private data raises a lot of questions.

Keywords: EU, border security governance, border management, smart borders

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**EUROPEAN UNION LONG-TERM GREEN POLICIES AND
ADAPTIVE UNIVERSITY GOVERNANCE**

Assoc. Prof. Mimi Kornazheva, PhD

Department of European Studies

and International Security

University of Ruse, Bulgaria

E-mail: mkornazheva@uni-ruse.bg

Abstract: *The paper discusses the concepts of governance and adaptation, focuses on adaptive governance and clarifies its origins. It regards adaptive governance in terms of the ever growing need to steer societal development and environmental protection as components of a single social-and-ecological system policy making, so that equity and sustainability could be achieved. EU green deal is explained as a triumph of adaptive governance, which opens windows of opportunities for all societal actors. Universities as key players in the societal field are criticized for silo approaches and for deficits of interdisciplinary degree programmes. The paper claims, that regulation, based on conservative educational culture has been dominating for years and has been producing rigid structures, which prevent from creative efforts for change. Finally, a vision for adaptive university governance is presented.*

Keywords: *adaptive governance, EU green deal, educational silos, collaborative approach*

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TWENTY-FIVE YEARS OF HUMAN SECURITY POLICIES. ANALYSIS OF GLOBAL, REGIONAL AND NATIONAL LEVELS OF GOVERNANCE

Assoc. Prof. Mimi Kornazheva, PhD

Department of European Studies
and International Security
University of Ruse, Bulgaria
E-mail: mkornazheva@uni-ruse.bg

Pr. Assist. Prof. Boryana Stancheva, PhD

Department of European Studies
and International Security
University of Ruse, Bulgaria
E-mail: bstancheva@uni-ruse.bg

PhD Student Krasimir Kornazhev

Department of European Studies
and International Security
University of Ruse, Bulgaria
E-mail: kornazhev@mail.bg

Abstract: Human Security (HS) is a discipline of the first Bulgarian university curriculum in Euro-Atlantic and Global Security. The bachelor degree program was introduced at University of Ruse in 2015. This 40-page study fits into the policy of the academic staff to regularly update the knowledge for teaching and learning. 2019 marks the 25th anniversary of the first use of the term HS in the United Nations Development Program (UNDP). This long period contains data, the abundance and topicality of which tempts with the potential to generate scientific results of theoretical and applied value. The study results are even more topical because of COVID-19 pandemic, as well. They ring the bell, claiming, that vulnerability is among the most enduring characteristics of the human being, that always and everywhere arrows of evil target his/her Achilles heel, that states still fail to respond to human security crises, relying mostly on silo mentality in national security governance. Findings are based on desk research, diachronic analysis, and use of comparative method. They consider the 25-year context of transformation, challenged by deprivation, famine, disease, natural disasters, civil wars and humanitarian crises, growing domestic political polarization, rising racism, xenophobia and hate speech, radicalization and terror. They view the positioning of human being at the heart of security governance as the most relevant policy response, commensurate with the risks in increasingly troubled societies. The paper assesses practices of HS paradigm at global, regional and national levels of governance, reviews critically theoretical weaknesses and provides policy recommendations.

Keywords: security policies, human security, multi-level governance

JEL Code: F52, F53

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GOVERNING SUSTAINABLE DEVELOPMENT OF RUSE: IMPACT OF EU 2014-2020 COHESION POLICY

Pr. Assist. Prof. Strahil Karapchanski, PhD

Department of European Studies

and International Security

University of Ruse

E-mail: karapchanski@uni-ruse.bg

Abstract: *The paper EU Cohesion Policy is the main instrument for redistribution and solidarity between Member States. It embodies the added value of cooperation and the principle of subsidiarity, thus creating benefits for both donors and beneficiaries. The paper outlines the importance of the urban dimension of the EU Cohesion Policy 2014-2020 by showcasing the sustainable development of the City of Ruse.*

Keywords: *EU cohesion policy, sustainable development, investments, projects, Danube region*

JEL Codes: *F53, H83, Z18*

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LIBERAL DEMOCRACY DEFICITS AT NATIONAL LEVEL AS VIEWED FROM EU PERSPECTIVE

Pr. Assist. Prof. Boryana Stancheva, PhD

Department of European Studies

and International Security

University of Ruse, Bulgaria

E-mail: bstancheva@uni-ruse.bg

Abstract: *The paper is based on the findings of author's PhD dissertation. It discusses liberal democracy deficits in EU member states and argues, that liberal democracy deficits in member states with former communist regimes generate values-based crises at EU level of governance. The analysis tackles the question whether the EU institutions have capacity to act as a democratic "guardian" and to cope with such problems beyond enforcement of relevant Lisbon treaty legal texts.*

Keywords: liberal democracy, EU member states, value-based crisis, EU institutions

JEL Codes: F53, F55

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THEORIES ON SEPARATISM AS A CHALLENGE TO STATE GOVERNANCE

Eva Parvanova, PhD Student

Department of European Studies and International Security

University of Ruse, Bulgaria

E-mail: eparvanova@uni-ruse.bg

Abstract: *The paper views separatism as an ideology, which is focused on the construction of political identity of a minority group with existing cultural identity, who coexists with a majority within the territorial borders of a sovereign state. This ideology aims at political self-determination with a minimum and a maximum goal, namely - from degree(s) of territorial autonomy in the same state to full independence and acquisition of the status of a sovereign state (secession). Such political projects characterize movements, which are observable in almost all 21st century liberal democracies. The findings of the theoretical analysis are presented as social constructs, which have emerged as a response to phenomena of particular historical and geographical contexts.*

Keywords: separatism, political identity, cultural identity, secessionism, social construction

JEL Codes: F51, F53, H77

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AN ATTEMPT TO OPERATIONALIZE THE CONCEPT OF RESILIENCE IN THE CONTEXT OF EUROPEAN SECURITY STRATEGIC GOVERNANCE

Nikolay Tsolev, PhD Student

Department of European Studies
and International Security
University of Ruse, Bulgaria
E-mail: ntsolev@uni-ruse.bg

Abstract: The paper discusses imminent risks for European Union, namely the current Covid-19 pandemic, illegal migration, terrorism, climate change as contexts, within which the concept of resilience is being socially constructed. Theoretical analysis is undertaken for the identification of a list of indicators, which can be used for measurement of resilience. The list includes: resistance (the magnitude of shock the system can absorb and remain stable), adaptability (the degree to which the system is capable of self-organization), and improvability (the degree to which the system can build capacity to learn and adapt). Finally, a definition of resilience is proposed. It will be used for further exploration of resilience to migration flows in EU border areas.

Keywords: Resilience, European Union, risks, governance of security

JEL Codes: F52, F53

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DEFICITS OF BULGARIAN NATIONAL SECURITY GOVERNANCE IN TERMS OF RESILIENCE

Nikolay Tsolev, PhD Student

Department of European Studies
and International Security
University of Ruse, Bulgaria
E-mail: ntsolev@uni-ruse.bg

Abstract: The paper is based on desk research, which aims to discuss the hypothesis of assumed deficits of national security governance of Republic of Bulgaria in terms of resilience. Analysis of official documents related to the topic is being presented. Deficits are being identified on the grounds of comparisons with similar regulatory frameworks of other countries, selected via best practice approach.

Keywords: Resilience, national security, European Union, risks

JEL Code: F52

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EXPLORING MULTI-LEVEL GOVERNANCE POTENTIAL FOR THE PROTECTION OF CULTURAL DIVERSITY IN THE EUROPEAN UNION

Essin Veysalova, PhD Student

Department of European Studies
and International Security
University of Ruse, Bulgaria
E-mail: eveysalova@uni-ruse.bg

Abstract: The paper assesses the potential of multi-level governance to protect cultural diversity in EU member states on the grounds of desk research. It examines relevant policies as reflected in official documents of EU and Bulgarian institutions. The conclusion asserts the hypothesis, that the potential exists, but there is a need to overcome disbalances of its exploitation at supranational, national and subnational levels of governance.

Keywords: cultural diversity, EU multi-level governance, national minorities, human rights

JEL Codes: F53, H70

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MULTI-LEVEL GOVERNANCE APPROACHES TO POLICY MAKING IN THE EUROPEAN UNION

Yordan Petrov, PhD Student

Department of European Studies

and International Security

University of Ruse, Bulgaria

E-mail: ypetrov@uni-ruse.bg

Abstract: *This paper discusses the complexity of policy-making in the European Union in the context of multilevel governance of EU co-funded programmes and projects. Complexity is explained on the grounds of the five-step approach to the policy making cycle (issue identification, policy formulation and tool development, consultation and decision making, implementation, evaluation) and the evidence-based policy making approach, which demands reliable research data and verifiable research findings. The analysis considers implications of these supranational processes for the national level of governance with a focus on Bulgaria. The assumption, which is drawn on the basis of author's observation as a team-worker in a range of projects, is that project implementation teams are negatively affected by national regulations.*

Keywords: EU multi-level governance, policy making cycle, programming, project implementation, evidence-based policy making

JEL Codes: F53, H83

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**REGULATORY CONSTRAINTS TO
EU MULTI-LEVEL PROJECT GOVERNANCE.
THE CASE OF BULGARIA**

Yordan Petrov, PhD Student

Department of European Studies
and International Security
University of Ruse, Bulgaria
E-mail: ypetrov@uni-ruse.bg

Abstract: *Since the accession of Bulgaria to the European Union, national government has been trying to create a regulatory framework, that optimises the absorption of European structural and investment funds (ESIF). A normative document for the national governance of the European funding was enacted in 2015 to address the needs of the state and the project beneficiaries and stakeholder. This paper presents a critical view on the outcome of this process and identifies constraints on the grounds of discourse analysis.*

Keywords: *European structural and investment funds, regulation, discourse analysis*

JEL Codes: *F53, H83*

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Transcript of a sitting of the Committee on European Affairs at the National Assembly of the Republic of Bulgaria, 02.09.2015

UNITED NATIONS CONTRIBUTION TO GLOBAL GOVERNANCE OF COUNTERTERRORISM

Assoc. Prof. Petar Marinov, PhD

Counterterrorism programme

Military Academy G. S. Rakovski

Sofia

Tel. 02/92 26620

Etien Kornazhev, Student

Department of European Studies

and International Security

University of Ruse, Bulgaria

E-mail: etienz@icloud.com

Abstract: *The paper is a voice in defence of multilateralism as one of the most valuable post-world-war achievements of the mankind, and as a target of negation by authoritarian regimes, which aim at bilateral only relations. It explores terrorism as a pressing security issue since 11 September 2001 and discusses its impact. Secondly, it analyzes the UN involvement as a global governance response to this global security problem. The findings disclose the strengths and weaknesses of UN with regard to countering terrorism, as well as its systemic and comprehensive approach.*

Keywords: *multilateralism, globalization, security, terrorism, counterterrorism, United Nations*

JEL Codes: *F51, F52, F53*

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RESEARCH OF THE DEGREE OF THE INFLUENCE OF THE ONLINE MEDIA ON THE PUBLIC OPINION

Elitsa Ilieva, PhD Student

Business and Management Faculty,
University of Ruse
Tel.: +359-88-9507782
E-mail: elieva@uni-ruse.bg

Assoc. Prof. Daniel Pavlov, PhD

Business and Management Faculty
University of Ruse
Tel.: +359-88-4343132
E-mail: dpavlov@uni-ruse.bg

Abstract: *The online media have their own tools and levers to influence public opinion. More and more scientists share this belief that the online media have identified a mechanism through which they manage to influence international crises and national conflicts, and therefore their role is important for the national security of the country, because through their actions or inactions they affect stability and security in the country. The survey was conducted among 700 respondents in August and September 2020 through online by a questionnaire with fourteen questions, mostly of them "closed" type, but a few of them - "open" ones. The answers to this survey would support the PhD research at the University of Ruse, on the topic "Threats to national security in EU member states (research in online media).*

Keywords: *online media, online survey, Bulgarian citizens, manipulation, influence public opinion.*

JEL Codes: F5

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RESEARCH OF THE PUBLIC ATTITUDE ABOUT THE INFLUENCE OF THE ONLINE MEDIA ON THE NATIONAL SECURITY OF THE REPUBLIC OF BULGARIA

Elitsa Ilieva, PhD Student

Business and Management Faculty,
University of Ruse
Tel.: +359-88-9507782
E-mail: eilieva@uni-ruse.bg

Assoc. Prof. Daniel Pavlov, PhD

Business and Management Faculty
University of Ruse
Tel.: +359-88-4343132
E-mail: dpavlov@uni-ruse.bg

Abstract: The purpose of the report is to present a survey of the attitude of Bulgarian citizens on the role and influence of online media on the national security of the country. The survey was conducted among 700 respondents in August and September 2020 through online by a questionnaire with fourteen questions, mostly of them "closed" type, but a few of them - "open" ones. The answers to this survey would support the PhD research at the University of Ruse, on the topic "Threats to national security in EU member states (research in online media).

Keywords: online media, national security, online survey, Bulgarian citizens, threats.

JEL Codes: F5

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FRI-ONLINE-1-LIPC

FRI-ONLINE-1-LIPC-01

**POLITICAL AND SOCIO-CULTURAL FACTORS AND THEIR
INFLUENCE ON THE VALUE HIERARCHY**

Rozalina Bozhilova-Kouncheva, PhD Student

Department of European Studies and International Relations

University of Ruse

Phone: 082 888 830

E-mail: rbozhilova@uni-ruse.bg

Abstract: *The aim of this paper is to trace and analyse to what extent values and their hierarchy are influenced by external factors. Values are considered as an element of culture. Hence, culture as a complex and dynamic system changes under the influence of various factors, leading to corresponding changes in the value hierarchy. A brief overview of the influence that technical innovations have on the value model in modern societies is done. Milton Rokeach's views and research on the 13-year change in values in American society are presented. The transformations of values are also included but in a cross-cultural perspective through the research of Ronald Inglehart. The article also analyses the transformations of the value model in Bulgaria. The society in Bulgaria is seen as a complex example of the influence of political and economic transformations on the value hierarchy. The article can initiate further discussion concerning notions as sustainability and variability of value models in the period of transition and democracy.*

Keywords: values, value hierarchy, value orientations, culture, cultural variability

JEL Codes: I000, I390

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FRI-ONLINE-1-LIPC-02

FIGHTING COVID-19: NATIONAL MEASURES AND THEIR CULTURAL ROOTS

Assist. Prof Hristina Sokolova, PhD

Department of European Studies, International Relations and Security,

University of Ruse

Tel.: +359 878537015

E-mail: hsokolova@uni-ruse.bg

Abstract: *The paper examines governmental measures fighting the coronavirus infection in 6 countries across the world. Reviewed sources are official reports from national governmental agencies and media sources. Research method is discourse analysis. Research paradigm is based on Geert Hofstede's cultural dimensions Uncertainty Avoidance, Power Distance and individualism/Collectivism.*

Keywords: *coronavirus, covid-19, intercultural communication, government, measures*

JEL Codes: *I15, I38*

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FRI-ONLINE-1-MIP

FRI-ONLINE-1-MIP-01

**SOLVING PARTIAL DIFFERENTIAL EQUATIONS UNDER BOUNDARY
AND INITIAL CONDITIONS VIA LAPLACE TRANSFORM**

Assoc. Prof. Julia Chaparova, PhD

Department of Mathematics,

University of Ruse

Phone: 082 888 226

E-mail: jchaparova@uni-ruse.bg

Abstract: *In this work we present the use of Laplace transform toward second order PDEs under boundary and initial conditions in bounded and unbounded domains. The subject is suitable for comprehensive reading by students in Engineering, as well as Applied and Financial mathematics.*

Keywords: *Heat equation in 1D and 2D, Wave equation, Laplace transform, initial and boundary conditions*

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AN ANDROID APP “FROM TOURISTS BY TOURISTS”

Prop. Assistant Valentin Velikov, PhD

Department of Informatics and Information Technologies,

University of Ruse, Bulgaria

Tel.: +359 886 011 544

E-mail: vvelikov@ami.un-ruse.bg

Bac. Petar Velikov

Department of Computer Science,

University of Roehampton, London

Phone: +447760191655

E-mail: vpetyr@yahoo.com

Abstract: *The paper reviews some android technologies for working with the internet, remote databases (big nonSQL database, as FireBase for example), threads, dynamic structures and more. The aim of the created practical application is to develop, acquire and test the corresponding technologies.*

It was necessary to be explored and studied these techniques and programming grips in connection with the creation and development of a lecture course.

„From tourists by tourists“ – the idea of the developed system is that once in a given city, the users/tourists can browse and rate showplaces and landmarks, as well as offer new ones to the administrators.

Keywords: android, Software Engineering, information systems, tourism

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REVIEW OF SEVERAL TECHNIQUES FOR ACCELERATING PHYSICAL SIMULATIONS ON THE GPU

Prof. Tzvetomir Vassilev, PhD

Department of Informatics and Information Technologies,

University of Ruse

Phone: +359 82 888 475

E-mail: tvassilev@uni-ruse.bg

Abstract: This paper reviews several techniques for accelerating physical simulations on the graphics processing unit (GPU). In the current paper they are applied to mass-spring cloth model and cloth-body and cloth-cloth collision detection, but they can be utilized in many other paradigms, where computations can be parallelized. The first technique uses OpenGL GLSL with compute shaders and shader-storage buffers for implementing the entire simulation, cloth model and image space based collision detection, on the GPU. The second utilizes CUDA (OpenCL) for implementing the cloth model with image space based collision detection and visualization in OpenGL. The last one uses again CUDA for the cloth model, but NVidia OptiX ray tracing engine for accelerated collision detection on the GPU. The last approach overcomes some drawbacks of the image space based collision detection. The conclusion compares the three techniques with their advantages and disadvantages and gives ideas of possible applications.

Keywords: Physical Simulation, Cloth modeling, GPU programming, Parallel programming

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IMPLEMENTATION OF MIND MAPS IN INTERDISCIPLINARY TRAINING IN INFORMATION TECHNOLOGIES AND LITERATURE

Assoc. Prof. Svetlozar Tsankov, PhD

Department of Informatics and Information technologies,
University of Ruse
E-mail: stsankov@uni-ruse.bg

Assoc. Prof. Mira Dushkova, PhD

Department of Bulgarian Language, Literature and Art
University of Ruse
E-mail: mdushkova@uni-ruse.bg

Abstract: This report presents methodological guidelines for constructing a model for creating and using Mind map in teaching literature, aimed at teachers and students majoring in „Bulgarian Language and History“ at the University of Ruse "Angel Kanchev". The integration of information technologies in the teaching of other disciplines creates an interdisciplinary relationship between the different academic disciplines. This is one of the ways to implement the contemporary innovative approach in teaching in higher education.

Keywords: information technologies, Mind map, Teaching, interdisciplinary, High school

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PREDICTIVE ANALYSIS AND EVALUATION OF THE BULGARIAN ECONOMY'S MOST SIGNIFICANT INDICATORS⁴

Slavi Georgiev – PhD Student,

Department of Applied Mathematics and Statistics,

Faculty of Natural Sciences and Education,

University of Ruse,

E-mail: sggeorgiev@uni-ruse.bg

Byulent Idirizov – PhD Student,

Department of Mathematics,

Faculty of Natural Sciences and Education,

University of Ruse,

E-mail: bidirizov@uni-ruse.bg

Abstract: This paper develops a mathematical methodology to study and predict the future values of some of the Bulgarian's economy indicators. The considered exponents include the harmonized consumer price index, the total business climate indicator, the state budget balance – deficit/surplus and the long-term interest rate for convergence assessment purposes. The employed approaches for predictive analysis are the (S)ARIMA methods from the time-series toolkit and the LSTM neural networks. The data is gathered from the Bulgarian National Bank and the National Statistical institute. The aforementioned models are calibrated and forecasts are made, which, in general, prognosticate a mid-term increase after a short-term decline of the economy indicators. They, in turn, predict a moderate rise of the Bulgarian economic situation. The future values of the factors are interpreted and justified and some important implications are drawn in the conclusion of the paper.

Keywords: Economy indicators, Convergence Criteria, Harmonized consumer price index, total business climate indicator, State budget balance, Long-term interest rate, ARIMA, LSTM, Forecast .

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⁴ Докладът е представен на заключителната студентска сесия на 11 ноември 2020 с оригинално заглавие на български език: ПРОГНОЗЕН АНАЛИЗ И ОЦЕНКА НА НАЙ-ЗНАЧИМИТЕ ПОКАЗАТЕЛИ НА БЪЛГАРСКАТА ИКОНОМИКА.

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APPLICATION OF THE BLOCK MAXIMA METHOD IN ANALYSIS OF CRUDE BRENT OIL FUTURES, USING MATLAB

Byulent Idirizov, PhD Student

Department of Mathematics

University of Ruse

Tel.: +359 87 6965721

E-mail: bidirizov@uni-ruse.bg

Assoc. Prof. Iliya Bryanov

Chief Actuary at Allianz Bulgaria, Sofia, Bulgaria

Department of Applied Mathematics and Statistics

University of Ruse

E-mail: ibryanov@yahoo.com

Abstract: *The paper reviews the block maxima (BM) approach in the analysis of extreme values of Crude Brent Oil with set of data for the period from 01.01.1982 to 31.12.2019. The Block Maxima method divides sample data into equal blocks. Predictions are based on the maximum values of the observations. a model is proposed to calculate the parameters of the distribution function of the maxima using the third order Householder's method.*

Keywords: *Crude, Brent, Maximums, Block, Minimums, Extremum, Model, Oil, Analysis, London Brent, Brent Sweet, Light Crude, Oseburg, Ekofisk, Forties*

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STATISTICAL STUDY OF THE RELATIONSHIP BETWEEN THE QUALITY OF PARTNERSHIPS AND THE DEGREE OF LIFE SATISFACTION

Assist. Prof. Stefka Karakoleva, PhD

Department of Natural Sciences and Education,

University of Ruse

Phone: 082-888 606

E-mail: skarakoleva@uni-ruse.bg

Abstract: *The article presents a statistical study of the relationship between the quality of the relationship in the partner couple and life satisfaction. The study of partnerships or intimate relationships, the reasons leading to a successful or unsuccessful partnership, as well as the impact that experiences in personal relationships have on other areas of human life is of great interest to psychology. Partnerships have been shown to have an impact on life satisfaction and subjective mental well-being, and unsatisfactory partnerships correlate with the incidence of mental and physical disorders, reduced ability to work and professional success.*

Keywords: *statistics, psychology, partnerships, life satisfaction.*

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FRI-ONLINE-1-MIP-08

USE OF CLOUD TECHNOLOGIES FOR TRAINING AND TEST CONTROL ON THE TOPIC "BASIC COMBINATORIAL CONCEPTS" IN EIGHTH GRADE

Assist. Prof. Stefka Karakoleva, PhD

Department of Natural Sciences and Education,
University of Ruse
Phone: 082-888 606
E-mail: skarakoleva@uni-ruse.bg

Petya Guteva, MsD

Department of Natural Sciences and Education,
University of Ruse
Phone: +359898597059
E-mail: petyaguteva2@gmail.com

Abstract: The article presents the possibilities for using cloud technologies for creating digital learning resources and for conducting electronic tests in the teaching of mathematics in eighth grade. Through the use of the Google applications, digital learning resources have been developed, which are used through a created digital classroom. Emphasis is placed on Google applications and their ability to be used in math education.

Keywords: education, mathematics, pedagogy, training, cloud technologies, eighth grade

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USE OF CLOUD TECHNOLOGIES FOR TRAINING AND TEST CONTROL ON THE TOPIC "ELEMENTS OF PROBABILITIES AND STATISTICS" IN SEVENTH GRADE

Assist. Prof. Stefka Karakoleva, PhD

Department of Natural Sciences and Education,
University of Ruse
Phone: 082-888 606
E-mail: skarakoleva@uni-ruse.bg

Stanislav Ivanov, MsD

Department of Natural Sciences and Education,
University of Ruse
Phone: +359883444062
E-mail: ivanovstanislav2256@gmail.com

Abstract: The article presents the use of cloud technologies for training and test control on the topic "Elements of probabilities and statistics" in seventh grade, as well as creating a web-based system of exercises, tests and self-preparation materials for seventh grade math students using of cloud technologies.

Keywords: education, mathematics, pedagogy, training, cloud technologies, seventh grade

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FRI-ONLINE-1-PP

FRI-ONLINE-1-PP-01

**DEVELOPMENT OF THE MENTAL OPERATION CLASSIFICATION
IN PRE-SCHOOL CHILDREN**

Assoc. Prof. Asya Veleva, PhD

Department of Natural Science and Education,

University of Ruse

Phone: 082 888 268

E-mail: aveleva@uni-ruse.bg

Abstract: *The modern society sets a requirement for reorientation of the educational system to competence approach. This means focusing not on knowledge but on development of children's thinking. In this context the main purpose of current paper is to systematize exercises for development of the mental operation classification in pre-school children. This is a prerequisite for development of logical thinking and formation of scientific concepts.*

Keywords: *classification, pre-school education; logical thinking*

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SOCIAL-PEDAGOGICAL SUPPORT FOR THE ELDERLY AND THE ELDERLY THROUGH SOCIAL SERVICES IN THE COMMUNITY - NEED AND CHALLENGE

Assoc. Prof. Bagryana Ilieva, MA, PhD

Department of Pedagogy, Psychology and History

University of Ruse

Phone: 082-888 219

E-mail: bilieva@uni-ruse.bg

Dima Spasova, PhD Student

Department of Pedagogy, Psychology and History

University of Ruse

Phone: 082-888 234

E-mail: dspasova@uni-ruse.bg

Abstract: This article is the result of an empirical study conducted to identify the need for the use of social services in the community by the elderly and the existing problems in the social system related to them. The intentions are to bring out the reasons for satisfaction with the use of the existing social services and the possibility to access the disclosed ones.

Keywords: Social services, social policy, human rights, specialized institutions, community, family, elderly and senile people

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ROMA GIRLS AND WOMEN – ISSUES AND OPPORTUNITIES FOR SUPPORT OF THEIR EDUCATION

Pr. Assist. Prof. Denitsa Alipieva, PhD

Department of Pedagogy, Psychology and History,

Univesity of Ruse

Phone: 082-888 752

E-mail: dalipieva@uni-ruse.bg

Abstract: The paper reviews existing issues of modern Romani family and attitude toward Romani girls and women in Romani society in Europe and Bulgaria. There are review of the aspects of education of this segregated group and the main factors of early drop-out of Romani girls from school that leads to social exclusion. The paper gives briefly a description of the good practices for inclusive education too.

Keywords: Romani girls and women, social exclusion

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FUNCTIONAL CHARACTERISTICS OF THE INSTITUTIONAL EDUCATIONAL ENVIRONMENT IN THE FORMATION OF INTERCULTURAL COMPETENCE IN ADOLESCENTS

Assoc. Prof. Desislava Vasileva Stoyanova, PhD

Faculty of Natural Sciences and Education,
Department of Pedagogy, Psychology and History,
University of Ruse

Phone: 888 268

E-mail: dstoyanova@uni-ruse.bg

Abstract: Interculturalization provides opportunities to develop the potential of global educational and social systemic self-organization in the direction of tolerance and in response to the need to meet the undesirable challenges of the present: xenophobia, fundamentalism, violence. The institutional educational environment as a particularly important factor in the process of socialization of adolescents translates the intercultural paradigm with the greatest intensity. The paper reviews existing approaches, strategies and educational policies in the field of intercultural education from the point of view of their implementation within the system of public education. The report presents the current parameters of the functional significance of public education institutions in relation to the intercultural sphere. The essence, significance, directions and current aspects of intercultural education are summarized. The perspectives and challenges for the system of public education in connection with the realization of effective intercultural education are considered.

Keywords: intercultural education, Functional aspects, institutions for public education, Methods, Models, Strategies, Efficiency, intercultural competence

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INCLUSIVE EDUCATION FOR CHILDREN OF PRESCHOOL AGE THROUGH THE BULGARIAN CHILDREN'S FOLKLORE GAMES

Assoc. Prof. Julia Doncheva, MA, PhD

Department of Pedagogy, Psychology and History

University of Ruse

Phone: 082-888 219

E-mail: jdoncheva@uni-ruse.bg

Ekaterina Ivanova, PhD Student

Department of Pedagogy, Psychology and History

University of Ruse

Phone: 082-888 219

E-mail: eivanova@uni-ruse.bg

Abstract: as a preparatory stage (an inclusive transition) to school, the preschool teacher has to overcome some serious challenges, related to strengthening the physical as well as the mental health of the children. In this complex activity also come the problems, connected to the preparation of the adolescents for the real life- their socialization and adaptation. Here, a particular significance has the work done on diagnostics of development of the cognitive processes, which form the basis of personal development. The game activity provokes the interest to the successful acquiring of new knowledge and consolidation of old knowledge; it also provides the learning of new skills, competences and habits, related to the full development of the children. In relation to the communication, education and to the formation of a child's personality we more often asking the questions: What would effectively help? Are we searching at the right place? Where is the key? Is it time to turn to our "roots" because as the people say: "A tree without roots cannot live!"?!

The Bulgarian children's folklore games are a part of the cultural national (the so-called non-material) heritage and wealth of our nation. Some of the games like for example the King-The Portal, Pots and Tag are also present in Russia, Turkey, the Czech Republic, Ukraine and Moldova. In the different countries the games have different names and slightly different rules. We can observe a trend for the return of those games in the active part of the children's lives (in the work of the preschool teacher) due to the fact that they develop certain not only motor skills but also mental constructs in a psychological-pedagogical aspect.

Keywords: Bulgarian children's folklore games, self-identification, socialization, preschool age

JEL Codes: I39, I2, I21, I24, I29

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ART AND CRAFT APPROACHES APPLIED IN EDUCATION AND DEVELOPMENT OF CHILDREN WITH INTELLECTUAL DISORDERS

Dr. Katerina Zlatkova-Doncheva, PhD

Faculty of Education,

St Cyril and Methodius University of Veliko

Tarnovo Phone: +359 876563679

E-mail: kzlatkova@gmail.com

Abstract: Current study research theoretical concepts of art and craft approaches applied in education of children with disorders of intellectual development. The paper is focused on arts implications in the context of neuroscience and the positive impact of art and craft techniques for cognitive and emotional development of children with intellectual disorders. The results outline that the use of creative activity could be very successful in making fine motor skills, visual-motor coordination, spatial orientation, accuracy and coordination of hands movements, and supports the writing process, formation of visual-motor ideas, improvement of perceptions, and thinking.

Keywords: intellectual Disability, Disorders of Intellectual Development, Art, Craft, Creative Activity, Special Education.

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THEORIES AND APPROACHES FOR STRUCTURING OF THE EDUCATIONAL CONTENT

Ch. Ass. Prof. Lora M. Radoslavova, PhD

Department of Education, Psychology and History

University of Rousse, Bulgaria

Tel.: +359889699115

E-mail: lradoslavova@uni-ruse.bg

Abstract: Relative to the modern technological and digital transformations in the educational system, the problem with the approaches and models of structuring the educational content becomes a significant challenge for the pedagogical specialists. There is a lack of modern concepts for adapting educational content to the digital orientation of the learning process, the need for new approaches to restructuring and digitization of curriculum content. This material presents an analysis of traditional theories and models for selection and structuring of educational content and outlines the need for their enrichment, transformation and adaptation to digital educational environment.

Keywords: Theories, Approaches, Curriculum, Models

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CONTEMPORARY DIMENSIONS OF THE PRINCIPLES OF INTERCULTURAL EDUCATION

Neli Il. Boiadjieva-professor, PhD

Department of Sciences for Education and Arts

University of Sofia "St.Kliment Ohridsky"

Tel.: + 359 888 438974

E-mail: nelybo2@abv.bg

Abstract: The paper offers presentation of some approaches to defining the problem of the principle for intercultural education in Bulgarian pedagogic literature and educational practice. Content analysis of the studies, books, university textbooks and political documents are made in the paper. There is a classification of the actual principles for intercultural education nowadays. intercultural education is connected with another general ideas as tolerant and humanistic attitude to the child, equality, individual and personal approach, empathy etc. intercultural education is one main contemporary principles of the education and a direction of the theory of education in pedagogy and school practice.

Keywords: principle of education, intercultural pedagogy, intercultural intercultural education

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INVOLVMENT OF PARENTS OF CHILDREN WITH SPECIAL EDUCATIONAL NEEDS (SEN) IN SOCIO-PEDAGOGICAL ACTIVITIES IN SUPPORT OF THEIR SUCCESSFUL SOCIAL REALIZATION

Associate Professor Valentina Vasileva, PhD

Department of Pedagogy, Psychology and History,
Univesity of Ruse
Phone: 082/888268
E-mail: vvasileva@uni-ruse.bg

Teodora Gerganova, PhD Student

Department of Pedagogy, Psychology and History,
Univesity of Ruse
Tel.: 0887327672
E-mail: tgerganova@uni-ruse.bg

Abstract: Modern society, in Bulgaria and internationally, is multicultural and is a collection of abstract today, the issue of active involvement of the family in the support of children with special educational needs is becoming increasingly relevant. This idea is gradually reflected in the creation of complex support, which is not only material assistance from the state, but includes a wide range of long-term social measures aimed directly at the families of children with special educational problems. a survey was conducted with parents of children with SEN, which shows their need for inclusion in socio-pedagogical activities in support of their children.

Keywords: children with special educational needs; family; socio-pedagogical activities.

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CONCEPTUAL APPROACHES IN DEFINING THE GOALS, TASKS, CONTENT AND ORGANIZATION OF INTERCULTURAL EDUCATION IN PRESCHOOL AND SCHOOL EDUCATION

Associate Professor Valentina Vasileva, PhD

Department of Pedagogy, Psychology and History,
University of Ruse
Phone: 082/888268
E-mail: vvasileva@uni-ruse.bg

Teodora Gerganova, PhD Student

Department of Pedagogy, Psychology and History,
University of Ruse
Tel.: 0887327672
E-mail: tgerganova@uni-ruse.bg

Abstract: Modern society, in Bulgaria and internationally, is multicultural and is a collection of representatives of different nationalities, with their characteristic cognitive, social, emotional characteristics. Compulsory education is therefore required to respond to this situation by developing intercultural competence of learners (children and adults). The approaches used in building intercultural competence aim to enrich the theoretical knowledge of adolescents and teachers about cultural diversity; for successful educational integration of children and students from ethnic minorities; for intercultural education and intercultural communication in the multicultural classroom.

Keywords: children, education, intercultural competence, multicultural classroom

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STRATEGY FOR EDUCATIONAL INTEGRATION OF CHILDREN AND STUDENTS FROM ETHNIC MINORITIES (2015-2020) (*Оригинално заглавие: СТРАТЕГИЯ ЗА ОБРАЗОВАТЕЛНА ИНТЕГРАЦИЯ НА ДЕЦА И УЧЕНИЦИ ОТ ЕТНИЧЕСКИТЕ МАЛЦИНСТВА (2015 – 2020)*)URL: sf.mon.bg/?h=downloadFile&fileId=2395 (Accessed on 25.09.2020)

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PROJECT BASED LEARNING IN AN INTERCULTURAL ENVIRONMENT THROUGH ETWINNING

Assist. Prof. Galina Georgieva, PhD

Department of Natural Sciences and Education,

University of Ruse

Phone: +359 82 888 752

E-mail: gggeorgieva@uni-ruse.bg

Abstract: The purpose of this report is to present the perspectives of including eTwinning into the educational curriculum of the pedagogical students in University of Ruse. It also outlines the opportunities for development intercultural interactions between future teachers from different countries through project activities in a multicultural digital environment using the resources of the eTwinning Platform.

Keywords: eTwinning, intercultural education, Project-based learning, Digital education

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MANIFESTATIONS OF ETHNIC IDENTITY AGAINST THE BACKDROP OF EMIGRATION

Ilana Atanasova Atanasova, PhD Student

Technical University - Varna

Department of Social and Legal Sciences

Phone: + 359 893 516871

E-mail: illiana.atanassova@abv.bg

Abstract: Social identity arises out of the process of group self-categorization and identification, of identifying oneself as a member of a group. The members of the ethnic group are interconnected by specific elements of culture, traditions, religion, language and morality in a lasting social cohesion of rich emotional and social value.

Ethnic identity is the psychological projection of the ethnicity on the Self- image of the individual. It expresses ethnic self-determination or the sense of belonging to a certain ethnic group and its corresponding values, norms and attitudes. Whether you belong to a given ethnic group is determined by blood relations, whatever happens within the ethnic community can be understood and regulated only from within and inside the ethnic group. Ethnic identity can be shared or acquired by means of continuity where there is no need of external regulation, in a non-formal manner. It is the membership of the ethnic group that predetermines and provides guidelines for people and communities' economic and political behaviour. Worldviews and attitudes toward life, social relationships, values and standards have their ethnic basis.

Keywords: identity, ethnicity, ethnic identity, emigration

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DIGITAL INTERACTION THROUGH TALES BETWEEN THE FAMILY, CHILDREN AND TEACHERS TO SUPPORT CHILDREN'S COMPETENCE

Assoc. Prof. Dr. Sonia G. Georgieva

Department of Pedagogy and Psychology
Faculty of Natural Sciences and Education
University of Ruse
Phone: +359 899925353
E-mail: sonya@uni-ruse.bg

Teacher: Eli Nikolova

Kindergarten, Vidin
Phone: +359 882372187
E-mail: eliikolovakkk@abv.bg

Abstract: *E-learning involves interaction between students and the teacher from a distance. With the development of technologies - audio-visual and then electronic - distance learning is increasingly associated with their use. As a result of the epidemic, education has undergone the biggest changes, which are still looking for their optimal solutions. On the threshold of a different school year, teachers, parents and students have many questions. Parents of current first- graders and children from preparatory groups in kindergartens are most worried due to the fact that remote interaction, according to them, implies a lower level of preparation for school readiness. This paper focuses on the digitalized fairy tale as a method for developing learning skills through interaction between family, children and their teachers. The tale, with its vital persuasiveness and emotional impact, combines the necessary cognitive content with the game, which is the main activity of preschool children. It would increase the pedagogical competence of parents to be included in the educational process.*

Keywords: Kindergarten, E- learning, Fairy Tales, Teachers, Parents, Children

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**ILARION STOYANOV'S VIEWS ON THE NEW BULGARIAN
LANGUAGE**

Ivo Bratanov, 1st class teacher, PhD

“Hristo Botev” Secondary School – Ruse

Tel.: +35982 82 90 32

E-mail: ibratanov@abv.bg

Abstract: The report focuses on the views of the Bulgarian Revival writer and clergyman Ilarion Stoyanov (Makariopolsky) concerning the structure of the Bulgarian literary language. He presents them in the afterword of his translation of the book "Pravoslavnoe uchenie" ("Orthodox teaching"), which was published in 1844 in Constantinople. Ilarion Stoyanov emphasizes the structure of Bulgarian language spelling and certain grammatical features. The report considers the relationship between traditional literature and colloquialism according to Ilarion Stoyanov's point of view. It identifies the reasons for the writer's adherence to these linguistic statements and highlights his ideas which seemed promising for the development of the modern Bulgarian literary language.

Keywords: history of the contemporary Bulgarian literary language; slavic literary language; Ilarion Stoyanov (Makariopolsky); "Pravoslavnoe uchenie" ("Orthodox teaching"); languagespelling model; dialect; literary tradition

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PHRASEOLOGY AND PHRASEODIDACTICS – CURRENT ISSUES OF TEACHING MODERN BULGARIAN LANGUAGE

Assoc. Prof. Emilia Nedkova, MA, PhD

Department of Bulgarian Language, Literature and Art

University of Ruse

Phone: 082 888 437

E-mail: enedkova@uni-ruse.bg

Abstract: The purpose of this paper is to search (by proposing specific methodological models) for the most direct path from the theoretical problems of phraseology to their solution from a methodological point of view. Such an approach is already oriented towards phraseodidactics which integrates the theory of phraseology and the methods of teaching it on a practical level (both in native language and in a foreign language). Phraseodidactics is also discussed in the paper as an underdeveloped field in the Bulgarian research environment (see Fedulenkova 2000; European education and modernity 2015). Therefore our attention here will be focused particularly on the study of Bulgarian phraseology in the teaching of Bulgarian language to students of pedagogical and philological specialties.

Keywords: phraseology, phraseodidactics, teaching problems, Bulgarian language

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THE THEORY OF LANGUAGE PERSONALITY: DEFINITION OF THE LINGUISTIC PHENOMENON

Asst. Prof. Niya Peneva, PhD

Department of Bulgarian language, Literature and Arts

University of Ruse

Phone: 082 888 664

E-mail: ndoneva@uni-ruse.bg

Abstract: The principles of the anthropocentric paradigm are closely related to the study of the individual regarded as a language personality. The core of the study is the language as means of revealing the personality's traits. In its descriptive part the theory of the language personality states that the term language personality is discussed mainly in the field of Russian linguistics and it focuses on the nature of the phenomenon.

Keywords: linguistics, linguopersonology, linguodidactics, definition of language personality

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THE MICROTHEME AS TERTIUM COMPARATIONIS IN LINGUOCULTURAL COMPARATIVE ANALYSES OF SHORT HUMOUROUS TEXTS

Tanya Borisova –PhD Student

Department of Bulgarian Language, Literature and Arts

University of Ruse

Phone: 082 888 612

E-mail: tborisova@uni-ruse.bg

Abstract: *Comparative cultural analyses of texts in different languages have their own traditions and terminology. Terms often used in linguocultural studies are: language - language personality – culture. The language and the language personality are taken as invariants in linguistic research, whereas defining an invariant in the field of culture is a challenge. Universalia are invariants and they are often considered tertium comparationis. In paremia texts analyses the term cultureme is used as a tertium comparationis. However, there are certain concerns about its use in comparative analyses of humorous texts, containing linguistic ambiguities. In this paper the need of introduction of another term to be used in linguocultural comparison of short humorous texts containing linguistic ambiguities is discussed. The suggested term is microtheme (микротема – in Bulgarian) and reasons for its introductions are presented.*

Keywords: jokes, cultural study, tertium comparationis, cultureme, microtheme

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AESTHETIC CHALLENGES TO THE BULGARAN THEATER AT ITS ENCOUNTER WITH MODERN EUROPEAN DRAMA AT THE BEGINNING OF 20TH CENTURY

Assoc. Prof. Velislava Doneva, PhD

Department of Bulgarian language, Literature and Arts

University of Ruse

E-mail: doneva_v@uni-ruse.bg

Abstract: Modern Bulgarian drama appeared mainly as a result of the interaction of two factors – the change in the spirit of the new generation and the aesthetic influences coming from abroad. It inherits from the European modern drama characteristics which function as artistic constructs, the most important ones being abandoning the traditional forms; breaking the dominant routine of realism; proclaiming individualism in literature and freedom in art; following the trend towards everything new, peculiar, even mystical; the author has a new type of self – esteem, a new understanding of the world and aesthetics; the protagonist is an individualist, speaks an exuberant language, his/her thoughts are directed towards the inner self, does not share any social ideas and does not recognise them as important, s/he is ready to make sacrifices to preserve their spiritual sovereignty, protests against the deep moral degradation of social, spiritual and even literary life, has burnt all bridges that lead back being certain the future belongs to them.

Since the demarcation line of the concept of “modernity” shrinks and expands, in aesthetic and formal terms, depending on the receivers’ intuitions, it is appropriate to specify that we accept P. Sondi’s view of modern drama which is related to a model of writing drama in the late 19th century created and defined by Ibsen, Strindberg, Maeterlinck, and Hauptmann’s dramas.

Keywords: theatre, aesthetics, modern European drama

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RELIGION AND THE RELIGIOUS IN THE PUBLICATIONS OF KONSTANTIN GALABOV AND TEODOR MILEV IN *IZTOK* AND *STRELETS*

Kamen Rikev, PhD

Institute of Modern Languages

Maria Curie-Sklodowska University in Lublin, Poland

Tel.: +48514441160

E-mail: rikev@umcs.pl

Abstract: The paper summarizes the views on religion and religiosity in the publications of Konstantin Galabov and Teodor Milev in two leading Bulgarian periodicals of the 1920s – “*Iztok*” and “*Strelets*”. These papers served as a platform for defenders of the occidentalization of Bulgarian culture with both intellectuals among their most active contributors. While Galabov, an university scholar, reveals a broad academic background, Milev’s texts reflect the impetus of a cultural visionary. The review of the publications leads to the conclusion that religion and religiosity are fundamental elements of cultural identity that can in no way be excluded from the debates on the national development of the early 20th century. According to the authors, the religious aspect sets higher dimensions of the various social and creative aspirations in past and modern times. The concept of faith in their texts is rarely commented, as, in accordance with the general trend in “*Iztok*” and “*Strelets*”, both authors prefer to use the terms “religion” and “mysticism” with no strict distinction between them. Religion, however, implies the meanings of an expression of intimate pursuits, rather than a doctrine of fixed dogmatics, cult and ethics. Thus Galabov’s and Milev’s works comply with the persuasion of other Bulgarian intellectuals of the 1920s: the more mystical it appears to be, the more vital and valuable the religious teaching. These cultural stances are expressed with the conviction that the nation is yet to build and develop its modern identity.

Keywords: Konstantin Galabov, Teodor Milev, religion, religious, *Iztok*, *Strelets*, Bulgarian culture.

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**X-XDESTINY AND DREAM IN TWO TEXTS OF BULGARIAN
LITERATURE OF THE 70S
(OBSERAVATIONS ON THE NOVEL SHORT SUN BY STANISLAV
STRATIEV AND MY NEANDERTHAL BY YANKO STANOEV)**

Zvezdelina Bratanova, 1st class teacher, PhD

„Vazrazhdane” Secondary School – Ruse

Phone: 0879629032

E-mail: zvbratanova@abv.bg

Marina Bratanova, M.H.

Hermes bookstores, Ruse branch

Phone: 087782903

E-mail: marina_bratanova@abv.bg

Abstract: The paper examines the ways of living of the young men. The main problem is the collision between how life happens and how have to happens. The article focus on the dream of the young man and how to realize it in a socialist society.

Keywords: dream, destiny, slavonic literature, jeans prose.

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SURROUND SOUND IN DOCUMENTARY FILM

Assistant Prof. Tsvetelina Tsvetkova, PhD

Faculty: Screen Arts, Department of Film and TV Sound

National Academy for Theatre and Film Arts, Sofia, Bulgaria

Tel.: +359888590250

E-mail: tsvetkova.tsvetelina@gmail.com

Abstract: *In recent years the aesthetics of fiction films influences more and more the sound of the documentaries. It elevates it to a whole new level but in the same time raises new problems. The most significant of them are these, concerning authenticity of the story in a non-fiction film. The use of the multi-channel surround sound formats in the documentary makes differences between this two genres smaller than ever.*

Since the demarcation line of the concept of “modernity” shrinks and expands, in aesthetic and formal terms, depending on the receivers’ intuitions, it is appropriate to specify that we accept P. Sondi’s view of modern drama which is related to a model of writing drama in the late 19th century created and defined by Ibsen, Strindberg, Maeterlinck, and Hauptmann’s dramas.

Keywords: Documentary, Sound design, Cinema, Film Sound, Surround sound

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FRI-ONLINE-1-AS-02

GENERAL ACOUSTIC FEATURES OF WOOD WIND INSTRUMENTS

Assoc. Prof. Pavel Stefanov, PhD

Department of Soundengineering and Sounddesign,
National Academy of Music “Prof. Pancho Vladigerov” – Sofia
Phone: 086-820 471
E-mail: pavel_stfnv@mail.bg

Abstract: *The paper reviews some of the inherent features of wood wind musical instruments. Some acoustic phenomena related to the way that sound is generated and radiated by wood winds, such as standing wave and resonance, are considered too. The acoustic features of wood wind instruments are of critical significance by the process of recording and reinforcement in order to achieve maximum sound quality. Knowledge of pollar pattern, frequency and dynamic range is very important for any sound engineer, composer or conductor. The main goal of this article is to help anyone who is interested in knowing and understanding better the acoustic features of wood wind instruments.*

Keywords: wood wind instruments, sound recording, acoustic features, resonance, standing wave

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SYMBIOSIS BETWEEN MUSIC AND RHYTHM OF THE MOVIE

Nina Altaparmakova

Faculty: Screen Arts, Department of Film and TV Directing and Animation
National Academy for Theatre and Film Arts, Sofia, Bulgaria
Tel.: +359888839488
E-mail: ninaalt@yahoo.com

Abstract: *Music has an extremely important role in the emotional impact of a movie. in this article we will explore how it influences the edit built in characteristically different scenes. How it catalyzes the impact from an actors' play. The way it emphasizes moments of the action in a movie. Music helps a lot with condensing time in a movie. It can be in unison with the picture or it can be in contradiction with it. The article will look into a series of pragmatic questions which arise during the post production of a movie – like choosing the music and its distribution throughout the duration of the movie. Its symbiotic relationship with the length and the content of the frames as well the problem with its final mixing and volume.*

Keywords: Editing, Film Music, Rhythm

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FRI-ONLINE-1-AS-04

COMPARATIVE TEST OF THE SUMMING CAPABILITIES OF THE MOST COMMON DAW SOFTWARE USED FOR DUBBING IN BULGARIA

Stefan Makedonski

Screen Arts Faculty,

National Academy for Theater and Film Arts “Krastyo Sarafov” - Sofia

Phone: 088-924 7218

E-mail: smakedonski@gmail.com

Abstract: *The article describes experiment, which compares the summing capabilities of the most commonly used audio programs for dubbing in Bulgaria, in order to determine whether there is a difference in the quality and characteristics of the resulting sound material. The experiment is conducted in two stages: summing voice (text) and music; summing two sinusoidal sound waves. After comparing the results all similarities or differences and the reasons for them were examined. In addition, various aspects of the functionality of the examined audio programs are described, including practical tips for specific settings.*

Keywords: Audio software, comparison, summing, experiment, mixing, dubbing, quality

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INNOVATIVE APPROACHES IN MUSIC EDUCATION: THE DOLL AS A SYMBOL AND DIDACTIC INSTRUMENT

Pr. Assist. Petya Stefanova, PhD

Department of Bulgarian Language, Literature and Art,

University of Ruse

Phone: 0896 820470

E-mail: pstefanova@uni-ruse.bg

Abstract: The doll as a cultural phenomenon has been known to mankind for thousands of years. Known in various educational systems, its applicability is wide-ranging and affects the overall psychological, emotional and physical development of the child. The place of the doll in music education has its traditions and established practices. The symbol itself creates conditions for interpretation and improvisation in the creative work of the pedagogue. Innovative approaches related to dolls can be found in the realization of all musical activities, as well as in the formation of musical abilities. This article proposes experimental practices and approaches related to the perception of music, music literacy and musical expression in all its forms.

Keywords: Music education, the doll as a symbol, didactic instrument, experimental practices of music education

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BETTING ON ANSWERS AS A WAY OF ENGAGING STUDENTS

Assistant Prof. Aleksandar Kosuliev, PhD

Department of Economics,
University of Ruse
Tel.: +359 82 888 557
E-mail: akosuliev@uni-ruse.bg

Assistant Prof. Elizar Stanev, PhD

Department of Economics,
University of Ruse
Tel.: +359 82 888 703
E-mail: eastanev@uni-ruse.bg

Abstract: *The paper presents a model for classroom activities where true or false and multiple choice questions are approached in an innovative way. instead of simply providing answers to the questions, students are required to place a bet on their preferred answer, starting from a predetermined set of points, which change on each subsequent iteration depending on the correctness of the answers to the previous questions. Students are divided in teams and make the decision about the bet together, competing against other teams. We describe the design of a template spreadsheet for the conducting of the activities and briefly discuss the advantages and disadvantages of the model.*

Keywords: *Teaching, Classroom games, Gamification, Education*

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GAMIFICATION OF THE CLASSROOM: A QUIZ-LIKE GAME WITH STRATEGIC CHOICES AND PLAYER INTERACTION

Assistant Prof. Aleksandar Kosuliev, PhD

Department of Economics,

University of Ruse

Tel.: +359 82 888 557

E-mail: akosuliev@uni-ruse.bg

Abstract: *The paper presents a model for classroom activities which employs several gamification elements – quizzes, teamwork, competition, game rounds, points, penalties and rankings. Students work in teams and can choose the type of questions to which they want to respond. Unlike traditional quizzes, they can also use special cards, which allows for role playing and direct interaction between the participating teams. The game rules and the conduct of the game are explained in details and a template spreadsheet for the game board is provided.*

Keywords: *Teaching, Classroom games, Gamification, Education*

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THE SCHOOL AS A FACTOR FOR OVERCOMING POVERTY AND SOCIAL EXCLUSION OF CHILDREN

Daniela Racheva, PhD

Faculty of Education

Sofia University 'St. Kliment Ohridski'

Sofia 1504, bul. "Tsar Osvoboditel" 15, room 67

E-mail: d.racheva@fp.uni-sofia.bg

Abstract: *The article examines the phenomenon of "poverty" as a problem of the state and as a challenge to the modern educational system. It examines the nature and specifics of child poverty, the causes of its occurrence and its consequences. The article includes parts of interviews with pedagogical specialists working with children from low-income and poor families, who share their experience and impressions of the realities and opportunities of the school to be a factor for social inclusion and personal realization of poor children and the alternatives that school education and upbringing provides to overcome deficits in their development.*

Keywords: *poverty, child poverty, education, school education, school upbringing*

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TESTING OF MATHEMATICAL KNOWLEDGE IN DISTANCE EDUCATIONAL ENVIRONMENT

Assoc. Prof. Emiliya Velikova, PhD

Department of Mathematics,
Faculty of Natural Sciences and Education
University of Ruse
Phone: +359 885635874
E-mail: evelikova@uni-ruse.bg

Pr. Assist. Prof. Ralitsa Vasileva-Ivanova, PhD

Department of Mathematics,
Faculty of Natural Sciences and Education
University of Ruse
Phone: +359 884109719
E-mail: rivanova@uni-ruse.bg

Abstract: Computer testing gained popularity in the pandemic in 2020. The article presents the advantages and disadvantages of computer testing of mathematics knowledge of students - future teachers. The possibilities of Google forms, are used. The effective educational technologies in the conditions of digital environment in relation to the traditional technologies of teaching mathematics, are analyzed.

Keywords: Computer testing, distance learning, digital environment, mathematics education

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THE IDEA OF SIMPLICITY IN KNOWLEDGE AND TRAINING IN NATURAL SCIENCES

Assoc. Prof. Boryana Todorova, PhD

Department of Public Health and Social Work,

University of Ruse

Phone: 0878-821 993

E-mail: btodorova@uni-ruse.bg

Abstract: The report considers the idea of simplicity as one of the Fundamental ideas of Natural History with methodological character, but also as a basic prerequisite and factor determining the existence of natural objects. The significance of the idea for the emergence of correspondences and uniform models in nature, its connection with the principle of analogy is outlined. The relationship between the principle of simplicity and the idea of elementariness is revealed. to clarify the presented theoretical formulations, examples from the field of natural sciences and the respective academic disciplines are presented. Special attention is paid to the golden section as a common pattern both in nature and in other areas of human activity.

Keywords: Principles of Simplicity, Analogy, Elementariness; Golden ratio

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FRI-ONLINE-1-ERI-06

DIGITAL INTERACTION THROUGH TALES BETWEEN THE FAMILY, CHILDREN AND TEACHERS TO CREATE LEARNING SKILLS

Eli Nikolova - Teacher

Kindergarten Detelina, Vidin

Phone: +359882372187

E-mail: elinikolovakkk@abv.bg

Abstract: E-learning involves interaction between students and the teacher from a distance. with the development of technologies - audio-visual and then electronic - distance learning is increasingly associated with their use. as a result of the epidemic, education has undergone the biggest changes, which are still looking for their optimal solutions. on the threshold of a different school year, teachers, parents and students have many questions. Parents of current first- graders and children from preparatory groups in kindergartens are most worried due to the fact that remote interaction, according to them, implies a lower level of preparation for school readiness. This paper focuses on the digitalized fairy tale as a method for developing learning skills through interaction between family, children and their teachers. The tale, with its vital persuasiveness and emotional impact, combines the necessary cognitive content with the game, which is the main activity of preschool children. It would increase the pedagogical competence of parents to be included in the educational process.

Keywords: Kindergarten, E- learning, Fairy Tales, Teachers, Parents, Children

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FRI-ONLINE-1-ERI-07

DIAGNOSTICS OF EDUCATIONAL MATHEMATICS ACHIEVEMENTS WITH DYNAMICAL TOOLS

Assoc. Prof. Emiliya Velikova, PhD

Department of Mathematics,
Faculty of Natural Sciences and Education
University of Ruse
Phone: +359 885635874
E-mail: evelikova@uni-ruse.bg

Pr. Assist. Prof. Ralitsa Vasileva-Ivanova, PhD

Department of Mathematics,
Faculty of Natural Sciences and Education
University of Ruse
Phone: +359 884109719
E-mail: rivanova@uni-ruse.bg

Magdalena Petkova, PhD

First Primary School "Otets Paisiy" – Ruse
Phone: +359 886162384
E-mail: magipetkova@ymail.com

Abstract: *The spread of information technologies leads to supporting the educational process through dynamic software as a method for diagnosing educational achievements in mathematics. The article presents methods for assessing students' knowledge of mathematics in the dynamic environment of GeoGebra.*

Keywords: *information technologies, dynamic environment, GeoGebra, mathematics education*

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CIRCLE DESCRIBED AROUND A TRIANGLE - STUDY MATERIAL FOR DISTANCE FORM OF LEARNING⁵

Assist. Prof. Anna Lecheva, PhD

Department of Mathematics,
Faculty of Natural Sciences and Education
University of Ruse
E-mail: alecheva@uni-ruse.bg

Assoc. Prof. Veselina Evtimova, PhD

Department of Mathematics,
Faculty of Natural Sciences and Education
University of Ruse
E-mail: v.evtimova@gmail.com

Eleonora Panayotova, MSc, Student

Department of Mathematics,
Faculty of Natural Sciences and Education
University of Ruse

Abstract: This paper discusses the teaching of 8th grade students on the topic of a **circle described around a triangle**. Theoretical and practical aspects of teaching and expanding the students' knowledge on the topic are presented. This paper acknowledges that geometric knowledge and skills contribute to the general and mathematical development of students by facilitating the development of observation, logical and spatial thinking, creative initiative and creativity.

The current curricula in mathematics, published on the website of the Ministry of Education and Science, were used. The choice of the GeoGebra software product for visualization of the theoretical material and the solutions of the proposed tasks is substantiated.

Keywords: E-Learning, Teaching, Geometry of the triangle, Circumscribed circle around triangle

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⁵Докладът е с оригинално заглавие на български език: ОКРЪЖНОСТ, ОПИСАНА ОКОЛО ТРИЪГЪЛНИК - УЧЕБЕН МАТЕРИАЛ ЗА ДИСТАНЦИОННА ФОРМА НА ОБУЧЕНИЕ

FRI-ONLINE-1-ERI-09

ACHIEVEMENTS OF THE HIGH SCHOOL OF MATHEMATICS "NIKOLA OBRESHKOV" KAZANLAK

Diana Dimitrova – MSc Student

Department of
University of Ruse
Tel.: +359 88 586909
E-mail: pgi.dimitrova@abv.bg

Assoc. Prof. Antoaneta Mihova, PhD

Department of Natural Sciences and Education
University of Ruse
Phone: +359 082 888 727
E-mail: amihova@uni-ruse.bg

Assoc. Prof. Tsetska Rashkova, PhD

Department of Natural Sciences and Education
University of Ruse
Phone: +359 082 888 489
E-mail: tsrashkova@uni-ruse.bg

Abstract: *The report reviews the historical development and the achievements of the High School of Mathematics „Nikola Obreshkov“ in Kazanlak. The school has established traditions as a leading school in the region. a great number of the graduates study, specialize or work at prestigious universities and companies in Bulgaria and abroad. Teachers have won plenty of awards and are known for their schools around the world.*

The report is a recognition for the contribution of the outstanding students and teachers of the high school over the years. All achievements of the high school show, on the one hand, the preparation in mathematics in Bulgarian high schools and, on the other, stimulate the development of mathematical education in our country.

Keywords: *The High School of Mathematics "Nikola Obreshkov", achievements, national school, Mathematical Olympiads*

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FRI-ONLINE-1-LS

FRI-ONLINE-1-LS-01

**THE INTERNATIONAL TREATY AS A SOURCE OF OBLIGATIONS
FOR THE STATE**

Assoc. Prof. Mariya Zheleva, PhD

Department of Criminal Law and Security, Faculty of Law,

University of Ruse, Bulgaria

Phone: +359 882 435315

E-mail: mzheleva@uni-ruse.bg

Abstract: *The subject of the report is the extent to which the state is obliged to comply with certain norms by virtue of its participation as a party to an international treaty. The research question that arises is to what extent it is possible to revise an existing international treaty if it is required by the circumstances or the interests of one of the parties. In this regard, international legal theory seeks a balance between two tendencies. The first trend is summarized by the maxim 'pacta sunt servanda', which justifies the sclerosing of conventional law. The second trend is the opposite and is motivated by the doctrine of 'rebus sic stantibus', according to which any international convention must be signed only with a general reservation, according to which the treaty is bound by the relevant state of affairs; therefore, once this situation changes, the contract itself must be changed as necessary.*

Keywords: *international Treaty, Fundamental Change of Circumstances, Pacta Sunt Servanda, Rebus sic Stantibus*

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FRI-ONLINE-1-LS-02

BASIC ISSUES OF FORENSIC PSYCHIATRIC EXAMINATION IN A CHILD DISPUTE

Assoc. Prof. Elitsa Kumanova, PhD

Department of Public Law, Faculty of Law,
University of Ruse, Bulgaria
E-mail: ekumanova@uni-ruse.bg

Assoc. Prof. Nikolina Angelova, PhD

Department of HealthCare, Faculty of Public Health and Health Care,
University of Ruse, Bulgaria
E-mail: nikolinaangelova@abv.bg

Abstract: *The article discusses the main guidelines for achieving safety in children and how this can be investigated the course of forensic psychiatric examination. The top child-parent relations, which can be observed in the course of the expert assessment, as well as the most frequently asked questions when appointing forensic psychiatric examinations are also considered.*

Keywords: *children, child-parent relations, forensic psychiatric examination*

FRI-ONLINE-1-LS-03

THE ESSENCE OF THE CONCEPT OF SOVEREIGNTY ACCORDING TO GEORG JELLINEK

Assist. Prof. Ivelin Velchev, PhD

Department of Public Law, Faculty of Law
University of Ruse, Bulgaria
Tel.: 0889 261 356
E-mail: ivelchev@uni-ruse.bg

Abstract: *Sovereignty has historically emerged as a political understanding and reflection of the actual regularity in the development of society, which regularity subsequently acquires a legal dimension.*

According to Jellinek, in antiquity it was not possible to fully understand sovereignty due to the absence of "opposites between state power and other authorities." the state must win its right to exist from the church, the Roman Empire and the large feudal lords. It is in this struggle that Jellinek sees the birth of sovereignty.

Keywords: *State, Sovereignty, Church, Monarch*

RESTRICTION OF FUNDAMENTAL RIGHTS IN THE CONTEXT OF A STATE OF EMERGENCY. GENERAL THEORETICAL ASPECTS.

Assist. Prof., Doroteya Dimova-Severinova, PhD

Department of Public Law, Faculty of Law

University of Ruse, Bulgaria

Tel.: 00359888795885

E-mail: ddimova@uni-ruse.bg

Abstract: In modern society, the basic right of the citizens are constitutionally established. The Supreme law of the Republic of Bulgaria allows temporary restriction on the execution of certain rights in the event of a state of emergency. on 13.03.2020, with resolution of the Bulgarian parliament a state of emergency has been declared on the territory of the Republic of Bulgaria, and with the same resolution the Council of Ministers has been assigned to take all the necessary measures in connection with the management of the emergency situation related to Covid-19 pandemic. Some of the imposed measures temporarily restricted the execution of certain rights of the citizens, which led to a sharp reaction from the society.

This new and unusual situation has raised among the society many debatable questions – subject of analysis of the present report: for the purposes of the imposed measures, for their validity, legitimacy and correctness, for the priorities of the values – both public and personal.

Keywords: state of emergency, restriction in execution of fundamental rights, measures, validity, legitimacy, purposes

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FRI-ONLINE-1-LS-05

TIME MEASURING IN LEGAL DISCOURSE

Yordan Yordanov, PhD Student

Department of Public Law, Faculty of Law

University of Ruse, Bulgaria

Tel.:082 888 434

E-mail: yyordanov @uni-ruse.bg

Abstract: *The category of time is a fundamental scientific category applied in all natural and social scientific studies. The revelation of its philosophical nuance contributes to the implementation of time in the discourse legal orders and the discourse legal positions.*

Keywords: *time, legal discourse, legal positions*

FRI-ONLINE-1-LS-06

REASONS FOR THE TERMINATION OF MAYORS' PREROGATIVES IN THE CONTEXT OF DECISION NUMBER 13 OF THE CONSTITUTIONAL COURT FROM 2020

Assoc. Prof. Zornitsa Yordanova, PhD

Department of Public Law, Faculty of Law,

University of Ruse, Bulgaria

Phone: 082 888-758

E-mail: ziordanova@uni-ruse.bg

Abstract: *In the paper the author analyses the grounds for the pro-term expiration of powers of mayors (of municipalities, quarters and mayoralties) according to the Local Self-government and Local Administration Act. Special emphasis is put on the latest decision of the Constitutional court of the Republic of Bulgaria which concerns one of the reasons for the termination of mayors' prerogatives – failure to comply with the obligations under Article 41, Paragraph 3 of the above-mentioned law in cases of initial incompatibility of the mayor's office with some private activities and positions. The author supports the decision of the Court and makes some conclusions about the legislation concerning the expiration of powers of mayors.*

Keywords: *Constitutional court, termination of prerogatives, mayors, incompatibility*

JEL Codes: *D 73, H 70*

ENSURING THE TRUTH IN THE ADMINISTRATIVE-CRIMINAL PROCEDURE

Assist. Prof. Dilyana Kalinova, PhD

Department of Public Law, Faculty of Law

University of Ruse, Bulgaria

E-mail: dkivanova@uni-ruse.bg

Abstract: Administrative-criminal procedures are part of administrative procedures. The administrative-criminal procedures are set of proceedings relevant to the implementation of administrative-criminal liability – for example, establishing an administrative violation and imposing an administrative penalty; appealings procedures of penal decrees; execution of administrative penalties. Ensuring the truth is directly relevant to the first two phases of the process. Each administrative penalty is imposed for an actually committed violation and in case of an indisputably established violator. These facts must be proved beyond doubt. Proof is also important at appealing procedures of penal decrees. All this determines the ensuring of the truth in the administrative-criminal procedures.

Keywords: Penal decree, Administrative punishment, Administrative violation, Administrative-criminal process, Proof, Due proof, Truth

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FRI-ONLINE-1-LS-08

FEATURES OF THE RESUMPTION OF ADMINISTRATIVE PROCEEDINGS AS AN EXTRAORDINARY CONTROL METHOD IN THE ADMINISTRATIVE PROCEEDINGS

Mariela Dimitrova Velikova, PhD Student

Department of Public Law, Faculty of Law

University of Ruse, Bulgaria

Phone: 0897475167

E-mail: mvelikova@uni-ruse.bg

Abstract: *The present study examines the features of the resumption of administrative proceedings as an extraordinary control method with its own appearance and place in the general system of the administrative procedures. The scope of this institute is limited, thus, to 'reopen' a proceeding means to revoke or modify the issued act by the immediately superior administrative authority. for this purpose, the resumption of proceedings is comprehensively studied as an exceptional and strictly formal procedure, related to precisely defined deadlines, special grounds or prerequisites for its implementation, legal and technical means for its initiation, limited range of decision-making bodies.*

In an attempt to clarify the significant meaning of this extraordinary control method, the report pays attention to its general purpose - the protection of citizens' rights. The study reveals the ultimate goal of the renewal of the administrative proceeding which is not to annul or amend the issued act, but to annul the proceedings itself on the basis of which a vicious administrative act was issued, and in a new, resumed proceeding to create a new act which is free from defects.

In conclusion, there is a comparative analysis according to the main features of the resumption of administrative proceedings under the Code of Administrative Procedures and Administrative offences and Penalties Act.

Keywords: *administrative proceedings, extraordinary control method, resumption, reopening, renewal.*

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FRI-ONLINE-1-LS-09

ELECTRONIC ADMINISTRATIVE SERVICES BY PRESENTING E-GOVERNMENT ACTS IN THE REPUBLIC OF KOREA AND THE REPUBLIC OF BULGARIA ⁶

Anelia Tsvetanova-Mincheva, PhD Student

Department of Public Law, Faculty of Law

Sofia University "St. Kliment Ohridski"

E-mail: anelia.tzvetanova@gmail.com

Abstract: *The paper reviews electronic administrative services by presenting e-government acts in the Republic of Korea and the Republic of Bulgaria. Special attention was paid to the legal definition of electronic administrative services and e-government. The paper reviews the existing way of providing these services in the form of portal, which is regulated in e-government acts. Emphasis is placed on the differences between the two countries in terms of defining the different types of electronic administrative services and the way they are provided. The purpose was to research good practices and their possible applicability.*

Keywords: *electronic government, e-government act, electronic administrative services, electronic government service.*

⁶ Докладът е представен за заключителната студентска сесия на 59-та научна Конференция на Русенски университет „Ангел Кънчев“ и Съюз на учените – Русе „Нови индустрии, дигитална икономика, общество – проекции на бъдещето III“ с оригинално заглавие на български език: Електроните административни услуги през призмата на Законите за електронно управление в Република Корея и Република България.

FRI-ONLINE-1-LS-10

THE CONCEPT OF “AGGRESSIVE TAX PLANNING” AND EU ANTI TAX AVOIDANCE PACKAGE

Assist. prof. Elina Marinova, PhD

Department of Public Law, Faculty of Law

University of Ruse, Bulgaria

E-mail: elina_marinova@uni-ruse.bg

Abstract: *The paper analyzes aggressive tax planning as undesirable practice of tax payers and offers a theoretical understanding of this phenomenon, compared with the concepts of tax abuse and tax avoidance. Aggressive tax planning is often seen as a form of tax avoidance that complies with the letter but not the spirit of the law. More precisely, aggressive tax planning goes between rules of law and not beyond the boundaries set by rules. It consists of schemes that reduce the amount of tax due to a level below the one intended by legislator for such income and has to be considered as noncompliance, but not as unlawful. The comprehensive EU package of both legislative and non-legislative measures aimed to effectively tackling tax avoidance issues is considered. The need for clarity and reliability of the anti tax avoidance rules is noted, in order to keep the balance between the need for jurisdictions to enforce their tax rules and the taxpayer's right to have certainty in the tax rules.*

Keywords: aggressive tax planning, tax avoidance, tax abuse, EU, anti tax avoidance rules

FRI-ONLINE-1-LS-11

HARMFUL TAX COMPETITION AS TOPICAL ISSUE OF EU TAX POLICY

Assist. prof. Elina Marinova, PhD

Department of Public Law, Faculty of Law

University of Ruse, Bulgaria

E-mail: elina_marinova@uni-ruse.bg

Abstract: *The harmful tax competition as a source of conflicts between the states has been for years one of the important topics of EU tax policy. The paper deals with the problems of this abusive practice and related countermeasures under EU legal system, needed in order to reduce distortions to the Single Market, to prevent significant losses of tax revenue and to contribute to fairness in distribution of the tax burden. It reveals the notion of harmful tax competition, its nature as a precondition for limiting national tax sovereignty through coordinated action at the European level and the key importance of a systemic and consistent legal framework on this issue, within the states can exercise their taxing sovereignty effectively and contribute to “good governance” in the tax area.*

Keywords: harmful tax competition, tax avoidance, good governance, EU, Code of Conduct for business taxation

LEGAL, ECONOMIC AND SOCIAL EFFECT OF REDUCED VAT RATE IN BULGARIA

Assist. Prof. Vanya Panteleeva, PhD

Department of Public Law, Faculty of Law

University of Ruse, Bulgaria

Tel.: +359 887 412 662

E-mail: vpanteleeva@uni-ruse.bg

Abstract: *The paper reviews legal, economic and social effect of the reduced VAT rate for certain goods and services in Bulgaria as a measure during COVID- 19 pandemic. The VAT rate reduction applies from 01 July 2020 to 31 December 2021. At first glance the reduction of the VAT rate for specific goods / services, seems to be with relatively limited effect, in fact it is a change in the whole philosophy of the tax system in the country. The effect of this reduction on the market, consumption and prices is unclear. The report analyzes how this reduction effects on the tax system, economic and social life.*

Keywords: tax, VAT, COVID-19, tax system, social system, economics

JEL Codes: K10, K34

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FRI-ONLINE-1-LS-13

SCOPE OF THE TERM „PUBLIC ENTERPRISE“ UNDER THE PUBLIC ENTERPRISES ACT

Assist. Prof. Anastas Georgiev, PhD

Department of Civil Law, Law Faculty,

Univesity of Ruse, Bulgaria

Phone: +35982888746

E-mail: ageorgiev@uni-ruse.bg

Abstract: The term “public enterprise” includes several types of traders: in the first place: commercial companies with more than 50 percent state / municipal participation in the capital, or in which the state / municipality otherwise exercises a dominant influence; secondly: the subsidiaries of the commercial companies with over 50 per cent state / municipal participation in the capital and the state enterprises, established by special laws on the grounds of art. 62, para 3 of the Commercial Law, if through them the state / the municipality controls more than 50 per cent of the voting shares or otherwise exercises control and, thirdly: the state enterprises, established by special laws on the grounds of art. 62, para 3 of the Commercial Law.

Keywords: Reform of state-owned enterprises; state-owned enterprises; public enterprises; commercial companies with more than 50 percent state / municipal participation in the capital; dominant influence; the subsidiaries of the commercial companies with over 50 per cent state / municipal participation in the capital and the state enterprises, established by special laws on the grounds of art. 62, para 3 of the Commercial Law; the state enterprises, established by special laws on the grounds of art. 62, para 3 of the Commercial Law; Organization for Economic Cooperation and Development (OECD); Guidelines on Corporate Governance of State-Owned Enterprises, edition 2015, Law on Public Enterprises of 2019.

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FRI-ONLINE-1-LS-14

LEGAL REGULATION OF PUBLIC ENTERPRISES IN BULGARIA - GENERAL CHARACTERISTICS

Assist. Prof. Anastas Georgiev, PhD

Department of Civil Law, Law Faculty,

Univesity of Ruse, Bulgaria

Phone: +35982888746

E-mail: ageorgiev@uni-ruse.bg

Abstract: *The reform of state-owned enterprises is motivated by Bulgaria's ambition to join the European Monetary Mechanism ERM-II and the Banking Union. to achieve these goals, Bulgaria is committed to fulfilling a number of commitments in the relevant policy areas, incl. improve the governance of state-owned enterprises by reviewing and aligning national legislation with the Organisation for Economic Cooperation and Development (OECD) Guidelines on Corporate Governance of State-Owned Enterprises, edition 2015. with the adoption of the new Law on Public Enterprises of 2019, an important step is being taken towards bringing the practices of exercising the rights of the state in public enterprises in line with the standards of the OECD Guidelines. Bulgaria is officially recognized by the OECD as a country implementing the OECD Guidelines, as it implements the priority recommendations in an appropriate manner.*

Keywords: *Reform of state-owned enterprises, Organisation for Economic Cooperation and Development (OECD Guidelines on Corporate Governance of State-Owned Enterprises, edition 2015, Law on Public Enterprises of 2019.*

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Doklad za tsyalostna predvaritelna otsenka na vŭzdeĭstviето na proekt na Zakon za publichnite predpriyatiya (**Оригинално заглавие:** *Доклад за цялостна предварителна оценка на въздействието на проект на закон за публичните предприятия*).

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<http://www.strategy.bg/PublicConsultations/View.aspx?lang=bg-BG&Id=4354>

FRI-ONLINE-1-LS-15

THE CONTRACT OF AGENCY

Assist. Prof. Anna Nikolova, PhD

Department of Private Law, Faculty of Law

University of Ruse, Bulgaria

E-mail: anikolova@uni-ruse.bg

Abstract: Among shipping services, the contract of agency is of great importance. In practice, the shipping agent is the one, who carries out all the accompanying activities in the area of a particular port. The legal framework for contract of agency is contained in Chapter IX, Section I of the Merchant Shipping Code. The report, by analyzing the rights and obligations of the parties, distinguishes the figure of ship agent from shipbroker and ship manager.

Keywords: agency contract, ship agent, ship management, ship broker.

JEL Codes: L10, L11

FRI-ONLINE-1-LS-16

PROBLEMS OF THE CONTENT OF THE AGREEMENT FOR DIVORCE BY MUTUAL CONSENT

Assist. Prof. Ventsislav L. Petrov, PhD

Department of Civil law studies, Faculty of Law

Sofia University, Bulgaria

E-mail: vencislav.petrov@yahoo.com

Abstract: The article researches the issues, which must be compulsory included in the agreement for divorce by mutual consent. The author thesis is that some of them must be excluded from this compulsory content. The article reviews also which other issues can be arranged in the agreement by the spouses. The thesis for expansion of the range of this facultative content of the agreement is defended.

Keywords: Divorce, divorce by mutual consent, divorce agreement, matrimonial residence, spouse maintenance

JEL Codes:

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FRI-ONLINE-1-LS-17

THE PROPRIETARY PROTECTION UNDER FRENCH AND GERMAN LAW

Assist. Prof. Sergey Kalinkov, PhD

Department of Civil Law, Law Faculty

University of Ruse, Bulgaria

E-mail: skalinkov@uni-ruse.bg

Abstract: Possession (possessory) protection occupies an important place in many modern legal systems. This legal institution protects the factual situation under the protection of the law against unlawful encroachments, regardless of whether it is based on subjective property law. The purpose of this report is, based on the analysis of the legislative approaches adopted in France and Germany, to highlight those positive points that could be adopted in the current Bulgarian property law in order to improve the regulation of possessory protection.

Keywords: possession, possession, protection, prohibited self-government

FRI-ONLINE-1-LS-18

RESPONSIBILITY OF THE CONSUMER FOR INCORRECT HANDLING OF GOODS AND REFUSAL TO PROVIDE SERVICES UNDER THE DISTANCE CONTRACT UNDER THE CONSUMER PROTECTION ACT

Ioana Kaneva, PhD Student

Department of Civil Law, Law Faculty,

Univesity of Ruse, Bulgaria

Phone: +359889995698

E-mail: ykaneva@uni-ruse.bg

Abstract: Distance contracts are quickly imposed in modern relations, as they provide a quick and easy way to conclude and execute. in view of consumer protection, the Bulgarian legislator regulates them in Article 45 et seq. of the Consumer Protection Act. The distance contract is a contract concluded between a trader and a consumer as part of an organized system of distance selling or providing services at distance without the simultaneous physical presence of the trader and the consumer, through the exclusive use of one or more means of communication until the contract is concluded, including the time of concluding the contract. (Art. 45 of the CPA). One of the basic rights of the consumer, which follows from the nature of the distance contract, is the right of withdrawal. However, its exercise raises certain practical issues related to the consumer's liability for improper handling of goods and refusal to provide services. These issues are the subject of this report.

Keywords: distance contract; right of withdrawal; user responsibility.

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COURT PROCEEDINGS FOR REMOVAL OF A CHILD FROM HIS BIOLOGICAL FAMILY

Denitsa Petrova, PhD Student

Department of Civil Law, Faculty of Law

University of Ruse, Bulgaria

Lawyer in the Ruse Bar Association

E-mail: dpetrova@uni-ruse.bg

Abstract: *The procedure for removing a child from his biological family is complex and one of the most common in practice. The regulation, although short, is very vague and this leads to significant difficulties in law enforcement. There are great differences in the different jurisdictions regarding the nature of the proceedings and the parties involved. These fluctuations in practice are undesirable, as they jeopardize not only the rights of the child, but also those of his parents, who, in addition to the obligation to raise the child, have the right to privacy and family life without unnecessary state intervention.*

Keywords: *child protection; removal of a child from his biological family; parental rights*

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FRI-ONLINE-1-LS-20

LEGAL ASPECTS OF THE SOCIAL AND SOLIDARITY ECONOMY

Plamen Petkov, PhD Student

Department of Civil Law, Faculty of Law

University of Ruse Bulgaria

E-mail: pvpetkov@uni-ruse.bg

Abstract: Limited partnership with shares is an independent type of commercial company, which combines elements of the ordinary (simple) limited partnership and the joint stock company. According to its legislation, KDA is closer to AD, which follows from Art. 253, para 2 of the Commercial Law. According to this provision for ADC, the provisions for AD apply accordingly, as there is no special regulation of ADC. This appendix (in many cases even directly and not accordingly) refers primarily to the capital of KDA and its share structure to which it is allocated.

Keywords: Commercial Law, commercial company, limited liability

FRI-ONLINE-1-LS-21

CAPITAL OF A LIMITED LIABILITY COMPANY WITH SHARES

Mihail Milanov, PhD Student

Department of Civil Law, Faculty of Law

University of Ruse Bulgaria

E-mail: misho.milanov@gmail.com

Abstract: Limited partnership with shares is an independent type of commercial company, which combines elements of the ordinary (simple) limited partnership and the joint stock company. According to its legislation, KDA is closer to AD, which follows from Art. 253, para 2 of the Commercial Law. According to this provision for ADC, the provisions for AD apply accordingly, as there is no special regulation of ADC. This appendix (in many cases even directly and not accordingly) refers primarily to the capital of KDA and its share structure to which it is allocated.

Keywords: Commercial Law, commercial company, limited liability

LEGAL AND AGREED REDUNDANCY SELECTION CRITERIA

Assist. Prof. Maria Radeva, PhD

Department of Public Law, Faculty of Law

University of Ruse, Bulgaria

Phone: 0887 299 552

E-mail: mradeva@uni-ruse.bg

Abstract: According to the Labour Code, in certain cases of termination of the employment contract, the employer has the right to make a selection in order to determinate which workers stay employed and who should be dismissed.

In case of multiple identical posts and employment functions, the Court accepts that the employer must inevitably make a selection.

The selection criteria are indicated in Art. 329 of the Labour Code- which of the workers has a higher qualification and who performs better at work. Beyond the regulated criteria, it is possible that to collective agreement, further criteria to be negotiated, which become mandatory for the employer.

The agreed criteria can be - performance appraisal, work experience, marital status, health status, acquired right to pension, pending retirement

Keywords: Labour Code, redundancy selection criteria, collective agreement

JEL Codes: K31

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FRI-ONLINE-1-LS-23

ON CERTAIN SPECIFICS OF THE PROVISIONS OF THE HEALTH AND SAFETY AT WORK ACT IN THE LIGHT OF DIRECTIVE / 89/391 / EEC

Mariyana Shirvanyan, PhD Student

Department of Civil Law, Faculty of Law

University of Ruse, Bulgaria

E-mail: irgo@abv.bg

Abstract: *The development analyzes according to their common legal aspects the provisions of the Health and Safety at Work Act in the light of the need to transpose a Council Directive of 12 June 1989, on the introduction of measures to encourage improvements in the safety and health of workers at work (89/391 / EEC). Aspects of their comparative study relate the general principles of the Directive and their respective reciprocal rules in national law. Emphasis is placed on the redefinition of the concept of "employer" following the transposition of the Directive and the related issues in the investigation and reporting of accidents at work.*

Keywords: *Directive / 89/391 / EEC, employer; accidents at work*

FRI-ONLINE-1-LS-24

PROBLEMS IN IMPOSING DISCIPLINARY SANCTIONS ON A WORKER UNDER 18 YEARS OF AGE

Vladimir Danev, PhD Student

Department of Civil Law, Faculty of Law

University of Ruse, Bulgaria

E-mail: lawyer.danev@abv.bg

Abstract: *The report will discuss the institute of disciplinary action against workers under the age of 18. Based on the analysis of labor law norms, norms related to the institute of legal capacity as well as the existing legal doctrine and practice in their application, current problems will be brought out and tendencies will be identified. Proposals will be made for the improvement of the Bulgarian legislation in the field of the above-studied institute..*

Keywords: *disciplinary sanctions, labor law*

FRI-ONLINE-1-NS

FRI-ONLINE-1-NS-01

THE CONSTITUTIONAL DEBATE IN BULGARIA 1956 - 1971 - MAIN STAGES

Prof. Nikolay Prodanov, DSc

Department of Criminal Law and Security, Faculty of Law

University of Ruse, Bulgaria

E-mail: n_prodanov@abv.bg

Abstract: Practically unknown fact from the recent history of Bulgaria is that in the period from the April Plenum of the Central Committee of the Bulgarian Communist Party in 1956 to the adoption of the Constitution of the People's Republic of Bulgaria in 1971 there is an almost continuous debate on the content of the basic law. The debate is not public, it is closed in close political and expert circles. The process is gradual, developing in three phases. In the spring and summer of 1956, an attempt was made to make partial changes to the 1947 constitution. In the period 1958-1961, a major "revision" of the constitution was made, and from individual statements by active participants in this process it became clear that in fact, the idea is to create a new basic law in practice. In the years 1968-1971, a new Constitution was purposefully created.

Keywords: Constitution, constitutional debate

FRI-ONLINE-1-NS-02

**CHANGES IN THE INTERNATIONAL ENVIRONMENT
AND NEW SECURITY THREATS**

Assoc. Prof. Kremena Rayanova, PhD

Department of Criminal Law and Security, Faculty of Law

University of Ruse, Bulgaria

Tel.: +359 82 888 736

E-mail: krayanova@uni-ruse.bg

Abstract: The main factor influencing world politics in the late twentieth - early twenty-first century is globalization. Without taking into account the nature, causes, main forms and possible consequences for the global system, the analysis of current global and security policies will be incomplete. First of all, it is necessary to analyze the definition of globalization. Despite the widespread use of the term "globalization", there is a lack of consensus among representatives of different scientific fields regarding the very phenomenon of globalization. Defining globalization as a long-term process implies a transition to a certain global state of the world - a state in which interconnected networks make traditional borders less significant..

Keywords: security threats, environment

FRI-ONLINE-1-NS-03

**BETWEEN REAL AND VIRTUAL LIFE OR INTERNET AND COMPUTER
ADDICTION**

Assoc. Prof. Elitsa Kumanova, PhD

Department of Public Law, Faculty of Law,

University of Ruse, Bulgaria

E-mail: ekumanova@uni-ruse.bg

Assoc. Prof. Nikolina Angelova, PhD

Department of HealthCare, Faculty of Public Health and Health Care,

University of Ruse, Bulgaria

E-mail: nikolinaangelova@abv.bg

Abstract: Internet addiction, computer addiction and the possibility of creating a game addiction, shopping mania, gambling addiction in the Internet environment are considered. According to the WHO, Internet addiction occurs in 2 to 10% of people who use the internet. Social networks are also a resource for fraudsters, can be used as a political tool and have a great impact on personal life.

Keywords: computer addiction, Internet addiction, social networks

FRI-ONLINE-1-NS-04

**LEGITIMATE ACTIONS OF THE BODIES OF THE MINISTRY OF
INTERIOR IN CASE OF MASS VIOLATION OF PUBLIC ORDER**

Assoc. Prof. Milen Ivanov, DSc

Department of Criminal Law and Security, Faculty of Law

University of Ruse, Bulgaria

E-mail: mivanov@uni-ruse.bg

Abstract: The report addresses issues related to the rules for wearing uniforms and the use of force and aids by MoI officials. The legal regulation of the activity and actions of the employees in case of violation of the public order is analyzed. Conclusions have been made about the adequacy of the legislation and its application by police officers and about defined recommendations that would lead to the elimination of shortcomings in the main regulatory documents or in the activities of the Ministry of interior.

Keywords: Ministry of interior, MoI officials. police officers

FRI-ONLINE-1-NS-05

FUNCTIONAL CHARACTERISTIC OF THE PUNISHMENT

Assist. Prof. Svetlin Antonov, PhD

Department of Criminal Law and Security, Faculty of Law

University of Ruse, Bulgaria

Tel.: +359 82888729

E-mail: spantonov@uni-ruse.bg

Abstract: *The present report reviews the punishment as public phenomenon. Its functional characteristic ventures outside the punishment's purely juridical being and holds it accountable for its special social role. This matter is not widely reviewed in the theory of criminal law, which causes further need to develop it by including the punishment's philosophical and social aspects. The report develops and analyses the four main functions of the punishment - juridical, social, ethical and psychological. The report also summarises the development of the functional essence of the punishment and compares it to the positions, maintained by the Western European criminal law theory.*

Keywords: *Crime, punishment, functions, tasks, goals, results*

FRI-ONLINE-1-NS-06

PROCEDURAL AND TACTICAL FEATURES OF THE INTERVIEW OF WOMEN VICTIMS OF DOMESTIC VIOLENCE

Assist. Prof. Nevena Ruseva, PhD

Department of Criminal Law and Security, Faculty of Law

University of Ruse Bulgaria

Tel.: +359889623456

E-mail: nruseva@uni-ruse.bg

Plamen Parvanov, PhD Student

Department of Criminal Law and Security, Faculty of Law

University of Ruse, Bulgaria

Tel.: +359888521282

E-mail: pppenchew@uni-ruse.bg

Desislava Petrova-Lyoleva, MEng.

Academy of Ministry of Interior, Sofia, Bulgaria, PhD Student

Tel.: +359888435235

E-mail: desviktorova@gmail.com

Abstract: *The purpose of this report is to address the issues related to the need to apply an individual approach to procedural actions and in particular - interviewing as a witness women victims of domestic violence, in its various forms and manifestations provided for in the Penal Code. At the end of present paper, the need for training on the topic in the initial and subsequent police training is described.*

Keywords: *crime, interrogation, evidence, victim, domestic violence, police education*

JEL Codes: *K410, K420*

THE PROTECTIVE ACT UNDER ART. 13 OF THE CRIMINAL CODE OF THE REPUBLIC OF BULGARIA - SOME PROBLEM ASPECTS

Lyuboslav Lyubenov, PhD

Department of Criminal Law and Security, Faculty of Law

University of Ruse Bulgaria

Tel.: +359 883417447

E-mail: lvlyubenov@uni-ruse.bg

Abstract: This publication does not aim to analyze in depth and comprehensively the institute of situation of emergency, this also refers to the protective act as part of its legal composition. The subject of consideration is limited and includes only those features and regularities of the protective act, which are related to certain legislative and theoretical ambiguities, problematizing its legal significance and useful effect. In this sense, in the report are carefully discussed the issues of: the conditions under which the protective act can be committed; the legal nature of the protective act; the circumstances excluding the saving nature of the act, as well as the criminal and civil consequences of the commission of the protective act. In the concluding part of the report some recommendations were made to the Bulgarian legislator for improvement of the legal framework concerning the application of the situation of emergency.

Keywords: criminal law, criminal proceedings, situation of emergency, protective act, damages, not dangerous to society

JEL Codes: K410, K420

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FRI-ONLINE-1-NS-08

"TWO OR MORE PERSONS" IN CRIMINAL LAW

Assist. Nikolay Nikolov

Department of Criminal Law and Security, Faculty of Law

University of Ruse, Bulgaria

Tel. +359 888 736565

E-mail: nalnikolov@uni-ruse.bg

Abstract: The article reviews the use, understanding and application of the term "two or more persons" in Criminal Law. The difference in the interpretation of the term when it refers to the perpetrators of the crime and the victims of the crime is pointed out and substantiated. It is argued that this difference is expressed in the different, broader understanding of the term from the definition given in Art. 93 item 12 of the Penal Code, as the evidence for this is related both to its terminological interpretation and to the spirit and letter of the law, as well as to the achievement of the measure of justice.

Keywords: "two or more persons", justice, perpetrators, victims

JEL Codes: K410, K420

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FRI-ONLINE-1-NS-09

A WAY TO RECEIVE RIGHTS THROUGH CRIMINAL BEHAVIOR- SOME PROBLEMS WITH THE EMBEZZLEMENT IN BULGARIAN PENALTY ODE

Ivan Ivanov, PhD

Tel.: +359 889 443 918

E-mail: ivanov_pravo@abv.bg

Abstract: *The summary gives information about a contemporary problem – the regulations of the national penalty code nowadays actually gives an option to legal manipulation and receiving indemnity in a large amount, because the phrasing of the articles and the procedure they prescribe are imperfect – the offender is given the right to repay the damages, caused by his unlawful actions, till the end of the judicial inquiry. in some cases when done, it transform legally the crime into an administrative conduct, punishable by an administrative fee and directly giving the former offender the right to receive a money-compensation. This problem could be easily resolved by a minor law-change.*

Keywords: *Embezzlement, compensation, crime, conduct, offender, damage, judicial inquiry.*

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FRI-ONLINE-1-NS-10

HISTORICAL OVERVIEW OF CORRUPTION IN EUROPE

Svetlana Ognyanova, PhD Student

Department of Public Law, Faculty of Law,

University of Ruse, Bulgaria

Tel.: +359878598116

E-mail: svetlanaognianova@abv.bg

Abstract: *The report reviews historical sources that cite corruption as a social phenomenon. The author emphasizes the European sources, and in particular the Bulgarian ones. The report recreates a historical ray, presenting the evolution of corruption from the Middle Ages to our modern society*

Keywords: , corruption, historical aspects, social phenomenon

FRI-ONLINE-1-HP

FRI-ONLINE-1-HP-01

**GUIDELINES FOR PREPARATION OF KINESITHERAPEUTIC
PROGRAMS ON A GIVEN CASE (CLINICAL CASE)**

Assoc. Prof. Irina Karaganova, PhD

Department of Public Health and Social Work,,

University of Ruse

E-mail: ikaraganova@uni-ruse.bg

Assoc. Prof. Stefka Mindova, PhD

Department of Public Health and Social Work,,

University of Ruse

E-mail: smindova@uni-ruse.bg

Abstract: *The use of ready-made kinesitherapy programs in the process of kinesitherapy is a common but incorrect practice. It is not uncommon to see ready-made kinesitherapy programs for patients with various diseases and injuries. In fact, are these programs appropriate for each patient or individual clinical case? The answer, of course, is NO! Kinesitherapy program is a methodically justified and applied system of means of kinesitherapy in the form of methods, techniques, poses, procedures according to the clinical and functional condition of patients in order to prevent, restore and maintain their health. Ready-made programs in kinesitherapy and the studied specialized literature should be the basis of our approach to the patient, but they should be adjusted on the basis of the individual approach to each individual case. Every individual case should be considered in detail, a full functional investigation should be carried out, to determine the specific objectives and tasks, to find the most suitable way of impact, to select the most suitable means and loads to achieve a full and effective recovery!*

The report was developed under a project of the Research Fund of the University of Ruse "Development and testing of a comprehensive approach for functional research and recovery in degenerative joint diseases."

Keywords: *Kinesiterapeutic programs, Clinical case, individual, Functional investigation, Kinesitherapy*

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PROFILE OF PATIENTS WITH ERECTILE DYSFUNCTION IN OUTPATIENT PRACTICE

Assist. Prof. Petar Antonov, MD, PhD

Department of Urology and General Medicine,

Medical University Plovdiv, Bulgaria

Tel.: +359 877 665907

E-mail: petar.antonov@mu-plovdiv.bg

Abstract: *Erectile dysfunction occurs in all age groups, with younger users seeking medical attention more actively. In the small number of adult users in the current study, there is likely to be a prevailing "taboo" on male sexuality among patients over a certain age. This dysfunction is caused by multifactorial etiological influences, as predominant in the case of psychogenic factors, such as anxiety, work under stress and problems in the internal connection. The majority of patients are self-directed at the beginning of the search for help, as the number of those who join self-medication is relatively high.*

Keywords: *erectile dysfunction, office patients with erectile dysfunction*

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FRI-ONLINE-1-HP-03

ANKLE FRACTURES WITH SYNDESMAL INJURY

Assoc. Prof. Yordan andonov, MD, PhD

Department of Public Health and Social Work,,

University of Ruse

Phone:+359888677772

E-mail: andonov@doctor.bg

Rumen Churov, MD

UMBAL Kanev AD

Department of traumatology and orthopedics

E-mail: rumchurovmd@gmail.com

Abstract: Ankle fractures are intrarticular. Isolated fibular fractures are most common (68%). Fractures of both malleoli represent 25% and of the three malleoli 7% of all. When the tibio-fibular syndesmosis is involved there is an increased risk of posttraumatic arthrosis, so special attention is needed. We present our experience in the treatment of this pathology, try to analyze our mistakes and we propose diagnostic and treatment algorithm to reduce them.

The report was developed under a project of the Research Fund of the University of Ruse "Development and testing of a comprehensive approach for functional research and recovery in degenerative joint diseases."

Keywords: Ankle fractures, syndesmosis laesion, treatment algorithm

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APPLICATION OF ANTIBIOTIC-LOADED IMPLANTS FOR THE TREATMENT OF POST-TRAUMATIC OSTEOMYELITIS

Assoc. Prof. Yordan andonov, MD, PhD

Department of Public Health and Social Work

University of Ruse

Phone:+359888677772

E-mail: andonov@doctor.bg

Rumen Churov, MD

UMBAL Kanev AD

Department of traumatology and orthopedics

E-mail: rumchurovmd@gmail.com

Abstract: *The posttraumatic osteomyelitis is one of the worst fracture complications. There a various causes for the chronification of the infection. The major one being the presence of encapsulated bacteria within poorly oxidised regions of the bone. The extensile debridement is the first and most important treatment step. The inevitable result is a bone and soft tissue defect of various size that can create mechanical instability and may lead to recurrent infection. The application of a antibiotic laden implants restores mechanical stability and fills the void thus controlling the infection. We present the results of such treatment of 12 posttraumatic infections for a period of 15 years. We try to clarify the indications and the limitations of the method.*

The report was developed under a project of the Research Fund of the University of Ruse "Development and testing of a comprehensive approach for functional research and recovery in degenerative joint diseases."

Keywords: *Posttraumatic osteomyelitis ,antibiotic loaded cement, chronic bone infection*

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FRI-ONLINE-1-HP-05

IMPLICATIONS OF THE POSTURE AND OF THE GRAVITATIONAL FIELD MANAGEMENT IN THE FIBROMYALGIA AND IN ITS SYMPTOMS OF PAIN AND PANIC

Tiziano Pacini, PhD

Sofia, Bulgaria, ul. D. Vatax, 30 -1510
Cell. +359878474304, +393355262723
E-mail: tizianopacini@gmail.com

Elisabetta De Juliis via Mulinaccio,

11 - 50032 Borgo San Lorenzo,
Italia Cell. +393356477583
E-mail: elisadejuliis@gmail.com

Ferdinando Pivetta Viale delle Grazie

5 – 33170 Pordenone (PN)
Cell. +393201428157
E-mail: pivettaferdinando@gmail.com

Abstract: *a 48 years old man who started the treatment with the Biomechanical Anthropometric Ergonomic method 18 months ago, referred pains diffused to the back and neck. The pain caused him panic attacks. The pains have attenuated but not subsided yet, the structural change is very important and it's detectable on the neck radiography.*

Keywords: *Posture, Biomechanical Anthropometric Ergonomic Method, back and neck pain, postural correctors.*

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Tiziano Pacini, Ferdinando Pivetta, Elisabetta de Juliis, Neck's posture: woman 54 years old suffering from Dizziness, Labyrinthitis, Headache, Neck Pain, Shoulder Pain, Carpal Tunnel Syndrome, treated with Biomechanical Anthropometric, University of Ruse, 2013

POSTURAL CORRECTION EXPERIMENT IN A GROUP OF ASYMPTOMATIC PEOPLE AGED BETWEEN 20 AND 60 YEARS OLD WITH THE PURPOSE OF VERIFYING THE FUNCTIONING OF THE SPINUP/P ACCORDING TO THE BIOMECHANIC ANTHROPOMETRIC ERGONOMIC METHOD

Tiziano Pacini, PhD

Sofia, Bulgaria, ul. D. Vatax, 30 -1510
Cell. +359878474304, +393355262723
E-mail: tizianopacini@gmail.com

Elisabetta De Juliis via Mulinaccio,

11 - 50032 Borgo San Lorenzo,
Italia Cell. +393356477583
E-mail: elisadejuliis@gmail.com

Guglielmo Casali

via 4 Novembre, 19 – 25016 Ghedi,
Italia Cell. +393407132987,
E-mail: gg.casali@gmail.com

Abstract: *a 48 years old man who started the treatment with the Biomechanic Anthropometric Ergonomic method 18 months ago, referred pains diffused to the back and neck. The pain caused him panic attacks. The pains have attenuated but not subsided yet, the structural change is very important and it's detectable on the neck radiography.*

Keywords: *Posture, Biomechanic Anthropometric Ergonomic Method, back and neck pain, postural correctors.*

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FRI-ONLINE-1-HP-07

RESEARCH OF THE QUALITY OF LIFE OF USERS IN CARDIAC SURGERY, CHECKING CARDIOREHABILITATION ONE MONTH AFTER DEHOSPITALIZATION

Chief Assist. Prof. Aleksandar andreev, PhD

Department of Public Health and Social Work,,
University of Ruse
E-mail: aandreev@uni-ruse.bg

Assist. Emiliya Stoykova

Department of Public Health,
Medical University –Varna “ Prof. Dr. Paraskev Stoyanov”,
Cardiosurgery klinik – UMBAL “ SVETA MARINA”
Phone : +35988479246
E-mail: emiliya.stoykova@gmail.com

Abstract: Cardiovascular surgery is one of the most intensively developing areas of modern medicine in the world. The leading reasons for this are the high frequency of these diseases. Cardiovascular diseases lead to physical impairment and reduced quality of life of patients with their direct impact on functional capacity and productivity. Cardiovascular rehabilitation is an integral part of modern cardiovascular surgery. Bulgaria is among the first countries to start developing cardiorehabilitation immediately after launching in Europe. It is important and crucial for the recovery of patients with cardiovascular surgery and interventions such as coronary artery bypass grafting, valve prosthetics, after transplants. Timely initiation, proper dosing, and continuation of outpatient rehabilitation are very important. Cardiac rehabilitation achieves not only prevention, but also improvement of functional capacity, relief of symptoms, reduction of risk factors, assistance in restoring normal activities, psychological support and last but not least, improving the quality of life for patients. The aim of the thesis is to study the quality of life in patients with cardiovascular surgery who undergo cardio-rehabilitation one month after discharge, to include it as a recommended element in their continued treatment in an outpatient setting.

The report was developed under a project of the Research Fund of the University of Ruse "Development and testing of a comprehensive approach for functional research and recovery in degenerative joint diseases."

Keywords: physiotherapy, cardiology, quality of life

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ART THERAPY TO HELP CANCER PATIENTS IN THE REGION OF BURGAS, BULGARIA

Assoc. Prof. Sonya Nencheva, PhD

Department of Rehabilitation and Marine Medicine,

Faculty of Public Health and Health Care,

University "Prof. Dr. Asen Zlatarov" - Burgas

Phone: +359 888 308 818

E-mail: s_nencheva@yahoo.co.uk

Abstract: Diseases of musculoskeletal system and connective tissue often result in damage related to patient disability. They occur in both adult and younger patients. In 2016, the number of people with recognized disability is 56 656 - 9.3 per 1000 population over the age of 16. There are 37 patients, two ambulatory practices in orthopedics, traumatology and rheumatology. Methods used: sociological, documentary and statistical. In the survey, the problem of mobility is a predominant factor – a major problem for self-service. Patients with such a problem are viewed as a burden to the people around them. This determines the great medical and social significance of mobility.

Keywords: occupational therapy, activities of daily life, disability

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ORIGIN OF CHRONIC THORACO-LUMBAR PAIN

Chief Assist. Prof. Yuliana Pashkunova, PhD

Department of Public Health and Social Work,

University of Ruse

Phone: 0889/255301

E-mail: ypashkunova@uni-ruse.bg

Abstract: Chronic pain in human pathology mostly occurs as a result of functional disorders caused by pathological morphological changes. The pain often is not caused by the place where it is located, but by neighboring or distant, connected areas. This is the reason why in most cases the physiotherapeutic procedures are directed mainly to the treatment of chronic morphological changes, without treating the functional disorders, which is a prerequisite for unsustainable results and aggravation of the condition. It is known that patients with chronic pain continue to experience it for a long time even after successfully overcoming the primary cause. Evidence of this theory is the so-called "phenomenon of centralization of pain", which is common in patients with chronic pain of various origins.

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Keywords: chronic pain, functional disorders, physiotherapeutic procedures, patients.

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FRI-ONLINE-1-HP-10

EFFECT OF THE APPLICATION OF MANUAL MOBILIZATIONS AND MOBILIZATIONS WITH MULLIGAN MOVEMENT AFTER SURGICAL TREATMENT OF ACHILLES TENDON RUPTURES

Assoc. Prof. Petya Parashkevova

Department of Public Health and Social Work,,

University of Ruse

Phone: + 359882898619

E-mail: pparashkevova@uni-ruse.bg

Assoc. Prof. Radoslava Deleva

Department of Public Health and Social Work,,

University of Ruse

Phone: + 359878580696

E-mail: rdeleva@uni-ruse.bg

Abstract: *The Achilles tendon is the thickest and strongest tendon in the human body. Traumatic injuries are common in modern traumatology and mainly affect young people of active working age. Trauma is usually associated with a forceful concentric or eccentric contraction of the triceps surae muscle during a sudden start or stop, landing after a rebound, and others. The aim of this report is to show the effect of the application of manual mobilization techniques and mobilizations with Mulligan movement in the postoperative recovery of patients with Achilles tendon rupture.*

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Keywords: *Achilles tendon rupture, mobilization techniques, mobilizations with Mulligan movement*

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FRI-ONLINE-1-HP-11

PHYSIOTHERAPEUTIC ALGORITHM OF PREVENTION IN NECK PAIN SYNDROMES

Assoc. Prof. Radoslava Deleva

Department of Public Health and Social Work,,

University of Ruse

Phone: + 359878580696

E-mail: rdeleva@uni-ruse.bg

Assoc. Prof. Petya Parashkevova

Department of Public Health and Social Work,,

University of Ruse

Phone: + 359882898619

E-mail: pparashkevova@uni-ruse.bg

Abstract: Neck pain is also known as cervicalgia, vertebral cervicocranialgia, cervical myofasciitis (fibrositis), cervical intestinal myofibrosis, cervical fibromyalgia. This can be associated with labels or diagnoses with acute or chronic pain syndromes that appear in the neck or occipital areas and spread to the head. The risk factors for the pathology of the cervical region are diverse - from physical overload, injuries, prolonged static stay in front of the screen, sedentary lifestyle, but the most risk factor remains aging. with age, degeneration occurs in cartilage and bone tissue, which inevitably leads to cervical osteoarthritis, cervical osteochondrosis or cervical spondylosis. Vertebral cervicocranialgia "became younger" and is much more common. Physical therapy is a key method to issue the problem, and it has the greatest effect in a prophylactic regimen. in the present report a multilayered physiotherapeutic algorithm has been developed including: patho-kinesiological analysis, massage, positioning, postural control, manual therapy have proven prophylactic and treatment effect.

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Keywords: cervicocranialgia, cervical osteoarthritis, cervical osteochondrosis, physiotherapy, massage, manual therapy

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BIOMECHANICAL CHANGES IN GAIT IN PATIENTS WITH OSTEOARTHRITIS OF THE HIP

Assoc. Prof. Ivelina Stefanova, PhD

Department of Public Health and Social Work,,

University of Ruse

E-mail: istefanova@uni-ruse.bg

Assoc. Prof. Stefka Mindova, PhD

Department of Public Health and Social Work,,

University of Ruse

E-mail: smindova@uni-ruse.bg

Abstract: Osteoarthritis of the hip joint (coxarthrosis) is characterized by progressive deterioration of joint function. Biomechanical changes occurring in all structures change the patient's gait. a person's gait has strong individual features. The motor habit is automated, and the movements and muscle participation are extremely economical. in healthy people this is not a strenuous motor activity, while in patients with arthrosis of the hip joint it leads to characteristic changes in gait, most often due to an attempt to spare the affected joint. This affects the proper distribution of weight and is often the reason for accelerating the degenerative processes in other joints. Demographic trends for population aging, high frequency and severe and irreversible disability of patients, defines coxarthrosis as a serious medical and social problem both for the country and worldwide. an important place for the prevention of complications of this disease is physical therapy with its specific methods and means of action.

Keywords: Osteoarthritis, Hip, Biomechanics, Physical therapy, Gait analysis.

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IS THERE A PLACE FOR KINESITHERAPY IN THE TREATMENT OF PATIENTS WITH COVID 19?

Chief Assist. Prof. Denitsa Vasileva, PhD

Department of Public Health and Social Work,

University of Ruse

Phone: 0878 25 39 07

E-mail: ddechewa@uni-ruse.bg

Abstract: Covid 19 is a disease affecting patients of all ages, whose clinical primary and most common symptoms are manifested by fever, rhinitis, cough, muscle pain, fatigue and severe manifestations of double bronchial pneumonia, the main problem in severe stages is respiratory failure. There is evidence in the scientific literature of a prophylactic focus of kinesitherapy on the complications of the disease. Also in a number of clinical studies the high efficiency of the application of respiratory kinesitherapy in mild forms of respiratory failure and the initial stages of pneumonia in different age groups of patients has been demonstrated. Respiratory kinesitherapy includes a range of rehabilitation techniques such as breathing exercises, vibration techniques, respiratory muscle training, percussion movements, postural drainage and more.

Keywords: Kinesitherapy, Covid 19, Respiratory kinesitherapy

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FRI-ONLINE-1-SW

FRI-ONLINE-1-SW-01

THE DEVIANT BEHAVIOR AS A BARRIER FOR SUCCESSFUL SOCIAL INCLUSION. SOCIOLOGY THEORIES OF DEVIANT BEHAVIOR

Assist. Prof. Teodorina Milusheva, PhD

Department of Social Work

Faculty of Education

Sofia University “St. Kliment Ohridski”

Tel.: +359 2 9308464

E-mail: teodorina.milusheva@fp.uni-sofia.bg

Abstract: *The paper reviews some issues of the deviant behavior as a barrier for a successful social inclusion. The paper also presents a brief overview of the most popular theories in three different sociological paradigms - structural functionalism, symbolic interactionism, conflict theory. Special attention is paid to the specific functions of deviation, as well the social factors that influence behavioral dysfunctions.*

Keywords: *Deviant behavior, Social inclusion, Sociology, Structural functionalism, Symbolic interactionism, Theory of conflict.*

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SOCIAL WORK IN HOSPITALS – NEEDS AND OPPORTUNITIES

Assist. Prof. Maria Stoykova, PhD

Department of Medico-Social Sciences,
South-West University “Neofit Rilsky”, Bulgaria
Tel.: 0878 748 631
E-mail: m_stoikova@swu.bg

Desislava Encheva, PhD Student

Department of Medico-Social Sciences,
South-West University “Neofit Rilsky”, Bulgaria
Tel.: 0884 255 454
E-mail: dessislava.encheva@gmail.com

Abstract: *The report presents the results of a survey of the attitudes of health and social specialists employed in multiprofile hospitals for active treatment (MPHAT) about the implementation of social work in these institutions. Through structured interviews as a method, 11 persons, representatives (executive directors, managers, social workers) of MPHATs from 7 districts in Bulgaria, were interviewed. The results of the content analysis of the collected data show the perceived need for social work. There are differences in the form of providing integrated care: by hiring a social worker in the hospital; cooperation and collaboration with health services; implemented by the hospital medical staff. The identified advantages of social work in the hospitals are related to: economic results for the medical facility; protection of patients' rights; support for health professionals and reducing the burden on their responsibilities; increased efficiency of the treatment process.*

Keywords: *Social work, Social worker, Hospitals, integrated care.*

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SOCIAL POLICIES EFFICIENCY AGAINST JUVENILE DELIQUENCY

Assist. Prof. Krasimira Georgieva

Department of Social and Legal Sciences,

Technical University of Varna, Bulgaria

Phone: 052-383-435

E-mail: krgeorgieva@tu-varna.bg

Abstract: This paper focuses on reviewing national and municipal policies against juvenile delinquency. The research of a specific public policy aims to determine and assess its efficiency regarding spending public funds. The conclusions of the research are summarized and serve as a basis for the thus formulated recommendations aimed at municipal budgets for more efficient public funds spending.

Keywords: Efficiency, Public funds, Social policies.

JEL Codes: L10, L11

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EXAMINATION OF PARENTING CAPACITY

Kameliya Radeva, PhD Student

Electrotechnical Faculty,
Technical University of Varna, Bulgaria
Tel.: +359 888 754 571
E-mail: kameliyarr@gmail.com

Abstract: *The paper reviews existing methods of parenting capacity examination and paid special attention to the parent's relationship to the child. The report refers to the parenting capacity assessment methods developed by prominent researchers in the field and provides some of the cross points of the mentioned research methods. The report considers the particularity of the evaluation process, minimum parenting criteria and the possible future behavioural change. The paper also provides some information about the potential of the multifamily group settings for examination the parenting capacity. The purpose of this report was to research the theoretical knowledge on this topic so far and outline the challenge of updating the parenting capacity assessment.*

Keywords: *Parenting capacity, the parent's relationship to the child, the parent's relationship to the role of parenting, influences from the family context, Relationships to the external world, Behavioural observations, Child welfare context.*

JEL Codes: C18, O35

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FRI-ONLINE-1-SW-05

INTERNET SOCIALIZATION OF THE CHILDREN AND YOUNGSTERS IN BULGARIA IN A GLOBAL PANDEMIC SITUATION

Principal Assist. Prof. Ana Popova, PhD

Department of Public Health and Social Work,

University of Ruse, Bulgaria;

Section: “Social control, deviations and conflicts”,

Institute of Philosophy and Sociology,

Bulgarian Academy of Sciences, Sofia, Bulgaria,

E-mail: apopova@uni-ruse.bg

Abstract: Nowadays in the globalized world and risky information society the humanity is facing some challenges of a new type – global pandemic situation caused by COVID 19 and accompanying social isolation, dramatic changes in the everyday life, appearance of a new type of socialization of kids and youngsters due to the more intensive impact of Internet and the social media.

There are numerous negative consequences of COVID 19 in a global scope: economic decline, increase of unemployment, economic difficulties for the employers and their companies but the most significant negative impact is for the people and their mental health suffering from decreasing social contacts and interactions.

In this situation Internet and the social media are transforming into one of the main agents for the secondary socialization of the kids and youngsters, replacing other agents and causing value transformations.

This paper explores and presents some empirical data about the influence of Internet and social media on the children and youngsters in Bulgaria in the context of COVID 19 pandemic situation.

Keywords: COVID 19, Secondary socialization, internet, Social media.

JEL Codes: I12

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FRI-ONLINE-1-SW-06

SOCIAL WORK WITH THE FAMILIES OF PERSONS WITH ONCOLOGICAL DISEASES - A FACTOR FOR IMPROVING THEIR QUALITY OF LIFE

Principal Assist. Prof. Evgeniya Bratoeva, PhD

Faculty of Public health and health care

Department of Public Health and Social Work

Professional Area „Social Activities“

University of Ruse

Phone: +359 887 243 807

E-mail: jeni_bratoeva1999@abv.bg

Abstract: *The report presents the results of a study conducted among people with cancer, in terms of changes in their situation in the family and received support from family members after diagnosis of the disease. In order to establish the period during which change is observed and patients receive (or not) support from their relatives, the study was conducted among two groups of people with cancer: group 1 - in whom the disease was diagnosed two weeks ago and group 2 - people in whom the cancer is treated for one year. Based on the presented results, appropriate methods of social work with family members who have a person with cancer are presented. The role of social work with family members of people with cancer is outlined, to improve the quality of life of the sick individual.*

Keywords: Social work, Quality of life, Cancer.

JEL Codes: I14, I31

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FRI-ONLINE-1-SW-07

ATTITUDES TO IMPLEMENT REFORMS IN THE SOCIAL WORK PROFESSION AND EDUCATION IN BULGARIA

Prof. Sasho Nunev, DSc of Social Work

Department of Public Health and Social Work,

University of Ruse, Bulgaria

Tel.: +359886802466

E-mail: sasho_nunev@abv.bg; snunev@uni-ruse.bg

<https://orcid.org/0000-0003-3414-0733>

Abstract: *The article presents a research identifying the attitudes towards reforms in the social work profession and education in the current situation in Bulgaria in students, doctoral students and professors of social work, social workers, social service providers, municipal and state employees administration for social activities and social assistance, representatives of non-governmental organizations, foreign participants (social work professors and experts) from Romania and Austria. The European context in the social work field is analysed and the necessity of conducting the research is argued. The conclusions from the quantitative and qualitative analysis of empirical data from the survey reveal the clearly expressed attitudes of the respondents to implement reforms, increase the public prestige of the social work profession and education, overcome the growing negative trend of blurring the boundaries of social work and its gradual deprofessionalization.*

Keywords: Social work education, Social work profession, Reforms in social work education and profession.

JEL codes: I20; I21; I28

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SUPERVISION IN SOCIAL WORK WITH STUDENTS – ENVIRONMENT FOR FORMATION AND DEVELOPMENT OF ANALYTICAL AND CRITICAL APPROACH TO THE IMPLEMENTED ACTIVITY

Prof. Sasho Nunev, DSc of Social Work

Department of Public Health and Social Work,

University of Ruse, Bulgaria

Tel.: +359886802466

E-mail: sasho_nunev@abv.bg; snunev@uni-ruse.bg

<https://orcid.org/0000-0003-3414-0733>

Abstract: *The article presents a research on the problems of supervision in social work in the practical training of students in the Social Work professional field at the University of Ruse, Bulgaria in the period 2014-2018. The purpose of the research is to identify the attitudes of the respondents to creating conditions in the supervision for the formation and development of an analytical and critical approach to the implemented activity. The quantitative and qualitative analysis of the research results confirms the accepted purpose and reveals the importance of the attitudes in their positive aspect as important factors for in-depth understanding of the acquired values, knowledge, skills and experience, realization of reflection, reflective learning, reflective capacity building and achievement and achieving cognitive, educational, practical and professional-personal development.*

Keywords: *Attitudes towards supervision in the social work practical training, Analytical approach, Critical approach, Reflective learning, Reflexive capacity, Student development.*

JEL codes: I20; I21; I29

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FRI-ONLINE-1-MCDA

FRI-ONLINE-1-MCDA-01

ANTIPLATE SMOKING - SMOKING STATUS AND NICOTINE ADDICTION

Assoc. Prof. Kristina Zaharieva, PhD

Department of Medical Clinical and Diagnostical Activities

University of Ruse

Phone: 0885 193 003

E-mail: kzaharieva@uni-ruse.bg

Abstract: Smoking is the largest preventable health risk and the most significant cause of premature death in the EU. for the first time, the World Health Organization (WHO) declared May 31 as World No tobacco Day in 1987, each year the WHO sets the motto of World No tobacco Day, aimed at preventing and limiting smoking among the population around the world. Without action by 2030, the epidemic will kill more than eight million people. Nicotine addiction is recognized as a disease that causes mental and behavioral disorders: numerous failed attempts to quit smoking; irritability, depression, insomnia, smoking cessation, etc. Research conducted: Objective: to study the smoking status and nicotine dependence of respondents with follow-up training activities for smoking cessation. The survey was conducted in the period 25.02.2019 -25.11.2019 and covered 157 respondents (135 students and 22 teachers) after informed consent. Results of the survey: 63% of respondents are regular smokers - 15% of them with moderate addiction, 31% with strong addiction and 17% with very strong addiction, the remaining respondents: episodic smoker, non-smoker, ex-smoker with mild and absent nicotine addiction. The results of the study were used to assess the motivation and readiness to quit smoking by applying a WHO-approved test and conducting training activities to quit smoking.

Keywords: smoking, nicotine addiction, smoking status

JEL Codes: L10, L11

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APPLICATION OF ELECTROMYOGRAPHY IN CLINICAL NEUROLOGY

Assoc. Prof. Neli Petrova, MD, PhD

Department of Medical Clinical and Diagnostical Activities,
University of Ruse

General and Vascular Neurology Ward, Kaneff University Hospital – Ruse

Phone: 0888 793 906

E-mail: nspetrova@uni-ruse.bg

Abstract: Electromyography (EMG) is a method for studying the bioelectrical activity of muscles, and electroneurography (ENG) - the bioelectric potentials of peripheral nerves caused in response to electrical stimuli. Presents the general principles of the generation of electrical potentials in healthy subjects. EMG can be performed in different muscle conditions - at rest, under tension, in voluntary contraction. EMG / ENG is used in peripheral nervous system injuries, differentiating central and peripheral nervous system injuries, clarifies the topic of damage to the peripheral nervous system - anterior horn, anterior root, plexus, peripheral nerve, neuromuscular synapse or muscle, has prognostic value. The role of the EMG in the diagnosis of neurological diseases is widely recognised and its importance is particularly emphasised in Guillain-Barre syndrome, compression neuropathies, carcinomatous neuromyopathy, neuropathies with systemic vasculitis.

Keywords: Electromyography, electroneurography, electrical potential, peripheral nerve, neuromuscular synapse

JEL Codes: I1-I19

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FEMALE PATIENTS WITH BREAST CANCER – AN INTERVIEW STUDY, EXPLORING NAUSEA AND VOMITING

Assoc. Prof. Teodora Nedeva, MD, PhD

Department of Medical Clinical and Diagnostical Activities,

University of Ruse

Phone: 0887 468 695

E-mail: tsherbanova@uni-ruse.bg

Abstract: Malignancies still remain one of the main causes of death nowadays after cardiovascular and neurology diseases. The number of cancer patients grows every year worldwide. Breast cancer still remains the most common malignant tumor among women and is still with very high mortality rate. There are several clinical trials reporting and measuring nausea and vomiting among oncology patients and in particular in women with breast cancer. The symptom- nausea, is complex and difficult and needs further investigations to improve our understandings about it and patients experiences and expectations during therapy. for this reason we conducted a pilot interview study. **Materials and methods:** included were female patients with breast cancer who had experienced nausea and vomiting during chemotherapy and/or radiation therapy. The patients underwent interview that focused definition of nausea, some grade scales and individual nausea features- location, duration, intensity, character, factors, other symptoms, treatment regimen, expectations and impact on patient's quality of life. Sociological and statistical methods are used **Results:** interviewed were 14 women undergoing at the moment chemotherapy (7 women) or radiation therapy (7 women). All the patients can define properly vomiting but not nausea- they give different definitions and expressions mainly including their feelings. Women can grade the symptoms by an ordinal grading scale from 0 to 10 and share different intensity range. They also report various duration and heaviness of the episodes, precipitating factors, response to treatment and impact on quality of life. **Conclusions:** Nausea and vomiting are complex and sometimes difficult for treatment symptoms. They can affect many of the breast cancer patients and have either objective or subjective features. Our study may provide valuable information for our patients and colleagues and can be basis for future larger investigations.

Keywords: breast cancer, factors, nausea, psychosocial aspects, quality of life, vomiting

JEL Codes: I1-I19

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FRI-ONLINE-1-MCDA-04

CLINICAL AND LABORATORY DIAGNOSTICS IN SUPPORT OF HEALTHCARE PROFESSIONALS

Denitsa Trancheva MD, PhD

Head of “Clinical Laboratory” Department,

Kaneff University Hospital, Ruse, Bulgaria

Phone: 0888 342 616

E-mail: deniza3@abv.bg

Abstract: *Clinical laboratory is a medical specialty of great importance in modern medicine. It assists health care professionals in the diagnostic process, to monitor the treatment and health status of patients, to make the most accurate and effective medical decisions related to the care and treatment of the sick persons. It has been proven, both in Bulgaria and worldwide, that about 70% of diagnoses are based on the clinical and laboratory results. Laboratory medicine around the world and the Clinical laboratory in Bulgaria are constantly evolving and improving, preserving the traditions established by the founders and enhancing the professional skills of new highly qualified specialists, worthy successors of the doyens in the discipline, which is entering a new era of its development – implementation of high-tech and precise equipment, standardization, continuous communication between medical professionals and laboratory doctors, between the laboratory results and the correct and timely clinical solution. Clinical and laboratory diagnostics is a significant and extremely crucial multidisciplinary activity within the health care services of each country and a carrier of its progressive development. Laboratory indicators and their competent interpretation are an essential element of each stage of the integrated continuum of health activities: health promotion, disease prevention, diagnosis, treatment, rehabilitation and re-socialization*

Keywords: *clinical and laboratory diagnostics, clinical laboratory, medical professionals*

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HOSPITAL ENVIRONMENT, STRESS AND CHILDHOOD PSYCHE

Assoc. Prof. Kiril Panajotov

Department of Medical Clinical and Diagnostical Activities,
University of Ruse
Phone: 0888309621
E-mail: zkm2@abv.bg

Tatyana Atanasova

Nurse UMBAL MEDICA, Ruse
Phone: 0885635514
E-mail: nursing_russe@abv.bg

Lecturer Vanya Dacheva

Department of Medical Clinical and Diagnostical Activities,
University of Ruse
Phone: 0885635514
E-mail: nursing_russe@abv.bg

Abstract from birth, the child has been stressed by the need to adapt to different conditions - to the family, to other children in the family environment, to the day nursery and kindergarten, to the specialized institution. Each of these environments has specific characteristics and requirements that must be learned by the child in order for him or her to adapt to them. a hospital stay is filled with many emotional moments that are often negative for a young child. The aim of the study is to determine the attitudes of the nurses from the Pediatric wards of UMHB "Kanev" AD, Rousse and MBAL-Byala-AD, to work with children and to apply methods for reducing the level of stress in the hospitalization of the children. **Materials and methods:** the opinion of 52 nurses from the pediatric wards of two hospitals in the Rousse region, February - May 2018, was examined. Documentary and statistical methods were used to analyze and evaluate the results of the anonymous survey. **Results:** the average age of the surveyed nurses was 49.35 years. Nurses aged 51-65 years accounted for the largest share in the age structure - 48%. The structure of the age and the average age of the nurses are indicators that characterize the respondents and outline the lack of continuity in the profession. 88% of pediatric nurses are satisfied with their work with children. 76% defined the terms stress, hospitalization, child care, health care, adaptation, which is informative about nurses' knowledge of the impact of stress on the child's psyche. 40% of respondents suggest that leisure time in the child's mode should be organized in the form of interactive and role-playing games depending on the age of the child. **Conclusions:** 1. in the Pediatric wards, nurses are good professionals and are satisfied with their work. 2. in the healing process, work is team-based, with communication between the nurse and parent at a level and a way of dealing with anxiety both at the parent and at the child. 3. 40% of the nurses consider that organized activities and interactive games lead to a faster adaptation of the child to the unusual hospital environment. **Conclusion:** Frequent hospitalizations and hospital stays can lead to stress and difficult adaptation in children, despite being cared for by medical professionals.

Keywords: hospital environment, childhood psyche, stress, communication.

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ANTIPLATELET DRUGS IN ACUTE CORONARY SYNDROME

Assoc. Prof. Ognyan Sherbanov, MD, PhD

Department of Medical Clinical and Diagnostical Activities

University of Ruse

Phone: 0889 232 744

E-mail: osherbanov@uni-ruse.bg

Abstract: Coronary artery disease (CAD) is a widespread disease with a very high mortality rate. Acute coronary syndrome (ACS) is the most significant manifestation of the disease. ACS is primarily caused by thrombosis in one of the coronary arteries. This is mainly as a result of pathological activation of platelets. Therefore, the use of antiplatelet agents is the cornerstone in the treatment of the disease. For decades, Acetylsalicylic acid (ASA, Aspirin) was the only proven antiplatelet agent, which reduced the incidence of reinfarction and mortality rate after ACS. With the development of the medical and interventional treatment of ACS, it became clear that there is a strong need for additional antiplatelet drugs. The latter, combined with ASA, have to reduce the incidence of thrombotic complications. Among those drugs are the inhibitors of P2Y₁₂-receptor in the platelet whose foundation leads to the scientifically proven long-term use of the so-called dual antiplatelet therapy (DAPT). Clopidogrel was the first to receive approval, followed by Ticagrelor and Prasugrel. The latter have shown their superiority in clinical trials versus Clopidogrel in their antithrombotic effect. Their prolonged use along ASA further reduces the incidence of cardiovascular mortality, new myocardial infarction and stroke in patients with ACS. Cangrelor also belongs to the P2Y₁₂ inhibitors group, but unlike the previous ones is administered only intravenously and has strict use indications. Another group of drugs with a proven antiplatelet effect is the so-called platelet glycoprotein IIb / IIIa receptor inhibitors (GP IIb / IIIa inhibitors). They have an extremely potent antiplatelet effect and are only administered intravenously in patients with an extremely high risk of thrombosis, usually in interventional procedures. The main serious side effect of antiplatelet agents is hemorrhagic complications whose risk is further accelerated by the use of DAPT. The use of different combinations of antiplatelet drugs in patients with ACS and the duration of their use is strictly individual. It is determined by each patient's profile, clinical manifestation, comorbidities with their appropriate therapies, and last but not least, a careful balance between the risk of thrombotic and hemorrhagic complications in the course of treatment.

Keywords: Acute coronary syndrome, antiplatelet agents, complications, dual antiplatelet therapy,

JEL Codes: L10, L11

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SOME ACCENTS WHEN TUSSAVIT-SYRUP TREATMENT

Assoc. Prof. Svilen Dosev, MD, PhD

Department of Medical Clinical and Diagnostical Activities;
Faculty of Public Health and Health Care
University of Ruse
Phone.: 0888885988
E-mail: dr.dosev@gmail.com

Chief Assist. Prof. Kina Velcheva, PhD

Department of Health Care;
Faculty of Public Health and Health Care
University of Ruse
Phone.: 0886211502
E-mail: kvelcheva@uni-ruse.bg

Abstract: Coughing is a protective phenomenon and a powerful physiological mechanism for clearing the airways of foreign matter and excess secretions. Respiratory disease is an acute cough. One of the medicines used in acute respiratory catarrh, colds, infections and inflammation of the mouth and pharynx is TUSSAVIT. The clinical trial confirmed the excellent tolerability, safety and efficacy profile of Tussavit® cough syrup in children, adolescents and adults. Tussavit® treatment: increases the ability to expectorate; decreases average respiratory rate; leads to an improvement in the overall condition; decreases secretion production from the upper respiratory tract; 98.3% of patients would be treated with Tussavit® again.

Keywords: Tussavit, coughs, antitussives, viral infections, allergies, medications

JEL Codes: J19, I12

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ADAPTATION OF THE ANATOMY MODULE FOR STUDENTS OF THE UNIVERSITY OF RUSE "ANGEL KANCHEV" DURING A PANDEMIC

Lecturer Vanya Dacheva,

Department of Medical and Clinical Diagnostic Activities,

University of Ruse

Tel.: +359 889 729 270

E-mail: vdacheva@uni-ruse.bg

Abstract: There is a long standing practice of incorporation of various online learning techniques established at the University of Ruse "Angel Kanchev". an online teaching tool for the anatomy module was first designed in 2006. This was a web-based test book which included maximum learning material from each section of the anatomy curriculum. It was successfully used during the social distancing measures imposed by the COVID-19 pandemic. When it comes to teaching techniques for the occupational therapy students, vital importance is placed on the interactive communication between students and teacher, with emphasis on the creation of visualisation of working practices, and anatomy modules, as well as the usage of all available teaching tools such as textbooks and assisted reading materials. The results show that students react positively to this type of distant learning, whilst teachers value the opportunity to carry out their lessons, albeit remotely.

Keywords: e-learning, Anatomy, Occupational therapy students, Education,

JEL Codes:

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FRI-ONLINE-1-HC

FRI-ONLINE-1-HC-01

**THE USE OF NEW TECHNOLOGIES AND SERIOUS
GAMES IN MEDICAL CARE TRAINING**

Assist. Prof. Galya Georgieva-Tsaneva, PhD

Institute of Robotics,
Bulgarian Academy of Sciences
E-mail: galitsaneva@abv.bg

Prof. Ivanichka Serbezova, PhD

Department of Health care,
University of Ruse
Phone: +359 88 7082800
E-mail: iserbezova@uni-ruse.bg

Abstract: : the report presents the application of innovative technologies in the educational process. in recent years, the educational process around the world has been enriched by the inclusion of videos, serious educational games, web-based digitized resources. This trend is also observed in medical education in Bulgaria. Methods for optimizing medical education through the use of video algorithms, serious games and virtual simulations are shown. Serious educational games offer an interactive, alternative way of learning the material, while offering students the opportunity to acquire knowledge and skills, learn to solve problems and interact with each other. The presented educational game was created especially for the medical specialty Midwives in the professional field of "Health Care". The game was created in the form of a test through the educational platform Kahoot. Moments from the creation of the game and some of the issues included in it are shown. The presented educational game can be used both for distance e-learning and for preparing students for an exam. Serious games are a tool for the development of imagination and creativity, a way to automate skills and therefore can play a very useful role in the educational process in medicine.

Keywords: Serious educational games, medical education, medical care training.

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WOMEN'S CONSULTATION - A COMPONENT OF OUTPATIENT CARE

Chief Assist. Prof. Kina Velcheva, PhD

Department of Health Care;

Faculty of Public Health and Health Care

University of Ruse

Phone.: 0886211502

E-mail: kvelcheva@uni-ruse.bg

Abstract: Modern social development, as well as the achievements of medical science (especially in the field of early prenatal resuscitation and care, molecular research, stem cells, in vitro and in situ fertilization, transplantation) cause the medical community to solve preventive and prophylactic dilemmas, subject to mandatory legal and moral-ethical provisions. After the study, it was concluded that a change in attitudes and patterns of behavior towards patients is needed. Good information, the choice of an appropriate method for counseling and the use of modern methods of prevention, the available information provide real opportunities for updating women's counseling.

Keywords: women's consultation, patients, pregnancy, outpatient care

JEL Codes: I10, J13

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FRI-ONLINE-1-HC-03

PARTICIPATION IN UNDERGRADUATE STUDENT SCIENTIFIC SESSIONS FOR DEVELOPING PROFESSIONAL COMPETENCIES AND CREATIVE SKILLS AMONG MIDWIFERY STUDENTS

Chief Assist. Prof. Tsveta Hristova, PhD

Department of Health Care,

University of Ruse

Tel.: 0878 389 793

E-mail: tshristova@uni-ruse.bg

Abstract: This report presents the midwifery education in a specific environment – individual work in a scientific-research field and reporting results in the students' scientific sessions. University of Ruse annually gives an opportunity to the future medical specialists to work on preferable scientific topics, to exchange experience with colleagues, to demonstrate creative ideas. The objective of an author study are the participants at the Forum during the period from 2016 to 2020. Documentary and sociological methods were used. Data were presented graphically. The analysis was based on the developed characteristics in the process of the research activity through the eyes of experts (tutors – scientific advisers). Students were transformed into active participants in the self – study, they developed knowledge and skills. The preferable topics for midwifery students and difficulties they met were discussed. It was concluded that the examined student activity was a didactic category through which new knowledge was gained and applied. Participation in the Undergraduate student scientific session builds essential professional competencies and positive motivation for further education. The role of the tutor is important as he supports and inspires student's creative contribution.

Keywords: students, midwives, undergraduate student scientific session, professional competencies, creative work.

JEL Codes: I 23

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FRI-ONLINE-1-HC-04

CONTROL AS A MOTIVE FOR FORMING PROFESSIONAL SKILLS AND COMPETENCIES DURING THE CLINICAL PRACTICE OF OBSTETRICIAN STUDENTS

Chief Assist. Prof. Yoana Lukanova, PhD

Faculty of Public health and Health Care,

Department of Health Care

University of Ruse

Tel.: 0885 047 644

E-mail: ylukanova@uni-ruse.bg

Abstract: *The clinical way of thinking of every future obstetrician is of extreme importance for dealing with occurred study problems during clinical practice. Since day one in the practice and study rooms of the Faculty of Social Health and Health Care with the assistance of the health care teachers, begins the acquiring of competencies and clinical way of thinking. The teachers have the best interest to increase this competence in obstetrician students, so that they can help the patients correctly without doing any harm. in order for the students to provide qualified and correct health care to the patients, it is necessary for the students to have formed for themselves professional skills and competencies, so that they can manage with excellence with the problem in a certain situation.*

Keywords: control, competencies, clinical practice, students, midwives, education, evaluation

JEL Codes: L10, L11

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ALTERNATIVES OF INSTITUTIONALIZATION FOR THE CHRONICALLY ILL PATIENTS

Assoc. Prof. Daniela Konstantinova, PhD

Health care Department,

University of Ruse

Phone: +359888520021

E-mail: ddraganova@uni-ruse.bg

Abstract: The main goal of this report is to examine barriers to overcoming institutional care in Bulgaria. Regardless of the interest and preference for services in specialized institutions, it is necessary to develop models of home services and community services, including integrated health and social services, to provide opportunities for older people to maintain their independence and way of life.

A condition for the success of the planned positive changes in the strategic documents is primarily related to the change of the legal framework and redistribution of funds for financing and maintenance of the activity.

Keywords: institutionalization, chronically ill, integrated health and social services

JEL Codes: I14, I24 I31, I38

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FRI-ONLINE-1-HC-06

INTERNATIONALIZATION AT HOME: USE OF XR TECHNOLOGIES IN THE MEDICAL PROFESSIONS AND HEALTH CARE TRAINING

Assoc. Prof. Despina Georgieva, PhD

Department of Health Care

University of Ruse

Phone +359 889789100

E-mail: dpgeorgieva@uni-ruse.bg

Chef Assist. Prof. Greta Koleva, PhD

Department of Health Care

University of Ruse

Phone: +359 88 2517173

E-mail: gkoleva@uni-ruse.bg

Chief Assist. Prof. Irina Hristova, PhD

Department of Health care

University of Ruse

Phone: +359 88 458 2733

E-mail: ihristova@uni-ruse.bg

Abstract: *Internationalization at Home is an increasingly widely used form of international education in Europe to improve the quality of higher education. The purpose of the scientific report is to present an innovative modern form of international training to acquire new knowledge in technology, knowledge sharing and implementation of international cooperation. Through a partnership between Savonia University of Applied Sciences, Savo Vocational College from Kuopio - Finland, „Angel Kanchev“ University of Ruse and Yatrus Foundation from Bulgaria, online training internationalization at Home: XR Technology in Multiprofessional Health Care is carried out. Students from the Department of Health Care in Nursing and Midwifery at the University of Ruse and students from Finland in similar specialties participate in a course aimed at acquiring knowledge and competencies for the use of HR technologies in the medical professions and training in Health Care.*

Keywords: *internationalization at Home, Virtual Reality, XR Technology, Training, Health Care, international Cooperation.*

JEL Codes: I23, O32, O39

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FRI-ONLINE-1-HC-07

SCALES FOR RISK ASSESSMENT OF PRESSURE ULCER. PREVENTIVE MEASURES

Assoc. Prof. Despina Georgieva, PhD

Department of Health Care

University of Ruse

Phone: +359 889789100

E-mail: dpgeorgieva@uni-ruse.bg

Chief Assist. Prof. Irina Hristova, PhD

Department of Health Care

University of Ruse

Phone: +359 88 458 2733

E-mail: ihristova@uni-ruse.bg

Chef Assist. Prof. Greta Koleva, PhD

Department of Health Care,

University of Ruse

Phone: +359 88 2517173

E-mail: gkoleva@uni-ruse.bg

Abstract: This report presents the most commonly used worldwide scales to assess the risk of pressure ulcer on Norton, Braden and Waterlow. Lecturers from the Department of Health Care at the University of Ruse have translated the three original scales into Bulgarian, which makes them applicable in the Republic of Bulgaria. Their use, as well as the activities and care to prevent the risk of pressure ulcer is an element of the quality of health care. Their actual application and documentation of the activity in nursing documentation will lead to a reduction of the hospital pre-hospital, as well as to an increase in the quality of life of the patients dependent on nursing care.

Keywords: Decubitus, Pressure Ulcer, Risk Assessment, Nurse, Prevention.

JEL Codes: I10, I12, I19

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CRIMINAL LIABILITY OF THE HEALTHCARE SPECIALIST – THE NURSE

Assist. Prof. Ivaylo Ivanov, PhD

Law Faculty

Department of Criminal Law Sciences and Security,

University of Ruse

Tel.: +359876668805

E-mail: imivanov@uni-ruse.bg

Atanas Atanasov – Health Care specialist

University Hospital “Kaneff”, Ruse

Phone: +359876128468

E-mail: efrain87@abv.bg

Assoc. Prof. Despina Georgieva, PhD

Faculty of Public Health and Health Care

Department of Health Care

University of Ruse

Phone: +359889789100

E-mail: dpgeorgieva@uni-ruse.bg

Abstract: *The purpose of this scientific work is to trace the contradictions regarding the criminal liability of the nurse in the Republic of Bulgaria. The tasks are aimed at examining the criminal law of Bulgaria in relation to the criminal liability of the nurse as a healthcare specialist. an important point in the publication is the analysis of existing terms related to the topic and the proposed new formulations that distinguish the criminal liability of the nurse from the criminal liability of all other medical professionals. Emphasis is placed on the need to put into practice nursing records, including an individual nursing record, as well as medical standards for health care. This will differentiate exactly the responsibility that the nurse might claim in the event of a job failure. The introduction of nursing records will lead to an increase in the quality of healthcare in the country. Nursing is a complex profession with a socially relevant function and, as such, requires a high level of competence and qualification, which in turn justifies increased responsibility - both civil and criminal.*

Keywords: Criminal liability, Nurse, Nursing, Nursing records, Health care standard.

JEL Codes: K14, I18

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FRI-ONLINE-1-HC-09

MEDICAL AND LEGAL ASPECTS OF THE INFORMED CONSENT FOR PROFESSIONAL SERVICES PERFORMED BY NURSE IN INDIVIDUAL OR GROUP PRACTICE HEALTH CARE

Assist. Prof. Ivaylo Ivanov, PhD

Law Faculty

Department of Criminal Law Sciences and Security,

University of Ruse

Tel.: +359876668805

E-mail: imivanov@uni-ruse.bg

Chef Assist. Prof. Greta Koleva, PhD

Public Health and Health Care Faculty

Department of Health Care

University of Ruse

Tel.: +359 88 2517173

E-mail: gkoleva@uni-ruse.bg

Abstract: Nurses, midwives and paramedics are now entitled to individual or group practices without a doctor, according to amendments to the Medical institutions Act proposed by the health ministry. However, the amendments do not provide for this activity to be financed with public funds, ie. nurses will be able to provide health services only for a fee from patients. However, the process of introducing nursing documentation is slowly but surely beginning to make its way in Bulgaria as well. This necessitated the preparation of a declaration of informed consent, through which patients seeking health care in individual or group health care practices, to express their consent, after prior notification by the medical professional about the medical activities to be performed, as well as the risks associated with them.

Keywords: Nurse, nursing documentation, informed consent, health care.

JEL Codes: I18, I19

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WILHELM CONRAD RÖNTGEN – 125 YEARS SINCE THE GREAT DISCOVERY OF X – RAYS

Chef Assist. Prof. Teodora Todorova, PhD

Department of Health Care,
Faculty of Public Health and Health Care
University of Ruse
Phone: 0897- 083 403
E-mail: tetodorova@uni-ruse.bg

Assoc. Prof. Dobrin Paskalev, MD, PhD

“Prof. Dr. P. Stoyanov” Medical University Varna
Phone: 0887-765 313
E-mail: dobrinpaskalev@yahoo.com

Abstract: *The German physicist Wilhelm Conrad Röntgen was born on March 27, 1845 in Lennep, Germany. He graduated from the Polytechnic University of Zurich and from 1888 worked as a professor at the institute of Physics in Würzburg. on the evening of November 8, 1895, he discovered previously unknown rays, which he called X-rays. on December 10, 1901, he received the first Nobel Prizen for Physics in Stockholm for his discovery. Prior to that, doctors had diagnosed and treated accordingly on the basis of an external examination. The revolutionary discovery in the late 19th century gave them the opportunity to "look" inside the patient. today, these rays are widely used for diagnosis in medicine. The report describes the life and work of the remarkable German scientist and is dedicated to the 125th anniversary of his significant discovery.*

Keywords: *Wilhelm Conrad Röntgen , X-Rays, Discovery*

JEL Codes: *I1, I2*

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GESTURAL MANAGEMENT SOFTWARE IN THE EDUCATION OF STUDENTS IN EYE DISEASES

Assoc. Prof. Krassimir Koev, PhD, DSc

Bulgarian Academy of Sciences,

Tel.: 089 6 29 10 20

E-mail: k00007@abv.bg, krkoev@uni-ruse.bg

Eng. Ivan Ralev, PhD Student

Department of Computer Systems and Technologies,

University of Ruse

Tel.: +359 897 552223

E-mail: iralev@uni-ruse.bg

Abstract: *The paper reviews a gestural management software in the education of students in eye diseases is offered, using a human-machine interface for its management. This is done with a creative intel realsense sr300 camera. The camera comes with a software package in which it is possible to intercept and process a gesture from the hands of a person needed to control the application. This allows for contactless control. The use of CMI in an application for training students in eye diseases leads to greater interactivity, an opportunity to develop associative and visual skills. The use of visual images increases the degree of assimilation of the study material by the student. The ability of the camera to be used at a distance of more than 0.40 m ensures the safety of research from pandemics, such as Covid-19.*

Keywords: *human computer interaction, creative intel realsense sr300 camera, gesture recognition.*

JEL Codes: *L86*

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FRI-ONLINE-1-HC-12

THEORETICAL MODEL OF A VIRTUAL EYE CABINET FOR STUDENT TRAINING

Assoc.Prof. Krasimir Koev, PhD, DSc

Bulgarian Academy of Sciences,

Phone: +359896291020

E-mail: k00007@abv.bg

Assoc. Prof. Despina Georgieva PhD

Faculty of Public Health and Health Care,

Department of Health Care,

University of Ruse

Email: dpgeorgieva@uni-ruse.bg

Ana-Maria Mladenova - Student

Faculty of Public Health and Health Care,

Department of Health Care,

University of Ruse

Phone: +35984294689

E-mail: a_mariq@abv.bg

Dimitar Marinov,

Yatrus Foundation

E-mail: yatrus@abv.bg

Nikolay Tonchev,

Yatrus Foundation

E-mail: nikolay_tonchev@abv.bg

Abstract: Virtual Reality (VR) is an emerging tool used in healthcare as a high-tech solution to improve medical education. Virtual simulation is a computer-simulated environment that allows the user to perform various scenarios in a risk-free environment. The use of VR with a pandemic situation from COVID-19 is especially relevant and significant. Objective: Creating a model of a virtual eye cabinet for student training.

Material and Method : Creating a virtual tour of an existing eye examination cabinet through the Matterport and Thinglink cloud platform with Oculus Quest 2 virtual reality glasses. These environments are created through multiple 360-degree photos. Information points are created to add information. Through them you can add video content, sound, text, picture for enrichment with information content. These environments are available for students on a tablet, smartphone computer, virtual reality glasses. Access is available at any time.

Results: a simulation model of a virtual eye cabinet is offered for training students in which an environment as close as possible to the real one in the eye cabinet can be recreated. Apparatus will be created to simulate the work of an ophthalmologist to train students. Virtual control of the ocular apparatus through the controllers and measurement of their indicators. In the virtual reality, the devices will have interactivity. It simulates the actual examination of the patient in order to avoid mistakes. It will be possible to simulate refractometry, examination of visual acuity, measurement of intraocular pressure, and a virtual simulation of the steps during the measurement of intraocular pressure. The calibration of the ocular apparatus in relation to the individual patient's needs will be simulated as well. After completing the simulation scenarios, the program displays the student's mistakes and evaluates his work. It is possible to record the errors in detail for further discussion and consideration. Creating a 3D object of the eyeball for more detailed visualization of the individual elements will be performed in order to be studied in detail by students. Creating a virtual reality application based on the game engine. Create augmented reality as each student can point a screen at a virtual eyeball or even an AR marker to see graphically animated content.

Conclusion: Creating a virtual eye cabinet model will provide a realistic feel and visual effects that provide feedback, allowing learners to develop sight and skills. It will allow faster learning for students and provide an environment in which learners can practice.

Keywords: virtual simulation, virtual reality, virtual eye cabinet, virtual walk.

JEL Codes: I23, O31, O39

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FRI-ONLINE-1-QHE

FRI-ONLINE-1-QHE-BOOK

**PROBLEMS AND PROSPECTS IN THE FORMATION OF HUMAN
CAPITAL IN THE FIELD OF EDUCATION IN BULGARIA**

Kristiyan Valchev, PhD

Municipality of Ruse

Phone: 0885/64-50-64

E-mail: k_valchev@mail.bg

Abstract: Along with the achievements in science and technology which have significantly changed modern society, the role of human capital in economic growth is also changing - humanity has very different ways of healing, working, and even communicating. There are new productions, new needs, new ways of reducing costs and new ways of generating profits. and all of this is due to the evolved human knowledge.

Globally, education is becoming the generator through which economies develop intensively. The priorities and investments that the individual country makes in its education system predetermine its long-term development and the evidence for this is already available in countries such as Estonia, Finland, Singapore, China and others.

Bulgaria is a country with a successful education system in the recent past and an inefficient one in the present. Despite the existence of several reforms, adopted new normatives, strategic and methodological changes, the human capital formed in the field of education remains irrelevant to the modern needs. Curriculars rely on memorizing non-functional knowledge, assessment methodology does not encourage critical thinking, and investment in research centers is too limited to generate scientific knowledge and achievements relevant to today's environment.

The object of the study is the human capital in Bulgaria, and the subject - the peculiarities of its formation in the field of education in the period 2000-2018 given its adaptability to modern economic conditions.

The main goal is to examine the changes in the qualitative and quantitative characteristics of the formed in the field of education human capital in Bulgaria, highlighting the changes and problem areas in it during the reviewed period.

Keywords: condition, formation, education, human capital, problems, prospects

JEL Codes: I21, I22, I23, I24, I25, I28

THE HEINNOVATE INSTRUMENT IN THE EVOLUTIONARY DEVELOPMENT OF THE UNIVERSITY MODEL (THE CASE WITH THE UNIVERSITY OF RUSE, BULGARIA)

COR MEM Prof. Hristo Beloev, DTSc DHC mult.

Department of Agricultural Technique

University of Ruse, Bulgaria

Phone: +359 82 888 240

E-mail: hbeloev@uni-ruse.bg

Prof. Velizara Pencheva, PhD

Department of Transport

University of Ruse, Bulgaria

Phone: +359 82 888 588

E-mail: vpencheva@uni-ruse.bg

Prof. Juliana Popova, PhD

Department of European Studies, International Relations and Security,

University of Ruse, Bulgaria

Phone: +359 82 888 564

E-mail: jppopova@uni-ruse.bg

Abstract: *The paper presents the stimulating role of the HEInnovate instrument in the contemporary development of the university model and especially in the positioning of the entrepreneurial university as a strong factor in the construction of the European Higher Education Area nowadays.*

The work discusses the indicators (criteria) of the HEInnovate instrument and their applicability for the evaluation of the entrepreneurial capacity of HEIs in a European and global context.

In a comparative perspective the paper presents also the results from several testings conducted by the University of Ruse in the period 2014-2020 through the usage of the HEInnovate instrument.

Keywords: HEInnovate instrument, entrepreneurial university.

JEL Codes: I23

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FRI-ONLINE-1-QHE-02

CHALLENGES IN THE PUBLIC COMMUNICATION AND DISSEMINATION OF INFORMATION THROUGH THE CHANNELS OF MASS MEDIA IN THE CONTEXT OF COVID 19 (THE CASE WITH THE UNIVERSITY OF RUSE, BULGARIA)

COR MEM Prof. Hristo Beloev, DTSc DHC mult.

Rector of Univeristy of Ruse

University of Ruse, Bulgaria

Tel.: +359 82 888 465

E-mail: hbeloev@uni-ruse.bg

Prof. Juliana Popova, PhD

Coordinator of Interinstitutional Communications

University of Ruse, Bulgaria

Phone: +359 82 888 564

E-mail: jppopova@uni-ruse.bg

Viktoriya Ivanova, PhD

Public Relations and Advertising

University of Ruse, Bulgaria

Phone: +359 82 888 355

E-mail: vivanova@uni-ruse.bg

Abstract: This paper presents the analysis of the work, which was carried out in the University of Ruse, in connection with the dissemination of Information through different channels for public communication, in the conditions of COVID-19 pandemic. the analysis consists of two parts – communication with students, lecturers, administrative staff and partner organizations and communication with the society, demonstrating the social responsibility of the university. in order to make a quantitative assessment of the executed communication activities, the dynamics of the number of the distributed press releases and the number of the publications, based on them has been presented, as well as the social media activity for the period 1 January - 30 June 2020.

Keywords: Communication channels, Mass media, Press releases, Covid-19 pandemic

JEL Codes: I23

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FRI-ONLINE-1-QHE-03

IMPROVING EDUCATIONAL MANAGEMENT SYSTEMS BY INTEGRATING QUALITY AND INNOVATIONS

Principal Assistant Tzvetelin Gueorguiev, PhD

Department of Machine tools and Manufacturing,

University of Ruse, Bulgaria

Tel.: +359 82 888 493

E-mail: tzgeorgiev@uni-ruse.bg

Assoc. Prof. Boris Sakakushev, PhD, p.m.a.

Department of Machine tools and Manufacturing,

University of Ruse, Bulgaria

Assoc. Prof. Boris Evstatiev, PhD

Department of Electronics,

University of Ruse, Bulgaria

Phone: +359 82 888 371

E-mail: bevstatiev@uni-ruse.bg

Abstract: *The paper presents a method for improving the educational management system at university level. Traditionally integrated management systems comprise of requirements for quality, environment, and occupational health and safety. The proposed method for improvement involves the synergy between the latest editions of several international standards such as ISO 9001 for quality, ISO 21001 for educational organizations, and ISO 56002 for innovation management systems. Recommendations for the practical implementation of the integrated management system are made.*

Keywords: *Quality, innovation, integrated Management System, Education*

JEL Codes: *I23, L15*

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TRENDS AND PERSPECTIVES FOR THE DEVELOPMENT OF THE ADMINISTRATION IN THE HIGHER SCHOOLS IN BULGARIA

Assoc. Prof. Tanya Grozeva, PhD

Department of Repair, reliability, machinery,
logistics and chemical technologies and Materials-handling Equipment,
University of Ruse, Bulgaria
Phone: 082 888 258
E-mail: tgrozeva@uni-ruse.bg

Abstract: Trends and Prospects for the Development of Administration in Higher Schools in Bulgaria: the public universities in Bulgaria have an administration, which is part of a team that, along with teachers and students, obeys the new policies in higher education and participates in the new management logic.

This requires administrative staff new competencies and skills in dealing with HEI information systems, the need for continuous qualifications and training, good interpersonal, team, IT, organizational and communication skills, time management skills, negotiation, presentation and analysis.

The tendency towards complex administrative services requires teamwork, effective synergies and coordination between departments, which are a key element of this service.

Keywords: administrative staff, new policies in higher education, qualifications and training, complex administrative services.

JEL Codes: I20

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ELABORATION OF QUANTITATIVE INDICATORS FOR CERTIFICATION OF ACADEMIC PROFESSORS

Assoc. Prof. Daniel Pavlov, PhD

Department of Management and Business Development,
Faculty "Business and Management",
University of Ruse, Bulgaria
Tel.: +359-88-4343132
E-mail: dpavlov@uni-ruse.bg

Abstract: *The environment in the beginning of 21st century has created many new challenges to the academic community in every university. The academic managers face increasing expenses while the incomes do not grow with the same rate. The professors are expected to do much more activities which creates the need to develop surten trust among them to reach the desired collaboration in every department and faculty. This trust could be well supported by introduction of quantitive indicators to measer the benefist of the academic activity. Therefore, the aim of this report is to present some ideas for appropriate improvements of the procedures for individual certification of the professors, which is obligatory in Bulgarian state universities.*

Keywords: individual academic certification, HEInnovate

JEL Codes: I2

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**RESULTS FROM INCREASING THE QUALIFICATION OF THE
LECTURERS AT THE UNIVERSITY OF RUSE FROM THEIR
PARTICIPATION IN PROJECT № BG05M2OP001-2.009-0011 UNDER
THE OPERATIONAL PROGRAMME HUMAN RESOURCES
DEVELOPMENT**

COR MEM Prof. Hristo Beloev, DTSc DHC mult.

Department of Agricultural Machinery,
University of Ruse, Bulgaria
Phone: +359 82 888 465
E-mail: hbeloev@uni-ruse.bg

Prof. Plamen Daskalov, PhD

Department of Automatics and Mechatronics,
University of Ruse, Bulgaria
Phone: +359 82 888 668
E-mail: daskalov@uni-ruse.bg

Assoc. Prof. Asen Asenov, PhD

Department of Transport,
University of Ruse, Bulgaria
Phone: +359 82 888 605
E-mail: asasenov@uni-ruse.bg

Assoc. Prof. Tsvetelina Georgieva, PhD

Department of Automatics and Mechatronics,
University of Ruse, Bulgaria
Phone: +359 82 888 668
E-mail: cgeorgieva@uni-ruse.bg

Abstract: *The paper presents the results from increasing the qualification of the lecturers at the University of Ruse from their participation in project with contract № BG05M2OP001-2.009-0011-C01, "Supporting the development of human resources for scientific research and innovation in the University of Ruse "Angel Kanchev". The project is funded with support from the Operational Program "Science and Education for Smart Growth", 2014-2020, financed by the European Social Fund of the European Union. The target group includes lecturers from University of Ruse. The number of the lecturers with increased qualification is 198. of which 95 are women and 103 are men. The selection of the target group is based on the criteria in the national normative documents and in the regulations of University of Ruse, which do not allow discrimination based on sex. The specialized courses – longterm - 9, shortterm - 4 and specialized - 10 are the three forms for qualification of the lecturers. in the paper is presented the distribution of lecturers by faculties, as well as the number of their visits by courses.*

Keywords: Qualification, Specialized Courses, Lecturers, Horizontal Principles

JEL Codes: I23

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Rules for the Implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria, (2011)
Quality Guide of Angel Kanchev University of Ruse., (2012)

STRUCTURE OF THE ACADEMIC STAFF OF THE UNIVERSITY OF RUSE FOR THE PERIOD 2015-2020 AND ITS IMPACT ON THE QUALITY OF EDUCATION

Assoc. Prof. Orlin Petrov, PhD

Department of Electrical Power Engineering,

University of Ruse, Bulgaria

Phone: +359 882 390 043

E-mail: opetrov@uni-ruse.bg

Abstract: One of the components affecting the quality of higher education is the quality and structure of the academic staff. An analysis of the change in the structure of the academic staff of the University of Ruse for the period 2015-2020 has been made. The summarized data are analyzed and show an improvement in the quality of the staff, reflecting on the quality of education. It was found that during the study period the staff of the University was rejuvenated. Although in a crisis, there is a recruitment of young people. This also implies a more modern vision of the University. The relevant conclusions have been made.

Keywords: Quality of Higher Education, Academic Staff

JEL Codes: I20

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FRI-ONLINE-1-QHE-08

RESULTS OF THE SUPPORT FOR PHD STUDENTS, POST-DOCTORAL STUDENTS AND YOUNG RESEARCHERS FROM PROJECT № BG05M2OP001-2.009-0011 IN THE OPERATIONAL PROGRAMME HUMAN RESOURCES DEVELOPMENT

COR MEM Prof. Hristo Beloev, DTSc DHC mult.

Department of Agricultural Machinery,

University of Ruse, Bulgaria

Phone: +359 82 888 465

E-mail: hbeloev@uni-ruse.bg

Prof. Velizara Pencheva, PhD

Department of Transport,

University of Ruse, Bulgaria

Phone: +359 82 888 588

E-mail: vpencheva@uni-ruse.bg

Prof. Diana Antonova, PhD

Department of Management and business development,

University of Ruse, Bulgaria

Phone: +359 82 888 726

E-mail: dantonova@uni-ruse.bg

Assoc. Prof. Tsvetelina Georgieva, PhD

Department of Automatics and Mechatronics,

University of Ruse, Bulgaria

Phone: +359 82 888 668

E-mail: cgeorgieva@uni-ruse.bg

Abstract: *The paper presents Results of support for doctoral students, postdoctoral students and young researchers from their participation in project with contract № BG05M2OP001-2.009-0011-C01, "Supporting the development of human resources for scientific research and innovation in the University of Ruse "Angel Kanchev". The project is funded with support from the Operational Program "Science and Education for Smart Growth", 2014-2020, financed by the European Social Fund of the European Union. The target group includes doctoral students and young researchers – 71 and postdoctors – 54 from University of Ruse. The total number of scientific publications of the target groups are 404. in the paper is presented the distribution of the participants by faculties, as well as the number of their publications. The publications are analyzed and the results as place of publication, number of publications per participant, number of publications in Bulgarian and English are shown.*

Keywords: *Scientific Research, Papers, Doctoral Students, Young Researchers, Postdoctors*

JEL Codes: *I23*

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FRI-ONLINE-1-QHE-09

NEW APPROACHES IN DOCTORAL EDUCATION AT THE UNIVERSITY OF RUSE – A RESPONSE TO THE CHALLENGES OF A NEW ERA

Assoc. Prof. Galina Ivanova, PhD

Department of Computing,
University of Ruse, Bulgaria
Tel.: +359 82 888 855
E-mail: givanova@ecs.uni-ruse.bg

Assist. Prof. Pavel Zlatarov, PhD Student

Department of Computing,
University of Ruse, Bulgaria
Tel.: +359 82 888 855
E-mail: pzlatarov@uni-ruse.bg

Principal Assistant Desislava Baeva, PhD

Department of Computer Science,
University of Ruse, Bulgaria
Tel.: +359 82 888 214
E-mail: dbaeva@uni-ruse.bg

Prof. Diana Antonova, PhD

Department of Management and Business Development,
University of Ruse, Bulgaria
Tel.: +359 82 888 249
E-mail: dantonova@uni-ruse.bg

Abstract: The emergence of new requirements during the pandemic have opened up new teaching opportunities and challenged educators to transcend themselves beyond the borders of everyday life, to discover new ways of inspiration, as well as unique, irreplaceable educational techniques which could only exist in an online environment.

This paper/article presents the experience of the University of Ruse in training doctoral students in the new conditions imposed by the COVID 19 pandemic. Specialized online solutions are provided for the training of doctoral students at the University of Ruse - a virtual library and an online system for doctoral students. The latter provides an opportunity for a fully online admission of new candidates for doctoral students and electronic document processing; in a state of emergency, one of the highest admissions of doctoral students at the University of Ruse was realized. The specially provided virtual classrooms and the virtual library for doctoral students allow the training of doctoral students to be carried out successfully in the new pandemic conditions.

The support of the self-regulation of the doctoral students is carried out with the specialized online system, in which an individualized profile of the trainee is maintained, along with the possibility for doctoral students to follow the terms and stages of their training. The training of doctoral students is individual and depends largely on their personal motivation and self-organization. With the help of the provided training monitoring environment, the aim is to find a balance between their freedom and the regulation of their educational process by their supervisor and the administrative staff, who monitor the observance of the legal deadlines in their training process.

The use of new online approaches to learning aims to enable young scientists to organize their own individual learning path to meet their preferences and educational needs. Conducting remote courses with doctoral students at a time and place convenient for them allows them to organize their own learning environment, their training to be more flexible and adapted to their specific needs. The paper/article also presents the results of a survey conducted in 2020 after three courses of training of doctoral students using the new approaches. The results show that doctoral students prefer online learning and appreciate the new approaches provided at the University of Ruse.

Keywords: Doctoral Students, Doctoral Education, Doctoral Training, Virtual Training

JEL Codes: I23

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INTERNATIONALIZATIONS FROM AT HOME THROUGH ONLINE LEARNING MODULES IN OCCUPATIONAL THERAPY

Assoc. Prof. Liliya Todorova,
Department of Public Health and Social Work,
University of Ruse, Bulgaria
Tel.: +359 886781013
E-mail: litod@uni-ruse.bg

Abstract: Internationalization has become one of the main pillars aiming to develop global learning in higher education. The COVID – 19 pandemic situation has resulted in a distinct rise of online learning. COPILOT (Cooperative ONLINE Peer-assisted and intercultural Learning in Occupational Therapy) is an Erasmus+ Strategic Partnership Project of six partner universities from Austria, Belgium, Bulgaria, Sweden, Switzerland, and the Netherlands, funded for the period November 2018 to May 2021. The most important outputs of the project are a model of embedded online intercultural learning, a pool of innovative, accessible and flexible online learning modules, and a collection of online educational resources (OERs). Transferability to other Health Studies Programs is an explicit goal of the project. Until now 7 modules have been fully developed and tested as pilots. Two pilots are running at the moment, one of them coordinated by the University of Ruse. Since 2016 students in Occupational Therapy from our university regularly take part in the modules. The project fosters international and intercultural learning from at home for students, who do not have the opportunity to go abroad.

Keywords: internationalization, ONLINE learning, intercultural exchange, Occupational Therapy

JEL Codes: I23

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COMPETENCE-BASED ASSESSMENT OF PRACTICAL TRAINING IN OCCUPATIONAL THERAPY FOR PHYSICAL DYSFUNCTION

Assoc. Prof. Petya Mincheva, PhD

Department of Public Health and Social Work

University of Ruse, Bulgaria

Phone: 082 821 993

E-mail: pmincheva@uni-ruse.bg

Assoc. Prof. Liliya Todorova, PhD

Department of Public Health and Social Work

University of Ruse, Bulgaria

Phone: 082 821 993

E-mail: litod@uni-ruse.bg

Abstract: *The practical training in occupational therapy is the most important part of the education. Competence-based assessment is used for already 4 years at the University of Ruse with students of the OT program. The paper presents an example of relating the course assignment with achieving specific competences in the area of occupational therapy for physical dysfunction and especially in arthritic diseases. The students must demonstrate relevant knowledge in the area of orthopedic conditions and their impact on client's daily occupations, and to apply relevant assessment methods, tools and intervention approaches. Competence-based assessment opens up opportunities for the student's equal career start as their foreign colleagues, but also gives critical and practical information for future employers.*

Keywords: Occupational therapy, Arthritis, Competences, Competence-based education

JEL Codes: I10, I23

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FRI-ONLINE-1-QHE-12

QUALITY OF ONLINE EDUCATION IN MEDICAL MAJORS AT RUSE UNIVERSITY “ANGEL KANCHEV”

Assist. Prof. Galya Georgieva-Tsaneva, PhD

Institute of Robotics,
Bulgarian Academy of Sciences
E-mail: galitsaneva@abv.bg

Prof. Ivanichka Serbezova, PhD

Department of Health care,
University of Ruse, Bulgaria
Phone: +359 88 7082800
E-mail: iserbezova@uni-ruse.bg

Abstract: This report discusses the outcomes and impacts of the educational process in Bulgarian higher education institutions during the compulsory and exclusive online training at the end of the school year of 2019/2020 on a local scale. The survey, conducted in August 2020 among students majoring in Midwifery and Nursing at the University of Ruse "Angel Kanchev", Bulgaria, demonstrates both benefits and limitations of learning in an electronic environment. today, medical education must incorporate innovative practices (videos, web-based resources, serious educational games, video simulations) into its traditional methods, in order to respond to contemporary challenges and requirements. The results of this study showcase University of Ruse "Angel Kanchev" successfully powered through the period of exclusive online training and is ready to confidently make its way to modern e-learning. The quality of education improves with employing online educational resources.

Keywords: quality of education, medical education, online training, video materials, serious educational games.

JEL Codes: I23

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FRI-ONLINE-1-QHE-13

RESULTS AND ANALYSIS OF THE SURVEY "EMERGENCY TRAINING"

Aneliya V. Manukova, Assoc. Prof., PhD

Department of Electronics

University of Ruse, Bulgaria

E-mail: amanukova@uni-ruse.bg

Viktoriya G. Petkova

Specialty Law, Second Year

University of Ruse, Bulgaria

E-mail: vikpetkova@abv.bg

Abstract: *The study presents the results of the survey "Emergency Education" of the academic publication of the University of Ruse newspaper "Studentska Iskra" related to the state of emergency COVID 19. The study aims to explore and summarize the views of students and faculty on online emergency education situation. an analysis and discussion of the received opinions were performed and the effectiveness of the distance learning was proved.*

Keywords: COVID 19, distance learning, emergency

JEL Codes: I20

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THE ACTIVITY OF COMPUTING AND INFORMATION SERVICES CENTRE IN UNISON WITH THE MISION OF RUSE UNIVERSITY

Assoc. Prof. Miroslav Mihaylov, PhD

Department of Agricultural Machinery,

University of Ruse, Bulgaria

Phone: 082-888 782

E-mail: mmihaylov@uni-ruse.bg

Abstract: *The paper presents the development of the Computing and information Services Centre at University of Ruse and its adapting in unison with the contemporary IT technologies. Growth of computer base, information support, cable and wireless networks are reviewed. The role of University Computing Center in their planning, desighing and estabilishing is emphasized. Versatile activities of the center are described in area of teaching, scientific and managing activities at University of Ruse as a factor for increasing their quality. The problems in everyday work of the center are analyzed and its optimized structure is given.*

Keywords: *University Centre, Computing Centre, information Service, internet, Cable net, Wireless network, information systems.*

JEL Codes: *I23*

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FRI-ONLINE-1-QHE-15

ESIAH CONCEPT. ON THE ROAD TO EUROPEAN ACADEMIC DOCTRINE

Assist. Prof. Teodor Kyuchukov, PhD

Agrarian and Industrial Faculty

Department of Industrial Design

University of Ruse, Bulgaria

E-mail: tkyuchukov@uni-ruse.bg

Abstract: *The idea of a European Academic Doctrine (ESIAH concept - Academic Doctrine of Light) is a useful experiment that aims to draw the attention of the younger generations to the fact that education has been, is and will be a wide open door to a bright future. Not only because man is responsible for himself to enrich his knowledge, to know himself and the world he inhabits, but also to keep the mind in good condition, which is the only unique sign of life as we know it today. A visible trend is observed in the desire of the elderly to step on the threshold of Alma Mater again. This phenomenon suggests that even at the age of 74, a person continues to study, to feel the need to collect and share knowledge, to improve their skills, to live. It is the responsibility of the current active generation to fill modern science and culture with new inspiring metaphors, based on knowledge, experience, imagination and dreams.*

Keywords: examination, skills, idea, attractors, harmony, Esiah concept – Academic Doctrine of Light, modern universities, fractal, rational management, intellectual maturity, authentic expression of harmony, quality of life, quality of higher education, ESG system, conscious transformation, inspiring metaphor, academic DNA.

JEL Codes: L10, L11

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FRI-ONLINE-1-QHE-16

ANALYSIS OF THE APPROACHES AND RESOURCES FOR TRACKING THE REALIZATION OF STUDENTS AT THE LABOUR MARKET

Assoc. Prof. Kaloyan Stoyanov, PhD

Head of the Career Development Centre,

Univesity of Ruses

Phone: +359 82 888 425

E-mail: kes@uni-ruse.bg

Vanya Naydenova, MSc

Career Development Centre,

Univesity of Ruse

Phone: +359 82 888 425

E-mail: kariera@uni-ruse.bg

Abstract: The paper reviews existing approaches for tracking the realization of students. Many universities apply a system for tracking the performance of graduates, using it to manage government education policies, as well as for career guidance of prospective students. This information and database of higher education institutions is used to assess the quality of the educational process. The main problem is the solution to the issue of tracking graduates. There are different tools that are applied and used by different universities around the world.

Keywords: Approaches and Resourses for Tracking the Labror Market Realization, Alumni portal, Alumni Tracking System, Effectiveness.

JEL Codes: I23

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DEVELOPMENT OF ARTIFICIAL INTELLIGENCE AND EFFECTS ON HIGH EDUCATION IN FINANCE, ACCOUNTING AND AUDITING

Associate Prof. Kamelia Assenova, PhD

Department of Economics

Univesity of Ruse, Bulgaria

E-mail: kassenova@uni-ruse.bg, kamelia_a@yahoo.com

Abstract: *With the rapid development of artificial intelligence(AI) technology, AI is widely popularized in financial field. From one side, the economy with artificial intelligence in the future faces new requirments to young people, graduaated different degrees. From other side, AI becomes the central element of education systems and the basic tool to obtain competitive advantages on education services market.*

In recent years due to the rapid development,the artificial intelligence (AI) has widely used in many aspects of financial industry. The artificial intelligence significantly impacts the activities of banking by payments and evaluation of creditworthiness, on financial market, institutions and regulation. As artificial intelligence changes every industry, it makes a significant impact in the world of accounting and audith. AI brings strong change to the entire financial industry, which creates a series of innovative financial services such as intelligent consultant, intelligent lending, monitoring and warning, and intelligent customer service as times required. AI-enabled systems for financeand accounting are the way professionals and their firms will stay competitive and attract the next generation as employees and customers.

The aim of our research is to determine main trends, challenges and opportunities in application of artificial intelligence in high education in finance, accounting and auditing, exploring financial and social benefits, prospects and threats of that process.

Keywords: *artificial intelligence, high education, finance, accounting, auditing*

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NOVEMBER RESEARCH CONFERENCE IN RAZGRAD

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COMPUTER VISION APPLICATION IN THE QUALITY EVALUATION
OF CEREAL-BASED PRODUCTS

Prof. Jasmina Lukinac, PhD

Prof. Daliborka Koceva Komlenić, PhD

Josip Juraj Strossmayer University of Osijek, Faculty of Food Technology Osijek

E-mail: jlukinac@ptfos.hr; daliborka.koceva@ptfos.hr

Assist. Prof. Gjore Nakov, PhD

Department of Chemical, Food and Biotechnology

University of Ruse "Angel Kanchev", Branch Razgrad, Bulgaria

E-mail: gnakov@uni-ruse.com

Assoc. Prof. Nastia Vasileva, PhD

Faculty and College of Sliven

Technical University of Sofia

E-mail: nastiav2001@yahoo.com

Prof. Marko Jukić, PhD

Josip Juraj Strossmayer University of Osijek, Faculty of Food Technology Osijek

E-mail: marko.jukic@ptfos.hr

Abstract: Humans do the visual inspection and quality control of many bakery products relying on the use of the sense of sight. Human inspection is a slow process, has poor repeatability and result varies from person to person. Computer vision system (CVS) is becoming one of the most important non-destructive, rapid, economic, consistent and objective inspection and evaluation technique in the food industry.

This inspection approach is based on image analysis and processing of many products from food industry for objective evaluation of quality parameters of the product. Its speed and accuracy satisfy ever-increasing production and quality requirements, and offers the potential to automate manual grading practices thus standardizing techniques and eliminating tedious human inspection tasks.

This paper is dealing with CVS application for quality inspection of the cereal-based product. This method is applied for the inspection and grading of cereal-based products based on shape, size, colour and internal structure. According to the obtained results, CVS can be successfully adopted for the quality analysis of many cereal-based products such as bread, cookies, crackers, pizzas, etc. Furthermore, the CVS method proved to be successful for examination of the wheat grain quality.

Keywords: Non-Destructive Methods, Image Analysis, Computer Vision, Cereal-based Products, Physical Properties

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FTIR MICRO-SPECTROSCOPY FOR STUDY INHOMOGENIOUS PHASE COMPOSITION AND STRUCTURE OF BIOLOGICAL MINERALIZATIONS

Assoc. Prof. Rositsa Titorenkova, PhD

Laboratory of spectroscopy

Institute of mineralogy and crystallography “Acad. I. Kostov”

Bulgarian Academy of Sciences

E-mail: rositsatitorenkova@imc.bas.bg

Abstract: Infrared micro-spectroscopy is a powerful tool, sensitive to chemical and structural inhomogeneity, phase impurities, isomorphic substitution, degree of structural disorder, crystal size and orientation. This method and various techniques for its application are very suitable for the study of biologically formed mineralized hard tissues which have a complex structure and specific crystal-chemical properties. The most highly mineralized tissues in vertebrates are the teeth, which are composed mainly of non-stoichiometric hydroxylapatite $\text{Ca}_5(\text{PO}_4)_3(\text{OH})_2$. This paper presents the spectral differences between healthy tooth enamel and dentine, which are basic in the study of changes resulting from pathology, dental treatment or external factors. Examples of pathological mineralizations such as urinary stones with various composition, identified by infrared spectra are presented. Also, the differences in the use of reflection and ATR infrared microspectroscopy are considered. This paper summarizes the advantages of the method and focuses on the information that can be extracted not only for the inhomogeneities in phase composition, but also for the structural characteristics of the most common mineralizations of biological origin.

Keywords: infrared microscopy, biological mineralization, inhomogeneity, phase composition, structure

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AN INTEGRATED APPROACH FOR WALNUTS INDUSTRIAL PROCESSING

Assoc. Prof. Cristina Popovici, PhD

Department of Food and Nutrition,
Technical University of Moldova, Republic of Moldova
E-mail: cristina.popovici@toap.utm.md

Prof. Mihaela Adriana Tița, PhD

Faculty of Agricultural Sciences, Food Industry and Environmental Protection,
"Lucian Blaga" University of Sibiu, Romania
E-mail: mihaela.tita@ulbsibiu.ro

Assoc. Prof. Alexei Baerle, PhD

Department of Oenology and Chemistry,
Technical University of Moldova, Republic of Moldova
E-mail: alexei.baerle@chim.utm.md

Abstract: Walnut is a crop of a high economic interest for the food industry. Their major constituents are triglycerides, in which monounsaturated (oleic acid mainly) and polyunsaturated fatty acids (linoleic and α – linolenic acids) are present in high amounts. The content of other bioactive components, such as proteins, tocopherols and phytosterols, has been also documented. Walnut kernel is appreciated as specialty nut also because of its characteristic flavor, aroma and health benefits. Walnut kernels are consumed fresh or toasted, alone or in other edible products. a major goal in walnut industry is to develop an integrated approach for walnuts processing to obtain large range of high quality food products. in this contribution, the development and characterisation of vegetable milk, oil and bioactive compounds derived from walnuts and their by-products is studied. Potentially walnuts were used to obtain these foods, not only able to exert health benefits, but also as an alternative to other food products. Processing steps and conditions to ensure chemical composition, quality properties, structure and rheological behavior of walnut based food products were analysed. These studies showed high potential and positive view on walnut industrial processing, in agreement with the current demand of healthy products. These results offer new interesting expectations to continue with this research line and demand the application of advanced technologies to provide better quality of the walnut products.

Keywords: Walnut, processing, high quality food

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**APPLICATION OF CHEMOMETRIC METHODS COUPLED WITH
INFRARED SPECTROSCOPY FOR DETERMINATION OF ETHANOL IN
PRESENCE OF METHANOL IN AQUEOUS SOLUTIONS**

Petar Petrov, PhD

Pro M Consulting,

Silistra, Bulgaria, www.pro-m-consulting.com

E-mail: consulting.pro.m@gmail.com

Abstract: A fast and cost-effective method, based on Fourier Transformed mid-Infrared Spectroscopy measurement coupled with chemometric method was developed for determination of ethanol in aqueous solutions at room temperature and presence of methanol. in order to facilitate the calibration process, and to minimize the effects of peaks' overlapping, an appropriate preprocessing of the IR signals was performed. The calibration was performed using 43 samples, with accuracy enough high, so that this method can be used in routine determinations of ethanol. The model was also tested on a separate set of other 9 validation samples, where it showed great performance with R^2 of prediction >0.99 . Consequently, the procedure can be used as a fast and reliable determination of ethanol in aqueous solutions containing methanol as a second alcohol. The method can therefore find application in different areas of the chemical and food industry, avoiding use of chemicals, consumables or expensive equipment as HPLC. in fact, this approach could be used in other applications where distinguishable signals in FTIR exist, as for example quality control in production of fuels, essential oils, biodiesel, drugs etc.

Keywords: Partial least squares, chemometric, FTIR, calibration, ethanol, methanol

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ELUCIDATION OF THE BINDING AFFINITY OF 2-CARBAMIDO-1,3-INDANDIONE TO NUCLEIC ACIDS

As. Nina Stoyanova

Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences, Bulgaria
E-mail: nnkova.nina@gmail.com

Assoc. prof. Nadezhda Markova, PhD

Institute of Organic Chemistry, Bulgarian Academy of Sciences, Sofia, Bulgaria
E-mail: nadya@orgchm.bas.bg

Assoc. prof. Petya Genova-Kalou, PhD

National Center of Infectious and Parasitic Diseases, Sofia, Bulgaria
E-mail: petia.d.genova@abv.bg

Assoc. prof. Ivan Angelov, PhD

Assoc. prof. Irena Philipova, PhD

Institute of Organic Chemistry, Bulgarian Academy of Sciences, Sofia, Bulgaria
E-mail: ipangelov@gmail.com, irena@orgchm.bas.bg

Prof. Venelin Enchev, DcS

Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences, Bulgaria
E-mail: veneline@gmail.com

Abstract: Indan-1,3-dione is a biologically inactive compound, but its 2-substituted derivatives are biologically active and have aroused serious interest in the recent decades. They are used in medicine and biology. Studies on their biological activity show the presence of anticoagulant, anti-inflammatory, antibacterial, protein-binding, antineoplastic and neuroprotective action. The photophysical properties of CAID and its possible application as a sunscreen and biomarker have recently been investigated. It shows very good photostability and absorbs light in part of the visible region (400–450 nm), UVA (320–400 nm), UVB (290–320 nm) and UVC (200–290 nm). CAID is suitable as a biomarker in the study of biologically important molecules because it absorbs and fluoresces in a very wide spectral range and has a high quantum yield. Fluorescent and computational methods were used to elucidate the binding expedient of 2-carbamido-1,3-indandione (CAID) tautomers, 2-(hydroxylaminomethylidene)-indan-1,3-dione and 2-carboamide-1-hydroxy-3-oxo-indane, to DNA and RNA nucleotides. The dependence of the fluorescence emission of CAID loaded nucleic acids sequences to 2-carbamido-1,3-indandione concentration, temperature and time variation was investigated. It was found from the fluorescence data that the subject compound binds to nucleic acids but does not intercalate. Quantum-chemical calculations were performed to clarify the binding expedient of the complexes between nucleotides and CAID. According to the experimental and theoretical results, the binding may be through hydrogen bonds. Because of the binding affinity of CAID to nucleic acids we decided to perform a survey on the cytotoxic, antitumor and antiproliferative effects of CAID on three types of tumor cell lines - hepatic carcinoma, cervical carcinoma and rhabdomyosarcoma as well as one untransformed line - lung fibroblast cells. CAID demonstrated the most significant antiproliferative activity against the rhabdomyosarcoma cell line in a concentration of 0.0001 mg/mL equal to the maximal nontoxic concentration. Because of the binding affinity to nucleic acids and the lack of cytotoxic effect on non-tumor cell lines, we can suggest that the subject compound could be suitable to be used as a novel type of fluorescent biomarker.

Keywords: 2-carbamido-1,3-indandione, fluorescent biomarker, cytotoxicity

FRI-ONLINE-1-CT(R)-03

PHOSPHORUS RECOVERY FROM SWINE SLURRY BY ACIDIFYING ULTRAFILTRATION AND STRUVITE CRYSTALLISATION

Maya Stancheva, PhD Student

Department of Chemical Technologies,
“Prof. D-r Asen Zlatarov” University, Burgas
E-mail: maya.stan4eva@gmail.com

Prof. Valentin Nenov, DcS

Department of Chemical Technologies,
“Prof. D-r Asen Zlatarov” University, Burgas
E-mail: vnenov@btu.bg

Assoc. Prof. Hyusein Yemendzhiev, PhD

Department of Chemical Technologies,
“Prof. D-r Asen Zlatarov” University, Burgas
E-mail: hyemendzhiev@btu.bg

Abstract: Recovering nutrients from waste is an alternative to the continuous phosphorus mining and fertilizers production. Domestic wastewater and waste streams from livestock are among the most promising sources of recycled phosphorus with potential application in the agriculture. The paper reviews a method of phosphorus recovery from swine slurry using stages of acidifying, ultrafiltration and crystallisation with an aim to extract phosphorus, purifying the fluid and sediment struvite crystals. The purpose was to examine the application of swine slurry, to establish pH-optimum for acidifying and crystallisation. Testings of ortho-phosphorus, ammonium and magnesium were carried out on every step of the examination, also they were accompanied with supporting tests which indicated the decreasing of organic matter.

Based on the results obtained, a procedure for acidic mobilization of the phosphates was developed as an initial step which significantly increased efficiency and recovery rate (up to 65%). Thereby the precipitation of struvite from wastewater and manure could be a step toward the development of hybrid technologies for simultaneously wastewater treatment and resource recovery which will contribute to the transformation of the economy from linear to circular approach.

Keywords: phosphorus, swine slurry, manure, ultrafiltration, struvite

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COMPARATIVE ANALYSIS OF BIOGAS PRODUCTION TECHNOLOGIES USING SUITABLE RAW MATERIALS

Eng. Evgeniy Ganev, PhD

Process Systems Engineering Laboratory,
Institute of Chemical Engineering, Bulgarian Academy of Sciences of Sofia
E-mail: evgeniy_ganev@iche.bas.bg

Prof. Venko Beschkov, DcS

Chemical & Biochemical Reactors Laboratory,
Institute of Chemical Engineering, Bulgarian Academy of Sciences of Sofia
E-mail: vbeschkov@bas.bg

Prof. Boyan Ivanov, DcS

Process Systems Engineering Laboratory,
Institute of Chemical Engineering, Bulgarian Academy of Sciences of Sofia
E-mail: b.ivanov@iche.bas.bg

Abstract: *The continuous increase in greenhouse gas emissions due to the rapid development of technical progress, as well as the growing needs for electricity require serious attention to the so-called "green energy" in order to meet permanently the needs of modern human society along with reducing emissions from greenhouse gases. Due to the natural putrefactive processes in the terrestrial flora and fauna, even without human intervention, significant amounts of gases (mainly methane) are generated, which can be used as green energy. Otherwise, they act as pollutants with the most serious greenhouse effect.*

The present paper focuses on the research of biogas production technologies, evaluation of raw materials and products, careful study and evaluation of all possible flows of raw materials and products, as well as environmental impact assessment as result of this activity.

Keywords: *Biogas, Anaerobic digestion, Bioenergy, Life-cycle assessment, Sewage sludge*

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FRI-ONLINE-1-CT(R)-05

TAUTOMERIC CONVERSION OF 2-CARBAMIDO-1,3-INDANDIONE UNDER INFLUENCE OF EXTERNAL ELECTRIC FIELD OR UV LIGHT

Prof. Venelin Enchev, DcS

Institute of General and Inorganic Chemistry,
Bulgarian Academy of Sciences, Bulgaria
E-mail: venelin@svr.igic.bas.bg

Prof. Vassil Delchev, DcS

Faculty of Chemistry,
University of Plovdiv, Bulgaria
E-mail: vdelchev@uni-plovdiv.bg

Assoc. Prof. Ivan Angelov, PhD

Institute of Organic Chemistry with Centre of Phitochemistry,
Bulgarian Academy of Sciences, Bulgaria
E-mail: ipangelov@gmail.com

Assoc. Prof. Nadezhda Markova, PhD

Institute of Organic Chemistry with Centre of Phitochemistry,
Bulgarian Academy of Sciences, Bulgaria
E-mail: nadya@orgchm.bas.bg

Abstract: 2-Carbamido-1,3-indandione (CAID), also known as 1,3-dioxo-2-indanecarboxamide, exists in the solid state as yellow-orange needles which sinter from 180°C to 220°C. CAID exists in solution in two tautomeric forms, 2-(hydroxyl-aminomethylidene)-indan-1,3-dione (**A**) and 2-carboamide-1-hydroxy-3-oxo-indan (**B**). The structures of both tautomers as well as the transition state for intramolecular proton transfer are located at MP2/6-31+G(d) level of theory for each magnitude and for opposite directions of the applied electric field. According to our SCS-MP2/6-31+G(d) field-free calculations the tautomer **A** prevail (59.3 %) while variation of the electric field strength along the direction from the indandione moiety to the carbamido fragment leads to stabilize of tautomer **B**, and at $25.7 \times 10^8 \text{ V.m}^{-1}$ electric field strength, the ratio drastically changed: 98.05 % **B** and 1.95 % **A**.

The tautomerization of CAID, $\text{A} \leftrightarrow \text{B}$, could occur thermally through a low energy barrier, $3.4 \text{ kcal mol}^{-1}$, or photophysically by internal conversion through a conical intersection S_0/S_1 and along the $^1\pi\pi^*$ excited-state reaction paths. The optic transitions $^1\pi\pi^* \rightarrow S_0$ are competitive reactions to the photophysical process. These optic transitions lead to the appearance of fluorescence bands, which should overlapped for the two tautomers, i.e. The two tautomers cannot distinguished by their fluorescent spectra only.

Keywords: 2-Carbamido-1,3-indandione, tautomerism, conical intersection, electric field, ab initio

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ASSESSMENT OF THE PERSONALITY OF PEOPLE, WORKING IN TECHNOLOGICAL SYSTEMS, WITH EYSENCK PERSONALITY QUESTIONNAIRE

Sabina Nedkova, PhD

Department “Technologies, materials and material science”,
Faculty of Technical Science
University “Prof. Dr. Asen Zlatarov”, Burgas, Bulgaria
E-mail: sabina_nedkova@abv.bg

Plamena Atanasova, PhD

Department “Technologies, materials and material science”,
Faculty of Technical Science
University “Prof. Dr. Asen Zlatarov”, Burgas, Bulgaria
E-mail: pl.veleva@abv.bg

Abstract: *The study of personality characteristics with the Eysenck personality test aims to assess the intelligence, social attitudes and overall image of a person working in a risky technological environment. The personality questionnaire will provide results on three main indicators of personality: "Lie", or how strong the desire of the person to "fit" into the environment, based on imaginary rather than real qualities; "Extroversion", or the degree of open expression of feelings; and "Sensitivity," or "Neuroticism," which determine an individual's emotional resilience. The individuals selected for evaluation work in a complex technological environment in which emotional stability and the ability to make adequate and objective decisions is of great importance. Very often, working in such an environment requires the employee to have authority and gain the trust of his colleagues, being an active part of the work society, in which it may be necessary to make difficult decisions to prevent risk situations, minimize and manage risk.*

Keywords: *Hans Eysenck, Professional psychology, Technological risk assessment*

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FRI-ONLINE-1-BFT(R)-01

**KINETIC ANALYSIS OF BIMOLECULAR COMPLEMENTATION
"VIRUS - HOST-CELL" BY SURFACE PLASMON
RESONANCE (SPR) METHOD**

Assist Prof. Evdokiya Belina, PhD

Institute of optical material and technologies (IOMT), Bulgarian Academy of Sciences (BAS), Sofia, Bulgaria

E-mail: evdokiyaabelina@yahoo.de

Radoslav Marinov, PhD Student

Department of Virology, National Centre of Infectious and Parasitic Diseases (NCIPD), Sofia, Bulgaria

E-mail: r.m.r@mail.bg

Assoc. Prof. Petia Genova-Kalou, PhD, specialist – virology

Department of Virology, National Centre of Infectious and Parasitic Diseases (NCIPD), Sofia, Bulgaria

E-mail: petia.d.genova@abv.bg

Prof. George Diankov, PhD

Institute of optical material and technologies (IOMT), Bulgarian Academy of Sciences (BAS), Sofia, Bulgaria

E-mail: ge.dyankov@gmail.com

Abstract: Since viruses are obligate intracellular parasites, they may exist and reproduce only in living host cell. In this bio-complex, the cell, in the role of host, provides its own structures and biosynthetic activity, but in accordance with the viral genetic program and with the direct participation of viral regulatory structures. Herpes simplex virus infections (HSV) are ubiquitous and widespread in the human population and represent a suitable model for study of virus-cell interactions. The aim of the present study is to detect and to evaluate the kinetics of a bimolecular "cell-host – herpes simplex virus" interaction in a condition of one-step virus growth infectious process using the surface plasmon resonance (SPR) method at different multiplicity of infection (MOI) and time of exposure. The obtained results are compared with other widely applicable methods such as microscopic observation of structural changes of infected cells and assay for detection of cell proliferation and survival. Human embryonal lung cells (Lep cell line) cultured at a density 3×10^3 cells/ml, post infected with HSV type 1 (HSV-1) with different MOI (0.01 and 0.1) were used. The cell survival and the structural-morphological changes associated with the different phases of the progression of the infectious process were evaluated by several methods: microscopic observation of changes in the morphology of the cell monolayer, MTT-assay and SPR technique. Cell survival and cytopathic changes are recorded at different intervals, which coincide with the different stages of the replication cycle of HSV-1 (3h, 6h, 8h, 12h, 16h, 24h and 48h). The obtained results from the SPR-method indicate accurate determination of the latent period at different MOI. The SPR method allows differentiation of the eclipse period from the latent phase, as well as determination of its duration at different MOI. The beginning of the latent and exponential phase (released virus) determined by the SPR method coincide with the structural-morphology changes registered by microscopic observation of the cell monolayer and with the reported survival rate by the MTT-assay. From the obtained results, it can be concluded that the SPR method is promising and could be used to assess the bimolecular interaction "host-virus" in vitro and for the laboratory diagnostic of many infectious.

Keywords: SPR method, multiplicity of infection (MOI), HSV-1, MTT-assay

FRI-ONLINE-1-BFT(R)-02

ANTIVIRAL EFFECT OF *GRAPTOPETALUM PARAGUAYENSE* E. WALTHER LEAF EXTRACT AND ITS PHENOL ACIDS FRACTION AGAINST HUMAN CORONAVIRUS 229E (HCoV-229E) *IN VITRO*

Mstr. Radoslav Marinov

Department of Virology, NRL “Cell cultures, rickettsia and oncogenic viruses”,
National Centre of Infectious and Parasitic Diseases, Sofia, Bulgaria
E-mail: r.m.r@mail.bg

Assoc. Prof. Nadezhda Markova, PhD

Institute of Organic Chemistry with Centre of Phytochemistry,
Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria
E-mail: nadya@orgchm.bas.bg

Assist. Prof. Ivayla Dincheva, PhD

Assoc. Prof. Ilian Badjakov, PhD

AgroBioInstitute, Plant Genetic Resources Group, Sofia, Bulgaria
E-mail: ivadincheva@yahoo.com, ibadjakov@gmail.com

As. Nina Stoyanova

Prof. Venelin Enchev, DSc

Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences, Bulgaria
E-mail: Nnkova.nina@gmail.com, veneline@gmail.com

Assoc. Prof. Petia Genova-Kalu, PhD

Department of Virology, NRL “Cell cultures, rickettsia and oncogenic viruses”,
National Centre of Infectious and Parasitic Diseases, Sofia, Bulgaria
E-mail: petia.d.genova@abv.bg

Abstract: It is known that some members of the Crassulaceae family possess several bio-medical benefits. *Graptopetalum paraguayense* E. Walther (GP) is a herbal medicine, belonging to this family. However, there is limited information in the literature on the antiviral, anti-oxidant and anti-inflammatory activities of this succulent plant. of interest of investigation is also a plant hydroxybenzoic acids fraction, such as gallic acid, trans-ferulic acid, syringic acid, and others.

The objective of our work was to evaluate, using colorimetric assay, the in vitro anti-human alpha coronavirus activities of *Graptopetalum paraguayense* E. Walther and its phenolic acids fraction in cell culture.

To evaluate the main organic groups, which had the aqueous leaf extract of the tested ethno plant was performed GC/MS analysis. to determine the capacity of the extract and its phenolic acids fraction (PAF) to inhibit the replication activity of human coronavirus strain 229E (HCoV-229E), as well as to evaluate the reduction of viability of infected or uninfected cells was used the MTT colorimetric assay. The results were expressed as maximal nontoxic concentration (MNC), 50% cytotoxicity (CC50) for MTT assay and 50% inhibitory concentration of the viral effect (IC50) for cytopathic effect (CPE) and MTT assay. The GP extract and PAF have not cytotoxic effect on human lung embryonal fibroblasts (Lep). The GP extract effectively inhibited HCoV-229E replication in dose-dependent manner. Furthermore, the GP extract was more effective inhibitor of HSV-1 replication in cultured cells (62%), whereas their PAF possessed lower effectivity (41%). The IC50 values range from 22.4 ± 0.2 to $88.2 \pm 7.7 \mu\text{g/mL}$.

According to results obtained, this plant extract protect cells against HCoV-229E infection, but the mechanism of their antiviral action and the active substances are not yet completely identified. Further studies are needed in order to verify which compounds could be responsible for this activity and how they exert their antiviral effects.

Keywords: *Graptopetalum paraguayense* E. Walther, GC/MS, hydroxybenzoic acids coronavirus, cytotoxicity, in vitro

EMERGING APPLICATIONS OF IONIZING RADIATION FOR PROCESSING OF MATERIALS IN BIOTECHNOLOGIES AND FOOD INDUSTRY

Assist. Prof. Delyan Gospodinov, PhD

Department of Machines and Apparatus in Food Processing Industry,
University for Food Technologies, Plovdiv, Bulgaria
E-mail: dgosp@abv.bg

Assoc. Prof. Vilhelm Hadjiski, PhD

Department of Technical Mechanics and Machinery,
University for Food Technologies, Plovdiv, Bulgaria
E-mail: hawi@abv.bg

Abstract: Ionizing radiation interacts with the materials by modifying their molecular structure and chemical composition. These changes substantially affect basic functional and technological properties of the materials such as strength, elasticity, plasticity, hardness, thermal conductivity, phase transition temperatures, chemical resistance, etc. This provides a possibility for using ionizing radiation for developing of new innovative materials, modification of existing materials with the purpose of improving their characteristics and processing of waste materials. The paper presents an overview of emerging modern radiation-based methods for treating of materials used in biotechnologies, food processing industry and food packaging and assesses the possibilities and benefits these technologies provide.

Keywords: ionizing radiation, materials, processing, modification, food, biotechnologies, packaging, innovation

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GAS PERMEABILITY OF BREAD

Assoc. Prof. Mykola Desyk, PhD

Department of Machines and Apparatus of Food and Pharmaceutical Productions
National University of Food Technologies, Kyiv, Ukraine
E-mail: nikdesyk@gmail.com

Oleksandr Kozak, Mas Student

Department of Machines and Apparatus of Food and Pharmaceutical Productions
National University of Food Technologies, Kyiv, Ukraine
E-mail: oleksandrkozak2@gmail.com

Prof. Vladimir Telychkun, PhD

Department of Machines and Apparatus of Food and Pharmaceutical Productions
National University of Food Technologies, Kyiv, Ukraine
E-mail: tvill@meta.ua

Ivanna Nazarenko, PhD Student

Department of Foodstuff Expertise
National University of Food Technologies, Kyiv, Ukraine
E-mail: yana.telychkun@gmail.com

Abstract: *The article presents the results of research of the permeability crust and central layers of bread products by gas, produced and transported from the workpiece to the environment during the vacuum cooling.*

It is proposed a scheme of laboratory installation and experimental procedure to study the permeability of the layers of the bread. investigated the impact of temperature and humidity of samples on the value of permeability. It is found values of gas permeability of bread crust in different zones of a surface of workpiece. It is proposed the methods for calculating surface areas for round and oval workpieces. It is found unit gas flow rates through the surface of products during vacuum cooling.

The results can be used to determine the modes in which the vacuum provided the integrity of workpiece.

Keywords: *Bread, Vacuum, Cooling, Gas permeability.*

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FORMATION OF SUSPENSION STRUCTURE IN THE PROCESS OF GRINDING IN BEAD MILLS

Kateryna Hrininh, PhD Student

Department of Machines and Apparatus of Food and Pharmaceutical Productions
National University of Food Technologies, Kyiv, Ukraine
E-mail: neackriss@gmail.com

Assoc. Prof. Oleksii Gubena, PhD

Department of Machines and Apparatus of Food and Pharmaceutical Productions
National University of Food Technologies, Kyiv, Ukraine
E-mail: gubena@meta.ua

Abstract: *It has been investigated the rheological properties of the suspension of farmaceutical and cosmetics preparates during grinding at an experimental laboratory bead mill of periodic action. The rheological characteristics have been investigated on a rotary viscometer Reotest 2. as a result of the research, the flow curve of the suspension during grinding has been constructed and it has been found that within the investigated range the product does not change the character of flow regardless of measurement time and temperature. Analysis of the curve of the suspension during grinding revealed features which explain formation of the structure. The dependence of the effective viscosity on the shear rate during grinding of the suspension is polynomial and confirms the non-Newtonian character of the product and is defined as a linear plastic body. The investigated finished product has 6.5 time's higher viscosity in relation to pure castor oil, which is explained by the high dry matter content (40 %) and the increase in the newly formed area. The viscosity of the suspension varies depending on the temperature: cooled to 20 °C, the finished product has a viscosity of 22.5% higher than immediately after the grinding process with a temperature of 34 °C.*

Keywords: grinding, suspension, shear stress, shear rate, effective viscosity.

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STUDYING AND IMPROVING THE CONTINUOUS PROCESS OF KNEADING YEAST DOUGH

Assoc.prof. Vitalii Rachok, PhD

Department of Machines and Apparatus of Food and Pharmaceutical Productions

National University of Food Technologies, Kyiv, Ukraine

E-mail: RachokV3478@gmail.com

Abstract: a study of the process of kneading wheat yeast dough with cam working was conducted. The aim is to determine the rational configuration of structural elements for continuous kneading of dough at different levels of frequency of the working elements rotation and the distance between them.

The kneading of wheat yeast dough by cam working elements is investigated. Mathematical modeling was performed using the Flow Vision software package based on the simulation of three-dimensional motion of liquids and gases in technical structures, as well as for the visualization of flow curves by computer graphics. Physical modeling was performed via experimental setup with cam kneading elements.

As the rotational speed of the working elements increases from 20 to 100 rpm, the mixing speed increases from 0.1 to 0.6 m/s, the distance between the cams does not affect the mixing in the specified range. The maximum values of pressure reach 16560 Pa for the distance between the cam working elements 2 mm and a speed of 100 rpm, the minimum 555 Pa for the distance between the cam working elements 10 mm and a speed of 20 rpm. In the mixing chamber, the highest-pressure values are formed in the contact zone of the cam working elements with the wall of the mixing chamber and in the contact zone of the two cams. The dependence of the viscosity in the mixing chamber on the speed of rotation of the working element is of a power nature and with increasing speed from 20 to 100 rpm decreases from 1600 to 320 Pa·s. Parts of the mixing chamber in which viscosity values in the range from 320 to 960 Pa·s are achieved are considered to be the most effective during mixing. Reducing the viscosity of the dough involves reducing energy costs during kneading.

To increase the carrying capacity of the cam working elements, improve mixing and reduce heat consumption, it is rational to use cam working elements with a variable pitch and a variable position of the cams at $\alpha = 45^\circ$ or a combined cam working element using a screw auger at the beginning of the working element.

Keywords: Modeling, Mixing, Yeast Dough, Kneading, Cam.

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EFFECT OF PROCESSING WITH ALTERNATIVE NON-THERMAL TECHNOLOGIES AND EDIBLE PACKAGING ON FOOD SAFETY AND QUALITY

Prof. Stefan Stefanov, PhD

Department of Machines and apparatus for the food and flavour Industry
University of Food Technologies, Plovdiv
E-mail: stvstefanov@yahoo.com

Ass. Prof. Yordanka Stefanova, PhD

Department General and Inorganic Chemistry with Chemistry Education
Plovdiv University "P. Hilendarski", Plovdiv
E-mail: jorpste@yahoo.com

Abstract: *New technologies for food processing and packaging are aimed at creating products for end customers with minimal loss of quality. In this regard, in the field of food science, processes are developed that spare raw materials and food products, with minimal impact on them and causing minor changes in their initial characteristics. They are considered non-traditional and alternative to the treatments used so far in mass food production. The effect of them is only now beginning to be studied in more depth. The results obtained so far show that they have a future.*

To ensure the safety of minimally processed raw materials and food products, as well as to preserve their properties for a longer period of time, a set of impacts is applied, which are known as technology with the application of more obstacles to spoilage reactions.

The article reviews literature sources that publish information on combined methods of food processing, for the packaging of which edible films or coatings are used. Results from the application of various barriers to specific food products are indicated. Based on the analysis, conclusions are made about the possibilities for practical implementation of the technology with obstacles in the food industry in combination with the use of edible films and coatings.

Keywords: *Edible Packaging, Edible Films, Edible Coatings, Non-thermal Processing,*

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SAT-ONLINE-P-2-CT(R)-01

**PREDICTING MOLECULAR PROPERTIES AND BIOACTIVITY SCORE
OF SIMILAR COMPOUNDS OF TAZAROTENE**

Assoc. Prof. Yana Koleva, PhD

Department of Chemistry,

University 'Prof. Assen Zlatarov'-Burgas, Bulgaria

E-mail: yanuriana@abv.bg

Abstract: *The purpose of present work was to define with a Tanimoto similarity metric of 0.8 similar compounds of tazarotene and to predict and analyze theirs molecular physicochemical properties and bioactivity score by the CompTox Chemistry Dashboard and Molinspiration software. The data analysis for the three similar compounds of tazarotene were found to have close molecular properties and structural features and their bioactivity score is active.*

Keywords: *tazarotene, similar compounds, predict, bioactivity score, molecular properties.*

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Molinspiration Chemoinformatic Software, URL: <https://www.molinspiration.com/>

SAT-ONLINE-P-2-CT(R)-02

QUANTUM-CHEMICAL AND DOCKING ANALYSIS ON THE BINDING
POTENTIAL OF HYDROXYBENZOIC ACIDS FROM
GRAPTOPETALUM PARAGUAYENSE E. WALTHER TO HSV
THYMIDINE KINASE ACTIVE SITE

Assoc. Prof. Miroslav Rangelov, PhD

Institute of Organic Chemistry with Centre of Phytochemistry,
Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria
E-mail: marangelov@gmail.com

Assist. Prof. Nadezhda Todorova, PhD

Institute of Biodiversity and Ecosystem Research,
Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria
E-mail: nadeshda@abv.bg

Assoc. Prof. Petia Genova-Kalu, PhD

National Reference Laboratory "Rickettsia and tissue cultures",
National Centre of Infectious and Parasitic Diseases, Sofia, Bulgaria
E-mail: petia.d.genova@abv.bg

As. Nina Stoyanova

Prof. Venelin Enchev, DSc

Institute of General and Inorganic Chemistry,
Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria
E-mail: Nnkova.nina@gmail.com, veneline@gmail.com

Assoc. Prof. Nadezhda Markova, PhD

Institute of Organic Chemistry with Centre of Phytochemistry,
Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria
E-mail: nadya@orgchm.bas.bg

Abstract: *Herpes simplex virus types 1 and 2 (HSV-1 and HSV-2) are members of the Herpesviridae family and are among the most common human pathogens, infecting about 90% of the world population. HSV thymidine kinase (TK) catalyzes the transfer of the gamma-phosphate group of ATP to thymidine to generate dTMP in the salvage pathway of pyrimidine synthesis. The dTMP serves as a substrate for DNA polymerase during viral DNA replication. TK allows the virus to be reactivated and to grow in non-proliferative cells lacking a high concentration of phosphorylated nucleic acid precursors. Thus, TKs are the main targets in anti-herpes virus treatments and potential therapeutic targets in antitumor gene therapy strategies. Recently we found that the total methanol extract from the succulent plant *Graptopetalum paraguayense* E. Walther (GP) demonstrates/has a significant inhibitory effect on HSV-1 as well as the GP phenolic fraction.*

Since TK appears to be a key feature in the replication of large DNA viruses such as HSV, we present theoretical investigations on the binding expedient of phenolic acids from this fraction to viral TK amino acids. Twelve different hydroxybenzoic acids such as gallic acid, trans-ferulic acid, syringic acid, and others were found by GS/MS analyses.

MOE 2016 software package was used to dock selected structures in the active site defined in published XRD (X-ray diffraction) structures of the Herpes Simplex Virus 1 thymidine kinase. The structure was protonated according to implemented Protonate3D algorithm and was scored according to implemented GBVI/WSA dG scoring function. The interaction energies of ligands (phenolic acids) in the pockets based on the GBVI/WSA dG scoring function were sorted and four best ligands according to ligand-pocket interactions were selected: trans-ferulic, gallic, syringic and gentisic acids have optimal interactions with the receptor.

From the results based on the molecular docking methods, different types of hydrogen-bonded complexes of hydroxybenzoic acids with amino acids, protonated amines, mineral acids and water molecules were modelled. The data received from our quantum-chemical calculations suggest that all twelve phenolic acids could form stable complexes with amino acids from the TK active site. The complexes formed are stable and trans-ferulic and gallic acids demonstrate great binding affinity to the active site of TK where they can exhibit their inhibitory properties. The calculations were performed at B3LYP/6-31+G(d,p) level of theory using GAUSSIAN 09 software package.

Keywords: *Graptopetalum paraguayense* E. Walther, thymidine kinase, Herpes Simplex virus, docking, quantum-chemical calculations, hydrogen-bonding.

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GREENHOUSE GAS REDUCTIONS THROUGH OPTIMAL BIODIESEL SUPPLY CHAIN

Eng. Yunzile Dzhelil, PhD

Laboratory “Process System Engineering”, Institute of Chemical Engineering,
Bulgarian Academy of Sciences, Sofia, Bulgaria

Phone: +359 87 645 4333

E-mail: unzile_20@abv.bg

Eng. Evgeniy Ganev, PhD

Laboratory “Process System Engineering”, Institute of Chemical Engineering,
Bulgarian Academy of Sciences, Sofia, Bulgaria

E-mail: evgeniy_ganev@iche.bas.bg

Prof. Boyan Ivanov, DcS

Laboratory “Process System Engineering”, Institute of Chemical Engineering,
Bulgarian Academy of Sciences, Sofia, Bulgaria

E-mail: b.ivanov@iche.bas.bg

Chief Asst. Prof. Desislava Nikolova, PhD

Department “Material science and technology”

Faculty of Technical Sciences

University “Prof. d-r Assen Zlatarov” – Burgas

E-mail: desislava_nikolova@btu.bg

Abstract: In the last few decades, attention has been focused on the world scientific community for prioritizing global closure, depletion of the ozone layer in the atmosphere and the danger to nature in general. a number of factors are analyzed, the influence on these processes is shown, as well as optimal opportunities for achieving sustainable development. One of these factors is emissions from the transport sector. The purpose of this article is presented on biodiesel as an alternative to conventional diesel fuel, contributing to the reduction of greenhouse gas emissions, provided for the entire life cycle of the fuel. The article presents a mathematical model of a Supply Chain for the production and distribution of biodiesel with the help of one that determines optimal values with minimal environmental pollution. a case for the Republic of Bulgaria is being considered.

Keywords: Biodiesel, Biodiesel blends, Emission, Supply Chain.

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SAT-ONLINE-P-2-CT(R)-04

INVESTIGATION OF ELECTRICAL CHARACTERISTICS OF BARIUM TITANATE (BaTiO₃)

Assistant Fila Yovkova, PhD

Department of Chemical Tehnology
Assen Zlatarov University, Burgas, Bulgaria
E-mail: fila_03@abv.bg

Prof. Irena Markovska, PhD

Department of Chemical Tehnology
Assen Zlatarov University, Burgas, Bulgaria
E-mail: imarkovska@btu.bg

Assos. Prof. Dimitar Rusev, PhD

Department Electronic and Electrotechnic
Assen Zlatarov University, Burgas, Bulgaria
E-mail: drr.rusev@gmail.com

Dimitar Georgiev, PhD Student

Department of Chemical Tehnology
Assen Zlatarov University, Burgas, Bulgaria
E-mail: postadg@abv.bg

Abstract: a technology for synthesis of barium titanate ceramics with high dielectric constant is proposed. in present work a sol-gel method was used for BaTiO₃ synthesis. Different mixtures have been studied and the technological regimes for obtaining a quality ceramic structure with high dielectric constant have been optimized. This ceramics could find application in the development of dielectrics for supercapacitors.

Keywords: Barium titanate, dielectric, supercapacitors

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MODIFICATION OF ULTRAFILTRATION POLYACRYLONITRILE MEMBRANES WITH NANOCCLAY PARTICLES

Assist. Prof. Milena Miteva, PhD

Faculty of Technical Sciences,
Unuversity "Profesor d-r Asen Zlatarov" - Burgas,
E-mail: rmkpetrovi@abv.bg

Assoc. Prof. Dimitrina Kiryakova, PhD

Faculty of Technical Sciences,
Unuversity "Profesor d-r Asen Zlatarov" - Burgas,
E-mail: dskiryakova@abv.bg

Prof. Stoyko Petrov, PhD

Faculty of Technical Sciences,
Unuversity "Profesor d-r Asen Zlatarov" - Burgas,
E-mail: stoiko.petrov1@gmail.com

Abstract: Polyacrylonitrile/nanoclay composite membranes were prepared by phase inversion of 17wt.% solutions of polyacrylonitrile (PAN) with various amounts of Nanomer 1.28E in solvents dimethylsulfoxide (DMSO) and dimethylformamide (DMF). Changes in the characteristics of PAN membrane before and after heat treatment and in dependence of the amount of nanoclay particles were observed by atomic force microscopy (AFM) and studied by the rejection (R, %) and permeability (J, l/m².h) to albumin and hysteresises relative to water constructed at $J=f(P)$ at $P=0.1-0.5$ MPa. The results show that nanoclay particles have a modifying effect and importance for the operational stability and characteristics of the membrane structure most effective at 1.5 wt.% of Nanomer 1.28E. The corresponding membrane reaches a water permeability from 110 to 188 l/m².h, the selectivity from 30 to 70 % with a mean square roughness (R_{max}) of the surface up to 58.4 nm.

Keywords: polyacrylonitrile, nanoparticles, nanocomposite, polymer membranes

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CORDIERITE CERAMICS WITH IMPROVED PERFORMANCE PROPERTIES

Assoc. Prof. Olena Karasyk, PhD

Department of Chemical Technology of Ceramics and Glass,
Ukrainian State University of Chemical Technology
E-mail: karalvit2015@gmail.com

Assoc. Prof. Tsvetan Dimitrov PhD

Department of Chemistry, Food and Biotechnologies
University of Ruse, Branch Razgrad
E-mail: tz_dimitrow@abv.bg

Abstract: Cordierite ceramics have found wide application in various branches of science and technology. Its distinctive feature is a low coefficient of linear expansion. However, it is practically impossible to obtain ceramics with zero porosity. Therefore, the study investigated the possibility of obtaining cordierite ceramics with improved performance characteristics. as a result of the development of the initial chemical composition of the base composition, it was possible to obtain materials with the following properties: porosity 1,4%, density 2.07 g/cm³, compressive strength 130 MPa, temperature coefficient of linear expansion $19,2 \cdot 10^{-7} \text{ deg}^{-1}$.

Keywords: Cordierite, Thialite, Porosity, Compressive strength, Temperature coefficient of linear expansion

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CHANCES OF UTILIZING OF SPENT CATALYSTS FROM PETROCHEMICAL INDUSTRY

Senior Assist. Prof. Ganka Kolchakova, PhD

Department of Material Sciences and Technology,

Assen Zlatarov University, Bulgaria

E-mail: gkolchakova@gmail.com

Abstract: The article investigates the possibility of utilization of spent catalyst from petrochemical industry. These waste products in combination with natural raw materials could be materials for a development of wide variety of products and can be successfully implemented in to industrial production.

Keywords: Spent Catalyst, Petrochemical industry, Waste, Ecology

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SAT-ONLINE-P-2-CT(R)-08

STUDY OF THE COLOR PARAMETERS OF ZIRCON CERAMIC PIGMENTS SYNTHESIZED FROM PURE RAW MATERIALS

Assistant Fila Yovkova, PhD

Department of Chemical Tehnology
Assen Zlatarov University, Burgas, Bulgaria
E-mail: fila_03@abv.bg

Prof. Irena Markovska, PhD

Department of Chemical Tehnology
Assen Zlatarov University, Burgas, Bulgaria
E-mail: imarkovska@btu.bg

Assos. Prof. Tsvetan Dimitrov, PhD

Department of Chemistry, Food and Biotechnologies
University of Ruse, Branch Razgrad
E-mail: tz_dimitrow@abv.bg

Abstract: Zirconium ceramic pigments with basic zircon phase - $\text{ZrO}_2\cdot\text{SiO}_2$ were synthesized by solid phase sintering of pure oxides: ZrO_2 , $\text{SiO}_2\cdot n\text{H}_2\text{O}$, and the following elements were added as colorants: V, Fe, Cr, Co and Mn. NH_4Cl was used as a mineralizer. The pigments were synthesized at three final firing temperatures: 1000, 1100 and 1200 °C. The color characteristics of the synthesized zirconium ceramic pigments were determined using a color measurement system - CIELab.

Keywords: zircon pigments, solid-state sintering, CIELab color measurement

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SAT-ONLINE-P-2-CT(R)-09

CORROSION INHIBITION OF LOW-CARBON STEEL IN A 0.1 M H₂SO₄ MEDIUM

Assoc. Prof. Temenuzhka Haralanova, PhD

Department of Chemistry, Food and Biotechnologies, Razgrad Branch,
University of Ruse
E-mail: tharalanova@uni-ruse.bg

Assist. Prof. Angel Dishliev, PhD

Department of Mathematics,
University of Chemical Technology and Metallurgy, 1756 Sofia, Bulgaria
E-mail: adishliev@gmail.com

Assist. Prof. Iliyana Nikolova, PhD

Department of Chemistry, Food and Biotechnologies, Razgrad Branch,
University of Ruse
E-mail: inikolova@uni-ruse.bg

Assist. Prof. Christian Girginov, PhD

Department of Physical Chemistry,
University of Chemical Technology and Metallurgy, Sofia
E-mail: girginov@uctm.edu

Abstract: In the present work, preliminary studies on the corrosion of low carbon steel in sulfuric acid medium with the addition of the organic substance 6-(10H-phenothiazin-10-yl)-1H,3H-benzo[de]isochromene-1,3-dione were performed. Its introduction into the corrosive medium (0.1M H₂SO₄) was carried out by its solution in ethanol. The gravimetric method was applied to determine the characteristics of the corrosion process. The corrosion rate, the degree of protection and the inhibition action coefficient were estimated by varying the concentration (5×10^{-7} – 5×10^{-5}) mol dm⁻³ of the inhibitor substance.

The obtained results clearly show that this compound has the potential to successfully be employed as an effective corrosion inhibitor of low carbon steel in sulfuric acid media. However, due to its low solubility in ethanol, experiments have been performed to find other suitable polar solvents to enable the increase of its concentration in the corrosive environment.

Keywords: low-carbon steel, corrosion, inhibitors, acidic media, 6-(10H-phenothiazin-10-yl)-1H,3H-benzo[de]isochromene-1,3-dione

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FEATURES OF THERMAL DESTRUCTION OF COMPOSITIONS OF SPODUMENE-EUCRYPTITE COMPOSITION OBTAINED BY SOL-GEL TECHNOLOGY

Assoc. Prof. Olena Khomenko, PhD

Department of Chemical Technology of Ceramics and Glass,
Ukrainian State University of Chemical Engineering, Ukraine
E-mail: elenahkts@ukr.net

Assoc. Prof. Tsvetan Dimitrov, PhD

Department of Chemistry, Food and Biotechnologies
University of Ruse, Branch Razgrad
E-mail: tz_dimitrov@abv.bg

Oleksandra Makedonskaya, Student

Department of Chemical Technology of Ceramics and Glass,
Ukrainian State University of Chemical Engineering, Ukraine
E-mail: jjqwertyqw@gmail.com

Abstract: The article is devoted to the study of glass-crystalline heat-resistant materials of the oxide system $\text{Li}_2\text{O-Al}_2\text{O}_3\text{-SiO}_2$. These materials were obtained by the sol-gel method, which is an alternative to traditional methods of obtaining structural materials using ceramic and glass technology. In the course of research, strict parameters for obtaining these materials with a high degree of homogeneity of their structure have been worked out. However, it has been established that the stability of materials significantly depends on the conditions for their further heat treatment: despite the expected low-temperature decomposition of some components of the composition, the temperature of the irreversible transition of the material to a stable state shifts to the region of 700-800 °C. This aspect is very important for long-term storage of the intermediate product.

Keywords: Sol-gel method, Heat-resistant glass ceramics, Spodumene, Eucryptite, Calcination

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SAT-ONLINE-P-2-BFT(R)-01

**STARCH SYRUPS AS SUBSTITUTES FOR SUGAR AND MILK POWDER
IN ICE CREAM**

Assoc. prof. Oksana Kochubei-Lytvynenko, PhD

Department of of Milk and Dairy Products,
National University of Food Technologies, Ukraine
E-mail: milknuft@i.ua

Prof. Galyna Polischuk, Dr. Eng. Sc.

Department of of Milk and Dairy Products,
National University of Food Technologies, Ukraine
E-mail: milknuft@i.ua

Assist. Oksana Bass, PhD

Department of of Milk and Dairy Products,
National University of Food Technologies, Ukraine
E-mail: kleona@meta.ua

Abstract: *The article considers the existing and promising ways to use starch syrup in milk-based ice cream recipes. The influence of substitution of sugar on dry skimmed milk starch syrup and starch on the characteristics of mixtures for the production of ice cream of classical types has been investigated. to study the possibility of simultaneous replacement of sugar and dry skim milk residue with starch syrup in milk-based ice cream, the degree of substitution of the milk component up to 30% is used, which will ensure its minimum possible content in the product (at least 7%). Simultaneous replacement of milk powder and sugar on the composition of starch syrup with different carbohydrate composition has been carried out. The article describes the results of analytical and experimental research methods: rheological characteristics and cryoscopic temperature of mixtures, organoleptic characteristics of ice cream, whipped cream, resistance to melting. as a result of the conducted researches the multifunctional technological properties of starch syrup with low and high degree of saccharification in the composition of mixtures for ice cream production as sweeteners, cryoprotectants, thickeners and structure stabilizers has been revealed. Studies confirm the feasibility of using composite mixtures of low-sugar and high-sugar starch syrup as substitutes for sugar and milk powder in ice cream. on the basis of research, ice cream recipes with improved characteristics and reduced cost have been developed.*

Keywords: *sugar substitutes, ice cream, starch syrup, sweeteners*

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MODELLING OF PROCESS OF PRESSING THE DOUGH IN MATRIX WITH SCREW INSERTS

Prof. Vladimir Grudanov, DcS

Department of Technology and Technical Support of Agricultural Processing Processes,
Belarusian State Agrarian Technical University, Belarus

E- mail: pererabotka.kafedra@mail.ru

Assoc. prof. Hanna torhan, PhD

Department of Technology and Technical Support of Agricultural Processing Processes,
Belarusian State Agrarian Technical University, Belarus

E-mail: anechkat@tut.by

Abstract: It is proposed to install special screw-shaped inserts in the matrix for the production of pasta. The inserts has has injection-type screws shape. This allows to regulate the process of pressing the dough, pre-compacting the dough, plasticizing it and simultaneously heating it.

A smooth transition of the dough in the forming holes is ensured, the hydraulic resistance of the forming channels is reduced, the quality of pasta improves, the productivity of the press increases and the durability of the matrix operation is increased.

A mathematical model of a pumping-type auger has been built, which makes it possible to obtain the same dough compaction coefficient for all screw channel inserts. The mathematical model of the screw sweep more accurately takes into account the shape of the helical groove in the normal section –a shape close to a trapezoid, and not to a parabolic segment.

The use of special inserts in the matrix improves the quality of semi-finished products, increases the productivity of the screw press by 20%, and reduces the specific energy consumption.

Keywords: pasta, dough, matrix, auger, seal.

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REASONING OF THE SELECTION OF TECHNOLOGICAL PARAMETERS FOR THE EXTRACTION OF SUMAC

Assoc. Prof. Uliana Kuzmyk, PhD

Department of Milk and Dairy Product Technology,
National University of Food Technologies, Ukraine
E-mail: ukuzmik@gmail.com

Assoc. Prof. Nataliia Yushchenko, PhD

Department of Technology and restaurant Ayurvedic products,
National University of Food Technologies, Ukraine
E-mail: YuNM_NUFT@ukr.net

Assoc. Prof. Tetiana Osmak, PhD

Department of Milk and Dairy Product Technology,
National University of Food Technologies, Ukraine
E-mail: osmaktg@ukr.net

Master Artur Mykhalevych

Department of Milk and Dairy Products Technology
National University of Food Technology, Kyiv, Ukraine
E-mail: artur0707@ukr.net

Abstract: In order to intensify the extraction process, the possibility of using a rotary-pulse apparatus was investigated. The use of rotary-pulse extractors makes it possible to intensify the process of eliciting extractive substances of plant raw materials in comparison with traditional methods, to improve the microbiological parameters of the obtained extracts due to the tightness of the circuit and to ensure the energy efficiency of the process.

It was found that with increasing temperature, the mass fraction of extractives increased, while the duration of the process at the selected temperature was of great importance. The duration of the extraction at a temperature of 20 °C for 10 min, gave the same yield of extractives as heating the system "raw materials/solvents" to a temperature of 80 °C without endurance.

To compare the results of experimental data determined by different methods, the coefficient of variation was calculated. That is, the use of a rotary-impulse apparatus makes it possible to increase the yield of extractives by an average of 24.5% in comparison with classical maceration.

Keywords: extraction, sumac, extractives, temperature.

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EVALUATION OF ANTIOXIDANT ACTIVITY OF HYDRAZONE

Assist. Prof. Nadya Agova - PhD

Department of Pharmaceutical Sciences,
Faculty of Pharmacy,
Medical University-Varna "Prof. Dr. Paraskev Stoyanov"
E-mail: Nadya.Agova@mu-varna.bg

Assoc. Prof. Miglena Todorova, PhD

Department of Biochemistry, Molecular Medicine and Nutrigenomics
Faculty of Pharmacy,
Medical University-Varna "Prof. Dr. Paraskev Stoyanov"
E-mail: miglena.todorova@mu-varna.bg

Assoc. Prof. Svetlana Georgieva– PhD

Department of Pharmaceutical Sciences,
Faculty of Pharmacy,
Medical University-Varna "Prof. Dr. Paraskev Stoyanov"
E-mail: fotkova@abv.bg

Abstract: Antioxidants are molecules that can prevent or slow damage to cells caused by free radicals. It is therefore important to determine the content and effectiveness of antioxidants in various chemical compounds and foods. This necessitates the development of a rapid method for determining the potential antioxidant effect. In the present study, we investigate the antioxidant potential of newly synthesized hydrazone of the antineoplastic drug bexarotene. The analyzes used (ABTS • + and DPPH) are widely used methods for assessing the antioxidant capacity of natural products. Both approaches are spectrophotometric techniques based on the quenching of stable color radicals. The DPPH method allows to determine the antioxidant activity by using a stable free radical - 1,1-diphenyl-2-picrylhydrazyl (DPPH; C₁₈H₁₂N₅O₆, M.m = 394.33). The study is based on measuring the suppression capacity of antioxidants to it. The antioxidant activity of the newly synthesized compound was also determined by ABTS [2,2'-azinobis (3-ethylbenzothiazoline-6-sulfonic acid)] cation radical decolorization method.

Keywords: Antioxidant activity, hydrazine, antineoplastic drug, bexarotene

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DEVELOPMENT OF COMPOSITE SAUCES FOR PASTEURIZED PRODUCTS

Prof. Vasyl Pasichnyi, DtS

Department of Meat and Meat production,
National University of Food Technology, Ukraine
E-mail: pasww1@ukr.net

Postgraduate Tetyana Khorunzha

Department of problem scientific and research laboratory
National University of Food Technology, Ukraine
E-mail: 0112199277@ukr.net

Polumbryk Manefa, PhD

Department of Meat and Meat production,
National University of Food Technology, Ukraine
E-mail: manefaiv2208@ukr.net

Abstract: The analysis of the market and trends in the sauce segment in Ukraine and around the world shows the orientation of consumers to healthy eating and the desire to consume environmentally friendly products. There is an active update of the range of sauces, because today the bulk of sauces produced by industry, falls on the segment of mayonnaise.

Fruit-based emulsion sauce formulations have been developed. The possibility of regulating the emulsifying ability and stability of emulsions using different types of dispersion was studied (1). The pH value for plum-based sauces varies depending on the recipe 3.2-3.5, after heat treatment, at a temperature of 85°C the values do not change (2, 3).

For tomato-based sauces, the pH value is 4.6-4.9, after heating it decreases slightly.

Stability of technological indicators of sauces at heating allows to recommend them for production of pasteurized products, including pasteurized sausages and canned meat ().

Keywords: sauce, pasteurization, emulsion

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BASIC PROVISIONS AND RESEARCH OF CONTINUOUS DOUGH KNEADING

Assoc. prof. Vitalii Rachok, PhD

Department Machines and apparatus of food and pharmaceutical productions,
National University of Food Technology, Ukraine
E-mail: RachokV3478@gmail.com

Assoc. prof. Yuliya Telychkun, PhD

Department Machines and apparatus of food and pharmaceutical productions,
National University of Food Technology, Kyiv, Ukraine
E-mail: tvill@meta.ua

Prof. Volodymyr Telychkun, PhD

Department Machines and apparatus of food and pharmaceutical productions,
National University of Food Technology, Kyiv, Ukraine
E-mail: tvill@meta.ua

Abstract: *The development of a continuous-action dough-mixing machine is accompanied by the choice of a rational configuration of the working element. Rationalization is realized by analyzing the various configurations of the working element and its effect on the kneading process. Imitation modeling aims to calculate the values of certain characteristics of a process that develop over time, by reproducing the flow of this process on a computer via its mathematical model.*

During projecting of the process of dough mixing, there is a range of issues related to the type of working elements is supposed to be chosen. on the basis of theoretical searches and obtained experimental results, after comparative analysis of working elements, it was decided to simulate the process of kneading yeast wheat dough using cam working elements.

Obtaining information about the process of mixing at any point in the mixing tank using simulation modeling and the results of a physical experiment allow to project an effective working element in a high-tech continuous mixing machine.

Dough kneading is a complex process that involves creating a homogeneous capillary-porous mass of flour, water, yeast, salt, and other components. The formation of dough during kneading occurs as a result of a number of processes, of which the most important are: physico-mechanical, colloidal and biochemical processes. All these processes occur simultaneously, mutually affecting each other and depend on the duration of kneading, temperature and the amount and quality of raw materials used during kneading the dough.

Keywords: Yeast Dough, Provisions, Continuous, Kneading.

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**SYNTHESIS, CHARACTERIZATION AND ANTIMICROBIAL STUDIES
OF 6 – PHENOTHIAZINIL – 1,8 – NAFTHOYLENE – 1,2 –
BENZIMIDAZOLE – 1 - OH**

Prof. Neyko Stoyanov, PhD

Department of Chemical, Food and Biotechnologies, Razgrad Branch,
“Angel Kanchev” University of Ruse
E-mail: nstoyanov@uni-ruse.bg

Assoc. Prof. Iliana Kostova, PhD

Department of Chemical, Food and Biotechnologies, Razgrad Branch,
University of Ruse
E-mail: ikostova@uni-ruse.bg

Chief Assist. Iliyana Nikolova, PhD

Department of Chemical, Food and Biotechnologies, Razgrad Branch,
University of Ruse
E-mail: inikolova@uni-ruse.bg

Assoc. Prof. Marin Marinov, PhD

Department of Chemistry and Phytopharmacy
Agricultural University - Plovdiv, Faculty of Plant Protection and Agroecology
E-mail: m_n_marinov@abv.bg

Abstract: *The subject matter of this article is the synthesis of isomeric luminescent compounds with orange-red color, containing a phenylthiazine ring and a 1,8 - naphthoylene - 1,2 - benzimidazole group. the IR-spectra of the individual isomers formed in the process of synthesis, their separation and antimicrobial activity were studied.*

Keywords: *Phenothiazin, Synthesis, Isomers, Antimicrobial activity*

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SIMULATION OF HIGH PRESSURE MEAT PATE PROCESSING

Prof. Victor Goots, DcS

Department of Hotel, Restaurant and tourist Business
Kyiv National University of Culture and Arts
E-mail: goots@ukr.net

Assoc. prof. Olga Koval, PhD

National University of Food Technologies,
E-mail: Koval_andreevna@ukr.net

Researcher Svitlana Bondar

Institute of Food Resources of the National Academy of Agrarian Sciences of Ukraine
E-mail: svetik-89@ukr.net

Assoc. prof. Oleksii Gubena, PhD

Department of Machines and Apparatus of Food and Pharmaceutical Productions
National University of Food Technologies, Kyiv, Ukraine
E-mail: gubena@meta.ua

Abstract: for meat pies, it is common to use mathematical models to use regression analysis. Each time there is a change in experimental data, a new mathematical model is built, which changes the number of important independent factors and the values of their degree. Therefore, the use of regression equations in the theory of modeling the processes of microbiological synthesis does not allow to obtain the required accuracy of the results and for this reason their use can not be considered satisfactory.

It is presented a new method of constructing a basic mathematical model for different types of pate in the form of a differential equation. The positive thing is that the characteristics of the model retain their dimensions: the magnitude of the pressure (Pa), the duration of its action (second), the optimization parameter - the magnitude of biological pollution (CFU). It makes it possible to determine the effectiveness of inactivation of microorganisms at different hydrostatic pressures and the duration of its exposure by the magnitude of the initial biological contamination of the pate mass.

A method has been developed that makes it possible, depending on the specific conditions of the technological process, to refine the optimization parameter. to do this, the exponent is additionally introduced into the mathematical model. This method of refining the mathematical model is well known, but the conditions for finding its value and other characteristics of the model remain imperfect and problematic.

Keywords: meat, pate, pressure, modeling.

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SAT-ONLINE-P-2-BFT(R)-09

SCIENTIFIC SUBSTANTIATION OF THE PROCESS OF MANAGING CRITICAL MODES OF PNEUMATIC TRANSPORTATION FOR FOOD PRODUCTS

Liudmyla Kryvoplias-Volodina, DcS

Department of Mechatronics and Packaging Technology
National University of Food Technologies, Kyiv, Ukraine
Tel.: +380508044075
E-mail: kryvopliasvolodina@camozzi.ua

Prof. Oleksandr Gavva, DcS

Department of Machines and Apparatus for Food and Pharmaceutical Industries,
National University of Food Technologies, Kyiv, Ukraine
Tel.: +380977700997
E-mail: gavvaoleksandr@gmail.com

Oleksandr Volodin, Master

Department of Mechatronics and Packaging Technology,
National University of Food Technologies, Kyiv, Ukraine
E-mail: sashavolodin11@gmail.com

Abstract: *The mathematical and physical models for critical modes of pneumatic conveying has been developed to ensure calculations and design of the main pneumatic product pipelines with a continuous mode of operation. The model takes into account the technological conditions of the gas suspension movement; the laws of motion of individual small-piece particles, taking into account their impact interaction and decompression, as well as real boundary conditions for the movement of a food product. The parameters of the zone of dynamic destruction of the layer of small-piece food product by the air shock wave were experimentally investigated and the comparison of the calculation results with the experiment was performed. The process of controlling the critical modes of pneumatic conveying based on proportional elements and feedback (current loop 4–20 mA) was theoretically described; investigation of the process of destruction of a cluster of products using an air wave and controlled decompression. an approach to modelling pneumatic conveying systems as a whole is proposed. The total pressure loss in the pneumatic conveying pipeline is investigated, it consists of: pressure losses arising from the movement of clean air; additional pressure losses arising from the movement of material; pressure losses to maintain the transported material in suspension in a vertical section; pressure loss for acceleration of transported particles when they are drawn into the transport pipeline; which are directly proportional to the volumetric mass of air, the speed of its movement and the weight concentration of the material in the mixture.*

Keywords: *pneumatic conveying, small-piece, model, modes, boundary conditions, control, layer.*

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FUNCTIONAL CHARACTERISTICS OF FOOD OF ANIMAL ORIGIN

Assoc. Prof. Tatjana Kalevska, PhD

Asocc. Prof. Daniela Nikolovska Nedelkoska, PhD

Asocc. Prof. Viktorija Stamatovska, PhD

Assist. Prof. Vezirka Jankuloska, PhD

Faculty of Technology and Technical Sciences - Veles

University "St. Kliment Ohridski" - Bitola, Republic of North Macedonia

E-mail: tatjana.kalevska@uklo.edu.mk; daniela.nedelkoska@uklo.edu.mk;

viktorija.stamatovska@uklo.edu.mk; vezirka.jankuloska@uklo.edu.mk

Assist. Prof. Gjore Nakov, PhD

Department of Chemical, Food and Biotechnology

University of Ruse "Angel Kanchev", Branch Razgrad, Bulgaria

Phone: +359894264250

E-mail: gnakov@uni-ruse.com

Abstract: Due to the growing concern of consumers about their own health, nutrition and food quality, in recent years the food industry has focused on the development of food products with functional characteristics (functional food) that have a special specific composition and nutritional quality. Functional foods in addition to traditional nutrients contain functional (bioactive) ingredients that positively affect health and reduce the risk of disease. Functional foods can be foods that naturally contain functional components, foods that are "enriched" with functional ingredients, or foods that remove certain ingredients, which reduces the risk of developing some diseases.

The functional characteristics of food of animal origin (milk, meat, egg) are the result of the natural content of functional components, due to which they have an irreplaceable role in nutrition globally. Incorporating bioactive ingredients in the processing of milk and meat (probiotics, prebiotics, antioxidants) or the replacement of some components (saturated fats) with components that have proven positive effect, allows the creation of functional dairy and meat products with favorable health and physiological effect. Today, the production of functional food is steadily increasing, and new products are increasingly accepted by consumers.

The paper is a review of literary data on the functional characteristics of different foods of animal origin and its importance in the diet.

Keywords: functional food, bioactive ingredients, food of animal origin

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SAT-ONLINE-P-2-BFT(R)-11

STRUCTURAL AND PARAMETRIC SYNTHESIS OF KNEADING MACHINES

Assoc. Prof. Igor Litovchenko, PhD

National University of Food Technologies, Kyiv, Ukraine

E-mail: postman300000@gmail.com

Prof. Oleksandr Gavva, DcS

National University of Food Technologies, Kyiv, Ukraine

E-mail: gavvaoleksandr@gmail.com

Oleksii Litovchenko, Graduate Student

National University of Food Technologies, Kyiv, Ukraine

E-mail: postman300000@gmail.com

Abstract: It are offered methods of analysis and research of hydrodynamic processes in kneading machines. in modern conditions, a qualitative full-fledged study of complex hydrodynamic processes that occur during the movement of the working bodies of the mixing equipment is impossible without the use of computer technology. Methods and programs of three-dimensional simulation computer modeling make it possible to obtain quantitative and qualitative characteristics of kinematic and dynamic processes. with the accumulation of a sufficient amount of information, it is possible to synthesize the design of the kneading machine, which will include technical solutions that allow you to create the optimal industrial design for today.

The analysis of constructions of kneading machines and a technique of research of their work gives the chance to define directions both improvement of work of existing, and to create new variants of a structure.

Keywords: mixing, bread dough, efficiency, modeling.

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PRACTICAL ASPECTS OF MODELING HYDRODYNAMIC CHARACTERISTICS IN THE SYSTEM OF PIPELINE VALVES

Sergii Volodin, Postgraduate

Department of Technological Satisfaction of Computer Technology Project,
National University of Food Technologies, Kyiv, Ukraine
E-mail: dir@camozzi.by

Prof. Valerii Myronchuk, DcS

Department of Technological Satisfaction of Computer Technology Project,
National University of Food Technologies, Kyiv, Ukraine
E-mail: mironchukvg@ukr.net

Abstract: Proper operation of control valves allows you to maintain the parameters of technological processes and increase the effect of juice purification and sugar yield, reduce the sugar content in molasses, reduce fuel consumption and milk of lime. Search for rational parameters. The technology of the control valve selection is offered in the work, on the basis of the analysis of the static characteristic of the working object. It is shown that when choosing the standard size of the valve according to the equations of flow and throughput characteristics, the operation of the valve is considered separately from the operation of the control system of flowing of modern sugar production. The technology of the control valve selection is offered in the work, on the basis of the analysis of the static characteristic of the working object.

Empirical methods have been used to calculate the cost characteristics for evaluating the operation of control valves and shut-off elements. Models of the object of regulation on the experimental stand are investigated. The study of the transient process when emptying the working chambers proved the following - the time of the transient process depends on the initial pressure in the chamber, the volume and type of muffler installed on the exhaust of the regulator (creates additional resistance to working air during discharge). At an initial pressure of 5 bar, for $V = 4$ l at step change of a control signal, time of transient process at use of the muffler on an exhaust to 1,8s is accurately fixed. When reproducing the operation of the regulator without a muffler - the transient time is twice less.

Keywords: control valves, parameters, technological processes, sugar yield.

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