

ABSTRACTS

THE RULER IN THE OLD BULGARIAN PREACHING TRADITION

Assoc. Prof. Todorka Georgieva, DSc

Department of Philological and Natural Science

University of Ruse "Angel Kanchev", Silistra Branch

Phone: +359 086 821 521

E-mail: tgeorgieva@uni-ruse.bg

Maria Tomova-Mihneva, PhD

Department of Philological and Natural Science

University of Ruse "Angel Kanchev", Silistra Branch

Phone: +359 086 821 521

E-mail: mtomova@uni-ruse.bg

Abstract: *The report examines the ancient Bulgarian writers' vision of the ruler, reproduced in various literary works, in which the problem of the moral strength and purity of the king is sharply examined. The idea of the "divinity of power" explored through the understandings of the compiler of the short Zlatostruy, created in the era when the Christianity was established in our country in order to fight against the Old Bulgarian paganism. In the translation and in the original words of Zlatostruy are exposed pride, greed and the unrighteousness of those who have departed from God and are sins of the rulers who are asked to become humble and to ask for forgiveness for their sins. The Bible and Gospel examples suggest that sin can be overcome if a person, whether it is a king or a servant, realizes his sins and asks to be forgiven in order to receive salvation of his soul.*

Keywords: *Zlatostruy, Tarzhestvenik from 12th Century, The Golden age of King Simeon, Ruler, Christianity, Paganism*

JEL Codes: I29

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FRI-216-1-SSH(S)-02

TOURIST POTENTIAL OF ROUSSE DISTRICT

Pr. Assist. Prof. Daniela Yordanova, PhD

Department of Business and Management

“Angel Kanchev” University of Ruse

Phone: 082-888 520

E-mail: dyordanova@uni-ruse.bg

Assoc. Prof. Milena Kirova, PhD

Department of Business and Management

“Angel Kanchev” University of Ruse

Phone: 082-888 520

E-mail: mkirova@uni-ruse.bg

Abstract: The paper proposes an evaluation of tourism potential of Ruse district based on PEST and SWOT analyses as well as functional analysis aiming improvement of implementation of local policy fostering tourism development in the region. As a result, the main trends, competitors, products and clients (tourists) are defined. Results are showing that district of Ruse is underdeveloped as touristic destination, therefore there is potential for various kinds of tourism. Some recommendations for further tourism development are proposed. The results had been presented in front of the working group for development of project of Strategy for sustainable tourism development of Ruse district 2020 – 2030 and will be included in official strategic document.

Keywords: tourism potential, Strategy for sustainable tourism development of Ruse district 2020 – 2030, PEST analysis, SWOT analysis, trends in tourism, tourist products

JEL Codes: L83, Z32, R58

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STORIES ABOUT THE PAST. PERSPECTIVES, STRATEGIES, RHETORIC

Assoc. Prof. Rumyana Lebedova, PhD

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

Phone: 0887632741

E-mail: rlebedova@uni-ruse.bg

Abstract: *Memory is built up of different types of stories about the past - those which are created by the documents, that formed the basis of the historical chronicle; those created by the press, driven by the ambition to capture authentic footage; those which are created by the literature, embodying the spirit of the times; those created by the participants and witnesses, immersed in the events, who have preserved the personal experience ... Each of the stories deals with different communicative strategies, with different rhetoric, looks at different patterns of thinking, is conditioned by different evaluations. There are different perspectives, the amount of information, the accents, the purpose, the relation between objectivity and subjectivity...*

Keywords: *Story, the past, authenticity, subjectivity, reality, fiction*

JEL Codes: *I29*

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A LOOK AT SOME OF THE FIRST SYNTAX TEXTBOOKS

Donka Radeva Ilieva

Senior teacher in bulgarian language and literature - first professional qualification

“Vasil Levski” secondary school, Duloovo, Silistra Region

Phone: 0886368008

E-mail: ilieva_d@mail.bg

Abstract: *The Renaissance is an important period of Bulgarian history and as such implies multifaceted interpretations of what is happening in the various spheres of the cultural and socio-political life. It was at this crucial time - towards the end of the nineteenth and the beginning of the next century, various issues related to the New Bulgarian literary language began to be discussed. As an evidence of the many processes serve us the reflections of Bulgarian writers on the problems of the language, as well as their ideas about its future structure and spelling.*

Other important testimonials are the various textbooks which appear - in the preface of the 1930s - the "decade of the first Bulgarian grammarians and of the first New Bulgarian school", clearly stated the "typical for the Enlightenment philosophy the pursuit of a new secular science, art and culture, towards transforming education and shaping the new person according to the new principles." Historical time is characterized by overall progress: education, cultural, literary, social and economic life, and at the same time there are unifying processes in the field of literary language.

Syntax knowledge is indisputably important to students in the past, and today - through them, students learn not only to write correctly, but also to enrich their speech both meaningfully and intonationally...

The purpose of the paper is to present briefly several syntax textbooks that have appeared during the historical period described, with no claim to the completeness and scope of the exposition.

Keywords: syntax, syntax textbook, literary language

JEL Codes: L10, L11

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THE RULER IN ZLATOSTRUY AND TARZHESTVENIK FROM 12TH CENTURY

Assoc. Prof. Todorka Georgieva, DSc

Department of Philological and Natural Science
University of Ruse "Angel Kanchev", Silistra Branch
Phone: +359 086 821 521
E-mail: tgeorgieva@uni-ruse.bg

Maria Tomova-Mihneva, PhD

Department of Philological and Natural Science
University of Ruse "Angel Kanchev", Silistra Branch
Phone: +359 086 821 521
E-mail: mtomova@uni-ruse.bg

Abstract: The paper examines the issue of the moral messages and lessons conveyed by the works in Tarzhestvenik from 12th century to the newly baptized Bulgarian people. It explores the notion of a "God-appointed ruler" accepted by the Christian religion as a guarantor of the inviolability of order and harmony in the human world. In the paper are examined the views of the medieval writers' of the earthly ruler as a God-fearing and fair spiritual leader of the people, as well as the views of the Heavenly, Only True King, "who holds human life in His palms".

Keywords: Tarzhestvenik from 12. Century, Zlatostruy, The Golden age of King Simeon, Ruler, Christianity, Paganism

JEL Codes: I29

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FRI-216-2-SSH(S)

FRI-216-2-SSH(S)-01

SYNONYMY IN LOGISTICS TERMINOLOGY DUE TO SHORTENING

Senior Lecturer Galina Velikova, PhD

Department of Language Training and Applied Linguistics

“N. Vaptsarov” Naval Academy, Varna

Tel.: 0888-618-677

E-mail: g.velikova@naval-acad.bg

Abstract: *In spite of the controversial attitudes to synonyms in terminology, research proves that they do occur in various kinds. This type of synonymy resulting from shortening may be due to univerbization, blending, abbreviation and clipping. These short forms of terms taken from logistics specialized texts are met both orally and in a written form and illustrate the principle of linguistic economy.*

Keywords: *synonymy in logistics terminology, univerbization, clipping, blending, abbreviation.*

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THE RELATIONSHIP BETWEEN POPULISM AND DIRECT DEMOCRACY – THE 2016 REFERENDUM

Stanislav Todorov – PhD Student
Department of Political sciences,
Sofia University “St. Kliment Ohridski”
Tel.: 0897345513
E-mail: stanislav.todorov1984@abv.bg

Assoc. Prof. Tatyana Burudjieva, PhD
Department of Political sciences,
Sofia University “St. Kliment Ohridski”

Abstract: *In the present study, based on the starting messages in connection with the referendum in 2016 in "Slavi's Show" I will show that the calling on people to direct participation does not automatically lead to direct democracy. The discourse analysis of the dominant messages of the explanatory campaign, provided by me, reveals the relationship between populism and direct democracy in the Bulgarian context, showing that for both calling on people is needed. Too bad that populism stands out based on the concept of Margaret Canon of populism, opposing to established institutions and norms the direct ruling of the people. The messages made violated the criteria of Robert Dahl for enlightened understanding of political issues (Dahl, R.; 1999), which is a prerequisite in the value level of the democratic process.*

Keywords: *populism, referendum, direct democracy.*

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FRI-216-2-SSH(S)-03

PHILOSOPHY OF CONTEMPORARY CHRISTIAN VALUES

Ivelin Atanasov Iliev

Senior teacher in philosophy, history - first professional qualification

“Vasil Levski” secondary school, Dulovo, Silistra Region

Phone: 0893698841

E-mail: makei@mail.bg

Abstract: *One of the humanity's most sustainable intellectual products is Christian values. They introduce sustainable civilizational norms that have been tested over time. They have a strict religious hierarchy and relate to certain situations in life. In the last few years, there have been a revival of Christian values.*

The Christian value system covers all areas of human activities. The change of the lifestyle and priorities of the modern man rearranged the notion of good and evil, beautiful and ugly. Many norms have emerged in the new realities. This shows us that traditional Christian values must be adapted to the new way of life. The real challenge is not to change the traditional logic of our axiological culture, but to stay true to the traditions.

Keywords: *Philosophy, Christian values*

JEL Codes: *L10, L11*

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Look at: <http://www.verav.ru/common/mpublic.php?num=3>

FRI-216-2-SSH(S)-04

ANTICHRIST BY EMILIYAN STANEV – A ATTEMPT AT PSYCHOLOGICAL READING OF THE TEXT

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 text and try to look closer the reasons of writing this book. First one is a look from the Bible and Christianity point of view and the second is from the psychoanalysis point of view. The 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 quotes by Sigmund Freud and Carl Jung, which gives an international outlook to the topic.*

Keywords: *Bible, Antichrist, Good, Evil, Freudian theory, personality.*

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POLICY OF THE BULGARIAN GOVERNMENT TO FIGHT CORRUPTION AFTER THE ACCESSION OF BULGARIA TO THE EUROPEAN UNION

Kosta Vlachkov – Student /PhD Student/

Department of Administration, Management and Political Science
Varna Free University "Chernorizets Hrabar"

Tel.: +359 887 04 59 71

E-mail: k.vlachkov@abv.bg

Assoc. Prof. Ivo Stamboliyski, PhD

Department of Administration, Management and Political Science
Varna Free University "Chernorizets Hrabar"

Tel.: +359 887 14 59 34

E-mail: ivo_stamboliyski@abv.bg

Abstract: The paper reviews existing the policy which is implemented by the Bulgarian government to fight corruption after Bulgaria's join to the European Union. The target is to take a "panoramic picture" of the system of anti-corruption strategies and laws, as well as to identify major problems in the system. Particular attention has been paid to the individual strategies developed and implemented, as well as to the legislation related to corruption, and to the prosecution as the main criminal body for combating corruption. Analyzing corruption and anticorruption actions, after the country's accession to the European Union, it can be objectively concluded what can be improved and what can be done to make anticorruption actions more effective in the future. The conclusions drawn can serve to create a new anti-corruption strategy adequate to the current situation in the country.

Keywords: Corruption, European Union, Regulation, Anticorruption actions

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National Strategy for Prevention and Combating Corruption in the Republic of Bulgaria 2015-2020 (**Оригинално заглавие:** Национална стратегия за превенция и противодействие на корупцията в Република България 2015–2020г.)

FRI-227-1-PPTM(S)

FRI-227-1-PPTM(S)-01

MORAL AND SPORT - UNITY AND/OR CONTRADICTION

Prof. Eleonora Mileva, DSc

National Sports Academy "Vassil Levski", Sofia, Bulgaria

Tel.: 0898 776676

E-mail: emileva2002@yahoo.com

Abstract: *The paper reviews the unity and contradiction of the moral and the commercial dimensions in the contemporary sports. Special attention was paid to the development of the elite sport and the influence of the process of commercialization on moral and ethic in sport. The purpose was to research the negative moral phenomena in the modern sport.*

Keywords: *Sport, Moral, Contradictions, Fair Play.*

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ANALYSIS OF CRITICAL THINKING WITHIN THE CONTEXT OF BENJAMIN BLOOM'S TAXONOMY OF EDUCATIONAL OBJECTIVES

Assoc. Prof. Diana Zhelezova-Mindizova, PhD

Department of Philological and Natural studies, Silistra Branch,
"Angel Kanchev" University of Ruse

Phone: 086-821 521

E-mail: dmindizova@uni-ruse.bg

Abstract: *The paper reviews different thinking skills when learning a language. These can be classified into three types: basic comprehension, critical thinking, and creative thinking. All play a key role in learning and should appear at different points within a lesson, but not necessarily in any particular order. We believe that up to now the lack of a clear working model—along with a lack of clear examples of critical thinking activities—has prevented teachers from helping learners to practice critical thinking skills to full effect. Critical thinking is presented as a mindset that involves thinking reflectively (being curious), rationally (thinking analytically), and reasonably (coming to sensible conclusions). It is analysed on one hand within the framework of Bloom's taxonomy in a cumulative aspect: that is to say, each behaviour or mental process was built upon the preceding one, starting with the simplest and ending with the most complex. And on the other, within the framework of Krathwohl and Anderson's vision who preferred to see these different skills as being of equal value, and employed at various times in learning.*

Critical thinking skills are not just a box of tools to be used when needed and then put away, but derive from a mindset that involves seeking knowledge in a particular way. The paper presents a model for the ELT learners to view critical thinking as a mindset that involves thinking reflectively (being curious), rationally (thinking analytically), and reasonably (coming to sensible conclusions).

Keywords: *Critical thinking skills, Reflective thinking, Rational thinking, Reasonable thinking*

JEL code: I29

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STRATEGIES TO AFFECT ANXIETY OF AT-RISK YOUTH RAISED OUTSIDE THEIR FAMILY

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 research investigate how different language strategies affect anxiety of at-risk children deprived of parental care in Bulgaria. Children raised outside their family (N=40) participated in 4 intervention strategies using following intervention: positive language with normal tone, positive language with high tone, negative language with normal tone and negative language with high tone. Surveillance has been conducted within standardized check list measuring 10 anxiety indicators: diffidence, dependence, dissatisfaction, reliance, insecurity; inadequacy, inactivity, non-communication, inability to seek help, and lack of empathy. Results outline that self assessment anxiety is more likely to be provoked by negative language with high tone while the use of negative language with normal tone has higher impact on interpersonal anxiety in order to decrease it.

Key words: anxiety, at-risk children, children deprived of parental care, linguistic and paralinguistic signs

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PRACTICAL TRAINING OF STUDENTS - FUTURE TEACHERS

Assoc. Prof. (Lina) Galina Lecheva, PhD

Department of Philological and Natural studies, Silistra Branch,

“Angel Kanchev” University of Ruse

Phone: +359 88 540 0647

E-mail: glecheva@uni-ruse.bg

Abstract: *The presented article examines the problem of the professional competence of students in pedagogical specialties. The article covers four parts. The first one follows the development of ideas on the essence of pedagogical competence. The second reveals the importance of the curriculum for the students' professional training, and the third - the importance of the practical training. The transition from the higher school to the practice is the subject of the exposition in the fourth part.*

JEL codes: I29

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GAME EFFECTS ON ACTIVITY PARTICIPATION OF CHILDREN AND YOUTH WITH INTELLECTUAL DISORDERS

Dr. Desislava Popova – PhD, assistant

Faculty of Education

St Cyril and Methodius University of Veliko Tarnovo

Phone: +359 877 772 799

E-mail: popova.desi@gmail.com

Abstract: Current report includes a brief summary of basic theoretical concepts for the use of game in dealing with children and youth with intellectual disorders. Game is an indispensable tool for achieving educational and psychological goals according to its specific features of a strong motivator and giving freedom of action. Different types of games have different levels of motivation. The study also presents data from a pilot study related to the level of activity of participants depending on the type of game. Results indicate the most desirable activities involving the construction and operation of the self-image. Cognitive game solving certain cognitive tasks is the least motivating for the subjected participants. Results presented could contribute to the correct selection of activities by different specialists.

Key words: children, young people, intellectual disability, game, group work, activity, motivation

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FRI-227-2-PPTM(S)

FRI-227-2-PPTM(S)-01

IT TECHNOLOGIES IN TEACHING LITERATURE

Assoc. Prof. (Lina) Galina Lecheva, PhD

Department of Philological and Natural studies, Silistra Branch,

“Angel Kanchev” University of Ruse

Phone: 086-821 521

E-mail: glecheva@uni-ruse.bg

Jel code: I29

Abstract: *Abstract: This study examined the status of technology integration in teaching literature in the University of Khartoum, Department of English, by investigating the teachers' and students' attitudes and uses of technology, the approaches used in teaching literature and the impact of technology integration on the teaching process. A mixed methodology involving two sets of questionnaires, classroom observation, structured interviews and a case study were used to collect data from 14 teachers and 143 students. The findings concluded that technology has a positive impact on students' engagement in learning literature. Despite the highly positive attitudes towards technology integration reported by teachers and students, traditional techniques are still dominant when teaching literature. Therefore, the study calls for providing the necessary equipment and teacher training programs regarding technology integration by the institution to enable both the teachers and students to cope with the challenges of the 21st century's rapidly evolving world. Keywords: TPCK, project based learning, student-centered.*

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COGNITIVE AND METACOGNITIVE RESOURCE OF ACTION RESEARCH

Assoc. Prof. Diana Zhelezova-Mindizova, PhD

Department of Philological and Natural studies, Silistra Branch,
"Angel Kanchev" University of Ruse

Phone: 086-821 521

E-mail: dmindizova@uni-ruse.bg

Jel code: I29

Abstract: The paper reviews Action Research is one of the most flexible qualitative types of pedagogical research that fully meets the educational priorities. It aims to conduct a pedagogical investigation by the teacher himself of an identified problem during the course-based learning process and to solve the problem with the help of students, parents, fellow teachers and administrators. In response to the national and European strategic priorities, this type of pedagogical research outlines the new paradigm of the modern teacher-researcher and his/her pedagogical reflection skills as a defining factor for sustainable professional development and improvement. The methodological construct Action Research is a convenient pedagogical tool and technological model for multifaceted investigation of teacher effectiveness and for the development of cognitive and metacognitive models for professional development of teachers.

Keywords: Action Research, teacher as researcher, learning by doing

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EMOTIONAL INTELLIGENCE AND ITS EFFECT ON AGGRESSION – SYRVEY FOR TEACHERS, PRINCIPALS AND PARENTS

Karina Gospodinova– PhD student

Faculty of Education

St. Cyril and St. Methodius University of Veliko Tarnovo

Phone: +359 882 066 269

E-mail: karina.eneva@gmail.com

Abstract: *This report analyses the results from a survey for teachers, principals and parents concerning their opinion on the importance of emotional intelligence for preschoolers and its effect on aggression. The results are showing statistically significant differences in the opinions of the respondents by type F (28, 7056) = 2.15, $p < .05$ and by age F(49, 12348) = 1.51, $p < .05$. No difference is shown based on the respondents' education.*

Key words: *emotional intelligence, aggression, preschool*

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SOME METHODOLOGICAL IMPLICATIONS FOR SUPPORTING MARITIME ENGLISH CLASSROOM ACTIVITIES

Assoc. Prof. Petina V. Vicheva, PhD

Department of Foreign Languages

“N. Y. Vaptsarov” Naval Academy, Varna

E-mail: petinav@abv.bg

Abstract: *The paper deals with some techniques in teaching students of Maritime English (mainly scaffolding) in performing dialogues used over the radio at sea, while using SMCP. The importance of the SMCP has been pointed out referring to the safety of shipping as well as the importance of English and especially the importance of Maritime English in communication at sea is stated indisputable. The problem of effectively teaching SMCP in real-life context limited dialogues calls for developing new and effective methods and techniques of teaching. Firstly, the model of open language experience task is developed in the frame of General English. Then the model is used to work upon it and enlarge to suit the needs of oral discourse of the Maritime Radio Communications.*

Keywords: *Maritime Radio Communications, concept of Scaffolded Instruction, language instruction.*

JEL codes: *I29*

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FRI-110-1-TS(S)

FRI-110-1-TS(S)-01

**RELATIVE QUANTITIES OF CO₂/G/KWH EQUIVALENT IN THE
ATMOSPHERE FROM THE GENERATION OF ELECTRICITY FOR
THE MOVEMENT OF ELECTRIC VEHICLES WITHIN THE EU**

Principal Assist. Prof. Milen Sapundzhiev, PhD

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

E-mail: milenvs@abv.bg

Principal Assist. Prof. Valentin Manev, PhD

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

E-mail: vmanev@mail.bg

Abstract: *In this report a comparative analysis was made about the relative amount of CO₂/g/kWh in the atmosphere of the countries in EU as a result of generating of electrical energy. The results give a clear picture about the real abilities for reduction of bad emissions in transport sphere in the whole EU*

Keywords: CO₂ emission, emission from generating of electrical energy, transport

JEL Codes:

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www.un.org/apps/news/story. Rearing cattle produces more greenhouse gases than driving cars

FRI-110-1-TS(S)-02

IMPACT OF UNLOADING VALVE SPRING TENSION ON HYDRAULIC CHARACTERISTICS OF CRI SOLENOID NOZZLES 1

Principal Assist. Prof. Valentin Manev, PhD

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

E-mail: vmanev@mail.bg

Principal Assist. Prof. Milen Sapundzhiev, PhD

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

E-mail: milenvs@abv.bg

Abstract:

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FRI-110-1-TS(S)-03

ELABORATION OF A DIDACTIC TEST FOR PRELIMINARY TESTING OF THE SCHOOL SUBJECT "MAN AND NATURE" (PHYSICAL PART) IN 4TH GRADE

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

Dorothea Dimitrov

St. 'Cyril and Methodi' School, Silistra, Bulgaria

Phone: +359 894471951

E-mail: dorothea_dimitrova@abv.bg

Abstract: *Blended learning covers the simultaneous application of traditional, e-learning and m-learning. The scope of her concept is constantly expanding with new training forms. Under the influence of digital technologies, blended natural science learning already speaks of 'augmented reality'.*

The purpose of the development is to analyze the dynamics in the development of taxonomies of educational goals, to present a didactic test for preliminary examination in the subject 'Human and nature' (physical part) in 4th grade, as part of a pedagogical experiment for application of blended learning.

Keywords: *Blended learning, Taxonomies of Educational Goals, Goal Matrix, Didactic Test.*

JEL Codes: *I20, I21*

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FRI-2G.204-KS-01

**PUBLIC-PRIVATE PARTNERSHIPS (PPP) FOR THE PREPARATION OF
LARGE INVESTMENT PROJECTS - *EXAMPLES FROM FRANCE AND
BULGARIA***

Prof. Emile Nixcolas Karailiev, PhD

University of Pantheon-Sorbonne University – Paris 1, France

Institut d'Administration des Entreprises (IAE)

Tel: 00 33617364518

E-mail: emilekarailiev@yahoo.co.uk

Abstract: *The use of the PPP business model to design, build and deliver infrastructure around the world has grown significantly in recent decades.*

Joint co-consortium projects launched in 2015, such as the Asian Development Bank (ADB), the European Bank for Reconstruction and Development (EBRD), the Inter-American Development Bank (IaDB), the Islamic Development Bank (IsDB), and the World Bank Group evidence and role models for the role and importance of PPPs, serving the needs of both governments and practitioners, filling the gap in the sound knowledge of the public-private partnerships' investment credibility.

PPPs are involved in a wide range of social and economic infrastructure projects. However, they are mainly used for the construction and operation of hospitals, schools, prisons, roads, bridges and tunnels, light rail networks, air traffic control systems and water and sewage installations.

For the European Commission, the term PPP is not defined at Community level. In general, it refers to forms of cooperation between public authorities and businesses that aim to secure the financing, construction, renovation, management and maintenance of service delivery infrastructure.

For the European Investment Bank, PPP is a generic term for the relationship between the private sector and public authorities, often with the aim of introducing private sector resources and/or expertise to assist in the presentation and provision of public sector assets and services. Thus, the term PPP is used to describe a wide variety of working agreements, from free, informal and strategic partnerships, to design, construction, financing and operation (DBFO) service contracts and formal joint ventures.

Standard & Poor's definition of a PPP is any medium- to long-term relationship between the public and private sectors involving the sharing of risks and rewards of multi-sector skills, expertise and finance to deliver desired policy outcomes.

The report provides examples of PPPs for successful large investment projects in France and Bulgaria.

Keywords: . public-private partnerships; infrastructure project; provision of public sector

JEL Codes: A10; A13; F21

ENTREPRENEURSHIP AND BUSINESS PLANNING OF STARTING COMPANIES FOR THE EXPLOITATION AND COMMERCIALIZATION OF RESEARCH RESULTS

Prof. Kostadin Kostadinov, PhD

Institute of Mechanics - BAS

Advisor to the Minister for Education and Science

Tel: +359 887 011 220

E-mail: kostadinov@mon.bg

Abstract: *The role of academic science as a source of knowledge and innovation is analyzed. The scientist is 'considered' in his roles as a fundamental element in this science, but also its representative in society. Attention is paid to the place and role of academic teams in the knowledge - education - business triangle, as well as the driving forces within it. As a result, some characteristic points and principles of academic science in a knowledge-based society are highlighted, with an emphasis on the three related elements. They are the main functional cells that generate, implement and exploit innovation. Therefore, all three countries benefit from their cooperation.*

(1) Science focuses on the practical application of research, as well as on financial provision and feedback from industry, which invariably enhances the potential of creative potential. (2) Education takes on a new form, the process of learning is greatly facilitated, it is materialized, and every level of the educational process is upgraded with practical orientation. (3) Businesses have the opportunity to receive, on request, the necessary research, technology, economic analysis and solutions, as well as well-trained and trained specialists.

Therefore, the digital economy is based on the presence of many similar equilateral triangles that cover industry, cluster or industry, start-ups academic companies, as well as the relevant scientific industries and universities, providing the necessary training.

Keywords: *academic science; R&D; commercialization of research; start-ups*

JEL Codes: *M11; M15; M21*

FRI-2G.204-KS-03

A PERSONALIZED APPROACH TO TREATMENT OF NEOPLASTIC LUNG DISEASES AND QUALITY OF LIVING – IN VIEW OF A THORACIC SURGEON

Prof. Dr. Danail Petrov, Doctor of Medical Sciences, FETCS, FEBTS
Head of the Breast Surgery Clinic at 'St. Sofia' Hospital, Medical University, Sofia
Tel: +359 887 234 759
E-mail: danail_petrov@hotmail.com

Abstract: *Personalized medicine is a relatively new method for the treatment and prevention of diseases that takes into account the individual variability of genes, the environment and the lifestyle for each person. This is achieved through individual genetic testing and targeted therapy in established alterations, as well as the processing of large amounts of data through supercomputing and artificial intelligence, including electronic health records.*

Lung cancer is one of the most common primary oncology sites with highest mortality. Evolutionary and revolutionary changes in treatment strategies for non-small cell lung cancer are reviewed. It is among the tumors with the highest number of established genetic mutations that stimulate tumor growth and are therapeutic targets for targeted therapy. On the other hand, the presence of protein expression is the basis for personalized immunotherapy in these cases. The advantages of these innovative therapies and their integration into the complex treatment of non-small cell lung cancer are presented.

Keywords: *personalized medicine; thoracic surgery; lung cancer; EBTCS; FEBTS*

JEL Codes: *I10, I12*

FRI-8.121-1-AMT&ASVM

FRI-8.121-1-AMT&ASVM-01

**INVESTIGATION OF THE INFLUENCE OF ADVANCED SOIL
PROTECTION TECHNOLOGY FOR MINIMAL AND
UNCONVENTIONAL TILLAGE USING ORGANIC FERTILIZER FOR
GROWING MAIZE FOR SLOPING GRAIN**

Assist. Prof. Iliana Ivanova Ivanova
Institute of Agriculture and Seed Science
"Obraztsov Chiflik" - Rousse
Tel.: +35982 820 801
E-mail: tri_dve@abv.bg

Abstract: Water erosion of the soil and reduction of soil organic matter are degradation processes causing significant damage to agricultural production in Bulgaria. Various agro-technical methods and technologies are used to overcome the negative impact of these two degradation processes. One of these soil protection technologies is the newly created, from the Institute of Soil Science, Agrotechnology and Plant Protection "Nikola Pushkarov" - Sofia and the University of Rousse "Angel Kanchev", an advanced technology for minimal and unconventional tillage using organic fertilizer material as mulch material.

The present study looks at some of the results of studies conducted with this technology over the period 2017-2019, in the cultivation of maize on sloping agricultural land, under irrigated conditions, on average eroded carbonate chernozem with a slope of 5° (8.7 %).

Keywords: water erosion, soil organic matter, maize, minimal tillage, surface mulching, vertical mulching, organic fertilizer.

JEL Codes: L10, L11

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DETERMINATION OF THE ECONOMIC AND SOIL PROTECTION EFFICIENCY OF ADVANCED TECHNOLOGY FOR MINIMAL AND UNCONVENTIONAL TILLAGE USING ORGANIC FERTILIZER IN THE CULTIVATION OF WHEAT ON SLOPE LANDS

Assist. Prof. Iliana Ivanova Ivanova

Institute of Agriculture and Seed Science

"Obraztsov Chiflik" - Rousse

Tel.: +35982 820 801

E-mail: tri_dve@abv.bg

Abstract: To limit soil degradation processes, water erosion and loss of soil organic matter in agricultural production have created and proved to have a positive impact a variety of modern soil protection systems for soil treatment, including separate reduced and unconventional treatments (direct sowing, surface and vertical) use of different mulching materials.

The present study evaluates the effectiveness of advanced technology for minimal and unconventional tillage using organic fertilizer, in growing wheat on sloping lands, under specific soil and climatic conditions.

Keywords: water erosion, soil organic matter, wheat, minimal tillage, unconventional tillage, mulching, organic fertilizer.

JEL Codes: L10, L11

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FRI-8.121-1-AMT&ASVM-03

CHANGES IN THE BIOCHEMICAL CHARACTERIZATION OF SPRING VETCH (VICIA SATIVA L.) CV. "TEMPO" DEPENDING ON CULTIVATION SYSTEMS

Prof., Todor Kertikov, DSci

Institute of Forage Crops, 5800 Pleven, Bulgaria

Phone: 0878 123 563

E-mail: t.kertikov@abv.bg

Gergana Kuncheva, PhD

Institute of Soil Science, Agrotechnologies and Plant Protection

"N. Poushkarov", 1080 Sofia, Bulgaria

Phone: 082 888 417

E-mail: g1nikolova@abv.bg

Prof., Daniela Kertikova, PhD

Institute of Forage Crops, 5800 Pleven, Bulgaria

Phone: 0879573099

E-mail: d_kertikova@abv.bg

Assoc. Prof., Atahas Atanasov, PhD

"Angel Kanchev" University - Ruse

Phone: 0885497406

E-mail: aatanasov@uni-ruse.bg

Abstract: The biochemical characterization was carried out on plant samples from a field experiment with a spring vetch cv. Tempo. The aim is to determine the biochemical changes in the forage of spring vetch (*Vicia sativa* L.) cv. Tempo, depending on the cultivation systems. The results show that treatment with the biopreparative "Ecofil P" has a positive effect on the content of plastid pigments and carotenoids in the leaves of spring vetch during the initial stage of its harvest. The content of crude protein and sugars in the organic crop and in the Ecofil P treated with the biological preparation sharply decreased compared to that reported in the control crops. The decrease in crude protein and sugars content was more pronounced during the second period of harvesting of vetch. The content of calcium, phosphorus and magnesium, regardless of the cultivation system, decreases as the crop is cut. The spring vetch growing systems tested have a positive effect on the content of total nitrate reductase activity and total content of plastid pigments.

Keywords: Spring vetch, Forage, Cultivation, Biochemical changes

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FRI-8.121-1-AMT&ASVM-04

INFLUENCE OF SYSTEMS OF CULTIVATION UNDER SPRING VETCH (VICIA SATIVA L.) ON YIELD ON FORAGE AND CRUDE PROTEIN

Prof., Todor Kertikov, DSci

Institute of Forage Crops, 5800 Pleven, Bulgaria

Phone: 0878 123 563

E-mail: t.kertikov@abv.bg

Assoc. Prof., Atahas Atanasov, PhD

"Angel Kanchev" University - Ruse

Phone: 0885497406

E-mail: aatanasov@uni-ruse.bg

Prof., Daniela Kertikova, PhD

Institute of Forage Crops, 5800 Pleven, Bulgaria

Phone: 0879573099

E-mail: d_kertikova@abv.bg

Gergana Kuncheva, PhD

Institute of Soil Science, Agrotechnologies and Plant Protection

"N. Poushkarov", 1080 Sofia, Bulgaria

Phone: 082 888 417

E-mail: g1nikolova@abv.bg

Abstract: The field experience covers a three-year period. The purpose of the experiment was to determine the influence of cultivation system in the spring vetch (*Vicia sativa* L.) cv. Tempo on forage and crude protein yield. The results show that the total (vetch + weed) productivity of both fresh and dry forage mass in spring vetch crops is not affected by the cultivation systems used. The three different vetch cultivation systems applied did not significantly affect the percentage of crude protein, crude fiber, calcium and phosphorus in the vetch biomass. By using different spring vetch systems under standard technology, the crude protein yield is 5,17% higher than that of inorganic-grown crops and 6,78% lower from the crop harvested from the crop treated with the bio insecticide "Ecofil P".

Keywords: Spring vetch, Systems of cultivation, Yields, Forage, Crude protein

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METHODOLOGY FOR DETERMINING THE EMISSIONS OF CARBON DIOXIDE AND OTHER GREENHOUSE GASES IN DIFFERENT SOIL TILLAGE

Prof. Petar Dimitrov Dimitrov, DSci

"Angel Kanchev" University - Ruse

Phone: 082 888 542

E-mail: pddimitrov@dir.bg

Correspondent member, Prof. Hristo Ivanov Beloev, DSci

"Angel Kanchev" University - Ruse

Phone: 082 888 240

E-mail: hbeloev@uni-ruse.bg

Assist. Prof. Gergana Slavova Kuncheva, PhD

Scientific section "Erosion of soil", Institute of Soil Science, Agrotechnologies and Plant Protection "Nikola Pushkarov" - Sofia

Phone: 082 888 417

E-mail: g1nikolova@abv.bg

Assist. Prof. Iliana Ivanova Ivanova

IASS Obrazcov Chiflik Rousse

Email: tri_dve@abv.bg

Abstract: Prolonged irrational and intensive tillage, along with the development of some soil degradation processes can increase emissions of carbon dioxide and other greenhouse gases. The tillage-induced changes in soil carbon can affect both the temporary and the long-term release of carbon dioxide from the soil. Therefore, it is required to select suitable for the specified operating conditions, modern systems for soil cultivation, which limit the degradation processes, as well as the intensive greenhouse gases emissions from soil. For this purpose, it is necessary to assess the release of carbon dioxide from the soil after each soil tillage using an appropriate methodology.

In this study is presented such a methodology for determining the released emissions of carbon dioxide and other greenhouse gases in the conditions of the Republic of Bulgaria.

Keywords: water erosion, soil compaction, soil organic matter, methodology, carbon dioxide emissions, greenhouse gases

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SYSTEM FOR MONITORING BEEHIVE

Assoc. Prof. Todor Delikostov, PhD

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

“Angel Kanchev” Univesity of Ruse

Phone: +359 82 888 701

E-mail: delikostov@uni-ruse.bg

Iliyana Ivanova, PhD student

Department of Agricultural Machinery,

“Angel Kanchev” Univesity of Ruse

Phone: +359 82 888 325

E-mail: itivanova@uni-ruse.bg

Abstract: *This paper describes developed systems for successful smart apiary management. Developed systems are based on temperature, humidity, sound and weight monitoring. Most suitable alternative power supply to this moment is usage of solar power with solar panels, which can be mounted on the hive. The purpose of this paper must offer and develop the information system, which supports the beekeeper in supporting their apiary.*

Keywords: *Beekeeping, Information Systems, Precision Beekeeping, Smart Apiary*

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M.Sc. Kristina Dineva, Assoc. Prof. Dr. Tatiana Atanasova. Computer system using internet of things for monitoring of bee hives, Institute of Information and Communication Technologies - Bulgarian Academy of Sciences, Bulgaria

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FRI-1.202-1-MR

FRI-1.202-1-MR-01

**METHODS FOR AGRICULTURAL MACHINERY MAINTENANCE
SPARE PARTS PLANNING**

Assoc. Prof. Daniel Leekassa Bekana, PhD

Department of Repair, Reliability, Machines, Mechnizms, Logistics and Chemical Technology,

“Angel Kanchev” University of Ruse

Phone: +359 82 888 701

E-mail: dbekana@uni-ruse.bg

Eng. Krasimir Radev, MsC

Department of Repair, Reliability, Machines, Mechnizms, Logistics and Chemical Technology,

“Angel Kanchev” University of Ruse

Eng. Kaloyan Nikolaev, MsC

Department of Repair, Reliability, Machines, Mechnizms, Logistics and Chemical Technology,

“Angel Kanchev” University of Ruse

Eng. Borislav Valchev, MsC

Department of Repair, Reliability, Machines, Mechnizms, Logistics and Chemical Technology,

“Angel Kanchev” University of Ruse

***Abstract:** The paper reviews existing methods spare part planning for agricultural machinery maintenance. Various metods of planning are included. Methods of spare parts planning were analysed and the advantages and disadvantages of these models were concederd. The specific features of spare parts planning for agricultural machinery maintenance are given.*

Model for spare part planning is driven. Factors and parametrs that affect spare parts planning are included.

Conclusions and recommendations for future research work on spare parts planning and their optimization while maintaining agricultural machinery are given.

***Keywords:** spare parts planning, model for spare parts planning, agricultural machinery maintenance*

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DETERMINATION OF THE STRUCTURAL CHARACTERISTICS OF THE PARTS OF AGRICULTURAL MACHINERY SUBJECT FOR REPAIR

Assoc. Prof. Mitko Nikolov, PhD

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

Angel Kanchev" University of Ruse, Bulgaria

Tel.: +359 82 888 458

E-mail: mnikolov@uni-ruse.bg

Assist. Prof. Iliya Todorov, PhD

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

"Angel Kanchev" University of Ruse, Bulgaria

Tel.: +359 82 888 239

E-mail: itodorov@uni-ruse.bg

PhD stud. Vladislav Stoyanov

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

"Angel Kanchev" University of Ruse, Bulgaria

PhD stud. Jordan Valchev

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

"Angel Kanchev" University of Ruse, Bulgaria

***Abstract** The article examines and establishes the distribution of the initial structural characteristics of the steel and cast iron parts subject to repair by overlaying process and assembled within widely used brands of tractors and agricultural machinery offered by Rapid KB in Bulgaria. Graphic data shows that between 85-90% of all cylindrical parts subject for repair are in the range of 30-70 mm. From the modal and average values of the statistical distribution of the studied brands of tractor and agricultural machinery, we have selected the structural characteristics of the physical model for laboratory studies of the quality of parts working within liquid friction conditions: material steel CT 45, sample diameter 50 mm after final machining of the coating, total length of the welding specimen 250 mm, length of the recovered section 40 mm, mass of the specimen 3.5-4 kg, thickness of the welded metal (unilaterally) 0,5-1,0 mm..*

***Keywords:** agricultural machinery, parts, structural characteristic*

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DETERMINATION OF THE DEGREE OF INFLUENCE OF BASIC STRUCTURAL PARAMETERS ON THE CHANGE OF THE IEC TECHNICAL AND ECONOMIC CHARACTERISTICS

Assis. Prof., Eng. Evgeni Enchev, PhD

Department of Agricultural Machinery,
„Angel Kanchev" 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
Technologies
„Angel Kanchev" University of Ruse, Bulgaria
Tel.: 082-888 701
E-mail: delikostov@uni-ruse.bg

Veselin Rusinov, PhD student

Department of Repair, Reliability, Mechanisms, Machines, Logistic and Chemical
Technologies
„Angel Kanchev" University of Ruse, Bulgaria
Tel.: 082-888 701
E-mail: vrusinov@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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FRI-9.3-1-THPE

FRI-9.3-1-THPE-01

**CONTROL OF THE BURNING OF STRAW BRIQUETTES AT THE END
OF THE FURNACE FOR THE INCREASE OF THE EFFICIENCY**

Emil Enache

University Politehnica of Bucharest, Romania

Phone: +40214029158

E-mail: lmihaescu@caz.mecen.pub.ro

Manager Emil Enache, ec.

E. Morarit S.A. Husi, Romania

Phone: +4 0335 426 839

E-mail: em_eex@yahoo.com

Prof. Ionel Pișă, PhD

Department of Technical Thermodynamics, Engines, Thermal and Refrigeration

University Politehnica of Bucharest, Romania

Tel.: +40214029158

E-mail: ionel.pisa@upb.ro

Prof. Gabriel Paul Negreanu, PhD

Department of Technical Thermodynamics, Engines, Thermal and Refrigeration

University Politehnica of Bucharest, Romania

Tel.: +40214029158

E-mail: gabriel.negreanu@upb.ro

Senior Researcher Viorel Berbece, Eng.

Department of Technical Thermodynamics, Engines, Thermal and Refrigeration

University Politehnica of Bucharest, Romania

Tel.: +40214029158

E-mail: vberbece@gmail.com

Prof. Gheorghe Lăzăroiu, PhD

Department of Energy Production and Use

University Politehnica of Bucharest, Romania

Tel.: +40722808709

E-mail: glazarioiu@yahoo.com

Anca Enache, ec.

E. Morarit S.A. Husi, Romania

Phone: +4 0335 426 839

E-mail: em_eex@yahoo.com

***Abstract:** Cereal straws represent the most difficult energy fuel from agricultural waste, although the lower calorific value is very high. The initial difficulties come from the very low bulk density, which implies the densification in the form of briquettes or pellets, with difficult and expensive operations. The difficulty is represented by the high tendency of slagging, with deposits with a high adhesion on the metal parts, especially in the final area of the furnace.*

In order to eliminate the slag it is mandatory to limit the temperature in the furnace below 1000K, which is achieved by increasing the cooling of the furnace, the main solution being the burning in the flame tube immersed in water.

Limiting the temperature in the furnace reduces the burning speed, so that for a complete burning of the straw briquettes, a mechanical installation was designed that controls the progress of the briquettes in the final area of the grate, until all of them have been burned. The work presents the conceptual design of this installation and the performances achieved for combustion.

Keywords: cereal straw briquettes, burning control, furnace efficiency.

JEL Codes: O33, Q24, Q42

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AN EVALUATION CRITICAL REVIEW OF THE MERIT OF AUGMENTATION TECHNIQUES BY SECOND LAW IN CIRCULAR TUBE WITH TWISTED TAPE AND WIRE COIL TURBULATORS

Eng. Daniela Kostadinova, PhD student

Department of Energy Techniques

Technical University of Gabrovo, 4 Hadzhi Dimitar Str.

5300 Gabrovo, Bulgaria

Phone: 0895419429

E-mail: didkamail78@abv.bg

Abstract: *There is an acknowledged growing need for efficient and sustainable systems that use available energy resources in an “optimal” (including constraints) way. Such a goal cannot be effectively achieved without taking into account the limits posed by the second law of thermodynamics. A possible approach consists in the so-called entropy generation analysis, which possesses key features making it more attractive than traditional energy balance approaches. In fact, entropy generation analysis allows for a direct identification of the causes of inefficiency and opens up the possibility for designers to conceive globally more effective systems.*

This paper presents a critical review of contributions to the theory and application of entropy generation analysis to different types of tubes. The effects of insertion of the two turbulators with different coil pitch and twist ratios on heat transfer and friction loss in the tube are examined by the second law of thermodynamics. In this paper we use six different types of tubes with the coil pitch ratio (CR) and the twist ratio (Y) of twisted tape. The focus of the work is only on contributions oriented toward the use of entropy generation analysis as a tool for evaluation of combined twisted tape and wire coil.

Keywords: *Second law analysis, Entropy generation, Thermodynamic optimization, , twisted tape, wire-coil insert*

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WITH TWISTED TAPE AND WIRE COIL TURBULATORS A CRITICAL REVIEW OF THERMAL AUGMENTATION IN CIRCULAR TUBE

Eng. Daniela Kostadinova, PhD student

Department of Energy Techniques

Technical University of Gabrovo, 4 Hadji Dimitar Str.

5300 Gabrovo, Bulgaria

Phone: 0895419429

E-mail: didkamail78@abv.bg

Abstract: *In the first part of this paper have been presented the influences of insertion of wire coils in conjunction with twisted tapes on heat transfer in a uniform heat-flux, circular tube using air as the test fluid. The wire coil used as a turbulator is placed inside the test tube while the twisted tape is inserted into the wire coil to create a continuous impinging swirl flow along the tube wall. The effects of insertion of the two turbulators with different coil pitch and twist ratios on heat transfer and friction loss in the tube are examined for Reynolds number ranging from 3000 to 18,000. The experimental results are compared with those obtained from using wire coil/twisted tape alone, apart from the smooth tube. In this paper we use six different types of tubes with the coil pitch ratio (CR) and the twist ratio (Y) of twisted tape. The results indicate that the presence of wire coils together with twisted tapes leads to increase in heat transfer over the use of wire coil/twisted tape alone. The combined twisted tape and wire coil with smaller twist and coil pitch ratios provides higher heat transfer rate than those with larger twist and coil pitch ratios under the same conditions. Also, performance evaluation criteria to assess the real benefits in using both the wire coil and the twisted tape of the enhanced tube are presented.*

Keywords: *Heat transfer enhancement, twisted tape, wire-coil insert, turbulator, performance evaluation criteria*

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METHODS, USED TO EVALUATE THE ENERGY EFFICIENCY OF SYSTEMS FOR TRANSPORTING FLUIDS

Eng. Reneta Dimitrova, PhD student

Department of Thermodynamics, Hydraulics and Environmental Engineering

University of Ruse

Tel.: +359 888 236

E-mail: rddimitrova@uni-ruse.bg

Abstract: This work represents an analysis of some approaches and methods for evaluating the energy consumption used for the transportation of fluids in pump and fan systems. As a criteria of effectiveness of the investigated systems the specific energy consumption, representing the consumed energy for the transportation of a unit fluid, has been selected. Exclusive attention is paid to the clarifying of the impact of this criteria on different factors, such as: the used method of flow rate regulation and change of the system's static head; the technical state of the pump aggregate, the features of the transported fluids; the electrical drive's work regime changing, etc. Different methods for quantitative evaluation required for accomplishing a comparative analysis of the impact of the investigated factors on the energy efficiency of systems used to transport fluids, has also been presented.

Keywords: Energy efficiency, Pumps, Fans, Flow rate regulation

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ELECTRO-HYDRAULIC ACTUATOR SYSTEMS WITH INTELLIGENT CONTROL - STATE AND PROSPECTS FOR DEVELOPMENT

Krasen Kostov, PhD Student

Department of Power Engineering,
Faculty of Mechanical and Precision Engineering,
Technical University of Gabrovo, Bulgaria
E-mail: k.kostov71@gmail.com

Abstract: *This article reviews publications on existing conventional and electro-hydraulic actuator systems with intelligent control strategy. The structure and the specifics of the operation of automatic electro-hydraulic systems are presented. The modern methods of control synthesis and the prospects for the development of electro-hydraulic actuator systems with intelligent control strategy and the possibilities for their use in practice are considered.*

Keywords: *Electro-Hydraulic System, Automatic System, Mathematical Model, PID Controller, Fuzzy Control, Neuro Control, Neuro-Fuzzy System, Intelligent System, Actuator, Pressure Pipeline.*

JEL Codes: *L10, L11*

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FRI-9.2-1-EC

FRI-9.2-1-EC-01

**LEGAL REGULATION OF THE END-OF-LIFE TIRES TREATMENT
AND END-OF-WASTE CRITERIA IN BULGARIA, UNITED KINGDOM
AND AUSTRALIA**

Nevena Ivanova, PhD student,

Department “Heat Engineering, Hydraulics and Engineering Ecology”,

Agrarian and Industrial Faculty

“Angel Kanchev” University of Ruse

E-mail: nsivanova@uni-ruse.bg

Abstract: *The possibilities End-Of-Life tires (EOLT) classified as waste after proper treatment to be accepted as raw materials are studied and discussed in the paper. The focus is on the possibility of recycling after proper treatment in accordance with the requirements of the Bulgarian environmental legislation, the availability of end-of-waste (EOW) criteria and the progress towards a circular economy. Basic aspects of the environmental policy of some countries - Bulgaria, United Kingdom and Australia - a country outside of the European Union are considered and commented.*

Keywords: *end-of-life tires (EOLT), regulatory framework, end-of-waste (EOW) criteria and circular economy.*

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LEGAL REGULATION OF CONSTRUCTION WASTE TREATMENT

Ing. Denitsa Hvarchilkova, PhD student,

Department "Heat Engineering, Hydraulics and Engineering Ecology",

Agrarian and Industrial Faculty

"Angel Kanchev" University of Ruse

E-mail: dhvarchilkova@uni-ruse.bg

Abstract: For the period 2013 - 2017, there is an almost threefold decrease in the amount of non-hazardous construction waste generated on the territory of the country. During the same period, hazardous construction wastes also decreased by over 50%. In 2016, 54% recycling of construction and demolition waste (CSF) was achieved with the aim of achieving a minimum of 70% by 2020, according to the Waste Management Framework Directive (Directive 2008/98/EC). On this basis, amendments to the Waste Management Act (WMA) were introduced and the Ordinance on construction waste management and input of recycled construction materials (NUSOVRM) was prepared. New standards for the quality of construction materials used have been modified and introduced. In order to reduce landfill recycling, financial incentives are provided by municipalities. Some of the public-funded construction sites require a mandatory percentage of recycled waste, depending on the type of site. Specific targets (for construction waste codes) introduced for recovery for each construction - for example 85% for concrete and reinforced concrete waste, 90% for metals.

Keywords: Construction and demolition waste (CDW), recovery process, recycling, re-using.

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FRI-16.203-1-ID

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**INVESTIGATION AND COMPARISON OF TAR RETENTION IN
SMOKING PIPE WITH ONE LARGE AIR CHAMBER AND A PIPE WITH
MORE SMALL AIR CHAMBERS**

Assoc.prof. Desislav Gechev Ivanov, PhD

Department of Industrial Design,
University of Ruse "Angel Kanchev"
E-mail: d_gechev@abv.bg

Abstract: Among the numerous pipe smoking filtration systems aimed at reducing tar and harmful emissions, several basic types have emerged:

- filtration through moisture absorbent paper
- filtration by metal cooler
- activated carbon filtration placed in a cylinder of moisture absorbent paper, more commonly known as a "9mm filter"
- filtration through an air chamber

The combination of several filter systems has been shown to have a positive effect on the reduction of tar and tar substances in tobacco smoke.

Keywords: Smoking pipe, tar

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FRI-16.203-1-ID-02

BEGINNING AND PERIODS IN THE DEVELOPMENT OF ERGONOMICS

Assoc. Prof. Cvetomir Konov

Department of Industrial Design,

University of Ruse "Angel Kanchev"

Phone: 082 888 558

E-mail: ckonov@abv.bg

Abstract: *Beginning and periods in the development of ergonomics: The report provides an overview over the course of the history of the development of the world of "science of work" (ergonomics), of the people who contributed to the differentiation and as a separate scientific discipline. It outlines the periods in the development of modern ergonomics from the middle of the XIX century to the present day, based on the development of the methodological and basis, as a result of the development of socio-economic relations around the world.*

Keywords: *Labor science, ergonomics, periods and development*

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FRI-1.417-1-MEMBT

FRI-1.417-1-MEMBT-01

SYNTHESIS OF MOBILE WALKING ROBOTS

Eng. Pavel Sinilkov, PhD

Tel. +359 895 484952

E-mail: sinilkov@mail.com

Abstract: A synthesis of a long kinematic chain with the ability to transform the chain from one species to another is shown. The method used is to divide the kinematic chain into functional units and to synthesize a space-periodic curve based on the spatial curve of the road. At the end, three results of solutions for this method of mobile walking robots, smooth road, hanging and flying are shown.

Keywords: walking robots, locomotion, synthesis

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FRI-1.417-1-MEMBT-02

STUDYING THE POSSIBILITIES OF AN APPROACH FOR LIMITING VIBRATIONS WHEN MACHINING THIN-WALLED BEAMS

Assoc. Prof. Dimitar Dimitrov, PhD

Department of Mechanical and Manufacturing Engineering,

“Angel Kanchev” University of Ruse, Ruse, Bulgariya

Phone: 082-888 653

E-mail: ddimitrov@uni-ruse.bg

Master Eng. Nikolay Nikolov, PhD student

Department of Mechanical and Manufacturing Engineering,

“Angel Kanchev” University of Ruse, Ruse, Bulgariya

E-mail: nknikolov@uni-ruse.bg

Abstract: The paper reviews existing methods of special seismic protection and discloses the added value of their application in the case of high-rise frame structures. Dynamic isolation systems are explored with the purposes: (1) to demonstrate efficiency of rubber isolation bearings and pile foundations with an “intermediate cushion” and (2) to assess effectiveness in terms of commercial benefits. SCAD-based spectral method is used to collect data in support of the structural analysis. The research findings are introduced as a numerical real problem solution, i.e. a simplified model, which can be applied for a 5-storey building. The paper is a tribute to the research contribution of Professor Andrei Reinhorn in the field of earthquake engineering. It covers all the aspects connected to earthquake engineering starting from computational methods, hybrid testing and control, resilience and seismic protection which have been the main research topics in the field of earthquake engineering in the last 30 years. The report provides the most recent advancements in these four different fields, including contributions coming from six different countries giving an international outlook to the topics.

Keywords: Metal cutting, vibrations

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RESEARCH OF THE POSSIBILITIES OF A METHOD FOR TOUCH PROBE COORDINATE MEASUREMENTS

Assoc. Prof. Dimitar Dimitrov, PhD

Department of Mechanical and Manufacturing Engineering,

“Angel Kanchev” University of Ruse, Ruse, Bulgariya

Phone: 082-888 653

E-mail: ddimitrov@uni-ruse.bg

Master Eng. Valentin Mihov, PhD student

Department Mechanical and Manufacturing Engineering,

University of Ruse “Angel Kanchev”, Ruse, Bulgariya

E-mail: vmihov@uni-ruse.bg

Abstract: The application of a touch probe coordinate measurements in CNC machines is a proven approach for solving various problems. For this purpose, special primary transducers are used - the so-called three-coordinate contact measuring heads. At such coordinate measurements the accuracy is influenced by the cumulative error. A part in this cumulative error is due to the three-dimensional measuring head. The contribution is significant for measuring heads that use an internal lever electro-contact system to generate a measurement signal. For these types of measuring heads, the principle of operation is known as the kinematic-resistance system. A specific feature of these is the formation of a large systematic error, which is a zone of insensitivity during measurement. The authors present in this publication their research on one of the possibilities of reducing this systematic error. It is suggested to use an electrical signal as a result of the contact of the measuring tip with the measured object. For this purpose, it is necessary to make minimal changes to the existing design of the measuring head. It is required that the measuring tip and the measuring object are electrically conductive and connected in an open electrical circuit which will close upon contact between them. The measuring head's internal electrical contact system is maintained and the head can be operated individually or together in both ways to generate a measuring signal.

Keywords: Accuracy, 3D Touch probe, Efficiency, Zone of insensitivity

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FRI-1.417-1-MEMBT-04

ABOUT THE INFORMATION ASSURANCE OF THE TURNING PROCESS

Assist. Prof. Svetlana Koleva, PhD

Department of Technology of Machine Tools and Manufacturing,
University of Ruse "Angel Kanchev"

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 "Angel Kanchev"

Tel.: +359 082888653

E-mail: menchev@uni-ruse.bg

Master Eng. Emil Belyov, PhD Student

Department of Technology of Machine Tools and Manufacturing,
University of Ruse "Angel Kanchev"

Tel.: +359 082888653

E-mail: emo_belyov@abv.bg

Abstract: *The increase of the effectiveness of technological processes of individual stages in the production of parts – design, implementation and full-scale production, is directly related to their information assurance. It is necessary to systemize, structure data and specify dependencies which will allow to minimize the level of uncertainty when formulating the technological solutions. The paper presents an analysis and research of the interrelations between the inputs and the output parameters of the turning process. The analysis is based on modeling of the interrelations of the various stages and schemes of machining by turning. More specific attention is devoted to the interrelationships between the strength deformations and the productivity of the process, the accuracy of the technological equipment- accuracy and productivity of the process, and accuracy of the previous processing (technological heredity) that vary in other realizations of the technological scheme.*

Keywords: *Technological processes, machining parts, information assurance*

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FRI-1.417-1-MEMBT-05

AUTOMATED MIXING AND DOSING OF LUBRICANTS WITH CONTROLLED CAVITATION

Assoc. Prof. Tihomir Todorov, PhD

Department of machine tools and manufacturing

University of Ruse "Angel Kanchev"

Phone: +359 884113775

E-mail: tmtodorov@uni-ruse.bg

Master Eng. Deniz Chakar, PhD Student

Department of machine tools and manufacturing

University of Ruse "Angel Kanchev"

Tel.: +359 897902390

E-mail: dchakar@uni-ruse.bg

Abstract: The paper aims to research and analyze the different methods and systems for mixing and dosing lubricants. Quite often, the industry uses outdated technological equipment and conventional methods for blending different types of viscosity and chemical composition of lubricants through mechanical stirrers and tanks.

The use of such technological equipment necessitates the use of energy in the form of heat during mixing, low degree of homogenization, low metering accuracy, process of cooling of already produced oils, additional storage tank, etc.

This approach of mixing and dispensing lubricants in large batches with high performance requirements, precision for blending, dosing and homogenization is extremely inefficient

With the help of innovative technology with a computerized system for dosing and mixing lubricating oils, it is possible to optimize and improve the operating modes of the process. The system is an alternative to conventional mechanical mixing of oils in stirrers. It has a mobile lubricating oil production plant and a cavitation column system that ensures cold mixing (without heating during the process). The process is fully automated in terms of both dosing and cavitation mixing.

Keywords: Cavitation Cold Blending of Lubricants (CCBL), innovative technology, mixing, blending, lubricants, cavitation.

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OPPORTUNITIES FOR HEAT TREATMENT PROCESSES SIMULATOIN

Master Eng. Iliyan Danev, PhD student

Department of Materials Science & Technology,
“Angel Kanchev” University of Ruse, Bulgaria
E-mail: idanev@uni-ruse.bg

Assoc. Prof. Danail Gospodinov, PhD

Department of Materials Science & Technology,
“Angel Kanchev” University of Ruse, Bulgaria
E-mail: dgospodinov@uni-ruse.bg

Abstract: *The article describes some new opportunities to simulate heat treatment processes in the industry. Different software packages and procedures are considered in the paper. The advantages and disadvantages of the actual solutions are indicated. Examples of using in industrial practice also are pointed.*

Keywords: *Heat treatment, Modelling and simulation, Microstructure prediction*

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FRI-1.417-1-MEMBT-07

DETERMINING THE OPTIMUM INCLINATION FOR 3D PRINTING - A CASE OF RAPID PROTOTYPING PARTS OF A SHELL ECO- MARATHON CAR

Assist. Prof. Emil Yankov, PhD

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

Phone: 082-888-309

E-mail: eyankov@uni-ruse.bg

Master Eng. Dimitar Kamarinchev, PhD student

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

Phone: 082-888-311

E-mail: dkamarinchev@uni-ruse.bg

Assoc. Prof. Roussi Minev, PhD

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

Phone: 082-888-310

E-mail: rus@uni-ruse.bg

Abstract: The article describes a number of reverse engineering cases in the field of rapid prototyping (RP) and parts design for eco-friendly racing car. The manufactured components were produced with the help of various process chains comprising: digital scanning, 3D CAD modeling, 3D printing with high-precision photo polymers (SLA type of 3D printer), and selection of techniques for precision and conventional investment casting.

The optimization of the accuracy and the quality improvement of the prototypes were the main technological problems revealed in the study. Particular attention has been paid to the influence of one of the basic technological parameters - the angle of inclination of the workpiece within the build chamber of the SLA apparatus.

Keywords: Rapid prototyping, 3D printing, Eco-friendly car, SLA, Rapid investment casting

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FRI-1.417-1-MEMBT-08

TECHNOLOGY MATURITY STUDIES OF EQUIPMENT FOR WELDING IN A PROTECTIVE GAS ENVIRONMENT

Master Eng. Sasho Iliev, PhD student

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

Phone: 082-888-311

E-mail: siliev@uni-ruse.bg

Assoc. Prof. Roussi Minev, PhD

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

Phone: 082-888-310

E-mail: rus@uni-ruse.bg

Assist. Prof. Nikolay Ferdinandov, PhD

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

Phone: 082-888-311

E-mail: nferdinandov@uni-ruse.bg

Abstract: Today the most rapidly developing method for production of welded structures is the MIG/MAG process. An extensive demand and expnding number of applications have been found in this technology and more particularly in the Impulse Welding with Inverter Multiprocessor Machines. Some of these devices feature Industry 4.0 generation communication components and capabilities. They have embedded welding procedures (WPS) according to ISO 151612, which meet the requirements of EN 1090-1. They also have Spatter Reduction Systems (SRS) that can regulate the additional heat transfer to the carbon and stainless steel material (up to 3 mm thick) to reduce the additional operations.

Yet the maturity level of these welding systems is not tourougly studied. The presentation is focused on the purpose and application all of the above technology features from the point of view of their maturity and readiness level for comersial applications. CMM (Capability Maturity Level) philosophy was brought to describe and asses the machines capabilities, application areas and their specific characteristics.

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

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FRI-1.417-1-MEMBT-09

NUMERICAL MODELING AND CALIBRATION OF STEEL PLATE TIG WELDING IN VACUUM

Assist. Prof. Ivo Draganov, PhD

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

Assist. Prof. Nikolay Ferdinandov, PhD

Department of Material Science and Technology,
University of Ruse
Tel.: 082 888 316
E-mail: nferdinandov@uni-ruse.bg

Assoc. Prof. Danail Gospodinov, PhD

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

Assoc. Prof. Rosen Radev, PhD

Department of Material Science and Technology,
University of Ruse
Tel.: 082 888 778
E-mail: rradev@uni-ruse.bg

Master Eng. Stiliyana Mileva, PhD student

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

Assoc. Prof. Yulian Angelov, PhD

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

Abstract: *The present work deals with the process of welding of steel plate by the TIG method in vacuum. A numerical model was created using the finite element method taking into account the nonlinear properties of the material. The heat flux from the weld arc is set to the surface as linear function, and volumetric, with a double ellipsoid distribution (Goldak). Results were obtained for the temperature field and the strain state of the plate. Experimental data were obtained for the shape and dimensions of the welding pool and the heat affected zone, which were used to calibrate the numerical model. The results of the weld plate displacements obtained from the simulation are compared with the results from the experiment.*

Keywords: *Vacuum welding, TIG, Numerical simulation, Finite element method, Model calibration*

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FRI-10.326-1-EEEE

FRI-10.326-1-EEEE-01

**THE CONDITIONS FOR SELF- SUSTAINED DISCHARGE IN
CYLINDRICAL GEOMETRY WITH CONSIDERING THE DIFFUSION
OF ELECTRONS TO THE WALLS**

Prof. Gulizar Alisoy, PhD

Department of Mathematics,
“Namik Kemal” University of Tekirdag
Phone: +90 282 2502734
E-mail: galisoy@nku.edu.tr

Prof. Hafiz Alisoy, DcS

Department of Electronics and Communication Engineering,
“Namik Kemal” University of Tekirdag
Tel.: +90 282 2502386
E-mail: halisoy@nku.edu.tr

Abstract: *In this paper, based on the equations for the density of electrons and ions under zero boundary conditions, expressions are obtained that enable us to determine the condition for the independence of the discharge when the diffusion of electrons to the walls is taken into account. By taking the boundary condition at the cathode, the relationship between the parameters necessary for ignition of the discharge was obtained and also the limiting cases. By taking into account the boundary condition at the cathode, a relationship was obtained between the parameters necessary for ignition of the discharge, and also considered the limiting cases.*

Keywords: *Bessel function, Non-self-sustaining discharge, diffusion of electrons*

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AUTOMATED CONDITION MONITORING SYSTEM FOR TURBINE GENERATOR UNIT SHAFTS

Assoc. Prof. Iuliia Kuievda, PhD

Department of Electrical Power Supply and Energy Management,
National University of Food Technologies, Ukraine
Tel.: +380 44 2895472
E-mail: julika@gmail.com

Prof. Serhii Baliuta, DcS

Department of Electrical Power Supply and Energy Management,
National University of Food Technologies, Ukraine
Phone: +380 44 2879333
E-mail: epp11@ukr.net

Prof. Valerii Kuievda, PhD

Department of Electrical Power Supply and Energy Management,
National University of Food Technologies, Ukraine
Tel.: +380 44 2895472
E-mail: epp2011@ukr.net

Abstract: Condition monitoring of the turbine generator unit (TGU) shaft is very important for TGU lifecycle estimation and operational reliability assessment. The lack of effective monitoring systems poses a threat to technogenic disasters. The paper presents an automated system for TGU shaft condition monitoring, its structure and operating algorithms. The main functions of this system are to detect impacts of perturbations from electric power system, to evaluate shaft material damage and to track the history of shaft torsional vibrations. It is also shown how the thermal power station statistics can be used for shaft damage analysis.

Keywords: Condition Monitoring, Turbine Generator Unit, Automated System

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FRI-10.326-1-EEEE-03

DESIGN OF SMART IRRIGATION SYSTEM BASED ON ARDUINO MICROCONTROLLER

Eng. Sechkin Remzi – PhD Student

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

Assoc. prof. Tsvetelina Georgieva, PhD

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

Prof. Nicolaos Sigrimis, PhD

Department of Department of Natural Resources Management and
Agricultural Engineering (NRM&AE),
Agricultural university of Athens, Greece
Tel.: +30-1-5294036
E-mail: n.sigrimis@computer.org

Abstract: *In order to meet the growing demand in agriculture, intelligent recovery has been made to facilitate production in a healthy way. In this study, the data obtained from the soil moisture sensors controlled by the Arduino Uno controller and according to these data the system is triggered and the pump releases the necessary water for irrigation of the plants. The water pump closes automatically when the soil meets the required water requirements. In addition, data processed in the Arduino Uno controller is transferred via wireless network modules to the interface created on the computer. According to these data, irrigation can be controlled by the remote computer at any time. With this project, the goal is to optimize the use of water resources, to achieve maximum energy savings, to eliminate excessive and unnecessary irrigation problems at the appropriate moment by irrigation.*

Keywords: Smart Recovery, Arduino Uno Controller, Interface

JEL Codes: C9

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FRI-10.326-1-EEEE-04

GRAPHICAL TOOL FOR QUALITY ASSESSMENT OF PLANTS USING IMAGE ANALYSIS

Assoc. prof. Tsvetelina Georgieva, PhD

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

Eng. Emil Stefanov, PhD Student

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

Eng. Nadezhda Paskova, PhD Student

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

Prof. Nicolaos Sigrimis, PhD

Department of Department of Natural Resources Management and
Agricultural Engineering (NRM&AE),
Agricultural university of Athens, Greece
Tel.: +30-1-5294036
E-mail: n.sigrimis@computer.org

Abstract: *The paper presents graphical tool for quality assessment of plants using image analysis. Two color spaces are used in the study – Lab and HSV for recognition of plant disease. The developed software tool is based on modules. Probabilistic neural network is integrated in the tool for objects classification. Graphical tool is tested with two samples – healthy and diseased plants. The results show that the accuracy is 95 % when all color components are used for recognition of plant diseases.*

Keywords: *Image analysis, Color features, Plant disease, Graphical tool*

JEL Codes: *C9*

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FRI-10.326-1-EEEE-05

DESIGN OF LOW COST MICROPROCESSOR SYSTEM FOR MEASUREMENT OF VEGETABLES COLOR FEATURES

Assoc. prof. Tsvetelina Georgieva, PhD

Department of Automatics and Mechatronics,

“Angel Kanchev” University of Ruse

Tel.: +359 82 888 668

E-mail: cgeorgieva@uni-ruse.bg

Eng. Emil Stefanov, PhD Student

Department of Automatics and Mechatronics,

“Angel Kanchev” University of Ruse

Tel.: +359 82 888 676

E-mail: estefanov@uni-ruse.bg

Eng. Nadezhda Paskova, PhD Student

Department of Automatics and Mechatronics,

“Angel Kanchev” University of Ruse

Tel.: +359 82 888 676

E-mail: npaskova@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

Prof. Nicolaos Sigrimis, PhD

Department of Department of Natural Resources Management and

Agricultural Engineering (NRM&AE),

Agricultural university of Athens, Greece

Tel.: +30-1-5294036

E-mail: n.sigrimis@computer.org

Abstract: The paper presents design of low cost microprocessor system for measurement of vegetables color features. The system is designed to evaluate and classify tomatoes into quality groups according to their degree of maturity. The Arduino microcontroller and TTL JPEG camera are used to design the system. The Arduino IDE software platform is used to program and adjust the basic parameters of the module. The vegetable evaluation module is developed in Matlab. According to the requirements for the maturity of tomatoes, the degree of maturity of tomatoes is divided into six groups: green tomatoes; light green tomatoes; light pink tomatoes; pink tomatoes; light red tomatoes and red tomatoes. The HSV model of the visual image, and more specifically its Hue component (color shade), is most suitable for solving this particular task. This color distribution is best suited to the task, because the degree of maturity is determined by the quantitative ratio of red to green. Most appropriate in this case is the use of the cumulative property for the H-component of the model. The property consists of checking the number of pixels of a given value, the resulting number being accumulated against the results already obtained for previous pixel values. From the results thus obtained, so-called "Cumulative histogram", from which the criterion for determining the degree of maturity of tomatoes is obtained. Further studies need to be conducted to refine the cut-off values of the criterion and to reduce the error of assessment and the impact of variety.

Keywords: Tomato Maturity, Color Spaces, HSV color model, Arduino Platform

JEL Codes: L10, L11

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INDIRECT APPROACH FOR SOIL PH MEASUREMENT USING IMAGE ANALISYS

Eng. Nadezhda Paskova, PhD Student

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

Assoc. prof. Tsvetelina Georgieva, PhD

Department of Automatics and Mechatronics,
“Angel Kanchev” University of Ruse
Tel.: +359 82 888 668
E-mail: cgeorgieva@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: *The paper presents indirect approach for soil pH measurement using image analysis. A system based on Arduino microcontroller is developed. The software of the controller and a graphical user interface have been developed for system setup, visualization and processing of the collected data. Two color spaces RGB and Lab are used for research of the influence between pH and soil color. Three kind of soil are used in the research. The correlation coefficient is used for assessment the informative color feature. It was found that G, a and b color components are informative for development of mathematical models for indirect measurement of soil pH using image analysis.*

Keywords: *Soil pH, Image analysis, Arduino microcontroller, Color features*

JEL Codes: *C9*

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APPROACHES FOR QUALITY ASSESSMENT OF PLANTS IN GREENHOUSES

Eng. Nadezhda Paskova, PhD Student

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

Assoc. prof. Tsvetelina Georgieva, PhD

Department of Automatics and Mechatronics,
“Angel Kanchev” University of Ruse
Tel.: +359 82 888 668
E-mail: cgeorgieva@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: *The paper presents the peculiarities and requirements for growing one of the main vegetable crops in Bulgaria - tomatoes. The basic chemical elements that plants need to grow properly are described. It is shown how the lack or presence of basic chemical elements influences plant growth. The methods and technical equipment for qualifying tomato plants in a greenhouse are analyzed. An overview of existing agricultural production valuation technologies has been made. The results of the analysis show that all mechanical methods for dividing tomatoes into size groups have a common drawback - a high degree of injury to the production during the separation process. The need for visual quality control coupled with increasing automation in all areas of production leads to the search for an automatic and objective evaluation of visual parameters such as size, shape, structure, color, etc. Camera systems, appropriate lighting, and computers provide the solution to this problem.*

Keywords: Tomatoes plants, Quality assessment, Visual control systems

JEL Codes: C9

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FRI-10.326-1-EEEE-08

DEVELOPMENT OF COLOR MODELS TO DETERMINE THE EXCESS OR DEFICIENCY OF CHEMICAL ELEMENTS IN PLANTS

Eng. Nadezhda Paskova, PhD Student

Department of Automatics and Mechatronics,

“Angel Kanchev” University of Ruse

Tel.: +359 82 888 676

E-mail: npaskova@uni-ruse.bg

Assoc. prof. Tsvetelina Georgieva, PhD

Department of Automatics and Mechatronics,

“Angel Kanchev” University of Ruse

Tel.: +359 82 888 668

E-mail: cgeorgieva@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:** The paper presents development of color models to determine the excess or deficiency of chemical elements in plants. Three color models were used in the study - RGB, Lab, HSV. A system for capturing the color characteristics of plants has been developed. The basic quality parameters of the soil - electrical conductivity and acidity, as well as the available chemical elements - were also measured in parallel. Mathematical models have been developed to indirectly determine the values of the basic chemical elements in plants by measuring their color characteristics. The accuracy of the developed mathematical models for indirect measurement of basic chemical elements in plants is yet to be determined.*

***Keywords:** RGB, Lab, HSV, Chemical elements, Soil electrical conductivity, Soil acidity*

***JEL Codes:** L10, L11*

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DESIGN OF SMART GREENHOUSE BASED ON ARDUINO MICROCONTROLLER

Eng. Sechkin Remzi – PhD Student

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

Eng. Nadezhda Paskova – PhD Student

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

Assoc. prof. Tsvetelina Georgieva, PhD

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

Prof. Nicolaos Sigrimis, PhD

Department of Department of Natural Resources Management and
Agricultural Engineering (NRM&AE),
Agricultural university of Athens, Greece
Tel.: +30-1-5294036
E-mail: n.sigrimis@computer.org

Abstract: In the paper is presented design of smart greenhouse based on Arduino microcontroller. The developed system measure and wireless transmit values of soil main quality indicators (pH, electrical conductivity and soil moisture) as well as temperature and humidity of the greenhouse. The physical implementation of the system is implemented by selecting suitable devices to measure the quantities, transmit and record the information. The web based software of the controller and a graphical user interface has been developed for system setup, visualization and processing of the collected data. Laboratory tests have been made to investigate the system's performance.

Keywords: Arduino Microcontroller, Graphical User Interface, Soil Main Quality Indicators

JEL Codes: C9

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FRI-10.326-1-EEEE-10

ESP8266 BASED MULTIFUNCTIONAL MODULE FOR MEASURING MICROCLIMATIC DATA

PhD student eng. Iordan Stoev
Department of Electronics,
Faculty of Electrical Engineering, Electronics and Automation,
University of Ruse "Angel Kanchev"
Phone: +359 876 621 196
E-mail: istoev@uni-ruse.bg

Abstract: *This paper presents a multifunctional module for measuring microclimatic data. The multifunctional module is based on the ESP8266 SoC module and consists of circuits to measure temperature, relative humidity, luminosity and barometric pressure. The measured data for each microclimatic parameter are presented in JSON format and can be collected for displaying and use by other systems. The multifunctional module also sends each measured parameter to a MQTT broker, that might be used for visualisation or database built up.*

Keywords: *IoT, ESP8266, Sensors, Temperature, Relative humidity, Barometric pressure.*

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APPROACH FOR ASSESSMENT OF THE SYNCHRONIZATION BETWEEN DIGITAL TEMPERATURE SENSORS

Iordan Stoev, PhD student eng.

Department of Electronics,
Faculty of Electrical Engineering, Electronics and Automation,
University of Ruse "Angel Kanchev"
Phone: +359 876 621196
E-mail: istoev@uni-ruse.bg

Snezhinka Zaharieva, PhD

Faculty of Electrical Engineering, Electronics and Automation,
University of Ruse "Angel Kanchev"
Phone: +359 886 336728
E-mail: szaharieva@uni-ruse.bg

Abstract: *The paper presents an approach for assessment of synchronization between digital temperature sensors in multifunctional modules, used in electronic system for data collection of temperature, relative humidity, luminosity and barometric pressure for management of residential energy systems. Using the presented approach, an application was developed in C++ that uses measured temperature data from the multifunctional modules to evaluate the synchronization between each two digital thermal sensors.*

Keywords: *Digital temperature sensors, Electronic systems, Multifunctional modules, Student's T-test.*

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EVALUATION OF GROSS ERRORS IN MEASURED TEMPERATURE WITH AN ELECTRONIC SYSTEM FOR MANAGEMENT OF RESIDENTIAL ENERGY SYSTEMS

Iordan Stoev, PhD student eng.

Department of Electronics,

Faculty of Electrical Engineering, Electronics and Automation,

University of Ruse "Angel Kanchev"

Phone: +359 876 621196

E-mail: istoev@uni-ruse.bg

Snezhinka Zaharieva, PhD

Faculty of Electrical Engineering, Electronics and Automation,

University of Ruse "Angel Kanchev"

Phone: +359 886 336728

E-mail: szaharieva@uni-ruse.bg

Abstract: *The paper presents evaluation of gross errors in measurements from multifunctional measuring modules in an electronic system for data collection of temperature, relative humidity, luminosity and barometric pressure for management of residential energy systems. Special attention was paid to the evaluation of gross errors of measured temperature from the multifunctional modules. Isolation of the gross errors from a temperature sensor was achieved on the basis of the statistical calculations.*

Keywords: *Chauvenet's criterion, Digital temperature sensors, Gross errors, Measuring, Multifunctional modules.*

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POSSIBILITIES FOR REMOTE CONTROL OF HOUSEHOLD LIGHTING INSTALLATIONS

Assoc. Prof. Orlin Petrov, PhD

Department of Electrical Power Engineering,

“Angel Kanchev” University of Ruse

Phone: +359 882 390 043

E-mail: opetrov@uni-ruse.bg

Abstract: *The report presents opportunities for remote control of residential power customers. Some options for managing on lighting systems are described. For all the solutions described, their advantages and disadvantages were analyzed. The optimal solution for remote lighting control using the existing WiFi network and the capabilities of mobile devices to provide a convenient control is selected. On the basis of the chosen decision a demonstration stand was made. A standard module for wireless control via WiFi is used. The advantages and disadvantages of the described solution are considered, as well as the possibility of integrating it into a common BMS system for complete building management. The relevant conclusions are made.*

Keywords: Remote control, Lighting installations, BMS

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FRI-10.326-1-EEEE-14

INVESTIGATION THE THERMAL PERFORMANCES OF A TYPE PHOTOVOLTAIC-THERMAL PANEL

Assoc. Prof. Konstantin Koev, PhD

Department of Electric Power Supply and Electrical Equipment,
University of Ruse "Angel Kanchev"
Phone: 082 888/ 201, 661
E-mail: kkoev@uni-ruse.bg

Mitko Nikolov – Student

Department of Electric Power Supply and Electrical Equipment,
University of Ruse "Angel Kanchev"
Tel.: +359 899 305391
E-mail: mitko0995@abv.bg

Abstract: The paper analyses thermal performances of a type thermal photovoltaic hybrid modules. They are in local area with continental climate. The mean values of ambient and modules temperatures and solar irradiance are measured. The values of thermal energy efficiency of the chosen thermal photovoltaic modules are calculated for measured temperatures. The results are analysed by difference temperatures.

Keywords: Solar energy, Thermal photovoltaic hybrid modules, Thermal energy efficiency

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RESEARCH OF THE SPECIFIC INDICATORS CHARACTERIZING HOUSEHOLD ELECTRIC CONSUMPTION

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: *In recent years, the trend is steadily increasing the relative share of household electricity consumption, being the second largest after the industrial sector. During this period, the rates of change in the prices of the main energy sources were different. On the one hand, they followed global trends, on the other, influenced by the regulatory regimes applied by the KEVR. Price changes inevitably lead to a rethinking of each household's energy or electricity portfolio. In recent years, air-conditioning systems, both for heating and cooling, have been steadily entering. The study of household electricity is a very topical issue in the current economic situation. On the basis of the collected statistical information, specific indicators of household electricity consumption for single-family dwellings with combined heating in a rural area were calculated and compared with those for previous survey periods.*

Knowledge of household electricity consumption is essential to improve the organization of electricity supply, the correct choice of power supply schemes, the selection of facilities and their operation.

Keywords: *household electricity consumption, specific indicators of household electricity*

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MODELING THE ELECTRICAL FIELD BETWEEN FLAT ELECTRODES OF A LABORATORY CHAMBER FOR PRE-SOWING TREATMENT OF SEEDS

Assoc. Prof. Kiril Sirakov, PhD

Department of Electrical Power Engineering

“Angel Kanchev” University of Ruse

Phone: 082 888 364

E-mail: csirakov@uni-ruse.bg

Abstract: The study proposes that the pre-sowing treatment of the seeds be carried out in a laboratory chamber with flat electrodes. In the Finite Element Method Magnetics (FEMM) software environment, the modelling of the electric field of the flat electrodes chamber.

It has been established that the adopted shape of the walls of the working chamber create non-uniformity of the electric field in the area of the treated seeds and thus result in uneven pre-sowing impact of the corona discharge field upon the seeds.

After the performed modelling it has been found that the connection on edges on the top and bottom bodies of the chamber distort the electric field in the inter-electrode gap.

Keywords: Finite Element Method Magnetics (FEMM) software environment, electrode system of flat electrodes, electric field strength

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COLOR FEATURES AS A MAIN FACTOR FOR DRIED APRICOTS QUALITY

Darinka Ilieva-Stefanova – Student / PhD Student / Young Scientist

Department of Automation and Mechatronics,

University of Ruse “Angel Kanchev”

Tel.: +359 896124791

E-mail: distefanova@uni-ruse.bg

Abstract: *The color characteristics are an important factor indetermining the quality of dried apricots. Understanding this factor is critical for obtaining a higher quality product. The characteristics are presented using the LAB color model. based on which the classification accuracy estimates are made. Predictive models have been developed to determine the quality indicators which define some characteristic nutrients, such as beta carotene and dried apricot potassium.. Two variations of PLSR and SVMR based regression analysis were used in the particular study process.*

Keywords: *Dried apricots; Color characteristics; Beta carotene; Potassium; Predictive models; Regression analysis*

JEL Codes

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FRI-10.326-1-EEEE-18

KNOWLEDGE ENGINEERING IN SMART AGRICULTURE TO SECURE FOOD AND THE ENVIRONMENT

Prof. Nicolaos Sigrimis, PhD

Department of Department of Natural Resources Management and
Agricultural Engineering (NRM&AE),
Agricultural university of Athens, Greece
Tel.: +30-1-5294036
E-mail: n.sigrimis@computer.org

Assoc. prof. Tsvetelina Georgieva, PhD

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

Eng. Emil Stefanov – PhD Student

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

Eng. Antonina Mihaylova – PhD Student

Department of Automatics and Mechatronics,
“Angel Kanchev” University of Ruse
Tel.: +359 82 888 676
E-mail: amihaylova@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: *The paper presents knowledge engineering in smart agriculture to secure food and the environment. Self-sufficiency in food production is of outmost importance, and is undoubtedly the first and foremost priority of every country on earth. The food production crisis is monumental as the earth's exploding population is expected to reach 9 billion by the year 2050. The problem is worsened by the fact that environmental indicators, such as the global biological footprint, is becoming intolerable, necessitating that all engineering sectors delicately balance a “resource savings” with a “clean environment”. High resolution management in food production, therefore, calls for comprehensive, knowledge-based decision high resolution management systems. Knowledge Engineering (KE) is an engineering discipline that involves integration of knowledge within computer systems designed to solve complex problems. These problems normally require a high level of human expertise. The Global Economy is moving from an industrial to a knowledge economy. This transition reflects that knowledge is both a precious product and a component of increasing importance in the production process. The biological sciences are adding value to a host of products and services, producing what some have labelled the “bioeconomy.” The ultimate aim of the bioeconomy is to maintain humans' prosperity by providing sustainable, smart (knowledge based) and inclusive economic growth and jobs, and by meeting the needs of a growing population while simultaneously protecting our environment and the resources.*

Keywords: Smart Recovery, Arduino Uno Controller, Interface

JEL Codes: L6, L63

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FRI-2G.302-1-CSN

FRI-2G.302-1-CSN-01

**OPTIMIZATION OF MODELS FOR TRAFFIC PREDICTION
IN MARKOV CHAINS**

Prof. Mihail Iliev, DcS

Telecommunications Department,
“Angel Kanchev” University of Ruse
Tel.: 082-888 673
E-mail: miliev@uni-ruse.bg

Assoc. Prof. Ivelina Balabanova, PhD

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

Georgi Georgiev, PhD

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

Assoc. Prof. Boyan Karapenev, PhD

Department of Communications Equipment and Technologies,
Technical University of Gabrovo
Phone: 0877 283 982
E-mail: bkarapenev@tugab.bg

Abstract: The paper presents the results in optimization of the Average Arrival Rate and Average Service Time factors in investigation of the teletraffic system $M/M/1/k$. The optimization processes with respect to models of predictable variations in Arrival and Exit times for processed system calls are realized. The polynomial predictive models on the basis of design of experiment and regression diagnostics of the data were obtained. Interior-point and Genetic algorithms about the target functions in defined functional limitations by graphical user interface Optimool in MATLAB are applied. Based on the nonlinear functional minimization performance, the optimums about the considered factors correspond to the minimums of the desired parameters of the incoming and outgoing traffics have been reached. The optimization procedures are illustrated by graphical diagrams, source code of the applications and sets of generated variables according to the target functions.

Keywords: Markov Chain, Regression Models, Optimization, Interior-point Algorithm, Genetic Algorithm
JEL Codes: L10, L11

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ANALYSIS OF THE QUALITY OF CUSTOMER TRAFFIC IN MARKOV CHAINS

Prof. Mihail Iliev, DcS

Telecommunications Department,
“Angel Kanchev” University of Ruse
Tel.: 082-888 673
E-mail: miliev@uni-ruse.bg

Assoc. Prof. Ivelina Balabanova, PhD

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

Georgi Georgiev, PhD

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

Assoc. Prof. Boyan Karapenev, PhD

Department of Communications Equipment and Technologies,
Technical University of Gabrovo
Phone: 0877 283 982
E-mail: bkarapenev@tugab.bg

Abstract: In this paper an approach for quality evaluation of Exit System Time data in Markov $M/M/c/k$ at $c = 15$ according to optimality criterion in the STATISTICA environment is implemented. The considered teletraffic system was modeled in a fixed Average Arrival Rate, Maximum Station Capacity and increasing Average Service Time. The basic concept is associated with searching, detection and excluding data from the composition of information sets in registered deviations from the calculated optimal and allowable maximum time limits. The objects of study are four simulation datasets about system users with priority of the service, respectively Cust. ID = 100, Cust. ID = 200, Cust. ID = 300 and Cust. ID = 400. An overall assessment of the data with regard to the parameters of the Mean values in each set about the Standard Error and the Confidence Interval 0.95% was made. The observations and samples about every customer were analyzed by Normal Probability and Individual plots, X-Bar and R Charts, Capability Indicators, Capability Plots and Histograms.

Keywords: $M/M/c/k$, QoS, Teletraffic Samples, Normal Distribution, Optimal Level

JEL Codes: L10, L11

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OPEN EDUCATIONAL RESOURCES ENHANCE THE STEAM EDUCATION

Assoc Prof. Nina Bencheva, PhD
Telecommunications Department,
“Angel Kanchev” University of Ruse
Phone: +359 887746257
E-mail: nina@uni-ruse.bg

Abstract: *The concepts of e-school or digital school formulated some years ago are visions of modernising the school with the use of ICT as the key elements of this change. In the beginning of our century, the education system deviated from the model of digitalisation of education based mostly on buying new equipment. Today, the vision of using new technologies at school rests on three pillars: Teachers' expertise, Educational Resources, Technological Infrastructure. A vital component of these concepts are the open educational resources (OER) and their openness. The paper studies the role of OER and their influence in enhancing the Science, Technology, Engineering, Arts and Mathematics (STEAM) education. In the paper, the European Union initiatives for increasing the development and usage of OER and enhancing STEAM education are explored. The role of OER for better STEAM education is analysed. The initiatives of the Bulgarian government and interested parties for expanding the use of OER are presented. The National Science Program "Information and Communication Technologies for a Single Digital Market in Science, Education and Security" (ICTinSES) and the role of the University of Ruse for implementation the programme is provided. The workpackages and the achieved results are presented. Conclusions and recommendations are made.*

Keywords: OER, STEAM, EU policies, ICT

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DESIGNING AN INTERACTIVE MULTIMEDIA BILINGUAL APPLICATION FOR THE COURSE “PULSE AND DIGITAL DEVICES”

Martin Ignacio Mazola Ortega

Erasmus Student at the Department of Telecommunications, University of Ruse
University of Malaga, Spain
E-mail: martinchomazzolaortega@gmail.com

Jakub Wysowski

Erasmus Student at the Department of Telecommunications, University of Ruse
University of Science & Technologies, Krakow, Poland
E-mail: jwysowski@student.agh.edu.pl

Assist. Prof. Adriana Borodzhieva, PhD

Department of Telecommunications
“Angel Kanchev” University of Ruse
Phone: 00359 82 888 734
E-mail: aborodzhieva@uni-ruse.bg

Abstract: Some tools for designing interactive and multimedia training systems are considered in the paper. Their advantages in teaching students at universities are described. A bilingual interactive and multimedia application has been developed in English and Spanish, the two most widely spoken foreign languages in the world. The application allows students to learn basic concepts of Boolean algebra, minimization with Karnaugh maps, as well as basic functional units of combinational type, such as code converters, decoders and encoders, multiplexers and demultiplexers, arithmetic circuits for addition and subtraction, as well as digital comparators. The application covers various types of testing exercises, in the form of combining in pairs, crosswords, etc. The application will be used in the educational process in the courses “Pulse and Digital Devices”, “Impulse and Digital Circuits”, “Digital Circuits”, “Synthesis and Analysis of Logic Circuits” for the bachelors in the specialties “Internet and Multimedia Communications”, “Information and Communication Technologies”, “Computer Control and Automation”, “Electronics” and Computer Systems and Technologies” in the University of Ruse “Angel Kanchev”.

Keywords: Pulse and Digital Devices, Active Learning, Interactive and Multimedia Learning.

JEL Codes: I21, I23

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FRI-2G.302-1-CSN-05

PLAY TO LEARN: USING DRONE-AIRCRAFTS AND BLOCK BASED PROGRAMMING FOR IMPROVING LEARNING SUCCESS RATES

Assist. Prof. Diyana Kinaneva, PhD

Department of Telecommunications,
“Angel Kanchev” University of Ruse
Tel.: +359 82 888 353
E-mail: dkyuchukova@uni-ruse.bg

Assoc. Prof. Georgi Hristov, PhD

Department of Telecommunications,
“Angel Kanchev” University of Ruse
Tel.: +359 82 888 663
E-mail: ghristov@uni-ruse.bg

Assoc. Prof. Plamen Zahariev, PhD

Department of Telecommunications,
“Angel Kanchev” University of Ruse
Tel.: +359 82 888 663
E-mail: pzahariev@uni-ruse.bg

Eng. Jordan Raychev, PhD

Department of Telecommunications,
“Angel Kanchev” University of Ruse
Tel.: +359 82 888 353
E-mail: jraychev@uni-ruse.bg

Abstract: The paper reveals the methods used for improving education. In the paper authors focus on developing attractive and innovative courses for kids and students in the field of STEAM education. The students, which will be enrolled in the course, will be provided with specialized educational drones that have the possibility to be programmed to implement ongoing task. The market is now flooded with every type of drones that are used for different purposes - there are industrial drones, drones for photography and video, drones for kids and for education and many others. The benefits of using educational drones are the possibility for DIY configurations. Students will play while at the same time will learn block-based programming, the principle of aerodynamics and will exercise their logical thinking and will use their skills of critical thinking. The course that is going to be developed will have content-based learning materials in order to attract young people and it will have practical orientation. Even more a different competitions might be organized among the enrolled students in order to strengthen their skills. The world is changing every day and we as humans must adopt to that change in every of its aspects. That's why developing of such courses for improving education and introducing the technologies is a must.

Keywords: block-based programming, API, UAVs, Airblock, Tello

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CREATION OF CONTENT-BASED EDUCATIONAL COURSES AND ATTRACTIVE APPROACH FOR ACQUIRING NEW KNOWLEDGE IN THE FIELD OF APPLIED PROGRAMMING BY USING UGVs

Assist. Prof. Diyana Kinaneva, PhD

Department of Telecommunications,
“Angel Kanchev” University of Ruse
Tel.: +359 82 888 353
E-mail: dkyuchukova@uni-ruse.bg

Assoc. Prof. Georgi Hristov, PhD

Department of Telecommunications,
“Angel Kanchev” University of Ruse
Tel.: +359 82 888 663
E-mail: ghristov@uni-ruse.bg

Assoc. Prof. Plamen Zahariev, PhD

Department of Telecommunications,
“Angel Kanchev” University of Ruse
Tel.: +359 82 888 663
E-mail: pzahariev@uni-ruse.bg

Eng. Jordan Raychev, PhD

Department of Telecommunications,
“Angel Kanchev” University of Ruse
Tel.: +359 82 888 353
E-mail: jraychev@uni-ruse.bg

Abstract: We now live in technological world where everything around us become digital. The globalization of technologies makes us rethink the way children learn, educate and entertain. In this paper, the authors provide an attractive approach for acquiring new knowledge and skills by creating content-based training courses, which combines all of the above-mentioned activities – learning, education and entertainment. A different type of unmanned ground vehicle (UGVs) are going to be used in the course. They have API interfaces that will allow students enrolled in the course to make custom configuration and set missions for implementation via block-based programming approach. The platforms also have low level programming capability, which can be used, for advanced training in order to enhance student's programming skills. The authors believe that “learning by playing” method for acquiring new knowledge will have better success rate.

Keywords: block-based programming, API, UGVs, Robomaster, Microbit

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FRI-2G.302-1-CSN-07

ENVIRONMENTAL MONITORING BY USING THIRD PARTY WEATHER DATA

Eng. Jordan Raychev, PhD

Department of Telecommunications,
“Angel Kanchev” University of Ruse
Tel.: +359 82 888 353
E-mail: jraychev@uni-ruse.bg

Assist. Prof. Diyana Kinaneva, PhD

Department of Telecommunications,
“Angel Kanchev” University of Ruse
Tel.: +359 82 888 353
E-mail: dkyuchukova@uni-ruse.bg

Assoc. Prof. Georgi Hristov, PhD

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

Assoc. Prof. Plamen Zahariev, PhD

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

Abstract: *The focus of the paper is to review and investigate the possibilities of integrating third party weather data into existing web-based interactive platform. There are many third party weather stations available on the market (of the shelf products as well as prototypes) and each and every one of them is using their own methods and algorithms for collecting and analyzing the data. The data collected from some platforms is typically integrated in interactive applications and it is not publicly available, while other platforms has publicly exposed API (Application Programming Interface) which could provide all available data in a preferable format of ours. The usage of such data is two-fold. Firstly, such data could be collected from multiple heterogeneous source and integrated into a single unified platform and secondly the collected data could be further analyzed and used to synthesize new weather prediction algorithms and models.*

Keywords: *API, Prediction algorithms and models, Weather data.*

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DEVELOPMENT AND EVALUATION OF AN URBAN CONCEPT VEHICLE POWERED BY HYDROGEN FUEL CELL

Assoc. Prof. Georgi Hristov, PhD
Department of Telecommunications,
“Angel Kanchev” University of Ruse
Tel.: 082 888 663
E-mail: ghristov@uni-ruse.bg

Assoc. Prof. Plamen Zahariev, PhD
Department of Telecommunications,
“Angel Kanchev” University of Ruse
Tel.: 082 888 663
E-mail: pzahariev@uni-ruse.bg

Assoc. Prof. Ivan Beloev, PhD
Department of Transport,
“Angel Kanchev” University of Ruse
Tel.: 082 888 605
E-mail: ibeloev@uni-ruse.bg

Assist. Prof. Diyana Kinaneva, PhD
Department of Telecommunications,
“Angel Kanchev” University of Ruse
Tel.: 082 888 353
E-mail: dkyuchukova@uni-ruse.bg

Eng. Jordan Raychev, PhD Student
Department of Telecommunications,
“Angel Kanchev” University of Ruse
Tel.: 082 888 353
E-mail: jraychev@uni-ruse.bg

Abstract: *To reduce the levels of harmful emissions and to minimize the noise pollution, many leading countries have started pilot project and initiatives for the gradual transition to electrical vehicles or vehicles powered by alternative fuel sources, including natural gas, hydrogen, propane, biofuels and methanol. The focus of this paper is to present the design, development and evaluation stages from the construction process of a hydrogen fuel cell powered vehicle, which is being created by students from the University of Ruse, Bulgaria.*

Keywords: *Alternative fuel sources, Electric vehicles, Hydrogen fuel cell, Vehicle prototype*

JEL Codes: *R*

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FRI-2G.303-1-CST

FRI-2G.303-1-CST-01

**DISTRIBUTED RING-BASED MUTUAL EXCLUSION
WITH FAILOVER RECOVERY**

Assoc. Prof. Milen Lukanchevski, PhD

Department of Computer Systems & Technologies,

University of Ruse “Angel Kanchev”

Phone: 0877 303 850

E-mail: mil@ieee.org

***Abstract:** The ring-based aka token-ring mutual exclusion algorithm is the simplest decentralized mutual exclusion algorithm. The only preliminary information any constituent system processes should know are its own identifier and the identifier of its immediate neighbor. The main drawback of this attractive algorithm is strong presumption of full system reliability which is impractical.*

The modified version of algorithm proposed in this paper eliminates presumption of full system reliability and guarantees failover recovery from any kind of multiple faults. Two strategies exist – without or with communicational ring reconfiguration.

Main part of the modification is new algorithm for mutual exclusion token control/recovery. It introduces one new initialization message <mrk_me_clr> and extension of mutual exclusion token <mrk_me> with time marker Ti. The time marker is used to control validity of mutual exclusion token and initialization message serves as separator between mutual exclusion token before and after failover recovery.

Keywords: Distributed Systems, Failover Recovery, Distributed Mutual Exclusion, Token-Ring.

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LIMITATIONS IN PROCESSING AND REPRODUCTION OF VIDEO AND AUDIO

Assist. Prof. Lachezar Yordanov, PhD

Department of Computer Systems and Technologies,

“Angel Kanchev” University of Ruse

Phone: +359 82 888 859

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

Abstract: *The report addresses problems encountered during the processing and reproduction of video and audio content of various computer systems. The processing of multimedia content involves the addition of graphical information. The studies made so far on the possible cause of the effects on reproduction are presented. The players and playouts that are used are specified.*

The diagram of standard video file processing, the processing of multimedia content by adding graphic information, sequence diagram for processing and modification of video content and state diagram are presented.

The studies conducted so far on the possible cause of the impact on reproduction are presented.

Keywords: *DirectShow, players, playouts, GraphStudio, Media Player, character generator*

JEL Codes: *I20, C88*

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ANALYSIS OF SOFTWARE TESTING TECHNIQUES AND RESULTS MEASUREMENT METRICS

MEng Tsvetelina Mladenova

Department of Computer Systems and Technologies,

“Angel Kanchev” University of Ruse

Tel.: +359 884 292 155

E-mail: tsmladenova@uni-ruse.bg

Abstract: *Software Quality Testing has always been a crucial factor when developing and delivering a product. The process of software testing refers to the evaluation of the software with the intention of finding an error in it [1].*

This paper reviews existing methods, techniques and web-based applications that create evaluate and measure software tests. In the process of the literature review, several testing methods are considered and their application is looked for in several existing systems. Some tests are being conducted and the results of every system is analysed and compared. Software metrics have a direct link with the measurement of the software quality [2] and having the correct measurement means is of an utter importance.

The goal of this study is to find the most suitable metrics and testing methods which will be used in the process of developing a software testing module in an ERP system.

Keywords: *Software Quality Testing, Software Metrics, Software Test Metrics, Software Development, Software Development Lyfe Cycle (SDLC), Testing Tools, Software Testing Tools*

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GRAPH DATABASE APPLICATION FOR REAL - TIME SENSOR SYSTEMS

Eng. Georgi Georgiev, PhD Student

Department of Computer Systems & Technologies University of Ruse

Tel.: 0035989-883-1934

E-mail: ggeorgiev@uni-ruse.bg

Abstract: *Everyday more and more devices are connected to the Internet simultaneously. The ability to connect and exchange information over many devices is essential nowadays. Constantly the data transferred over devices are heterogeneous and real-time. Many devices transmit data over the internet in vast quantities. Devices such as cars operate with live sensor data, GPS coordinates and many more. The collected data must be processed in a fast manner and represented to users in a more natural form. Graph databases remain a viable alternative over the old database systems. The dominance of Graph databases in real-time applications forces developers to operate with such systems due to the fact that graphs have a high expressive power to process complicated structures of sensor data. In this paper, we study a graph database modelling for storing live sensor readings and offer a new way to process real-time data. The main objective of the survey is to provide an architectural approach for storage, representation and processing of large amounts of live streaming data.*

Keywords: *Graph Database, real-time, sensors, data storage, GPS coordinates*

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FRI-2G.303-1-CST-05

DEVELOPMENT OF VIRTUAL AI AVATAR

MSc Martin Kaloev, PhD student

Department of computing

“Angel Kanchev” University of Ruse

Phone: 089 582 4314

E-mail: kaloev_92@mail.ru

Abstract: *This article follows the process of creating a virtual prototype of an avatar capable of emotional expression and interactive communication that changes over time. The purpose is to create an avatar capable of communicating with a person by imitating expressions and learning phrases and concepts. Such an avatar can be useful for learning about the concepts of artificial intelligence as a teaching tool or as an advertising development if implemented in an institution's website. The challenges that such a project must address is the use of an appropriate animation method, the selection of a suitable conversation script, and the elaboration of a hierarchy of processing what has been learned using natural language analysis methods (1). A further development of the project is an analysis of the information collected (2) and improvements made to user comments.*

Keywords: *chat bot, artificial intelligence, natural language processing, animation, avatar, humanoid*

JEL Codes: *L10, L11*

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FRI-2.203-1-TMS

FRI-2.203-1-TMS-01

**CALCULATION METHODOLOGY OF ECONOMIC EFFICIENCY IN
MACHINES' BRAKE SYSTEM REGULATED REPAIR WORK**

Henrik Vardanyan, PhD in "Cars and Tractors"

Faculty of Agrarian Engineering

Armenian National Agrarian University

Phone: +37496222523

E-mail: henrik1993@inbox.ru

Abstract: *In the article is elaborated the method of calculating the economic efficiency of regulated repair of brake system of machines with the help of which the increase in the balance of profit was regulated under regulated repairing conditions, it made about 8.6 million AMD (18 thousand \$) for 100 units minibuses per year, and profitability increased by 0.12%.*

Keywords: *Brake axle, reliability, critical machine parts, profit, profitability*

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FRI-2.203-1-TMS-02

EXPERIMENTAL STUDY ON HAZARDOUS FIRE FACTORS IN A PASSENGER TRAIN COUPE

Svilena Arabadzhieva

Faculty of Fire Safety and Civil Protection,

Academy of the Ministry of Interior

Tel.: 02/9821280

E-mail: ssarab@mail.bg

Todor Toshev

First Regional Fire Safety and Civil Protection Station- Plovdiv

E-mail: t_toshev17@abv.bg

Abstract: The report presents the results of a full-scale experiment in a real-size passenger train coupe model. Real fire scenario is simulated in real conditions. The purpose of the study is to identify the occurrence of the critical importance of hazardous fire factors for humans. The full-scale experiment was preceded by a series of small-scale experiments designed to investigate the fire performance of interior materials after a specified period of time using standardized laboratory methods.

Keywords: passenger train coupe, fire, heat, smoke, toxicity, loss of vision

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STUDY OF SOME EXPLOITATION PROPERTIES OF CONVERTED ELECTRIC VEHICLE, BY REASON OF THE CHANGE IN MASS AND THE LOCATION OF THE MASS CENTER

Assistant Professor Evgeni Evgeniev Sokolov, PhD

Department Combustion Engines, Automobile Engineering and Transport,

Faculty of Transport

Technical University Sofia, Bulgaria

E-mail: evg_sok@tu-sofia.bg

Abstract: In the paper measurements of the weight of the front and rear axle of vehicles with different number of people and different payload are made. The mass and location of the mass center of an automobile converted to an electric car are determined. Their influence on the traction properties, the ability of climbing the inclines, start and stop was investigated. The results obtained from the measurements of the converted and conventional vehicles are analyzed and presented graphically.

Keywords: Electric vehicle, convert, mass center.

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FRI-2.203-1-TMS-04

EXPLORING DIFFERENT CAR SUSPENSION SOLUTIONS FOR THE SHELL ECO-MARATHON COMPETITION

Assoc. Prof. Rosen Hristov, PhD

Department of Transport Engineering and Technologies,
Technical University of Varna

Phone: 052-383 321

E-mail: rosen.hristov@tu-varna.bg

Abstract: This report examines various options for implementing a car suspension for a Shell Eco-marathon competition. Most important is the lightness and non-deformability of the frame, which is directly dependent on the type of suspension mounting. Strength studies of various materials used in the manufacture of front control arm have been made. The advantage of elements composed of carbon composites is confirmed. The characteristics of two carbon composite pipes made using different manufacturing technology are presented. The weights of a particular carrier made of different materials are compared.

Keywords: Car, Carbon fiber, Efficiency, Suspension

JEL Codes:

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MODELLING OF WORKING PROCESS OF DIESEL ENGINE WHEN WORKING WITH ADDITION OF GAS FUEL

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

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 model that allows the calculation and analysis of the parameters of the working process in a diesel engine with volumetric mixture formation when working with biodiesel and mixtures of diesel fuel with it. For calculation a mathematical model was used to calculate the basic parameters of the working process based on the change in pressure in the engine cylinder. Theoretical calculations have been made to optimize the combustion process for a particular engine under these conditions. An in-depth study of the characteristics of biodiesel fuels used in working process modeling has been made.

Keywords: Mathematical model, diesel, biodiesel, fuels

JEL Codes:

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FRI-2.203-1-TMS-07

MODELLING OF WORKING PROCESS OF DIESEL ENGINE WHEN WORKING WITH ADDITION OF GAS FUEL

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

Eng. Nikolai Andonov, PhD student

Department of Transport Engineering and Technologies,
Technical University of Varna, Bulgaria

Tel.: +359 52 383 464

Assoc. Prof., Krasimir Bogdanov, PhD

Department of Transport Engineering and Technologies,
Technical University of Varna, Bulgaria

Tel.: +359 52 383 321

Abstract: The report includes calculations that provide detailed information on the change in process parameters, performance indicators and characteristics of working process of a diesel engine with volumetric mixture formation when working with the addition of gas to the filling manifold. For calculation a mathematical model was used to calculate the basic parameters of the working process based on the change in pressure in the engine cylinder. From the calculations, it could theoretically optimize the combustion process for a particular engine by regulating the amount of gas fuel added.

Keywords: Mathematical model, diesel, CNG, fuels

JEL Codes:

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OPERATION OF DIESEL ENGINE WITH FUELS AND OILS TREATED WITH NANOPARTICLE ADDITIVES

Assoc. Prof. Zdravko Ivanov, PhD

Department of Transport Engineering and Technologies,
Technical University of Varna, Bulgaria
Tel.: +359 52 383464
E-mail: zdravko.ivanov@tu-varna.bg

Assist. Prof. Veselin Mihaylov, PhD

Department of Transport Engineering and Technologies,
Technical University of Varna, Bulgaria
Tel.: +359 52 383464
E-mail: v_mihaylov@tu-varna.bg

Abstract: *The use of nanoparticles as an additive to oils and fuels is intended to influence the engine's working process in order to improve mechanical losses in the engine and its environmental performance. Improving mechanical losses results in a reduction in energy consumption and hence a reduction in carbon emissions. Studies in this regard show that nanoparticles influence various physical processes occurring in the cylinder, mainly in the period before the combustion phase.*

Keywords: *nano particles, nano additives, diesel engine,*

JEL Codes:

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FRI-2.203-1-TMS-09

ANALYSIS BRAKING DECELERATION OF LIGHT VEHICLES

Assoc. Prof. Zdravko Ivanov, PhD

Department of Transport Engineering and Technologies,
Technical University of Varna
Phone: 0877 - 426 030
E-mail: zdravko.ivanov@tu-varna.bg

Assoc. Prof. Radostin Dimitrov, PhD

Department of Transport Engineering and Technologies,
Technical University of Varna
Phone: 0877 - 426 096
E-mail: r_dimitrov@tu-varna.bg

Eng. Stoyan Stoyanov, PhD student

Department of Transport Engineering and Technologies,
Technical University of Varna

Eng. Daniel Ivanov, PhD student

Department of Transport Engineering and Technologies,
Technical University of Varna

Abstract: *The article makes an in-depth analysis and comparison of the braking deceleration of different types and weights of light vehicles. The calculation of the braking deceleration is made on the basis of the braking distance of the vehicles, measured at braking of vehicles from 100 to 0 km./h., according to data taken from technical sources. In the analysis of braking deceleration, cars are grouped by type and own weight. Analyzed light vehicles are driven from internal combustion engine, hybrid technologies and electrical power. Also the analyzed vehicles are with and without ABS system. The results obtained are compared with the data available in the technical literature for braking deceleration and on base of this, the obtained results are analyzed.*

Keywords: *Braking deceleration, Braking distance, ABS, Light vehicles*

JEL Codes: *L62, R41*

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EXPERIMENTAL STUDY OF POST-INJECTION FOR SOOT REDUCTION AT MEDIUM LOAD OF A LIGHT-DUTY DIRECT INJECTION DIESEL ENGINE

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

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

Abstract: *This paper presents an experimental study on soot reduction by means of post injection. The post injection leads to higher temperature during the late combustion in the combustion chamber thus increases the oxidation rate of the soot previously formed. However, the optimization of the timing and quantity of the injection fuel is essential. The higher amount of injected fuel and retarded injection cause to lower thermal efficiency due to higher heat losses. The experiments were conducted on an automotive turbocharged diesel engine at typical operating points. The injection strategy consists of a pilot injection, main injection and a post injection. In order to assess the effect on post injection the pilot and main injection were constant. In-cylinder pressure was also recorded in order to evaluate the engine efficiency.*

Keywords: soot, diesel engine, post injection

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STANDARDS AND METHODS FOR MEASURING VEHICLE NOISE

Kamelia Dimitrova, PhD student

Department of Engines and Transport Equipment

“Angel Kanchev” University of Ruse

Phone: 0882923209

E-mail: kbdimitrova@uni-ruse.bg

Abstract: The paper deals with the main sources of noise, produced by automobiles. It examines the harmful impact of roadway vehicle noise on human health and the existing methods for measuring the levels of noise. The considered vehicle noise limit values are in accordance with the latest EU regulation on the sound levels of motor vehicles, international noise standards and the Bulgarian regulation for measuring internal and external vehicle noise. The report further examines the methodologies used in measuring the noise emissions of vehicles when they are moving and when in park. It also reviews a system for measuring vehicle noise in enclosed spaces (noise cameras). This type of equipment is rather expensive and is primarily used by research companies and departments dedicated to the performance testing of manufactured products. All conditions, which could affect a vehicle noise evaluation - different types of road surfaces, meteorological conditions, and other factors, are presented in accordance with the methods applied in international standards.

Keywords: vehicle, noise emission, international standart, measurement, internal noise, external noise.

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BDS Edition of the Bulgarian Institute for Standardization Compass Issue 2 March - April 2011 ISSN 1313-9290 benefits from the standards (**Оригинално заглавие:** БДС Издание на Българския институт за стандартизация Компас Брой 2 март - април 2011 ISSN 1313-9290 ползата от стандартите)

Measurement of noise emitted by accelerating road vehicles - engineering method - part 3: indoor testing in m and n categories

Regulation (eu) no 540/2014 of the council of the european parliament of 16 April 2014 on the noise level of motor vehicles and interchangeable silencing equipment, amending Directive 2007/46 / EC and repealing Directive 70/157 / EEC (**Оригинално заглавие:** Регламент (ес) № 540 / 2014 на европейския парламент на съвета от 16 април 2014 година относно нивото на шума от моторните превозни средства и заменяемите шумозагличителните уредби, за изменение на Директива 2007 / 46 / ЕО и за отмяна на Директива 70 / 157 / ЕИО)

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A REVIEW OF THE POSSIBILITY FOR USING OF ALTERNATIVE FUELS AND BIOFUELS IN HYBRID VEHICLES

Assist. Prof. Krasimir Markov, PhD

Department of Engines and Vehicles

“Angel Kanchev” University of Ruse

Phone: 082 888 373

E-mail: kmarkov@uni-ruse.bg

Abstract: *The electrification of the automotive fleet increases with every year. More and more automotive manufacturers offers hybrid and electric vehicles on the market. It is considered that the hybrid vehicle would occupy a high percentage of the fleet in the near future compared to the electric vehicle. The internal combustion engine in the hybrid vehicle would still be a source of harmful emissions. An interesting and not fully researched question to this vehicle type is the use of alternative fuels and biofuels. For this reason, the subject of this article is an overview of the available literature. In conclusion after the analysis it can be said that the hybrid vehicles which use alternative fuels and biofuels are more environmental friendly than the hybrid vehicles which use conventional fuels.*

Keywords: Hybrid vehicles, alternative fuels, ethanol, biodiesel, hydrogen, biofuels, emissions.

JEL Codes: L10, L11

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FRI-2.203-1-TMS-13

INVESTIGATION OF THE ENGINE OPERATION ON GASOLINE-ISOPROPANOL FUEL BLENDS

Assoc. Prof. Kiril Hadjiev, PhD

Department of Engines and Transport Engineering ,
“Angel Kanchev” University of Ruse
Phone: 082-888 332
E-mail: khadjiev@uni-ruse.bg

Assoc. Prof. Emilian Stankov, PhD

Department of Engines and Transport Engineering ,
“Angel Kanchev” University of Ruse
Phone: 082-888 332
E-mail: khadjiev@uni-ruse.bg

Dipl. Eng. Nikolay Daskalov,

Department of Engines and Transport Engineering ,
“Angel Kanchev” University of Ruse
Phone: 082-888 332
E-mail: khadjiev@uni-ruse.bg

Abstract: *The experimental investigation is conducted to evaluate the effect of using blends of isopropanol with gasoline (5, 10, 15 and 20% isopropanol by volume) on the performance and exhaust emissions of a four cylinder port fuel injection (PFI) test gasoline engine. The test is conducted with the engine working at one speed (2500 min⁻¹) and different loads (inlet manifold depression $\Delta p_k = 310-540$ mmHg). The results for power, specific fuel consumption (FSC) are presented graphically on the same graph for different blends and neat gasoline*

Keywords: *Gasoline Engine, Isopropanol, Fuel Blends*

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IMPROVING MEASUREMENT ACCURACY THROUGH THE RANDOMIZATION METHOD

Assoc. Prof. Atanas Iliev, PhD

Department of ICE and AT, "Angel Kanchev" University of Ruse

Phone: 082-888-272

E-mail: ailiev@uni-ruse.bg

Assoc. Prof. Petar Kazakov, PhD

Trakia University, Faculty of Technics and technologies, 38 Graf Ignatiev str., 8602,

Yambol, Bulgaria, E-mail: peter_yb@abv.bg

Abstract: Of the errors made during each measurement, the most significant contribution is made by random errors. They appear arbitrarily, have an unpredictable character and significantly reduce measurement accuracy. Therefore, defining them is a paramount task. For this purpose, there are many methods based on the theory of their normal distribution. One of the main methods of "combating" random error is the method of "randomization" - conducting individual attempts on a pre-prepared plan, obtained by generating random numbers.

Keywords: measurement, random errors, measurement accuracy, method of "randomization"

JEL Codes: L10, L11

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FRI-2.203-1-TMS-15

LIFE CYCLE ASSESSMENT FOR COMPRESSED AIR AND CONVENTIONAL CARS CONCERNING ENERGY CONSUMPTION AND CO₂ EMISSIONS

Assoc. Prof. Ivan Evtimov, PhD

Department of Engines and Vehicles,

“Angel Kanchev” Univesity of Ruse

Tel.: 082-888 527

E-mail: ievtimov@uni-ruse.bg

Prof. Rosen Ivanov, DSc

Department of Engines and Vehicles,

“Angel Kanchev” Univesity of Ruse

Tel.: 082-888 528

E-mail: rossen@uni-ruse.bg

Chief Prof. Georgi Kadikyanov, PhD

Department of Engines and Vehicles,

“Angel Kanchev” Univesity of Ruse

Tel.: 082-888 526

E-mail: gkadikyanov@uni-ruse.bg

Chief Prof. Gergana Staneva, PhD

Department of Engines and Vehicles,

“Angel Kanchev” Univesity of Ruse

Tel.: 082-888 526

E-mail: glstaneva@uni-ruse.bg

Abstract: *This paper presents an analysis concerning effectiveness of compressed air traction in comparison with conventional cars. The Life Cycle Assessment method, regarding energy spent for extraction the raw materials/sources, manufacturing the components and vehicle, motion, maintenance and repair during exploitation period and the recycling process, is used. The influence of the production technology of the electric energy, needed for charging the battery, is taken into account. On graphics, the energy consumption and CO₂ emissions for the life cycle of compressed air cars and conventional cars are presented. Examples for Bulgaria and EU countries are given. The main influence on the effectiveness of compressed air cars has the structure of energy mix of the country where the electric car is produced and is used in exploitation.*

Keywords: *Fuel consumption, Energy consumption, Compressed air cars, Environmental protection*

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FRI-2.203-1-TMS-16

THE BUTANOL AS ALTERNATIVE FUEL FOR DIESEL ENGINES

M. Eng. Emil Mitev, PhD Student

Department of Engines and Vehicles,

University of Ruse, Bulgaria

Tel.: +359894949777

E-mail: emitev@uni-ruse.bg

Abstract: *In order to reduce the harmful emissions from road transport, the exploration for new alternative energy sources is required. One of these new energy sources is alcohol, which has been used more and more frequently in recent years, both in gasoline and diesel engines. Butanol is a type of alcohol, green energy resource, derived from the fermentation of non-consumable biomass. The report examines butanol as an alternative source of energy and its impact on the power and environmental performance of the diesel engine.*

Keywords: *Butanol, Diesel, Efficiency, Emissions, Performance, Alcohol.*

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INVESTIGATING THE OPPORTUNITIES OF AUTOMATED TEST MACHINES USED FOR RESEARCH OF MECHANICAL SYSTEMS

João Ribeiro

Department of Machine Science, Machine elements, Engineering Graphics and Physics,
University of Ruse "Angel Kanchev", participant in Erasmus+
E-mail: 1161049@isep.ipp.pt

Hugo Alves

Department of Machine Science, Machine elements, Engineering Graphics and Physics,
University of Ruse "Angel Kanchev", participant in Erasmus+
E-mail: 1161035@isep.ipp.pt

Gergana Mollova - PhD Student

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

Abstract: *The improvement of the strength and exploitation characteristics of mechanical transmissions and other components is a significant and interdisciplinary problem. The solution of this problem becomes possible through improving the methods in the area of machine design and the existing approaches in experimental investigations. The paper summarizes some of the most important existing methods of experimental research of mechanical components and systems with automated test machines. The objective of the research presented is to investigate the opportunities to increase the application of automated test machines for investigation of strength and dynamic characteristics of different mechanical components and systems. The authors' team also discusses the opportunities for data processing in an environment of LabVIEW and/or MATLAB. Conclusions are deduced.*

Keywords: *Automated Test Machines, Experimental Research, Mechanical Systems, Effectiveness, Efficiency*

JEL Codes: *Q49*

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IMPROVING STUDENTS' COMMUNICATION AND PROBLEM SOLVING SKILLS DURING TEAMWORK

Hugo Alves

Department of Machine Science, Machine elements, Engineering Graphics and Physics,
University of Ruse "Angel Kanchev", participant in Erasmus+
E-mail: 1161035@isep.ipp.pt

João Ribeiro

Department of Machine Science, Machine elements, Engineering Graphics and Physics,
University of Ruse "Angel Kanchev", participant in Erasmus+
E-mail: 1161049@isep.ipp.pt

Yordanka Dimitrova - PhD Student

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

Abstract: *The paper presents the successful experience of a team of the lecturers and Erasmus students at the University of Ruse in the area of using innovative training technologies. Different options for the improvement of the communication between lecturers and students and for increasing the students' interest towards different complicated subjects are analyzed. Special attention is dedicated to the improvement of important social skills of students such as: leadership, teamwork, work ethic, additivity, communication, presentations and problem solving skills. The objectives of the training and learning technologies applied (joint scientific work with the students, organization and implementation of meetings with members of professional engineering clubs, peer review) are to increase the chances of professional development and realization of students from engineering bachelor degree courses through participation in international programs and scientific activities. Based upon the results achieved by the academic staff of the University of Ruse, main characteristics of a new educational approach are analyzed. The main features of this approach are the individual work and supervision concerning each student.*

Keywords: *Training Technologies, Leadership, Teamwork, Communication and Problem solving skills*

JEL Codes: *A30*

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FRI-2.203-2-TMS

FRI-2.203-2-TMS-01

DEVELOPMENT OF A TETHERED AIR HANDLER WITH A SOFT LINK

Dipl. Eng. Yavor Yotov, PhD Student

Department of Mechtronics,
Institute of Mechanics, BAS, Bulgaria
Tel.: +359 888 966 602
E-mail: Javor.jotov@imbm.bas.bg

Assoc. Prof. Simeon Iliev, PhD

Department of Engines and Vehicles,
“Angel Kanchev” University of Ruse
Phone: 082-888 331
E-mail: spi@uni-ruse.bg

Abstract: *The high own weight relevant to the relatively low carrying capacity of the air handlers is vastly due to the uneven cantilever load of the air platform when handling. The air turbulence flow formed by the movement of the rotor also hinders the air handling. In order to solve these problems, a new air handler scheme is presented in this document, where the centre of gravity remains unchanged or its impact is kept to a minimum during manipulation. Instead of installing a robotic manipulator directly into the flying system, it is replaced by a gripper mounted on an active platform, which itself is attached to the centre of gravity of the main flying system by a soft link. The handler is co-operated by two independent, but interlinked and interoperable systems. One system holds the main carrying function and the other system - the positioning. The carrier system can serve both as an autonomous aircraft and to be piloted. For positioning and self-stabilisation, the air handler's system (HBM) is equipped with two drive types: winch and motor propeller groups. This document provides an overview of the system of HBM, including the concept, hardware implementation, the principle of management and control and the initial experimental results.*

Keywords: Air Platform, Robotic, Air Manipulator, Flying System, Multirotor System

JEL Codes: D82, L93

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FRI-2.203-2-TMS-02

ASSESSMENT OF TIME IRREGULARITIES OF ROAD ACCIDENTS IN BULGARIA

Prof. Velizara Pencheva, PhD

Department of Transport,
“Angel Kanchev” University of Ruse
Phone: 082-888 240
E-mail: vpencheva@uni-ruse.bg

Assoc. Prof. Asen Asenov, PhD

Department of Transport,
“Angel Kanchev” University of Ruse
Phone: 086-821 605
E-mail: asasenov@uni-ruse.bg

Eng. Stanimir Penev,

Department of Transport,
“Angel Kanchev” University of Ruse
Phone: 086-821 605
E-mail: spenev@uni-ruse.bg

Abstract: With the help of statistical data, a time analysis of the occurrence of traffic accidents in Bulgaria has been made. The purpose of this paper is to cross the number of traffic accidents with killed and injured in the country (period 2000 - 2019) from different time aspect and try to identify critical day and hour, or month and day. The analysis and results can be used as inputs for visualization and time maps. Basic aim of this paper is to emphasize and show temporal analysis as a method for visualization and searching specified patterns in time for decision making process.

Keywords: assessment, time maps, temporal analysis, traffic accidents

JEL Codes: L10, L11

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FRI-2.203-2-TMS-03

OPTIMIZATION OF THE CARRIAGE OF TRANSIT GOODS BY ROAD BETWEEN TWO PORTS AS PART OF MULTIMODAL TRANSPORT WITH A REQUIREMENT FOR QUICK DISCHARGE OF THE VESSEL

Eng. Boril Ivanov, PhD student
Department of Transport,
“Angel Kanchev” University of Ruse
Phone: 082-888-605
E-mail: bivanov@uni-ruse.bg

Abstract: The report presents a mathematical model for synchronizing the port cargo handling operations with vehicles' scheduling in transit of large cargo lots between two port terminals as part of a multimodal supply chain. The option and sub-options considered prioritize fastest possible discharge of the vessel and provides for the unloading of the entire shipment at the initial port and subsequent dispatch at a calculated interval without a planned detention of the vehicles at the receiving port.

Keywords: freight transport, multimodal transport, road transport, port-to-port transit, mathematical model, minimizing trucks' detention.

JEL Codes: L91

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METHODS TO REDUCE THE NUMBER OF INCIDENTS WITH VULNERABLE ROAD USERS

Assist. Prof. Toncho Balbuzanov, PhD

Department of Transport,
“Angel Kanchev” 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 vulnerable road users. The dynamically changing environment in the crossing areas is explored to reduce road accidents with vulnerable road users. Some methods for reducing accidents with pedestrians and cyclists have been examined. The construction of specialized facilities may be a solution in some cases, limiting traffic and reducing speed in others. The combination of measures usually gives the most effective results.*

Keywords: *traffic safety, pedestrians, detection, road crossing.*

JEL Codes: *R41*

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FRI-2.203-2-TMS-06

ASSESSMENT OF THE MAAS SYSTEM AS A TOOL FOR SHARED ECONOMY IN TRANSPORT AND THE APPLICATION OF HYDROGEN MOBILITY

Prof. Velizara Pencheva, PhD Eng.

University of Ruse, Bulgaria,
Department of Transport
Phone: 082 888 240
E-mail: vpencheva@uni-ruse.bg

Assoc. Prof. Asen Asenov, PhD Eng.

University of Ruse,
Department of Transport
Phone: 082 888 605
E-mail: asasenov@uni-ruse.bg

Assist. Prof. Dimitar Grozev, PhD.

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

Assoc. Prof. Ivan Beloev, PhD

University of Ruse,
Department of Transport
Phone: 082 888 605
E-mail: ibeloev@uni-ruse.bg

Assoc. Prof. Tsvetelina Georgieva, PhD

University of Ruse,
Department of Automation and mechatronicst
Phone: 082 888 668
E-mail: cgerogieva@uni-ruse.bg

Prof. Plamen Daskalov, PhD Eng.

University of Ruse, Bulgaria,
Department of Automation and mechatronicst
Phone: 082 888 668
E-mail: daskalov@uni-ruse.bg

Abstract: *The paper examines the development and status of urban passenger transport in the country and the possibilities for the functioning of the integrated urban mobility system (MaaS). Based on an analysis of European urban mobility policy and good practices, three main pathways for the development of urban transport systems have been identified through engineering and technological solutions for greening vehicles and by changing conventional modes of transport (with public transport and personal vehicles) in shared and integrated mobility models. It is pointed out that the three roads are not separate, and the servicing (broadening of the range of services and offering complex solutions) of transport on shared and integrated mobility routes can create incentives for even faster technological upgrading of vehicles.*

Keywords: *Mobility as a Service (MaaS), urban passenger transport, urban mobility, integrated mobility model*

JEL Codes: *L91*

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FRI-2.203-2-TMS-07

STUDY OF THE POSSIBILITIES OF APPLYING HYDROGEN MOBILITY IN MODERN CITIES

Assoc. Prof. Asen Asenov, PhD Eng.

University of Ruse,
Department of Transport
Phone: 082 888 605
E-mail: asasenov@uni-ruse.bg

Prof. Velizara Pencheva, PhD Eng.

University of Ruse, Bulgaria,
Department of Transport
Phone: 082 888 240
E-mail: vpenceva@uni-ruse.bg

Assoc. Prof. Ivan Beloev, PhD

University of Ruse,
Department of Transport
Phone: 082 888 605
E-mail: ibeloev@uni-ruse.bg

Assist. Prof. Dimitar Grozev, PhD.

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

Prof. Plamen Daskalov, PhD Eng.

University of Ruse, Bulgaria,
Department of Automation and mechatronicst
Phone: 082 888 668
E-mail: daskalov@uni-ruse.bg

Assoc. Prof. Tsvetelina Georgieva, PhD

University of Ruse,
Department of Automation and mechatronicst
Phone: 082 888 668
E-mail: cgerogieva@uni-ruse.bg

Abstract: *The state of transport in the city of Ruse and its impact on the environment were evaluated. Based on a study of engineering and technological developments, European policies and good practices for sustainable mobility, the potential and perspectives for the possible implementation of hydrogen mobility in the city are identified. Suitable applications for hydrogen mobility are for urban transport and logistics and inland waterway transport.*

Keywords: *urban transport, hydrogen mobility, inland waterway transport, alternative energy sources*

JEL Codes: *L91*

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FRI-2.203-2-TMS-08

DETERMINING THE POWER REQUIRED TO DRIVE A PROTOTYPE WITH HYDROGEN FUEL CELL

Assist. Prof. Dimitar Grozev, PhD

Transport Department,
University of Ruse “Angel Kanchev”
Tel.: 082 888 231
E-mail: dgrozev@uni-ruse.bg

Assoc. Prof. Ivan Beloev, PhD

Transport Department,
University of Ruse “Angel Kanchev”
Tel.: 082 888 352
E-mail: ibeloev@uni-ruse.bg

Assoc. Prof. Georgi Hristov, PhD

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

Abstract: *This report examines the required power of a urban vehicle prototype with hydrogen cells. The main objective is to obtain such a car with the lowest fuel consumption and the highest mileage under predetermined construction and road conditions. The results of the study make it possible to determine the required power and driving conditions in which the energy consumption is the lowest.*

Keywords: *Efficiency, Effectiveness, urban, vehicle, prototype, hydrogen cells*

JEL Codes: *L91*

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CREATING A URBAN VEHICLE PROTOTYPE WITH A HYDROGEN FUEL

Assist. Prof. Dimitar Grozev, PhD
Transport Department,
University of Ruse "Angel Kanchev"
Tel.: 082 888 231
E-mail: dgrozev@uni-ruse.bg

Assoc. Prof. Ivan Beloev, PhD
Transport Department,
University of Ruse "Angel Kanchev"
Tel.: 082 888 352
E-mail: ibeloev@uni-ruse.bg

Assoc. Prof. Georgi Hristov, PhD
Department of Telecommunications,
"Angel Kanchev" University of Ruse
Tel.: 082 888 663
E-mail: ghristov@uni-ruse.bg

Abstract: *This report analyzes known urban vehicle prototypes with a hydrogen fuel. On the basis of the obtained results, calculations were made, a scheme for the control and propulsion of an alternative hydrogen car was drawn up. With the designed car, road tests were conducted using the methodology of the Eco Run marathon to determine the mileage of one m3 of hydrogen at Mercedes track in London. The results show that the car can run a mileage of 118 km and is suitable for the race.*

Keywords: *Efficiency, Effectiveness, urban, vehicle, prototype, hydrogen cells*

JEL Codes: *L91*

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FRI-2.203-2-TMS-10

A STUDY OF THE INFLUENCE OF INPUT PARAMETERS ON OUTPUT RESULTS ON THE DELTA V METHOD

Assoc. Prof. Daniel Lyubenov, PhD

Department of Transport,
“Angel Kanchev” University of Ruse
Phone: (+359) 082 888 605
E-mail: dliubenov@uni-ruse.bg

Eng. Filip Kirilov, PHD Student

Department of Transport,
“Angel Kanchev” University of Ruse
Phone: 0885/004356
E-mail: fkirilov@uni-ruse

Abstract: *The inspection of the accident scene and the vehicles, the study of different traces and findings, the determination of the dynamic parameters of the movement, the choice of different methods, quantities and dependencies are the main tasks of the expert. Measurement of vehicle deformations is an important point in the expert study of road accidents. In expert practice, it is very important for experts to know the influence of different input parameters on outputs. Knowledge of this can improve the analysis of the accident and the quality of the expertise. This paper presents a study of the effect of the depth of deformation and mass of the vehicle on the speed of a real accident.*

Keywords: *Vehicle Accident Reconstruction, Delta V Method, Collision Speed*

JEL Codes: *L91*

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EXAMINATION OF BASIC QUALITIES OF CANDIDATES FOR DRIVERS CATEGORY «B» FOR THE SAFE DRIVING OF A VEHICLE

Eng. Nikolay Paunov

Department of Transport,

“Angel Kanchev” University of Ruse

Phone: +359 82 888 605

E-mail: npaunov@uni-ruse.bg

Abstract: *This article views a new organization and structure applicable to the training of drivers of B category. This organization and structure may be viewed as further development of third and most notably fourth level of GDE matrix or a completely new level. More precisely in the article is developed the matter about the profile of the learners of B category. A treatment of this problem under this name (profile of the learner) does not exist in any specialized literature on the topic. Hence this can be taken as contribution to the theory and practice of drivers' training. There are in fact two examinations: at the beginning of a new training every learner goes through a short examination in the driving school the results of which determine his or her profile. At the end of the training the learner goes through another short examination to determine his or her profile as ready to participate in an exam or being in need of extra training i.e. the principle of individual approach is used when training learners. The different profiles of the learners give the instructor the opportunity to divide them into three groups with each group performing a different amount of learning activity based on it's participants. Our research shows that during preparation of learners none of them have their profile determined. It was established that instructors are not familiar with third and fourth level of GDE matrix. The research on the topic of learners' profiles continues.*

Keywords: *Кандидат-водач, GDE matrix, Категория В*

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FRI-2.203-2-TMS-12

A STUDY OF ADVANCED SYSTEM FOR TRAINING OF DRIVERS CANDIDATES

Polina Atanasova, PhD student

Department of Transport,

“Angel Kanchev” University of Ruse

Phone: (+359) 082 888 605

E-mail: patanasova@uni-ruse.bg

Abstract: *The current study examined the effectiveness of advanced system for training of drivers candidates. In order to ensure high road safety, it is necessary to use modern information technologies and technical means to improve the quality of training of drivers. A modern driver training and administration system has been created that can be used in driver training courses. This system would facilitate and improve the effectiveness of practical training for drivers. The possibilities offered by the system are presented. The system is an innovative information-communicative, providing a link between the learner, the training center and the trainer. The success of driving license applications trained using the system was compared to candidates trained without this advanced technology.*

Keywords: Road traffic safety, Training of candidates for drivers

JEL Codes: L91

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FRI-2.203-2-TMS-13

STUDY OF THE DEVELOPMENT OF LOGISTICS WAREHOUSES AND THE ROLE OF THEM IN 3PL OPERATOR

Eng. Ivan Petrov,
Department of Transport,
“Angel Kanchev” 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 individual warehouses and their role in freight transportation are determined. Their role in the work of 3PL operators in medium-sized cities was evaluated. Based on the processed data from a logistics warehouse in the city of Rousse, its place and importance in the supply chain are determined. The efficiency of the use of the different types of warehouses and the need for the development of the existing warehouse infrastructure were investigated.*

Keywords: Warehouse, Logistics, 3PL, Outsourcing

JEL Codes: L91

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A STUDY OF THE BRAKING PROPERTIES OF CARS

Eng. Filip Kirilov, PHD Student

Department of Transport,

“Angel Kanchev” University of Ruse

Phone: 0885/004356

E-mail: fkirilov@uni-ruse

Abstract: One of the important steps in a road accident investigation is to determine the vehicle's stopping distance. Braking deceleration is one of the factors on which the stopping distance depends. In Bulgarian technical literature, information on vehicle braking deceleration is insufficient. This paper presents the results of an experimental study of the braking properties of cars. The study was done with VBOX data logger equipment. Braking deceleration data for different cars during emergency braking was obtained.

Keywords: Road Safety, Braking Deceleration, Vehicle Accident Reconstruction

JEL Codes: L91

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A STUDY OF THE VULNERABLE ROAD USERS SAFETY IN BULGARIAN ROADS

Eng. Ivo Balevski, PhD student

Department of Transport,

“Angel Kanchev” University of Ruse

Tel.: (+359) 0894 884 250

E-mail: ibalevski@uni-ruse.bg

Abstract: *This study presents data and analysis of the state of traffic safety in Bulgaria. Data provided by the State-Public Advisory Committee on Road Safety. Information on the number of crashes and injuries for the period 2013 - 2018 is provided. In this work, the classification of accidents was made according to different criteria. An analysis of the causes of accidents has been made. This work can be used to improve road safety in Bulgaria*

Keywords: *Road Traffic Safety, Vulnerable Road Users*

JEL Codes: *L10, L11*

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Durzhavno-obshtestven konsultativen komitet po bezopasnost na dvizhenieto po putishtata

FRI-2.203-2-TMS-16

RESEARCH CROSS-DOCKING WAREHOUSE ORGANIZATION AS PART OF THE INTEGRATED DELIVERY SYSTEM IN CONDITIONS OF 3PL OPERATOR

Eng. Iskren Petrov, PhD student

Department of Transport,
“Angel Kanchev” Univesity of Ruse
Phone: 082-888-608
E-mail: iskipetrov@uni-ruse.bg

Eng. Ivan Petrov, PhD student

Department of Transport,
“Angel Kanchev” Univesity of Ruse
Phone: 082-888-605
E-mail: ipetrov@uni-ruse.bg

Eng. Valeri Gamozov, PhD student

Department of Transport,
“Angel Kanchev” Univesity of Ruse
Phone: 082-888 608
E-mail: gamozov@uni-ruse.bg

Abstract: The article examines and analyzes the types of cargo units served in cross-docking warehouses and their seasonal load. Warehousing is considered as part of the 3PL operator's integrated delivery system. The results of the study show what types of cargo units are served at the 3PL operator's cross-docking warehouse and the seasonal unevenness of the cargo units served.

Keywords: 3PL operator, cross-docking warehouse, loading unit

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FRI-2.203-2-TMS-17

ANALYSIS OF THE SOME BUSES ROUTES FROM URBAN PASSENGER TRANSPORT IN BIG CITY

Chief assistant professor Pavel Stoyanov, PhD

Department of Transport,
"Angel Kanchev" University of Ruse
Phone: 082-888 515
E-mail: pstoyanov@uni-ruse.bg

Abstract: In this work an analysis of the operation of several bus routes by urban passenger transport in the city of Sofia is made. It also defines and defines basic indicators of the quality of the transport service (travel interval, travel time and number of courses) and examines routes along which buses pass. The methodology used for the study includes statistics for a period of two years of Sofia Transport EAD - Druzhba. The results of the analysis show the weaknesses in the work of the carrier and make it possible to take measures to improve the quality of bus services.

Keywords: Urban passenger transport, Transport services, Passenger traffic, Time travel

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FRI-2.203-2-TMS-18

MODELING AND SIMULATION APPROACHES FOR HYBRID FUEL CELLS

Prof. Velizara Pencheva, PhD

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

Assoc. prof. Tsvetelina Georgieva, PhD

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

Assoc. prof. Asen Asenov, PhD

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

Eng. Sechkin Remzi–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: *In the paper are presented modeling and simulation approaches for hybrid fuel cells. One of the biggest challenges is increasing of energy consumption. Against the backdrop of the depleted natural fuels, the planet's growing population is increasingly consuming energy. On the other hand, the use of traditional carbon-containing fuels to meet energy needs leads to an increasing environmental pollution. The use of new, greener sources and converters of energy is becoming one of the most current and urgent tasks of our time. Fuel cells are a new promising technology for producing electricity from hydrogen or other high-efficiency, low-emission fuels. They are still more expensive than existing technologies and there are technical challenges that need to be overcome their commercialization. Therefore, accurate and effective methodologies for fuel cellular systems design are important. The type of hybrid fuel cellular systems, different approaches for modeling and simulation of the systems are described in the paper.*

Keywords: Hybrid Fuel Cell, Modeling, Simulation, Software Tools

JEL Codes: C9

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FRI-2G.404-1-EM

FRI-2G.404-1-EM-01

**ANALYSIS OF CHANGES IN THE METHODOLOGY FOR
DETERMINING THE PRICE OF THE “IRRIGATION WATER SUPPLY”
SERVICE IN THE REPUBLIC OF BULGARIA¹**

Chief Assist. Prof. Krasimira Zagorova PhD

Department “Industrial Management”

Technical University of Varna, Bulgaria

Phone: +359 894642305

E-mail: kzagorova@tu-varna.bg

Abstract: The present paper focuses on some crucial changes introduced in the methodology for determining the price of the irrigation water (“irrigation water supply” service), provided to the farmers - water users in the Republic of Bulgaria. The methodology for determining the price of the irrigation water reflects the distinctive conditions and specific requirements related not only to the technical parameters of the respective hydromeliorative systems but also to the particular requirements related to their operation and maintenance. With the adopted amendments, the price structure shall be formed on the basis of two components - a constant one, covering the fixed costs of water supply, determined on the basis of the irrigated areas and variable one, calculated on the basis of measured volumes of supplied irrigation water.

Keywords: Irrigation costs, Price, Methodology, Irrigation water providers

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¹ Presented a plenary report of October 27, 2016 with the original title: ANALYSIS OF CHANGES IN THE METHODOLOGY FOR DETERMINING THE PRICE OF THE “IRRIGATION WATER SUPPLY” SERVICE IN THE REPUBLIC OF BULGARIA

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FRI-2G.404-1-EM-02

ANALYSIS OF THE CHARACTERISTICS OF LUXURY RESIDENTIAL PROPERTIES

Kristian Valchev, Ph.D.

Economics and Management of Construction Department

University of economics - Varna

Tel.: 0885/64-50-64

E-mail: k_valchev@mail.bg

Abstract: *The analysis of the luxury residential property market, which is conducted in this report is based on the following study:*

• *A survey among the real estate and construction companies in the luxury segment on their views on issues related to the characteristics, classification and market of luxury residential properties.*

The structured questions and results are analyzed and presented in tables and graphs, which we believe allow us to trace and compare the views of the two groups of respondents and to look for the reasons for the emerging trends and problem areas. The methodology allows luxury residential properties to be explored from a market point of view as well as from their quality characteristics and standards.

Keywords: *quality, market, luxury homes, characteristics*

JEL Codes: *R21; R23; R3; R58*

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OPPORTUNITIES AND ADVANTAGES OF SMALL ENTERPRISES WITH TRADE MARK REGISTRATION

Neli Rasheva - PhD Student

Department of Management and business development,
Faculty Business and Management,
University of Ruse "Angel Kanchev"
Tel: +359888860759
E-mail: nrasheva@abv.bg

Assoc. Prof. Daniel Pavlov, PhD

Department of Management and Business Development
Faculty Business and Management,
University of Ruse "Angel Kanchev", Bulgaria
Tel: +359884343132
E-mail: dpavlov@uni-ruse.bg

Abstract: Bulgaria's membership in the European Union in 2007 gave an additional opportunity for local enterprises to even their activities with all member states. One of the major challenges for small companies proved to be a reorientation towards business activities with protected own intellectual property rights. In this regard, the present study surveys the opportunities and advantages that small enterprises acquire through registration of their own trademark in Bulgaria and the European Union.

Keywords: trademark, small business, competitiveness

JEL: M10, O30

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GUIDELINES FOR MOTIVATING POLICE OFFICERS

Lyudmil Stoyanov

Department of Management and Business Development,
University of Ruse, Bulgaria
Tel.: +359 89 4653067
E-mail: ldochev2000@abv.bg

Assoc. Prof. Emil Kotsev, PhD

Department of Management and Business Development,
University of Ruse, Bulgaria
Phone: +359 88 8838250
E-mail: ekotsev@uni-ruse.bg

Abstract: The paper tries to link the theory and practice in the field of police officers' motivation. A number of reforms in the Ministry of the Interior during the last three decades are taken into consideration. A brief analysis of their effect on the quality of police officers' motivation and work is offered. As a basis for the analysis the Hackman&Oldham's Job Characteristics Model is used. Some proposals and recommendations for future activities that could have a positive effect on the police officers' motivation and the quality of their work are offered by the authors.

Keywords: Motivation, Job Characteristics, Quality of Work, Police Officers

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FRI-2G.404-1-EM-05

ANALYSIS OF THE WILLINGNESS OF SMALL MACHINE-BUILDING ENTERPRISES TO PUBLIC-PRIVATE PARTNERSHIPS WITH RUSE UNIVERSITY AND THE DEPARTMENT OF MANAGEMENT AND BUSINESS DEVELOPMENT

Diana Avramova - Student / PhD Student / Young Scientist

Department of Management and business development,

University of Ruse "Angel Kanchev"

Tel.: +359889517349

E-mail: davramova@uni-ruse.bg

Abstract: Limited financial revenues push the higher education institutions to seek collaboration with business, including public-private partnerships. The paper presents a review of the results of a study on the willingness of small manufacturing enterprises to Public Private Partnership with Ruse University and the Department of Management and business development

Keywords: Public Private Partnership, university

JEL Codes: M10, I20

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FRI-2G.404-1-EM-06

STRESS MANAGEMENT AS A TOOL FOR PREVENTION OF BURNOUT SYNDROME

Svilen Ruskova, PhD

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

Ivalina Ruseva, PhD student

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

Abstract: In any organization, the effective use of human resources depends on quality management. In this context, this report examines issues related to stress management, outlines the main characteristics of stress and strategies for managing it, used as a tool against prevention of Burnout syndrome. Occupational burnout is the last stage as a result of excessively high levels of stress, and for this reason managing it is also a major prevention against burning and maintaining the efficiency of human resources.

Keywords: stress, stress management, burnout syndrome, prevention, organization, human resources

JEL Codes: M1, M12

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A PRIORI RESEARCH ON LEAN TOOLS IN BUSINESS ²

Adriana Simeonova, PhD Candidate

Department of Management and Business Development,
Angel Kanchev University of Ruse, Bulgaria
Tel.: +359883437295
E-mail: asimeonova@uni-ruse.bg

Assoc. Prof. Dr. Anton Nedyalkov

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

Abstract: This a priori research of Lean tools in business is expected to help companies, researchers and business consultants to identify the key steps in organizations applying lean business model. The purpose of this paper is to discuss the common used lean tools as part of company management and possibility for organizations to apply these instruments, including Six Sigma, TPS, TQM, Toyota style, Kaizen, Kanban, etc. The concept is to find which of them are industry applicable and how management could invest as least as possible resources to obtain as much as possible customer satisfaction including covering their demands. In most of companies mistakes are done through applying the Lean model. 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 25 Lean tools are analysed; 2) opportunities to improve production system using lean tools are discussed; 3) some preliminary benefits and misunderstandings of Lean tools are demonstrated.

Keywords: Lean Tools, Operations Management.

JEL Codes: L23, M11.

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EVALUATION OF MOTIVATION AS AN ELEMENT OF EMOTIONAL AND SOCIAL INTELLIGENCE IN NON-PROFIT ORGANIZATIONS

Chief assistant Prof. Irina Kostadinova, PhD

Department of Management and business development,
University of Ruse "Angel Kanchev"

Phone: +359 885382300

E-mail: ikostadinova@uni-ruse.bg

Sevjan Ahmedova, student

Department of Management and business development,
University of Ruse "Angel Kanchev"

Phone: +359 877266986

Abstract: *The aim of the report is to examine the role of motivation as a determinant of human resources management through the analysis of emotional and social intelligence in organizational context related to the public sector. The subject of analysis is the manifestations of the Emotional & Social intelligence (E&SI) of the managers and the staff in the Second District Fire Safety and Protection of the Population District - Ruse and the Faculty of Fire Safety and Protection of the Population at the Academy of the Ministry of Internal Affairs - Bulgaria on one hand and the medical personal from Okmeydani Training and Research Hospital, Istanbul and teachers from the primary school Hamdullah Suphi Tanrıöver İlkokulu, Istanbul (Turkey).*

Keywords: *Motivation, Human resources, Emotional & Social intelligence, Competencies*

JEL Codes: *M12, M51, M53, M54*

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FRI-2G.404-1-EM-09

PERSPECTIVE OPPORTUNITIES ON LABOR MARKET SUPPLY: A COLLATERAL IMPLICATION OF THE INNOVENTER PROJECT

Assoc. Prof. Emil Kotsev, PhD

Department of Management and Business Development,

University of Ruse, Bulgaria

Phone: +359 88 8838250

E-mail: ekotsev@uni-ruse.bg

Abstract: *The paper presents the results of a survey done during the implementation of INNOVENTER - an international project, funded by EU (full title "Innovative vocational social entrepreneurship training"). The research is conducted among high school students from 16 schools in Rousse, Razgrad and Silistra. On the basis of the results obtained, the paper identifies a perspective niche in near future labor market supply.*

Keywords: INNOVENTER, Social Intrapreneur, Labour Market Supply, Attitude

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APPLICATION OF THE REGRESSION ANALYSIS TO THE WORK WAGE

Assoc. prof. Trufka Dimitrova, PhD

Department of Mathematics and informatics
Shumen University "Konstantin Preslavski
Tel.: "+359 892 603018
E-mail: trfktdt@abv.bg

Desislava Ivanova, BSc Student

Department of Mathematics and informatics
Shumen University "Konstantin Preslavski
Tel.: "+359 892 603018
E-mail: nikolaeva_desi@abv.bg

Abstract: A multidimensional regression analysis has been considered, based on an online survey of 83 people living and working in Bulgaria, a model with three independent variables and cut out highly distinctive values. The aim is to show the dependence of a dependent variable, such as the average monthly salary, on the independent variables: Years of training / self-study, Years of service, Level of cognitive abilities. The programming language R, was used in the grouping and in constructing the graphical images of the data as well as in realizing the regression analysis and evaluating the model parameters.

Keywords: Regression, Salary, Internship, Education, Cognitive abilities.

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FRI-2G.404-1-EM-11

MAIN CHARACTERISTICS OF SOCIAL ENTREPRENEUR - EVIDENCE FROM INNOVENTER PROJECT

Assoc. Prof. Miglena Pencheva, PhD

Department of Management and Business Development,

“Angel Kanchev” University of Ruse

Phone: +359 82 888 715

E-mail: mpencheva@uni-ruse.bg

Abstract: *The paper examines social entrepreneurship topic. More precisely, main characteristics of social entrepreneur are explored. These concept is investigated with purposes of: 1) to define core characteristics of social entrepreneur; 2) to outline main characteristics according to Bulgarian and Romanian samples; 3) to compare results of both groups. The report provides evidence gained in the frame of Innoventer Project.*

Keywords: *Social entrepreneur, Social entrepreneurship*

JEL Codes: *M13, M19*

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FRI-2G.407-1-EM

FRI-2G.407-1-EM-01

**A STUDY ON THE FEES AND COMMISSIONS BURDEN ON THE
SMALL SAVERS OF THE BULGARIAN BANKING SECTOR IN 2019**

Assist. Prof. Elizar Stanev, PhD

Department of Economics,

University of Rouse "Angel Kanchev", Bulgaria

Tel.: 082 888 703

E-mail: eastanev@uni-ruse.bg

Abstract: *Amidst the legislative push towards unifying and lowering banking service fees and commissions in order to make them more available to a larger public, the following paper explores the profitability of savings, deposit and payment accounts within the Bulgarian banking sector in 2019 from the lense of the small, retail customer, offering a new approach towards the calculation of the burden of operational taxes. The main thesis of the paper stipulates that with interest rates and operational fees on banking services as they are, savings accounts can be a significant drain on the finances of the general population considering the average household income and savings potential. Since, traditionally, the Bulgarian banking sector dominates over the capital markets, from the standpoint of the average Bulgarian household the lossess incurred from using a payment or savings account can be compensated by owning deposit assets, but, as it turns out - only if said assets are above a significant threshold. An attempt was made to calculate the aforementioned threshold by using empirical data.*

Keywords: Bulgarian banking sector 2019, banking service operational fees, banking fee burden

JEL Codes: G21, E58

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<https://www.nsi.bg/bg/content/3239/%D0%B3%D0%BE%D0%B4%D0%B8%D1%88%D0%BD%D0%B8-%D0%B4%D0%B0%D0%BD%D0%BD%D0%B8>

DSK Bank fees and commissions

<https://dskbank.bg/docs/default-source/bank-tariff/%D1%82%D0%B0%D1%80%D0%B8%D1%84%D0%B0-%D0%B7%D0%B0-%D1%84%D0%B8%D0%B7%D0%B8%D1%87%D0%B5%D1%81%D0%BA%D0%B8-%D0%BB%D0%B8%D1%86%D0%B0.pdf>

Eurostat, data on Household savings rate in the EU

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UBB Bank fees and commissions

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UBB Bank interest rates for retail customers

https://www.ubb.bg/attachments/Rate/285/main_bul/Tariff-Interest-Rates-Retail-20-11.pdf

UniCredit Bulbank fees and commissions

https://www.unicreditbulbank.bg/media/filer_public/3a/f0/3af00d76-3f0f-4b3a-8867-4913bf4e74a0/retail_tariff_external_bg.pdf

FRI-2G.407-1-EM-02

ARE EMPLOYEES PAID THEIR MARGINAL PRODUCT? ANALYSIS OF WAGE SETTING PRACTICES FROM BULGARIA

Assistant Prof. Aleksandar Kosuliev, PhD.

Department of Economics,

“Angel Kanchev” University of Ruse

Tel.: +359 82 888 557

E-mail: akosuliev@uni-ruse.bg

***Abstract:** Neoclassical theory postulates that factors of production are paid according to their marginal productivity. We test this assumption by examining data from job adverts by big employers from the retail and telecommunications sectors in Bulgaria. The results show that while these companies follow nation-wide pricing policies for their final goods and services, they pay different wages in different regions, taking into consideration the state of the local labour market.*

***Keywords:** labour market, wages, marginal productivity theory.*

***JEL Codes:** D01, D33, J30*

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LOCAL BUDGETS - MORE DECENTRALIZATION, MORE EFFICIENCY

Assoc.Prof. Kamelia Assenova

Department of Economics

“Angel Kanchev” University of Ruse

E.mail:kassenova@uni-ruse.bg

Abstract: *The expansion of the fiscal powers of the municipalities in Bulgaria in order to use the resources more efficiently and better to meet needs remains a partially realized goal.*

The goal of economic policy is improving the well-being of all citizens in the country. It requires high and sustainable economic growth, low unemployment, rising incomes and an equal level of satisfaction with public goods in all regions of the country. The local budgets together with the central public expenditures make possible achievement of these goals. It requires to increase the efficiency of public expenditure incurred by local authorities. At the same time, they must have economic interest to realize more local budget revenues and it remains at their disposal. The centralized decision-making leads to inefficiency. The public goods provided in all parts of the country and for all citizens must be in accordance with their needs and approximately the same quality. The data for Bulgaria for the period 2010-2015 show a strong redistribution of the own revenues of the municipalities and they have no interest to raise them. Local public spending is not dependent on revenue accumulated. This situation requires changing the relations between central and local budgets and put in the practice financial equalization by transferring some of the tax revenues to municipalities.

Keywords: *State and Local Government, Fiscal policy and behavior of Economic Agents*

JEL Codes: *H7, H3*

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ONLINE POSITIONING OF BIOLOGICAL BEE HONEY FROM REGION OF ROUSSE

Assoc. Prof. Lyubomir Lyubenov, PhD

Department of Economics,

“Angel Kanchev” University of Ruse

E-mail: LLyubenov@uni-ruse.bg

Abstract: On the one hand, the organic honey from region of Rousse has a difficult differentiation but on the other hand, it is under an intense competitive pressure and in a position of product parity. Its positioning on the online market is a serious positional problem, which makes it extremely important for its success and so difficult at the same time. The leadership on medicinal plants and biodiversity in Europe, as well as the leadership on organic beekeeping, allows the positioning of the beekeeping from region of Rousse through biodiversity and quality. The regional honey needs to be differentiated by brand and domain name. The brand forms an image of high quality, emphasizing the origins from environment with high biodiversity. The domain name provides fast, cheap, interactive and personalized global access, respectively global and much more precise differentiation and positioning. The influencers have an important role in the online positioning of bio honey. Unlike the similar offline positioning approach, they do not have to be celebrities - they can be also manufacturers, therapists, and much more. The influencers are the most visible and affecting figures on the social networks and play an important role for the online positioning.

Keywords: Biodiversity, Differentiation, Brand, Domain name, Influencers.

JEL Codes: M31, Q13

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WHEN EMPLOYERS POST THEIR WAGES? ANALYSIS OF JOB ADVERTS FROM RUSE, BULGARIA

Assistant Prof. Aleksandar Kosuliev

Department of Economics,
“Angel Kanchev” University of Ruse
Tel.: +359 82 888 557
E-mail: akosuliev@uni-ruse.bg

Abstract: Prices are an important element of the market mechanism as they channel information and create incentives for market agents. Yet, prices are often absent from the labour market. An analysis of online job adverts from Ruse, Bulgaria show that only a quarter of the adverts feature posted wages. We suggest that the decision to not disclose the payment is rational under information asymmetry. Employers are more likely to gain from keeping wages secret with regards to high-skilled, multidimensional and high-paid jobs, while with low-skilled and low-paid jobs the payoff from doing so is smaller. The data tentatively supports the hypothesis, the relations being as expected, but not always having statistical significance.

Keywords: labour market, wages, information asymmetry

JEL Codes: J20, J30, D47

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CONTEMPORARY DIMENSIONS OF THE INTERNATIONAL COMPETITIVENESS

Anzhela Petrova, PhD student

Department of Economics,
“Angel Kanchev” University of Ruse
E-mail: apetrova@uni-ruse.bg

Abstract: The globalization of economic activity contributes to the expansion of the international business and economic interdependence of the countries. The competition is becoming essential and posing the problem for the competitiveness of companies producing and offering goods and services, both on the national and international market. Company competitiveness is associated with the development and maintenance of competitive advantages, as well as with the achievement of high profit values and economic efficiency. In an effort to achieve competitive advantages, companies implement international businesses, create worldwide manufacturing facilities and constantly invest in establishment of new products, services, technologies, forms of management, marketing and competitive strategies.

Keywords: Competition, International Companies, Competitive Advantage, Competitiveness

JEL Codes: F23, M2

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CULTURE AND ECONOMICS - CULTURAL VALUES AS A FACTOR FOR ECONOMIC GROWTH

Desislava Dimitrova - PhD Student

Department of Business and Management
University of Ruse "Angel Kanchev"
Tel.: +373 889160487
E-mail: d.lenkova.d@gmail.com

Prof. Dr sc. Oec Dianko Minchev, PhD

Department of Business and Management,
University of Ruse "Angel Kanchev"
Phone: +359 82 888 357
E-mail: dminchev@uni-ruse.bg

Abstract: *The paper reviews the relation between economic performance and cultural context within which economic agents act and interact on micro and macro level. The main goal of the research is to trace the relation between economy and cultural values, which has been identified, as the core element of socio-cultural environment. By synthesized review of main theoretical concepts this work tries to outline the main channels through which the value system of national cultures can affect the economic development of a state. Thus, it sets the basis for further research on the direction of cultural influence by identifying the core areas for comparison between different national cultures and economies.*

Keywords: *Culture, Values, Economic performance, Growth.*

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THEORETICAL FOUNDATIONS OF DEFLATION ACCORDING TO JOHN MAYNARD KEYNES

Georgi Georgiev, PhD student

Department of Economics

“Angel Kanchev” University of Ruse

E-mail: gmgeorgiev@uni-ruse.bg

Abstract: Deflation could be considered as one of the most harmful economic phenomena, even more dangerous than inflation. Despite the fact that this phenomenon is not a new one, lots of countries experience deflation nowadays and it is difficult for them to prevent and to cope with it. Taking into account the negative consequences of deflation, the purpose of this paper is to analyze the problem from the Keynesian economics point of view because the main policy of the central banks for fighting against deflation is conducting a pro-inflation policy, targeting an annual inflation rate of 2-3% in order to maintain economic stability and growth. However, this is a standard Keynesian recipe against deflation. This raises the question whether it is necessary the government to involve actively in the economy to help correct market failures such as deflation. So that the aim of the report is to describe this kind of a policy and moreover why it is necessary for the economic stability.

Keywords: deflation, Keynesian economics, theoretical foundations, maintain economic stability and growth

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FRI-2G.407-1-EM-09

DIGITAL INFORMATION REVOLUTION IN THE CONTEXT OF THE LONG WAVES THEORY BY N. KONDRATIEV

Romanova Yulia Aleksandrovna

Doctor of Economics

Moscow State University of Technology and Management Named after K. G. Razumovsky

Institute of Market Problems RAS

Russia, Moscow

8-916-198-40-52

Ryulia1@yandex.ru

Egorenko Anna Olegovna

Candidate of economic Sciences, associate Professor

Head of the Department of State and Municipal Management

Moscow Regional Socio-Economic Institute,

Russia, Moscow region, Vidnoye

8-964-508-28-86

annaegorenko@yandex.ru

Abakarova Patimat Magomedovna

Candidate of Economic Sciences, associate Professor

Associate Professor of Economics and Accounting Department

Moscow Regional Socio-Economic Institute

Russia, Moscow region, Vidnoye

8-903-423-48-84

Abstract: *The article shows the interconnection between Kondratiev's long waves theory and the digital information revolution that is happening in the world today. It describes the cycles (patterns) of the five long time periods in the world economy which have already taken place and have been accompanied by declines and uptums and gives a forecast for the development of the national economy leading sectors in the context of the sixth technological structure.*

Keywords: *long waves, technological structure, cycle, crisis, information technology, digital information revolution.*

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STUDY AND APPLICATION OF THE CONCEPT OF CONCURRENT ENGINEERING IN TOOL DESIGN AND SERVICE

Assoc. prof. Pavel Vitliemov, PhD

Department of Management and Business Development,

University of Ruse, Bulgaria

Tel.: +359 888566362

E-mail: pvitliemov@uni-ruse.bg

Abstract: *The paper presents the concept of the approach to implement the concurrent engineering simultaneously in the new product design and its tooling equipment. An algorithm is proposed for concurrent engineering of new products taking into account their market and life cycle and their tooling design and service, showing the relationship between the designer-manufacturer and manufacturer-supplier of special tooling equipment. The tool should be equipped with a sensor system in order to collect information about its status during the operation and to provide real-time service. The proposed algorithm will make more effective the application of innovations in the industrial production.*

Keywords: *Concurrent engineering; tool; design; service*

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VIEWS ON ANXIETY AND CREATIVITY IN MANAGEMENT THEORY

Silviya Ivanova Beloeva, PhD

Department of Management and Business Development,

University of Ruse "Angel Kanchev"

Tel.: +359 88 9205663

E-mail: slambeva@uni-ruse.bg

Abstract: *The document looks at existing views on anxiety and creativity as management tools. The aim is to provide a content analysis of the literature that presents theories about the importance of anxiety as a way of stimulating innovative thinking to create new products. The connection between the limits of positive anxiety and creativity is being sought as driving factors for the process of creating new products. The document is a tribute to Professor Ron May's scientific contribution to the full study of anxiety as a social phenomenon. The report provides the latest developments in the world of literature, linking the topic of anxiety and creativity as influential factors for creating new products in the industry.*

Keywords: *Anxiety, Creativity, Management Theories, Innovations, New product Development*

JEL Codes: *O14, O32*

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FRI-2G.509-1-LCSIPC

FRI-2G.509-1-LCSIPC-01

**SEMIOTICS IN THE COMMUNICATION OF SPECULATIVE
FREEMASONRY**

Doncho Ivanov, PhD
Department of Public Communications
UniBIT Sofia
Tel.: 0888 802 389
E-mail: bnagency@abv.bg

Abstract: *The paper reviews existing methods of special seismic protection and shows the necessity to use them in the high-rise frame structures. Special attention was paid to the dynamic isolation systems. The purpose was to research the efficiency of rubber isolation bearings and pile foundations with an "intermediate cushion" and to demonstrate the commercial benefits of the special seismic protection. Structural analysis was carried out by a spectral method by means of program SCAD. On the basis of the results was achieved a numerical solution of the problem for a simplified model and for a real 5-storey building. The paper reviews existing methods of special seismic protection and shows the necessity to use them in the high-rise frame structures. Special attention was paid to the dynamic isolation systems. The purpose was to research the efficiency of rubber isolation bearings and pile foundations with an "intermediate cushion" and to demonstrate the commercial benefits of the special seismic protection. Structural analysis was carried out by a spectral method by means of program SCAD. On the basis of the results was achieved a numerical solution of the problem for a simplified model and for a real 5-storey building.*

Keywords: *Keywords: symbols, myths, rituals, initiation societies, mysteries*

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FRI-2G.509-1-LCSIPC-02

SOCIAL MEDIA AND THEIR IMPACT ON VALUE ORIENTATIONS

Rozalina Bozhilova-Kouncheva, PhD student

Department of European studies,

“Angel Kanchev” University of Ruse

Tel.: 082 888 532

E-mail: rbozhilova@uni-ruse.bg

Abstract: *The purpose of the report is to trace in a diachronic way how technological innovations affect value orientations. A brief overview of the industrial revolutions and their impact on the social development and values of society is done. As a result of technical inventions, the advent of the Internet is seen as a major factor in the creation of social media. A chronological analysis of social media has been made and the advantages and disadvantages of their growing influence have been compared. The report can initiate further discussion concerning notions as social media etiquette, the power of social media, and should the social media be restricted.*

Keywords: *technological innovations, value orientations, industrial revolution, social media.*

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FRI-1.405B-1-MIP

FRI-1.405B-1-MIP-01

CLASSIFICATION OF THE p -GROUPS G HAVING A NORMAL ABELIAN SUBGROUP H OF INDEX p SUCH THAT $G_{(p)} = \{1\}$ ³

Prof. Ivo Michailov, DcS

Faculty of Mathematics and Informatics,
Shumen University “Episkop Konstantin Preslavski”
E-mail: i.michailov@shu.bg

Assistant Ivan Ivanov, PhD

Faculty of Mathematics and Informatics,
Shumen University “Episkop Konstantin Preslavski”
E-mail: ivan.ivanov@shu.bg

Ivaylo Dimitrov, doctoral student

Faculty of Mathematics and Informatics,
Shumen University “Episkop Konstantin Preslavski”
E-mail: pmg.iv.dimitrov@abv.bg

Abstract: In this article we prove a classification theorem for p -groups G having a normal abelian subgroup H of index p under the assumption that the p -th lower central subgroup $G_{(p)}$ is trivial.

Keywords: nilpotent groups, p -groups.

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³ Partially supported by Scientific Research Grant RD-08-118/04.02.2019 of Shumen University.

SINGLE FACILITY LOCATION PROBLEMS IN K-TREES

Vladislav Haralampiev – PhD Student

Department of Computing Systems,
Sofia University “St. Kliment Ohridski”

Tel.: +359 888 88 77 87

E-mail: vladislav.haralampiev@fmi.uni-sofia.bg

Abstract: *Single facility location problems are a large class of optimization problems, concerned with the placement of a facility to optimize costs, while considering various factors. Many of these problems require at least quadratic time in general graphs. In contrast, a lot of these problems can be solved in near-linear time in trees. K-trees are a generalization of trees and offer increased representational power. In this paper, we present an algorithm for solving the 1-minisum problem in k-trees in $O^*(n \lg(n))$ time and suggest a general framework for efficiently solving single facility location problems in this class of graphs.*

Keywords: *facility location, k-trees, parameterized complexity*

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SOME HOLDER APPROXIMATIONS AMONG THE ARITHMETIC, HARMONIC AND QUADRATIC MEANS

Assist. Prof. Todor Mitev, PhD

Department of Mathematics,

“Angel Kanchev” University of Ruse

Phone: +359 82-888 634

E-mail: tmitev@uni-ruse.bg

Abstract: Let A_n , H_n , S_n be the arithmetic, harmonic and quadratic means respectively for the positive real numbers a_1, a_2, \dots, a_n . In this article we prove the following theorem:

Theorem. For $n = 5$ $A_n \geq (1 - \lambda)H_n + \lambda S_n \iff \lambda \leq \frac{\sqrt{5}}{5}$.

Keywords: Arithmetic mean, Harmonic mean, Quadratic mean, Inequalities

JEL Codes:

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FRI-1.405B-1-MIP-04

ANALYSIS OF THE HEDGING OF PORTFOLIO WITH FUTURES

Byulent Idirizov, Doctoral student

Department of Mathematics,

“Angel Kanchev” University of Ruse

Tel: +359 87 6965721

E-mail: byulent.idirizov@bulmarket.bg

Abstract: *In this paper a mathematical model for determining the impact of the price of the traded asset on the value of the portfolio in trading with futures is considered. The model can also be used with other type of derivatives, such as forwards. It helps for a making a detailed analysis of the portfolio's nature, gives transparency and clarity. Making a good analysis of the portfolio is key to successful investing and successful trading, which can be used by traders to develop strategies to reduce the risks and to increase the profit in trading with futures and other similar derivatives.*

Keywords: *Futures, Forwards, Future contracts, Forward contracts, Portfolio management, Stock exchange, Price, Derivative, Finance, Long Market Position, Short Market Position.*

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ACKNOWLEDGEMENTS

The research is supported by a contract of Rouse University "Angel Kanchev" with No. BG05M2OP001-2.009-0011-C01, "Support for the development of human resources in the field of research and innovation at the Rouse University" Angel Kanchev ", funded by the Operational Program "Science and Smart Growth Education 2014-2020, co-funded by the European Social Fund of the European Union."

FRI-1.405B-1-MIP-05

STUDY OF THE POSSIBLE USAGE OF INTERNET OF THINGS DEVICES IN THE SPHERE OF HEALTHCARE

Assoc. Prof. Rumen Rusev, PhD

Department of Informatics and information technologies,

“Angel Kanchev” University of Ruse

Phone: +359 82-888 754

E-mail: rumen.rusev@uni-ruse.bg

Msc. Ivo Rusev

Department of Informatics and information technologies,

“Angel Kanchev” University of Ruse

Phone: +359 885-706 464

E-mail: rusev.i@gmail.com

Abstract: *This paper examines the possible applications of Internet of Things (IoT) in the monitoring of the health status of individuals. Various parameters are considered, the systematic analysis of which can help to improve the health and the quality of life of people. Different health monitoring parameters are taken into consideration. The analysis of those can help for the improvement of the health condition and the quality of life. Different types of devices are considered which can be used for achieving the set goals. Analysed are the activities on which statistical data can be gathered for analysis and prediction of the health status of a person. The same methods are used for health problem detection with the possible notification of a healthcare specialist.*

Keywords: *Internet of Things (IoT), healthcare*

JEL Codes: *L86, I19*

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FRI-1.405B-1-MIP-06

GENERATION OF A PROBABILITY MODELS FOR THE QUANTITY AND QUALITY OF WATER SURFACE BASED ON NEURAL NETWORKS

Assist. Prof. Iliya Vukarski, PhD

Department of Computer Science, Faculty of Information Sciences
University for Library Studies and Information Technologies, Sofia
Phone: +359 886 861 605
E-mail: i.vukarski@unibit.bg

Assoc. Prof. Alexander Shikalanov

Department of Computer Science, Faculty of Information Sciences
University for Library Studies and Information Technologies, Sofia
Phone: +359 888 209 936
E-mail: ctmdevelopment@yahoo.com

Prof. Mariyana Lyubenova

Department of Ecology and Environment Protection
St. Kl. Ohridski University of Sofia
Phone: +359 89 874 0115
E-mail: ryann@abv.bg

Assistant Prof. Simona Peteva, PhD

Department of Ecology and Environment Protection
St. Kl. Ohridski University of Sofia
Phone: +359 897 881 334
E-mail: simona_peteva@abv.bg

***Abstract** - The issue that is related with the river and lake systems levels, as well as their pollution, threatens all components of the environment, especially on large-scale is the impact on the biodiversity, the functioning of ecosystems and the ecosystem services they offer, as well as on the health status of the human population. By creating new models which are able to calculate and generate forecast levels for the expected flow of the rivers, the expected level of lakes and the concentration of pollutants in them is one of the tasks on the agenda in order to provide opportunity for the local authorities to react and identify measures to take actions based on the results that were obtained from the probability models. The Artificial Neural Network training is based on training with a set of data that were collected at equal time intervals over for a particular period of time. For example, when training Neural Networks with collected on a yearly basis data for the pollution levels of rivers, lakes, oceans, air, soil, it is possible to generate a probability model for the expected level of their pollution over the next two years. The models created can also be used to evaluate the efficiency of the decisions taken.*

***Keywords:** Neural Networks, Probability models, water, pollution.*

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FRI-2G.305-1-ERI

FRI-2G.305-1-ERI-01

NOVELTIES IN TEACHERS' EDUCATION IN LATVIA

Docent Dace Kūma, Dr.math.

Faculty of Science and Engineering

Liepaja University, Latvia

Tel.: +371 26305871

E-mail: dace.kuma@liepu.lv

Lecturer Dina Barute, Mg.sc.edu.

Faculty of Science and Engineering

Liepaja University, Latvia

E-mail: dina.barute@liepu.lv

Abstract: *The educational system in Latvia has been constantly changing in recent decades. In October 2016 started project "Skola 2030" ("School 2030"), supported by ESF. The aim of this project is to create a new competences based standards and curricula in all subjects started from preschool (kindergarden) up to high school (12th Grade including). A new curriculum also demands new approach in teachers' education. Therefore, the Ministry of Education and Science of Latvia in 2017 decided to develop a new teachers' education system. In 2018/19 was realized a project for development of study programs in teachers' education of various subjects. The main novation is that starting from 2022 in Latvia teachers' education could be realized according the same study programs in every university where teacher's education will be offered, all previous study programs for teachers' education should be closed or reorganized.*

In the paper will be discussed the new school mathematics standard and curriculum and new study programs for teachers education in Latvia.

Keywords: Education of teachers, Teachers of mathematics, Mathematics school curricula

JEL Codes:

REFERENCES

The project "Competency Approach to Learning Content" Online <https://www.skola2030.lv/> (in Latvian) [viewed 17.09.2019]

Regulations of the Cabinet of Ministers on State Basic Education Standards and Models of Basic Education Programs. Online <https://likumi.lv/ta/id/303768> (in Latvian) [viewed 17.09.2019]

THE FERMI-WALKER DERIVATIVE IN DUAL LORENTZIAN SPACE

$$D_1^3$$

Assoc. Prof. Fatma Karakuş, PhD

Department of Mathematics,
Faculty of Science and Arts
University of Sinop, Turkey
Phone: +90 368 271 55 20-4217
E-mail: fkarakus@sinop.edu.tr

Assist. Prof. Tevfik Şahin, PhD

Department of Mathematics,
Faculty of Science and Arts
University of Amasya, Turkey
Phone: +90 358 242 16 13-4675
E-mail: tevfiksah@gmail.com

Prof. Yusuf Yaylı, PhD

Department of Mathematics,
Faculty of Science
University of Ankara, Turkey
Phone: +90 312 212 67 20-1414
E-mail: Yusuf.Yayli@science.ankara.edu.tr

Abstract: In this study, we defined Fermi-Walker derivative in dual Lorentzian space D_1^3 . Fermi-Walker transport and non-rotating frame concepts are given for dual Lorentzian space D_1^3 . Being non-rotating frame conditions are analyzed for Frenet frame of each dual curves in dual Lorentzian space. Firstly, Fermi-Walker derivative are investigated along any dual spacelike and timelike curves. The necessary conditions to be Fermi-Walker transport are explained for the dual curves. Then, we show that Frenet frame is non-rotating frame along dual planar curves. And then, the necessary definitions and theorems of Fermi-Walker derivative are analyzed for any dual spacelike curve with a lightlike (null) principal normal.

Keywords: Fermi-Walker derivative, Fermi-Walker transport, Non-rotating frame, Dual spacelike curve, Dual timelike curve, Dual Frenet frame Efficiency, Effectiveness, GPS, Seismic Protection Methods, Model

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FRI-2G.305-1-ERI-03

TEACHING AND LEARNING MATHEMATICS BASED ON COMPETENCIES

Assoc. Prof. Ion Mierlus-Mazilu, PhD

Department of Mathematics and Computer Science
Faculty of Civil, Industrial and Agricultural Buildings
Technical University of Civil Engineering Bucharest, Romania
Phone: +40 212 421 208
E-mail: ion.mierlusmazilu@utcb.ro

Assoc. Prof. Emilia Velikova, PhD

Department of Mathematics
Faculty of Natural Sciences and Education
“Angel Kanchev” University of Ruse
Phone: +359-885 635 874
E-mail: evelikova@uni-ruse.bg

***Abstract:** Mathematics plays one of the most important roles in developments of our modern and technology-centered society. In fact, good mathematical skills are crucial for science and economy. Unfortunately, various studies have shown that mathematical competence in Europe has weakened in recent decades. The lack of mathematical proficiency is already causing problems in engineering mathematics' and other courses in European HEIs. In fact, this seems to be a global problem, and e.g. the learning outcomes of Eastern European countries have been weaker than expected, especially in mathematics, after they moved to the Western European model of education (e.g. SEFI 2002).*

As we all know, Mathematics is an essential part of any engineering degrees. Mathematics is a tool that engineers still use throughout his or her life. It is therefore important that this knowledge and competencies have to be properly seated. Thinking about this, we proposed the 'New Rules for assessing Mathematical Competencies' project to change the educational paradigm and to get a common European teaching and learning system based on competencies rather than contents.

Additionally, in recent years the study groups have been increasing and becoming even more heterogeneous. This naturally causes problems for organization of mathematics' teaching as for example the entry level of competence in mathematics (RulesMath project study this problem) varies greatly depending on the background studies. Under these circumstances, taking into account individual needs or organizing dynamic and creative activities becomes almost impossible during the classroom sessions. As a sum of many factors, it has been reported that the drop-out rates are high in the field of technology

In this paper, we will present how we can teach, how students can learn mathematics based on competencies, how materials developed within this project are used by students in our universities and their positive influence in the process of teaching and learning mathematics.

Keywords: Innovative teaching and learning Methods, Competences, Engineering Mathematics Education.

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European project Rules Math – New Rules for Assessing Mathematical Competencies URL: <https://rules-math.com/> [viewed 09.09.2019]

MATHEMATICAL PROBLEM POSING IN ELEMENTARY SCHOOL

Assist. Prof. Desislava Georgieva, PhD

Department of Algebra and Geometry

Faculty of Mathematics and Informatics+

St. Cyril and St. Methodius University of Veliko Tarnovo, Bulgaria

Phone: +359 887 244 498

E-mail: d.georgieva@ts.uni-vt.bg

Abstract: D. Polya – prominent scientist and educator consider the idea for problem-posing from learners. This article reviews the opinion of the different researchers. On the base of the outlined classification of the solved problems in elementary school is concretized the situation for problem-posing from school pupil. It is concluded that the synergistic process of creative activity problem-posing and problem-solving must start from the earliest stage of training.

Keywords: Problem-posing, Mathematical problem classification, Problem-posing activity, Problem-posing situations.

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FRI-2G.305-1-ERI-05

DETECTION OF MATHEMATICAL ABILITY FOR LOGICAL THINKING IN 10TH GRADE STUDENT

Mag. Valeriya Krusteva-Radneva

Department of Mathematics

Faculty of Natural Sciences and Education

University of Ruse "Angel Kanchev"

Tel.: +359 884 709 500

E-mail: vale__19@abv.bg

Assoc. Prof. Emilia Velikova, PhD

Department of Mathematics

Faculty of Natural Sciences and Education

University of Ruse "Angel Kanchev"

Phone: +359 885 635 874

E-mail: evelikova@uni-ruse.bg

Abstract: *Personality development gets its full realization through the harmonious deployment of human abilities. Capabilities are an essential characteristic of the individual, a decisive factor in all spheres of life. That is why the development of abilities is an important unit in the system of modern education and education and is one of the central tasks of the training. Therefore, the essential importance of learning is the general and special abilities of man.*

Keywords: *Mathematical abilities, Logical thinking, Tasks, Experimental research*

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FRI-2G.305-1-ERI-06

EXPLORING THE ROLE OF EDUCATIONAL PROJECTS IN CHANGING THE MINDSET AND FORMING EUROPEAN SELF - AWARENESS AND IDENTITY

Assoc. Prof. Emiliya Velikova, PhD

Department of Mathematics

Faculty of Natural Sciences and Education

“Angel Kanchev” University of Ruse

Phone: +359-885 635 874

E-mail: evelikova@uni-ruse.bg

Sevda Tsvetanova, PhD

Sr Lecturer in English

Phone: +359-889 205 770

E-mail: tsvetanova.sevda@gmail.com

Abstract: *The paper presents the research results of a survey aimed to identify the change of mindset and attitude of several target groups with regard to their European awareness and identity. The survey was conducted among 120 respondents from various generations and from 12 European countries. It was developed under the “Building Bridges for Europe” (BBE) Erasmus+ project, which was implemented by partners of the European umbrella organization “Danube-Networkers for Europe (DANET) e.V.”, coordinated by the affiliated “Institute for virtual and face-to-face learning in adult education at Ulm University (ILEU) e.V”, Germany. The survey identifies the key factors that influence the change of mindset of EU citizens leading to abandoning stereotypes and diminishing prejudices against other cultures, which is a major goal in education and lifelong learning as a whole.*

Keywords: *change of mindset, European awareness, educational situations, BBE, DANET*

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FRI-2G.305-1-ERI-07

METHODS OF INSTRUCTION IN STRAIGHT CIRCULAR CYLINDER

Yoana Nedelcheva – Master degree student

Master degree course

Information Technologies in Mathematics and Informatics Education

Department of Mathematics

Faculty of Natural Sciences and Education

University of Ruse “Angel Kanchev”

Tel.: +359 882 049 001

E-mail: anizko@abv.bg

Assoc. Prof. Emilia Velikova, PhD

Department of Mathematics

Faculty of Natural Sciences and Education

University of Ruse “Angel Kanchev”

Phone: +359 885 635 874

E-mail: evelikova@uni-ruse.bg

Assoc. Prof. Ion Mierlus-Mazilu, PhD

Department of Mathematics and Computer Science

Technical University of Civil Engineering Bucharest, Romania

Phone: +40 212 421 208

E-mail: ion.mierlusmazilu@utcb.ro

Abstract: Training aimed at solving cylinder problems develops spatial and logical thinking and creates conditions for the application of knowledge to geometric objects in the plane and in space. The purpose of the paper is to present the basic properties of the cylinder and its application in various tasks. The tasks of the project are:

- to enable students to get acquainted with basic theoretical information about a straight circular cylinder,
- to show tasks for introducing new knowledge,
- to master new knowledge and creative tasks and tasks for self-preparation and teamwork, through which to introduce and consolidate knowledge about rotary bodies.

It aims to deepen the curiosity about geometry with spatial thinking.

Methodical development can be useful in classroom and extracurricular forms of mathematics training for deepening students' interest in geometry, for acquiring and deepening learners' knowledge, and for developing their problem solving skills.

Keywords: cylinder, straight circular cylinder, cylinder problems, space figures

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FRI-2G.305-1-ERI-08

CREATING INTERACTIVE EDUCATION ENVIRONMENT BY INFORMATION AND COMMUNICATION TECHNOLOGIES

Mag. Vizhdan Muhareмова

Department of Mathematics
Faculty of Natural Sciences and Education
University of Ruse "Angel Kanchev"
Tel.: +359 882 049 001
E-mail: anizko@abv.bg

Assoc. Prof. Emilia Velikova, PhD

Department of Mathematics
Faculty of Natural Sciences and Education
University of Ruse "Angel Kanchev"
Phone: +359 885 635 874
E-mail: evelikova@uni-ruse.bg

Abstract: The paper presents the most important positive and negative characteristics of the education environment in Mathematics training from the point of view of new information and communication technologies usage. An algorithm for creating interactive education environment is also presented.

Keywords: interactive education environment, information and communication technologies, mathematics training

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FRI-2G.305-1-ERI-09

WEB-BASED SCHOOL GEOMETRY LEARNING

Seyde Isufova, MSc

Department of Mathematics
Faculty of Natural Sciences and Education,
University of Ruse "Angel Kanchev"
Phone: +359 887834157
E-mail: seyde95@abv.bg

Pr. Assist. Prof. Ralitsa Vasileva-Ivanova, PhD

Department of Mathematics, Faculty of Natural Sciences and Education,
University of Ruse "Angel Kanchev"
Phone: +359 884109719
E-mail: rivanova@uni-ruse.bg

Magdalena Petkova, PhD

First Primary School "Otetz Paisii" – Ruse
Phone: +359 886162384
E-mail: magipetkova@ymail.com

Abstract: The paper describes steps for developing a 9th grade geometry learning website by using the weebly.com platform. It contains four sections and a contact form. Video-lessons on basic geometry topics for 9th grades are also included, as well as sample tests.

Keywords: Web-site, Geometry, Education

JEL Codes:

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FRI-2G.305-1-ERI-10

STUDYING POLYNOMIALS USING INFORMATION TECHNOLOGIES

Gyunsel Ali, MSc

Department of Mathematics

Faculty of Natural Sciences and Education

“Angel Kanchev” University of Ruse

Phone: +359 882 049 001

E-mail: anizko@abv.bg

Assoc. Prof. Antoaneta Mihova, PhD

Department of Mathematics

Faculty of Natural Sciences and Education

“Angel Kanchev” University of Ruse

Phone: 082 888 727

E-mail: amihova@uni-ruse.bg

Abstract: *The article describes a test created by Microsoft Forms for knowledge assessment on the topic of factoring of polynomials in 7th grade.*

Keywords: *Education, Polynomials*

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FRI-2G.305-1-ERI-11

STUDYING THE VIETA'S FORMULAS AT SCHOOL USING INFORMATION TECHNOLOGIES

Melin Rasim, MSc

Department of Mathematics
Faculty of Natural Sciences and Education
“Angel Kanchev” University of Ruse
Phone: +359 896 803 432
E-mail: nebahat72@mail.bg

Assoc. Prof. Antoaneta Mihova, PhD

Department of Mathematics
Faculty of Natural Sciences and Education
“Angel Kanchev” University of Ruse
Phone: 082 888 727
E-mail: amihova@uni-ruse.bg

Abstract: The article describes a test created by Microsoft Forms for knowledge assessment on the topic Vieta's formulas in 9th grades.

Keywords: Education, Vieta's formulas

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FRI-2G.405-1-PP

FRI-2G.405-1-PP-01

**PRINCIPALS AND APPROACHES FOR SELECTION AND
STRUCTURING OF KNOWLEDGES IN THE LESSON OF ‘AROUND
THE WORLD’**

Assoc. Prof. Julia Doncheva, PhD,
Department of Pedagogy, Psychology and History
‘Angel Kanchev’ University of Ruse
Phone: +359 82-888 219
E-mail: jdoncheva@uni-ruse.bg

Abstract: *The paper reviews existing methods of the purpose of each methodology is to create educational conditions for the preparation of the child, as a future mature person for a particular direction and a certain aspect of life in which he or she is about to be involved. All methodologies in preschool age have a similar purpose. In order to fulfill its purpose, the methodology, figuratively speaking, falls into the hands of the teacher, organizes in a certain way the educational process. Depending on what aspect of life the child is preparing for, the educational process organized by each methodology is specific, original and unique. When formulating the key concepts and categories of methodology (subject, tasks, approaches, principles, forms, methods, etc.) there should be no unification, uniformity between all methodologies, but there must be taking into account the specifics of the educational process accordingly educational field.*

The methodology of getting acquainted with the outside world in its content is multidimensional, implying the complete formation of the child's personality for life. Typical here is the consideration of the objective reality and the natural and social environment of the child as sources of information, forming knowledge and competences. Unlike the educational work in the other educational areas of the teacher, there is another factor, which is called the life cognitive and social experience of the child. It defines the "luggage" with which the child enters the development of the topic. The dimensions of life experience are something individual, personally defined. It depends on where and how he lives outside the kindergarten, what his daily life is, and what kind of natural and social objects he interacts with and interacts with, under the influence of what natural and social factors he is in his normal existential existence. In other words, different children on different topics are "loaded" with different cognitive and social experiences in volume and content. The teachers should consider this experience, know it, and consider it as individual for the different children and, based on it, and decide what and how much knowledge to develop in the relevant topic. Recognizing this life's social and cognitive experience is only in the familiarity with the outside world, it is typical, characteristic, its peculiarity.

Keywords: Principles, Lesson, methods of teaching and learning

JEL Codes: I39, I2, I21, I24, I29

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FRI-2G.405-1-PP-02

EMOTIONAL INTELLIGENCE – CONTENT ANALYSIS OF THE THERMINOLOGY IN EDUCATIONAL MATERIALS FOR PRESCHOOL

Karina Gospodinova– PhD student

Faculty of Education

St. Cyril and St. Methodius University of Veliko Tarnovo

Phone: +359 882 066 269

E-mail: karina.eneva@gmail.com

Abstract: This report represents a content analysis of six preschool program systems for the frequency of appearance of several terms in the domain of emotional intelligence. Manuals dedicated to emotional learning are also examined. Teachers currently have the emotional intelligence idea integrated within the curriculum, thus this analysis shows whether the frequency of appearance of the terms differs among the program systems and the manuals dedicated for increasing emotional intelligence in preschool.

Keywords: emotional intelligence, emotional competence, emotional literacy, emotional plasticity, emotional quotient, empathy, feeling, emotion

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FRI-2G.405-1-PP-03

THE PSYCHOLOGICAL ASPECTS OF PROFESSIONAL- PEDAGOGICAL COMMUNICATION AND THEIR IMPORTANCE IN THE EDUCATIONAL PROCESS

Prof. Stoyko Ivanov, DcS

Sofia University "St. Kliment Ohridski"

Department of Social, Organizational, Clinical and Educational Psychology

Phone: +359884798669

E-mail: stoyko.v.ivanov@gmail.com

Abstract: *The purpose of the article is to reveal some of the psychological aspects of professional-pedagogical communication. I define this concept and describe its meaning for the pedagogical and educational process. The varieties and indicators that determine these two processes are mentioned. The characteristics of effective vocational-pedagogical communication, the mechanisms of influence in this process and its goals are also revealed.*

Keywords: *Professional-pedagogical communication, Students, Teachers.*

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THE ABILITY TO COMMUNICATE /KEEPING IN TOUCH WITH OTHERS/ AT SCHOOL NOWADAYS – GOOD PRACTICE

Assoc. Prof. Bagryana Ilieva, PhD

Department of Natural Sciences and Education,

“Angel Kanchev” University of Ruse

Phone: 082/888-268

E-mail: bilieva@uni-ruse.bg

Ivelina Dimitrova

Doktoral student/candidate in educational psychology

Sofia University „St. Kliment Ohridski“

Psychologist in Friedrich Schiller German Language School

Phone: 0888 903 241

E-mail: ivelina.dimitrova_supne@abv.bg

Abstract: *In today's hectic and fast-paced life, adults have less time than ever to interconnect with their children. It is observed that parents find not enough time to discuss children's issues or questions. What is the situation at school? It is a common practice in schools that lessons are used to recount, read and write with comprehension, etc., but not to have discussions about current topics and get to know each other. In many school modules such as Bulgarian lessons, ethics and law or when they visit the school psychologist, it is of crucial importance to stress on the topics which trigger the interactions between children.*

The current topic is intended to assist in thinking, organising various situations and identifying specific habits when children communicate in schools. The proposed report presents the practical school work with children which are related to the implementation of educational content in any of the disciplines. It is also shown some ideas of group communications which are based on observations and interactions with children from secondary school.

Keywords: *communication, school, conversation, mood, children, scholars, approach, subjects*

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PSYCHOEMOTIONAL PROBLEMS OF THE ADOLESCENTS WITH DELIQUENCY⁴

Pr. Assisst. Denitsa Alipieva, PhD

Department of Pedagogy, Psychology and History,

“Angel Kanchev” University of Ruse

Phone: 082-888-752

E-mail: dalipieva@uni-ruse.bg

Abstract: *The paper reviews the main psychoemotional characteristics, factors and methodology for pedagogical and psychological work with adolescents with delinquent behaviour.*

Keywords: *Delinquent Behaviour, Crimes*

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⁴The report reflects the results of the work on project No 2019-RU-05, funded by the Research Fund of the University of Ruse.

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FRI-2G.405-1-PP-06

ALTERNATIVE COMMUNICATION AND AGGRESSIVE BEHAVIOR IN RESIDENTIAL CARE CENTRES FOR YOUTH WITH DISABILITIES

Dr. Desislava Popova – PhD, assistant

Faculty of Education

St Cyril and Methodius University of Veliko Tarnovo

Phone: +359 877 772 799

E-mail: popova.desi@gmail.com

Abstract: Aggressive behaviour has been subjected for many years by numerous studies in the scientific community but it always remains an up-to-date topic because of its practical value. Current report is devoted to analyzing the topic in the context of an extremely specific group - children and youth with severe disabilities living outside their family. Presented research data include methods for reducing physical aggression by providing alternative communication models. Results reflect a tendency to reduce aggression during the work sessions for the whole group but a lack of transposition of new strategies into daily life has been founded. An important conclusion has been outlined that it is needed to apply similar principles at every level of life in the residential care center for youth with disabilities.

Keywords: aggression, children and young people with disabilities, resident services, alternative communication, group work

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STRATEGIES TO IMPACT AGGRESSION OF AT-RISK YOUTH WITHOUT PARENTS

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: The study research possible impact of different language strategies to aggressive expressions of at-risk children deprived of parental care in Bulgaria. Children raised outside their family (N=40) participated in 4 interventions strategies using following implications: positive language with normal tone, positive language with high tone, negative language with normal tone and negative language with high tone. Measurements have been accomplished by applying surveillance with standardized check list using Buss-Durkee tools for aggression. Results outline that the use of negative language would increase aggressive behavior, but the power of voice has an additional impact that should be taken into account according to child personality and specifics.

Keywords: aggression, at-risk children, children deprived of parental care, linguistic and paralinguistic signs

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EMOTIONAL STRESS AND EDUCATIVE STRATEGIES FOR REGULATING THE EMOTIONAL STATES OF ADOLESCENTS

Assoc. Prof. Valentina Vasileva, PhD

Department of Pedagogy, Psychology and History,
"Angel Kanchev" University of Ruse

Phone:

E-mail: vvasileva@uni-ruse.bg

Abstract: Emotionality is the most characteristic feature of children. They respond emotionally to the positive and negative changes in their environment. Emotions are of great importance for the adaptation of the child to the changing environment. Under certain conditions, the experiences of adolescents are negative, which in turn leads to neurotic or somatic disorders and are the cause of stress.

Keywords: children, emotions, emotional stress, factors, educational strategies

JEL Codes: I 29

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This work was supported by the University of Ruse Research Fund under contract no 19-ФПНО-02 "Optimizing educational strategies to regulate emotions and feelings in education and the social pedagogical field"

FROM TRAUMA TO HEALING – PROVIDING TRANSITION AND DEVELOPMENT THROUGH SYMBOLIC ATTACHMENT

Petya Cheshmedzhieva, PhD

Center for Psychological Services and Development "Psycomfort"

"Angel Kanchev" University of Ruse – A part-time lecturer

Phone: +359887923413

E-mail: petia.cheshmedzhieva@gmail.com

Abstract: The report reviews the attachment mechanisms as a therapeutic one against the separation mechanism by which the trauma affects the psychic and diverts development from its inherent potential. An example is presented from the author's practice in psychological counselling on child development problems of a 7-8-year-old with mental trauma from early childhood. There are being discussed: 1. The grieving of loss issues by the child and by the loved ones. 2. Trauma in projective psycho diagnosis. 3. The attachment-based intervention. 4. The therapeutic effect in children's drawing and the change in emotional and social functioning. Based on the result obtained, conclusions are drawn about the role of significant adults and the psychologist in the healing of the child.

Keywords: Adopted child, Attachment-based intervention, Child-parent relationship, Child's drawing, Developmental psychology, Reconnecting, Symbolized association.

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THE ROLE OF EGO STATES FOR EMOTIONAL INTELLIGENCE OF THE THEACHERS⁵

Pr. Assist. Prof. Denitsa Alipieva, PhD

Department of Pedagogy, Psychology and History,

“Angel Kanchev” University of Ruse

Phone: 082-888 752

E-mail: dalipieva@uni-ruse.bg

Abstract: The paper reviews existing theories of emotional intelligence compared to transactional analysis of Eric Berne. In the American and European countries there are many approaches to apply the theoretical and practical frames of TA to training and practice of the teachers and other professions in the field ‘human-human’. This paper presents a study of the prevalence of the Ego states Adult, Parent and Child and strategies for handling of conflicts in teachers in different levels of education.

Keywords: Transactional Analysis, Emotional Intelligence, Ego States

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⁵The report reflects the results of the work on project No 2019-RU-05, funded by the Research Fund of the University of Ruse.

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FRI-2G.405-1-PP-11

PARENTS AND TEACHERS AS MOTIVATORS FOR YOUNG PEOPLE'S PHYSICAL ACTIVITY

Assoc. Prof. Desislava Stoyanova, PhD

Department of Pedagogy, Psychology and History,
"Angel Kanchev" University of Ruse
E-mail: dstiyanova@uni-ruse.bg

Assoc. Prof. Valentina Vasileva, PhD

Department of Pedagogy, Psychology and History,
"Angel Kanchev" University of Ruse
Phone:
E-mail: vvasileva@uni-ruse.bg

Assoc. Prof. Iskra Ilieva, PhD

Department of Physical Education and Sport
"Angel Kanchev" University of Ruse;
And Medical University - Pleven
E-mail: isilieva@uni-ruse.bg

Mag. Deyan Staykov

Department of Pedagogy, Psychology and History,
"Angel Kanchev" University of Ruse
E-mail: dstaykov@uni-ruse.bg

Abstract: *Forming healthy lifestyle habits starts from an early age. At each educational stage, the interest in motor activity needs to be maintained and updated. Competition is one of the possibilities to test the acquired technical skills. It is at the heart of sporting events, in the form of holidays and sports weeks. It is decisive in planning and organizing them in accordance with the School Sports Calendar, as well as in competitions in high school competitions. Parents and teachers are the main motivators for practicing physical activity and sports for adolescents. Their attitude as adults with a wealth of life experience is projected on children's perceptions of the world, the benefits of different types of activities.*

Keywords: *Motivation, Parents, Teachers, Physical activity, Proper posture, Children, Students, Motives, Muscle balance, Physical education and sports*

JEL Codes: *I 12, I 20, I 21, I 29*

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This work was supported by the University of Ruse Research Fund under contract no 2019-RU-05 "Investigation of muscle balance and development of pedagogical methodology for self-regulation in the city of physical activity, physical education and sport – first stage (for students, teachers and staff of the University of Ruse)"

The study was supported by contract of University of Ruse "Angel Kanchev", № BG05M2OP001-2.009-0011-C01, "Support for the development of human resources for research and innovation at 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.

FRI-2G.405-1-PP-12

GAMING APPROACH TO ACHIEVING AND MAINTAINING PROPER BODY POSTURE AT CHILDREN'S

Assoc. Prof. Iskra Ilieva, PhD

Department of Physical Education and Sport
"Angel Kanchev" University of Ruse;
And Medical University - Pleven
E-mail: isilieva@uni-ruse.bg

Prof. Antoaneta Momchilova, DS

"Angel Kanchev" University of Ruse;
E-mail: amom@abv.bg

Assoc. Prof. Asya Veleva, PhD

Department of Pedagogy, Psychology and History
"Angel Kanchev" University of Ruse
E-mail: aveleva@uni-ruse.bg

Mag. Ekaterina Ivanova

Department of Pedagogy, Psychology and History
"Angel Kanchev" University of Ruse
Phone: 0897212775
E-mail: eivanova@uni-ruse.bg

Abstract: Achieving and maintaining a proper body posture starts from a young age. Posture is defined as the location of the bone and joint segments of the body at a particular time. It can be static when the body is at rest - standing, sitting, lying down; or dynamic when the body moves and changes the location of its segments. Maintaining proper body posture is accomplished by toned and working muscles. That is why exercise and physical activity need to be practiced daily. At the preschool age, the play approach has emotional impact and is used as a priority in children's education.

Keywords: Gaming Approach, Posture, Preschool Age, Physical Activity, Preschool Physical Education, Methodological requirements, Muscle balance, Physical education and sports.

JEL Codes : I 12, I 20, I 21, I 29

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This work was supported by the University of Ruse Research Fund under contract no 2019-RU-05 "Investigation of muscle balance and development of pedagogical methodology for self-regulation in the city of physical activity, physical education and sport – first stage (for students, teachers and staff of the University of Ruse)"

The study was supported by contract of University of Ruse "Angel Kanchev", № BG05M2OP001-2.009-0011-C01, "Support for the development of human resources for research and innovation at 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.

COMPARATIVE ANALYSIS OF THE RESULTS OF THE PSYCHO-PHYSICAL ACHIEVEMENTS OF 6-TH GRADE BOYS

Dr. Valery Yordanov – PhD,
Department of Physical Education and Sports
Angel Kanchev University of Rousse,
tel .: +359 82 888 652,
E-mail: viordanov@uni-ruse.bg

Abstract: In connection with the study of the physical activity and the psycho-physical achievements of the 6th grade students, tests were carried out at the "Hristo Botev" school in Rousse, Bulgaria with the boys of the class. Tests were mandatory for all boys. The motor activity, the physical qualities, the knowledge and the skills of the students were improved.

Keywords: boys, results, education.

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FRI-2G.405-1-PP-14

PSYCHOLOGICAL-PEDAGOGICAL FEATURES AT THE MODERN EDUCATIONAL-TRAINING ACTIVITY OF 15-YEARS OLD FOOTBALL PLAYERS

Chief assistant Kamen Simeonov, PhD

Department Physical Education and Sport,

“Angel Kanchev” University of Ruse

Phone: 082-888 225

E-mail: simeonov_kamen@abv.bg

Abstract: *The psychic training is an important part of the comprehensive and complex preparation within the educational-training process at 15-years-old football players. The most actual task in the modern theory and methodics of the training at 15-years-old football players is optimizing the educational-training process. The aim of the current study is to show the main psychological and pedagogical preconditions for optimizing the educational-training process.*

Keywords: *Young football players, Psychic processes, Football, Development.*

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FRI-2G.307-1-LL

FRI-2G.307-1-LL-01

**THE LANGUAGE USE OF THE BOOK “PRAVOSLAVNOE UCHENIE”
(GRAPHIC AND SPELLING PECULIARITIES) OF ILARION
STOYANOV (MAKARIOPOLSKY)**

Ivo Bratanov, 1st class teacher, PhD

“Hristo Botev” Secondary School – Ruse

Tel.: +35982-82-90-32

E-mail: ibratanov@abv.bg

Abstract: The report is written in connection to the language of the book “Pravoslavnoe uchenie” (“Orthodox teaching”) translated by the Bulgarian Revival bishop and writer Ilarion Stoyanov (Makariopolsky). The report exposes important graphic and spelling peculiarities of the language of this text. The review shows that the translator contributes to the approval of a series of norms, inherent to the contemporary Bulgarian language.

Keywords: history of the contemporary Bulgarian literary language; Slavic literary language; Ilarion Stoyanov (Makariopolsky); “Pravoslavnoe uchenie” (“Orthodox teaching”); graphic and spelling peculiarities; language-spelling model; dialect; literary tradition.

JEL Codes: L10, L11

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ON THE LEXICAL INNOVATIONS IN BULGARIAN LANGUAGE AND THE CASES WHEN THEIR USE IS UNDESIRABLE

Assoc. Prof. Emilia Nedkova, PhD
Department of Natural Sciences and Education,
“Angel Kanchev” University of Ruse
Tel.: +359 082-888-437
E-mail: enedkova@uni-ruse.bg

Abstract: Based on the illustrative material excerpted from the Dictionary of New Words in Bulgarian Language, the current paper aims to highlight the use of those lexical innovations that are marked in the dictionary with a stylistic note saying undesirable word or phrase. The author attempts to search for and present the reasons for this undesirable use in everyday communicative practice.

Keywords: Lexical innovation, Modern Bulgarian Language, Undesirable use

JEL Codes:

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ABOUT SOME ASPECTS OF THE LANGUAGE BEHAVIOR OF THE PROTESTING BULGARIAN IN 2013

Ass. Prof. Niya Peneva, PhD

Faculty of Natural Sciences and Education

Department of Bulgarian Language, Literature and Art

“Angel Kanchev” University of Ruse

Tel.: 082/888 664

E-mail: ndoneva@uni-ruse.bg

Abstract: The language of the protesting Bulgarian from 2013 is one of direct suggestion, which is specific key to the hidden meaning of words, acting beyond their conceptual shell. It is unique in its realization because the collective tradition and the author's interpretation meet, intertwine and penetrate into each other there. Highlights of the most essential sides, features and ingredients of the behavioural system of the contemporary protesting Bulgarian from 2013 allow you to trace the dynamics of its image.

Keywords: language, behavior, protesting Bulgarian, communication, strategies, aggression

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FIVE FEATURES THAT TURNED ATANAS DALCHEV'S FUNERAL INTO A LANDMARK EVENT

Kamen Rikev, PhD

Institute of Slavic Philology

Maria Curie-Sklodowska University in Lublin, Poland

Tel.: +48514441160

E-mail: rikev@umcs.pl

Abstract: The paper reveals five distinctive features that turned the funeral of the notable poet and translator, Atanas Dalchev (1904–1978), into a landmark event in the Bulgarian communist society of the late 1970s. These are the astonishment of friends and colleagues of the poet's wish to be buried according to the Eastern Orthodox tradition, the necessity of civil servants and members of the Union of Bulgarian Writers to communicate with representatives of the clergy during the funeral, the presence of five priests at the funeral service in Sofia's Seven Saints church, the quick composition of two obituaries (one by the Writers Union and the other by close friends), and the unexpectedly large number of people present at the church service. These five aspects of Dalchev's funeral have been noted in detail in memoirs, published after 1986. They undoubtedly fit into the enduring broader tendency of erasing the manifestation of Dalchev's Christian faith in his life and literary works.

Keywords: Atanas Dalchev, writer's funeral, socialist Bulgaria, Crypto-Christianity, Union of Bulgarian Writers.

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ELIN PELIN - "THE SINGER OF SOCIAL MISERY"

Senior Assist. Professor Nikola Benin, Ph.D

Department of Bulgarian Language, Literature and Art“,

“Angel Kanchev” University of Ruse

Tel.: 082 888 664

E-mail: nbenin@uni-ruse.bg

Abstract: *The social themes and problems in the works by Elin Pelin have been clarified thoroughly, using different approaches. Village life and customs, rural environment, the peasant's indescribable labor, his morality and human weaknesses, his anger and struggles against injustice – all of them have been researched and analysed in great details. Therefore, it is necessary to change the epistemological paradigm when reading Elin-Pelin's work, as Elin Pelin is not solely a social author.*

Here we choose to reflect on the "social distress" in his stories, understood as suffering, deprivation, hard life, human anxiety and mental trauma. From here we will discuss not so much the life of the peasant, product of a particular social environment, with its moral values and patriarchal norms of behavior, as the causes and culprits in that environment for the rise of grief and pain. In other words, the evil that brings despair and inconsolable grief.

Keywords: *Elin Pelin, short stories, social misery*

JEL Codes:

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THE CONCEPT OF FEMININITY IN VICTORIAN SOCIETY AND THE VIEWS OF GEORGE MACDONALD ON WOMEN

Senior Lecturer Iliyana Benina, Ph.D

Department of Foreign Languages,
"Angel Kanchev" University of Ruse

Phone: 082 888 230

E-mail: ibenina@uni-ruse.bg

Abstract: *Gender relations in nineteenth-century Britain during the Victorian period must be viewed in terms of the ideology of the "separate spheres" that characterize the position of man and woman in society. Innocence, chastity, obedience, moral purity, passivity are the basic elements that enter the paradigm of the category of "femininity" and build a construct that is accepted and endorsed by Victorian society.*

Although George MacDonald may not be qualified as a "feminist", he is concerned with the unjustly positioned woman as a "second sex" and differs to a great extent from the traditional Victorian writers, as he insists on women's self-determination. In this respect, MacDonald uses the fairytale and fantasy genre as an artistic tool for social criticism. The writer advocates equality of men and women and often regards them as equal partners and followers.

Keywords: *gender relations, Victorian society, George MacDonald, the category "femininity", ideology of "separate spheres".*

JEL Codes:

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GENERATING IDEAS OF MODERN EDUCATION BASED ON THE MESSAGES OF THE BOOKS FROM THE REVIVAL PERIOD (THE COMPILATION OF A READER CONTAINING LITERARY WORKS FROM THE REVIVAL PERIOD)

Assoc. Prof. Velislava Doneva, PhD

Department of Bulgarian Language, Literature and Art,
“Angel Kanchev” University of Ruse
E-mail: doneva_v@uni-ruse.bg

Assoc. Prof. Mira Dushkova, PhD

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

Abstract: *The current paper presents the process of preparing and compiling an original reader containing literary works from the Revival period. The reader is a result of the collaboration between members of the academic staff of the Department of Bulgarian Language, Literature and Arts and students from the Bulgarian Language and History undergraduate programme at the “Angel Kanchev” University of Ruse. The main sources of the texts included in the reader are books, course books and periodicals from two of the funds of the “Lyuben Karavelov” Regional Library in Ruse – the Incunabula Fund and the “Mihail Arnaudov” Fund. The reader comprises: 1. Articles; 2. Short folk genres, wise sayings; 3. Parables, fables, stories, cautionary tales; 4. Poetry; 5. References; 6. Appendix. The reader can be used in the training of school students in humanities high schools or of university students in the field of humanities. Despite the fact that the reader is not a popular genre nowadays, it will be useful to present-day young people due to its integrative character and due to its applicability to act as a source of historic information, as a model for text composition, as an example of the way in which the Bulgarian language of the past looked like, as a generator of topics and ideas focused on the individual, his/her nature, dreams, notions, attitude to the enlightenment.*

Keywords: *reader, course project, Bulgarian literature of the Revival, Child and young adult literature, enlightenment, literacy, periodicals.*

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LINGUISTIC ASPECTS OF THE CONTEMPORARY THEORIES OF HUMOUR

Tanya Borisova, PhD Student

Department of Bulgarian Language, Literature and Arts

“Angel Kanchev” University of Ruse

Phone: 082 – 888 612

E-mail: tborisova@uni-ruse.bg

Abstract: *Humour, laughter, fun and situational jokes are phenomena related to intelligence and are a result of the evolutionary development of humans. Although there are various situations which trigger hearted laughter, verbal jokes and humour are considered to be more sophisticated, refined and requiring more cognitive skills and knowledge. Despite the fact that the term “humour” is largely used in everyday life, it is still hard to define it and it is even harder to explain what makes a text a humorous one. The present paper, therefore, provides an overview of some of the contemporary theories of humour and discusses their similarities and differences by providing specific examples of jokes as an illustration*

Keywords: *Humour, Verbal Jokes, Linguistic Ambiguities, Theories of Humour.*

JEL Codes: *L10, L11*

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FRI-2.205-1-AS

FRI-2.205-1-AS-01

**THE SUCCESS OF THE FILM MUSICAL – PSYCHOLOGICAL AND
SOCIO-CULTURAL PREREQUISITES OF THE USAGE OF MUSIC
IN THE AUDIENCE'S FAVORITE GENRE**

PhD Krasimira Ivanova

Faculty: Screen Arts, Department of Screen Research and Screenwriting

National Academy for Theatre and Film Arts, Sofia, Bulgaria

Tel.: +359889991489

E-mail: krasimira.iv77@gmail.com

Abstract: *The paper uses the perspective of the psychology of perception, music therapy, sociology of culture to explain the enduring popularity of the film musical. The invariable success of the genre is also due to the specific ability of music to tune the human psyche in a certain way. Its use as a mnemonic mechanism, as a subconscious mechanism for awakening feelings and associations, etc. shows how it works as a shortcut to the tops of box office charts.*

Keywords: *Music, Cinema, Film Musical, Psychology*

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FRI-2.205-1-AS-02

MUSIC IN TV SERIES OF THE NEW GENERATION

Desislava Georgieva, PhD Student

Screen Arts Faculty,

National Academy for Theatre and Film Arts “Krastyo Sarafov”

Phone: +359882714409

E-mail: desislava.desislava@hotmail.com

Abstract: *This article examines music in the new generation of series, made after 2000-th year.*

The sound of TV series is an elaborate complex of all the sound events, and music is its main element, together with dialogs, sounds effects and silence itself. Usually it's the main cause of emotional charge. In the new generation of series music goes out of its role of being a “background” in all the action. Carefully thoughtful, selected and/or composed, music is filled with dramatic functions and it has great influence on the overall aspect of the series. It is one of the important factors, that interacts with each other, shaping the hybrid appearance of the new wave of TV series, which we witness.

The TV series that Netflix, HBO and similar to them platforms offer us today intrigue with their exceptional quality in both sound and image, fascinating story lines and cinematic brilliance, which we witness on the screen. The link between those series is blurring the border between cinema and television, which definitely appears in their music image as well.

Keywords: *music, TV series from the new generation, sound in TV series, sound directing, film score, the role of music.*

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RECORDING SYMPHONIC ORCHESTRA

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 basic existing methods of recording a symphonic orchestra. Sound recording systems and microphone techniques are explored with the intention to demonstrate advantages and disadvantages of different approaches, and to assess effectiveness in terms of good sound quality. Acoustics principals and physical sound behavior are reviled in order to analyze and establish successful orchestral recording practices. The article summarizes the author's work and experience as a long-time recording engineer in the field of classical music. It covers many aspects connected to symphonic sound and acoustical recordings starting from spatial placement of musicians, microphone set up, recording and mixing orchestral music.

Keywords: Sound, Recording, Microphone, Sound Quality, Timbre, Musical Instrument, Orchestra,

JEL Codes:

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FRI-2.205-1-AS-04

THE SOUND DESIGN OF THE DOCUMENTARY “THE FAMOUS STRANGER”- DIRECTOR SVETOSLAV OVCHAROV

Valeria Krachunova-Popova, PhD

Faculty: Screen Arts, Department of Film and TV Sound
National Academy for Theatre and Film Arts, Sofia, Bulgaria
Tel.: +359887698643
E-mail: v.krachunova@gmail.com

***Abstract:** Documentary cinema has been extensively and thoroughly researched by Bulgarian and foreign scholars. A number of authoritative publications are devoted to the history of cinema sound. But there are not much works devoted to comprehending the work and meaning of the soundtrack of the sound film, in particular for the documentary, are units worldwide; in this article, the documentary "The Famous Stranger" will be considered exclusively in terms of use and handling of sound.*

The paper briefly reviews the process of the sound design, recording, editing and mixing sound effects and music for Svetoslav Ovcharov's documentary "The Famous Stranger".

Keywords: Sound design, Cinema, Film Sound, Documentary, Music

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THE ROLE OF MUSIC IN CINEMA

Tsvetelina Tsvetkova

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: *The paper briefly reviews the role of music as one of the main elements of cinematic sound. Music joined the moving pictures long before every other component – at the very beginning. There never was such thing as "silent movie". Even the first shorts, shown in late 19th century, were accompanied by music. Having the power to rule the emotions of the viewers, it became an inseparable part of the movie experience. It has always been used to immerse the audience in the world of the film. Although nowadays more and more of the films count mainly on the sound effects to create impressive sound design, the role of music as a tool of creating a strong emotional impact has not decreased.*

Keywords: *Music, Sound design, Cinema, Film Sound, Cinema History*

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TEACHING CLASSICAL MUSIC NOTATION TO STUDENTS AS AN ACT OF CREATION

Assoc. Prof. Petya Stefanova, PhD

Department of Bulgarian Language, Literature and Art,

“Angel Kanchev” University of Ruse

Phone: 0896 820470

E-mail: pstefanova@uni-ruse.bg

Abstract: This paper examines the process of teaching the rules and symbols of music notation to schoolchildren and creating opportunities for them to show their creativity. In search of efficient and attractive methods to present sheet music to schoolchildren, researchers in musicology and music theorists offer a number of methods. The author reviews several approaches put forward by renowned pedagogues, musicologists and textbook writers who belong to different periods of the development of music education in Bulgaria. New classroom tasks and games designed to acquaint pupils with music notation symbols and to develop their musical literacy with the help of literature and art are offered. These classroom activities take the form of games in front of a colourful instillation. The results of their approbation in a music workshop are also discussed. In connection with her work as a university teacher, the author describes some of her students' projects that involve creative solutions to the task of teaching musical notation to schoolchildren.

Keywords: Music notation literacy, methods of teaching music notation, creating music

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FRI-K.201-1-HP

FRI-K.201-1-HP-01

**THERMOGRAPHY AND POSTURE
IN ASSOCIATION WITH THE B.A.E. METHOD**

Tiziano Pacini, PhD

ul. D. Vatax, 30 -1510 Sofia, Bulgaria
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

Andrea Pacini via Mulinaccio,

11 - 50032 Borgo San Lorenzo, Italia
Cell. +393383856086,
E-mail: pacioandre@gmail.com

Abstract: *The thermography allows to see in real time the muscular function of the various body parts. A person shows at the thermographical investigation a muscular surface which is detectable as image proportional to the quantity of heat emitted by the muscle and by their working. The usage can be studied in association with the B.A.E. method. Postural alteration have as a consequence a variation of the muscular work of the various parts of the body. The thermographical investigation of the body surfaces as a whole allows a comparison with the photographic images used with the B.A.E. method. The thermography confirms and strengthen the vision of the symmetry as it allows the verify of the heat developed by the muscles and makes it proportional to their visual symmetry. Method: people treated with the B.A.E. method, checked with classic photography and thermography shows a perfect coherence between the two types of investigations: the thermography allows the verification of the variation of the muscular work in real time unlike the normal photography which is good at a time distance but with a minimal effectiveness in short periods of time.*

Keywords: posture, B.A.E. method, thermography applied to people.

JEL Codes: I 10, I 20

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FRI-K.201-1-HP-02

INVERSION OF CERVICAL LORDOSIS

Tiziano Pacini, PhD,

ul. D. Vatax, 30 -1510 Sofia, Bulgaria
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

Andrea Pacini via Mulinaccio,

11 - 50032 Borgo San Lorenzo, Italia
Cell. +393383856086,
E-mail: pacioandre@gmail.com

Loredana Granata via G. Verdi,

26, - 50066 San Clemente, Reggello Italia
Cell. +393881460207,
E-mail: loredanagranata28@gmail.com

Abstract: Postural alteration of the rachis in a 37 years old female. The person, despite having a complex clinical picture of the rachis, the official medicine wasn't able to help her. She was treated with the B.A.E. method: check up after the first 8 months and then after 2 years. The person has headaches and frequent low back pains since the age of 20. Treatment checked with the B.A.E. method. The person complained headaches and lumbar back pain. Method: person with negative physiotherapy and postural exercises outcomes, she was treated with the B.A.E. method for 2 years with positive outcomes. She started practicing sports after 8 months of the B.A.E. method.

Keywords: Posture, B.A.E. method, scoliosis, headaches and back pain

JEL Codes: I 10, I 20

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FRI-K.201-1-HP-03

POSTURAL IMPLICATION AND MANAGEMENT OF THE GRAVITATIONAL FIELD IN THE FIBROMYALGIA AND IN ITS SYMPTOMS OF PAIN AND PANIC

Tiziano Pacini, PhD

ul. D. Vatax, 30 -1510 Sofia, Bulgaria
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: 47 fibromyalgic man is being treated for the pain as he reports pain diffused to the back and the neck. This pain leads him into a panic state. He is being treated with the B.A.E. method for 4 months. The pain relieved a bit but they are not yet removed, the structural change is very important, with the Thermography we analysed the variation and the quantity of work done by the superficial muscles. Method: person with scoliosis and postural disturbs all over the body, pain and panic treated clinically as a fibromyalgic has been associated to the B.A.E. method.

Key Words: Posture, Biomechanic Antropometric Ergonomic method, fibromyalgia, back and neck pain, panic crisis.

JEL Codes: I 10, I 20

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Pacini, T., F. Pivetta, E. 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 "Angel Kanchev", 2013

FRI-2.113-1-SW

FRI-2.113-1-SW-01

**ASSESSMENT OF OCCUPATIONAL RISKS FOR WORKERS
IN THE FIELD OF SOCIAL SERVICES**

Assoc. Prof. Ivanka Stoyanova-Todorova, PhD

Department of Social and Economic Sciences,

Technical University of Gabrovo

Tel.: 066 827 327

E-mail: vantod61@abv.bg

Abstract: Risk assessment is part of the overall activity for ensuring healthy and safe workplace conditions. The paper assesses the occupational risks of workers at the Day Care Center for Children and Youth with Disabilities. Hazards and harmful effects for them have been identified and the degree of risk for the various job positions has been determined. The leading risk factors for social workers - neuro-psychic and psycho-emotional load - have been identified. The necessary risk mitigation measures include a rational work and rest regime, as well as the adoption of stress reduction and relaxation strategies.

Keywords: occupational risks, risk assessment, work conditions, identified hazards, harmful effects, neuro-psychic tension, psycho-emotional load

JEL Codes: I3, J71, J78

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Law on Health and Safety at Work (SG 124/1997, amended and supplemented) (**Оригинално заглавие:** Закон за здравословни и безопасни условия на труд (ДВ 124/1997, изм. и доп.))

Labour Code (**Оригинално заглавие:** Кодекс на труда)

Ordinance No. 5 of the MLSP and the MoH on the Procedure, Manner and Periodicity for Performing the Risk Assessment, (SG 47/1999) (**Оригинално заглавие:** Наредба № 5 на МТСП и МЗ за реда, начина и периодичността за извършване на оценката на риска, (ДВ 47/1999)

Ordinance No. RD-07-2 of December 16, 2009. on the conditions and procedure for conducting periodic training and briefing of employees on the rules for ensuring healthy and safe working conditions (**Оригинално заглавие:** Наредба № РД-07-2 от 16.12.2009г. за условията и реда за провеждането на периодично обучение и инструктаж на работниците и служителите по правилата за осигуряване на здравословни и безопасни условия на труд)

Ordinance No. 15 / May 31, 1999 on the Conditions, Procedures and Requirements for the Development and Implementation of a Physiological Mode of Work and Rest at Work Ordinance No. RD-07-3 of 18.07.2014 on the minimum requirements for the microclimate of workplaces (**Оригинално заглавие:** Наредба № РД-07-3 от 18.07.2014 за минималните изисквания за микроклимата на работните места)

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FRI-2.113-1-SW-02

COMMUNICATION IN SUPERVISION WITH SOCIAL WORK STUDENTS

Assoc. Prof. Sasho Nunev, DSc of Social Work

Department of Public Health and Social Work,

University of Ruse, Bulgaria

Tel.: +359 886 802 466

E-mail: sasho_nunev@abv.bg

Abstract: *The paper presents a research on problems of communication in supervision of social work students in their practical training. Theoretical and applied concepts of the content and specific aspects of communication types in social work supervision with students are analysed. The research is realized with students from the programs of social work in Bachelor's and Master's degrees at the University of Ruse in the period 2014 - 2018. The purpose of the research is to identify the respondents' attitudes towards the supervisor's style of communication and interaction in the working relationship between a supervisor and supervised student. Quantitative and qualitative analysis of the results of the empirical research reveals evidence of a sustained positive orientation in students' attitudes toward using by the supervisor in a constructive, positively oriented, dialogical, culturally sensitive, and non-discriminatory style of communication and interaction in a supervisory working relationship. Conclusions of the importance of the use of different types of communication in the supervision of social work with students are presented as one of the important factors for improving its quality and effectiveness of practical training.*

Keywords: *Supervision of students, Communication in supervision with students, Types of communication in supervision, Style of communication, Attitudes towards communication style in supervision*

JEL Codes: I23, I29

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FRI-2.113-1-SW-03

COMPONENTS DEFINING SOCIAL SERVICES IN THE CONTEXT OF EFFICIENCY

Assist. Prof. Plamen Kolev, PhD

Department of Social and Economics sciences,

Technical University of Gabrovo

Phone: 0899274607

E-mail: rex_77@abv.bg

Abstract: It is the significance of the final result in determining the effectiveness of social work, determining the need to study this phenomenon and to systematize specific indicators for measuring and assessing the effectiveness of social services. The expectations of stakeholders in social services are also different in the context of efficiency and quality of customer service. One of the main reasons for this arises not only from the nature of social services and the assisting process, but also from the different concepts of efficiency of the social system.

Keywords: Efficiency, Social services, Components, Measurement.

JEL Codes: I38

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FRI-2.113-1-SW-04

RESEARCH ON THE LEVEL OF RECEIVED SUPPORT FROM PERSONS WITH ONCOLOGICAL DISEASES FROM THE NEAR FAMILY ENVIRONMENT

Assist. Prof. Evgeniya Bratoeva

Department of Public health and social work

University of Ruse "Angel Kanchev"

Phone: 0887 243807

E-mail: ebratoeva@uni-ruse.bg

Abstract: *Having a cancer leads to a change in quality of life. The patient cannot fully fulfill his / her commitments to children, spouse and parents for an indefinite period of time, which leads to a change in the lifestyle of everyone in the immediate family environment. The publication presents the results of a study on the degree of support received by people with cancer while treating the disease from the immediate family environment. The study was conducted among 304 people with existing cancer. All are Bulgarian citizens, residents of Rousse, Razgrad and Silistra districts and are in the age group of 35-60 years.*

Keywords: *clinical social work, oncology, palliative care*

JEL Codes: *I14, I31*

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FRI-2G.104-1-HC

FRI-2G.104-1-HC-01

RECTOCELE IN WOMEN AND ITS REPAIR

Assoc. Prof. Georgi Hubchev, MD, PhD

Department of Health care

University of Ruse “Angel Kanchev”

Phone: 0888 317 020

E-mail: georgihubchev@abv.bg

Abstract: Rectocele - a diverticular bulging of the front wall of the rectum into the back wall of the vagina. This is a very common disease and it is found in 15-43% of women. The most common symptoms of rectocele are difficulty in emptying the rectum during the bowel movement and the feeling like there is a foreign object in the perineal region, caused by seeping of the stool into a blind pouch. Pelvic organ prolapse in women is one of the present-day problems in the modern medicine due to its high frequency. Our study of 100 patients, who have undergone a surgery in the course of 10 years (from 2000 to 2010), based on the standard methods, using transvaginal access, showed that 30% of them still had symptoms of difficult and incomplete rectal emptying during defecation.

Keywords: Rectocele, pelvic floor, connective - muscle structures

JEL Codes: I12, I19

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THE ROLE OF STEM CELLS IN THE TREATMENT OF URINARY INCONTINENCE-SURVERY

Assoc. Prof. Georgi Hubchev, MD, PhD

Department of Health care

University of Ruse "Angel Kanchev"

Phone: 0888 317 020

E-mail: georgihubchev@abv.bg

Abstract: At present, there are many approaches in the treatment of urinary incontinence: lifestyle modification and behavioural therapy (pelvic floor muscle strengthening exercises, quitting caffeine and fizzy drinks and so on); pharmacologic (M-cholinolytics, b3-agonists, norepinephrine - serotonin reuptake inhibitors), surgical (colposuspension, sling surgeries, artificial sphincter), minimally invasive therapy (use of botulinum toxin - type A, different types of laser, volume-forming substances). The low efficacy of both behavioural and medication therapies as well as the patients' unwillingness to undergo a surgery, necessitates searching less invasive and more effective alternative treatment for urinary incontinence. In this regard, a potential approach to treat UI is the use of cell-based therapies. Currently, clinical trials are performed to determine the role of stem cells.

Keywords: Urinary incontinence, pubourethral tendon, stem cells

JEL Codes: I12, I19

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PELVIC INFLAMMATORY DISEASES CURRENT CONCEPTS -REVIEW

Assoc. Prof. Georgi Hubchev, MD, PhD

Department of Health care

University of Ruse "Angel Kanchev"

Phone: 0888 317 020

E-mail: georgihubchev@abv.bg

Abstract: *In the present review, current literary data regarding epidemiology, etiology, pathogenesis, diagnostics and treatment of pelvic inflammatory diseases (PID) are introduced. Medical and social consequences of PID, related to the negative effects on female reproductive health, require timely antibacterial therapy, which purpose is to eradicate all potential etiologic agents at the inflammatory site. Comparative analysis has been made on the advantages and some disadvantages of the standard treatment strategies, used for PID in the USA and Europe. Having in mind the broad spread of antibiotic resistance to fluoroquinolones, the insufficient sensitivity to first-line antibiotics (doxycycline) in particularly *Mycoplasma genitalium* in the treatment regimen of PID, plus the second/third-generation cephalosporins, Metronidazole, it is recommended to add Azithromycin as a first-choice antibacterial drug.*

Keywords: *Pelvic inflammatory diseases, microorganisms, antibiotic therapy*

JEL Codes: *I12, I19*

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FRI-2G.104-1-HC-04

COMPLICATIONS OF LAPAROSCOPIC SURGERIES IN GINECOLOGICAL PRACTICE

Assoc. Prof. Georgi Hubchev, MD, PhD

Department of Health care

University of Ruse "Angel Kanchev"

Phone: 0888 317 020

E-mail: georgihubchev@abv.bg

Abstract: *The frequency rate of laparoscopic urological complications is 0.42-1.6%). Bladder injury is not so common because the bladder is usually emptied by a catheter prior to the exam or a permanent Foley catheter is inserted. Injury to the ureter is possible with coagulation of peritoneal endometrial sites, during amputation and extirpation of the uterus. The ureteral injury is discovered intraoperatively in less than 7% of the cases. In the postoperative period such patients usually develop ureterovaginal fistulas and urinoma with urinary peritonitis.*

Keywords: *Endoscopic surgery, complications, hysterectomy*

JEL Codes: *I12, I19*

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FRI-2G.104-1-HC-05

ATTITUDES TOWARDS IMPLEMENTING VIRTUAL EDUCATION IN HIGHER HEALTHCARE EDUCATION IN BULGARIA

Prof. Ivanichka Serbezova, PhD

Department of Health care

University of Ruse "Angel Kanchev"

Phone: +359 88 7082800

E-mail: iserbezova@uni-ruse.bg

Daniela Lyutakova - Student / B.Sc. Student / Young Scientist

Department of Health care

University of Ruse "Angel Kanchev"

E-mail: lachezarova@gmail.com

Abstract: *Undoubtedly, virtual education is on the rise with many universities implementing it more and more in their curriculums - whether as a component in itself or as a thorough approach. Due to the specifics of healthcare education in universities, virtual education may hold a great potential to reinforce and expand learning and teaching experiences for both students and academic staff. Notably, most students nowadays do not know or remember a time of their lives when technology and internet were not present, so implementing virtual education is an entirely logical way to engage them. As with any innovation, a detailed research of present conditions and attitudes is necessary before further actions are undertaken to integrate virtual education in Bulgarian higher education institutions. Thus, this report examines the awareness and attitudes towards virtual education of both Bulgarian students and educators within the regulated healthcare majors. A few universities which educate student nurses and student midwives are included in this research, data collected is graphically presented and tendencies discussed.*

Keywords: *virtual education, student nurses, student midwives, regulated majors, healthcare, education innovations, virtual simulations, research, attitudes*

JEL Codes: *I*

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VIRTUAL EDUCATION FOR HEALTHCARE EXPERTS - RESEARCH ON THE INTERNATIONAL EXPERIENCE

Prof. Ivanichka Serbezova, PhD

Department of Health care

University of Ruse "Angel Kanchev"

Phone: +359 88 7082800

E-mail: iserbezova@uni-ruse.bg

Abstract: Virtual education was first employed in the mid-1990s and has become a staple in some fields, allowing for catering to diverse groups of contemporary students studying various majors, distance courses of education, better efficiency in communicating and high quality training of skills and competences, etc. Healthcare, on the other hand, is under a constant demand for educated and qualified experts, whose expertise is up to date not only in regard to evidence based medicine, but also to technological advancement. Virtual education, consisting of various elements, including virtual simulations, video materials and online learning, may be the right tool to engage students in healthcare majors or post graduate medical students, offering safe environment for skill development, interactive content, efficient communication on all levels and better time management options for both students and educators. This article aims to examine international experience concerning the implementation of virtual education in healthcare educational courses in order to research the main pros and cons of this innovative methodology. The data would provide a solid ground to build on before venturing in developing strategies for modernising local Bulgarian education for healthcare experts, using virtual educational tools and selecting those which are fitting best to our own circumstances.

Keywords: virtual education, healthcare specialists, nurses, midwives, innovations in education, international experience, scoping review

JEL Codes: I

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TIME OF ALTERNATIVE PERFORMANCE COMPARED TO TRADITIONAL METHODS HYGIENE IN THE FIELD OF HEALTH CARE

Assoc. Prof. Despina Georgieva, PhD

Department of Health Care

University of Ruse "Angel Kanchev"

Phone: +359 88 9789100

E-mail: dpgeorgieva@uni-ruse.bg

Chef Assist. Prof. Greta Koleva, PhD

Department of Health Care

University of Ruse "Angel Kanchev"

Phone: +359 88 2517173

E-mail: gkoleva@uni-ruse.bg

Chief Assist. Prof. Irina Hristova, PhD

Department of Health care

University of Ruse "Angel Kanchev"

Phone: +359 88 4582733

E-mail: ihristova@uni-ruse.bg

Abstract: Managing the time to carry out nursing activities in the face of ever-increasing responsibilities and the lack of sufficient nurses will result in greater work efficiency. Hygienic care for patients who cannot self-care are basic nursing activities and are carried out in two ways: traditionally with water and soap and single materials using the "dry bath" method. The time for performing hygienic care - washing of the head, as well as bathing in the patient's bed by the method of "dry bathing" is much shorter. In this study, timing proves four times the reduction of time by applying modern methods, respectively, for washing the head (from 22.05 min. To 5.45 min.) And bathing the patient in bed (from 47.21 min. To 12. 01 min.). Investing in up-to-date equipment and securing financing for dry-bathing products will ensure efficient use of the resource's time. Other studies have proven cost-effective, increased patient comfort and safety, and reduced healthcare associated infections (IDMS).

Keywords: time efficiency, timekeeping, bathing the patient, washing the head, traditional, alternative hygiene method

JEL Codes: I

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The report reflects the results of the work on the project: No 2019-RU-07 "Development and research of a comprehensive concept for changing traditional methods with alternative methods and means for the hygiene of patients who are unable to self-serve", funded by the Fund "Science research" of Ruse University "Angel Kanchev".

FRI-2G.104-1-HC-08

INCREASING THE QUALITY OF HEALTH CARE THROUGH TECHNICAL SHEETS FOR HYGIENE CARE BY DRY BATHING

Chief Assist. Prof. Irina Hristova, PhD

Department of Health care
University of Ruse "Angel Kanchev"
Phone: +359 88 4582733
E-mail: ihristova@uni-ruse.bg

Assoc. Prof. Despina Georgieva, PhD

Department of Health Care
University of Ruse "Angel Kanchev"
Phone: +359 88 9789100
E-mail: dpgeorgieva@uni-ruse.bg

Chef Assist. Prof. Greta Koleva, PhD

Department of Health Care
University of Ruse "Angel Kanchev"
Phone: +359 88 2517173
E-mail: gkoleva@uni-ruse.bg

Abstract: *The quality of health care and patient safety are top priorities for healthcare systems worldwide. The standards provide a professional framework and high quality healthcare. Against the backdrop of numerous worldwide and European patient safety guidelines and measures, there are still no legally adopted Health Care Standards. One of the quality enhancement tools is the technical fiche. This scientific report presents two technical fiches - a head wash and a hygiene bath in a patient's bed by the method of "dry bathing". Changes in the hygiene care algorithms used so far are required due to the introduction of an innovative hygiene care method in the training and practice of Bulgaria. The purpose of the developed datasheets is to improve the quality of hygienic health care with the following quality indicators: reduction of hospital-acquired infections, increased patient satisfaction and a significant reduction in the time to perform them. A skill assessment protocol has been developed for each of the algorithms, which provides objectivity in the assessment.*

Keywords: *quality of health care; standard, technical slips, hygiene care, dry bath method, nurse.*

JEL Codes: *I*

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ATTITUDE TOWARDS PATIENTS WITH DEMENTIA IN BULGARIA

Assoc. Prof. Daniela Konstantinova, PhD

Department of Health care

University of Ruse "Angel Kanchev"

Phone: +359 88 8520021

E-mail: ddraganova@uni-ruse.bg

Abstract: As reported by the World Health Organization (WHO), every three seconds a new case of dementia occurs in the world. According to a study on Alzheimer's problems in our country, 82 percent of people whose relatives have dementia and Alzheimer's are not familiar with the forms of support for these patients, and another 77% have no information about social institutions providing support to those affected by the disease. People with dementia are a vulnerable and rapidly growing group worldwide. The problem is especially acute in Bulgaria because of the large percentage of aging population and increasing life expectancy. Experts on the problems of dementia are adamant that patient care is an interdisciplinary problem that requires coordinated action by institutions involved in diagnosis, treatment, training of medical personnel, support for families and carers.

Keywords: dementia, support, aging population

JEL Codes: I11

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FRI-2G.104-1-HC-10

MIDWIFERY AND NURSING SPECIAL CARE REQUIRED IN PREECLAMPSIA PREVENTION

Chief Assist. Prof. Tsvela Hristova, PhD

Department of Health care
University of Ruse "Angel Kanchev"
Phone: +359 87 8389793
E-mail: tshristova@uni-ruse.bg

Chief Assist. Prof. Teodora Todorova, PhD

Department of Health care
University of Ruse "Angel Kanchev"
Phone: +359 88 8694158
E-mail: tetodorova@uni-ruse.bg

Abstract: Preeclampsia is specific condition that occurs during pregnancy and leads to multi-system complications, preterm births and perinatal infant mortality. Preeclampsia is a serious health problem worldwide. Every year ten million pregnant women are affected by this illness, and 76 000 of these cases have fatal consequences. A solution to this problem has been the establishment of the American Preeclampsia Foundation and the European Foundation for the Care of Newborn Infants that effect prevention, health education and support for the mother and her family. A prominent place in healthcare promotion is held by the midwife and the nurse as specialists of women's health. In outpatient care, nurse-monitored duties of concomitant diseases should be performed towards expectant mothers. Obstetric care is particularly crucial for prevention, promotion and monitoring during pregnancy and labor. A study of pregnant women with preeclampsia in stationary treatment is provided. The causes leading to this illness are analyzed. The data analysis is represented graphically. A plan of necessary midwifery and nursing health care responsibilities is suggested. A conclusion is drawn that our country does not have an implemented programme for preeclampsia prevention. Special nursing and midwifery care duties have a necessary and significant role in the medical team protecting women's health. The midwife with her professional competencies should have the opportunity for an active involvement in the prevention of this medical condition.

Keywords: : Obstetric care, Nursing care, Preeclampsia, Prevention, Pregnancy

JEL Codes: I12

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FRI-2G.104-1-HC-11

INVESTIGATION OF NEEDS FOR PHYSICAL ACTIVITIES OF STUDENTS SPECIALTY "MIDWIFE" AT UNIVERSITY OF RUSE - BULGARIA AND THEIR MOTIVATION TO PARTICIPATE

Chief Assist. Prof. Tsvela Hristova, PhD

Department of Health care
University of Ruse "Angel Kanchev"
E-mail: tshristova@uni-ruse.bg

Chief Assist. Prof. Iskra Ilieva, PhD

Department of Physical Education and Sport
University of Ruse "Angel Kanchev"
E-mail: isilieva@uni-ruse.bg

Chief Assist. Prof. Yoana Lukanova, PhD

Department of Health care
University of Ruse "Angel Kanchev"
E-mail: ylukanova@uni-ruse.bg

Abstract: The effectiveness of the Physical Activity of the students is a result of their motivation and satisfaction of their needs. They determine the direction to make specific decisions and take appropriate actions to achieve goals that can be related to health, fitness, proper body posture, absorption of knowledge and skills in the preferred sport, social networking, recreation.

Many authors have identified the existence of a close relationship between the development of the individual and his needs. They are the "anchor points" on which activity is based. Establishing them is a kind of feedback between the students and the teacher. A priority of physical education teaching and training is the enhancement of students' health and physical culture.

It is the midwife who guides the pregnant woman, monitors the proper performance of the motor mode, controls and helps. The professional competence for this is nowadays mainly built up in specialized courses in postgraduate training or through self-study. Very few such questions have been raised during the training of students specialty "Midwife" at the Bachelor of Higher Education.

The analysis of these needs can summarize and rank the following factors for motivation to participate:

1. Health promotion;
2. Maintaining a proper body posture and muscle balance;
3. Good physical shape;
4. Attendance - as a regular physical education and sports lesson

Keywords: Motivation, Needs, Posture, specialty "Midwife", Physical Activity, Health Care, Methodological Requirements, Muscle Balance, Physical Education and Sports, University Of Ruse - Bulgaria.

JEL Codes: I10, I11, I12, I20, I21, I29

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The study was supported by contract of University of Ruse "Angel Kanchev", № BG05M2OP001-2.009-0011-C01, "Support for the development of human resources for research and innovation at 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.

FRI-2G.104-1-HC-12

MODELS FOR OPTIMIZING THE CLINICAL PRACTICE OF MIDWIFERY STUDENTS BY APPLYING A PRACTICAL CLINICAL PRACTICE GUIDE “REACT QUICKLY”

Chief Assist. Prof. Yoana Lukanova, PhD

Department of Health Care

University of Ruse “Angel Kunchev”

Phone: +359 88 5047644

E-mail: ylukanova@uni-ruse.bg

Abstract: The practical training of midwives and nurses is a combination of methods, techniques, forms and means. The disclosure of their patterns is intended to assist the teacher in his practical work with the students, which will lead to the formation of habits and skills in the students. In teaching medical knowledge, it is necessary to master the pedagogical techniques and mastery of training. General and specialty nursing and clinical practice teachers must have excellent professional competence, be proficient in, and know perfectly all practical skills and procedures.

Keywords: midwives, practice, clinical practice, training, study aids, optimization, professional competence

JEL Codes: L10, L11

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ACUTE RENAL IMPAIRMENT IN THE CASE OF IN VITRO: A CASE REPORT

Chief Assist. Prof. Teodora Todorova, PhD

Department of Health care
University of Ruse "Angel Kanchev"
Phone.: +359 89 708 3403
E-mail: tetodorova@uni-ruse.bg

Chief Assoc. Prof. Tsveta Hristova, PhD

Department of Health care
University of Ruse "Angel Kanchev"
Phone: +359 87 838 9793
E-mail: tshristova@uni-ruse.bg

Abstract: *Pregnancy is an important event in every woman's life. The hormonal changes that occur during this period are a prerequisite for the occurrence of kidney disease. Acute renal impairment is a condition in which kidney function is impaired for a short period of time - hours, days or weeks. The early diagnosis and treatment of many kidney diseases leads to a slow / stop progression or to a complete cure. Usually, the condition in which the human body reaches acute renal impairment is reversible. Complaints from the urinary system can occur during pregnancy. During normal pregnancy, kidney disease can occur due to a disorder in urodynamics, which explains the higher incidence of kidney crises in pregnant women. Preeclampsia is a serious problem and is the leading cause of maternal death.*

Keywords: *Acute Renal Impairment, In Vitro, Pregnancy.*

JEL Codes: *I12*

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SAVANT SYNDROME: PAST, PRESENT, FUTURE

Gamze Yasharova, nurse

University multidisciplinary hospital for active treatment "Kanev"

Phone: +359 88 446734

E-mail: g_19@abv.bg

Chef Assist. Prof. Greta Koleva, PhD

Department of Health Care,

University of Ruse "Angel Kanchev"

Phone: +359 88 2517173

E-mail: gkoleva@uni-ruse.bg

Assoc. Prof. Despina Georgieva, PhD

Department of Health Care,

University of Ruse "Angel Kanchev"

Phone: +359 88 9789100

E-mail: dpgeorgieva@uni-ruse.bg

Chief Assist. Prof. Irina Hristova, PhD

Department of Health care

University of Ruse "Angel Kanchev"

Phone: +359 88 4582733

E-mail: ihristova@uni-ruse.bg

Abstract: Savant syndrome defines the people who have severe developmental and mental disabilities but also have extraordinary mental skills which are missing in many people. Although general mental capacity is under average mental level, savant has excessive knowledge about one or more domains. It is accepted that as many as one in 10 persons with autistic disorder have such remarkable abilities in varying degrees, although savant syndrome occurs in other developmental disabilities or in other types of central nervous system injury or disease as well. These are music, art, calendar calculating, mathematics and mechanical or spatial skills. Savant skills can also be divided into three as savants who have splinter skills, talented savants and prodigious savants. A remarkable memory welds to the special abilities determined in savant syndrome. Savant syndrome can be congenital or it can be acquired. Most often savant skills emerge in childhood, superimposed on some underlying developmental disability present at birth. However, acquired savant skills can also appear, when none were previously present, in neurotypical individuals following brain injury or disease later in infancy, childhood or adult life.

Keywords: Savant, Autism, Memory, Talent, Savant Syndrome

JEL Codes: I12

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HEALTH-RELATED QUALITY OF LIFE TO PEOPLE WITH POLIMORBILITY

Assist. Prof. Katya Popova, PhD

Department of Health Care
University "Prof. d-r Asen Zlatarov" - Burgas
Phone: +359 89 8783551
E-mail: katja.popova62@gmail.com

Assoc. Prof. Galina Terzieva, PhD

Department of Health Care
University "Prof. d-r Asen Zlatarov" - Burgas,
Phone: +359 88 4785575
E-mail: galina.terzieva@abv.bg

Assist. Prof. Monika Obreykova

Department of Health Care
University "Prof. d-r Asen Zlatarov" - Burgas
Phone: +359 88 7635475
E-mail: monika_obreykova@abv.bg

Abstract: Health-related Quality of Life (HrQoL) is the major indicator of public health assessment. The purpose of this study is to examine the subjective assessment of the physical, social and psychological functioning of the elderly and older people with chronic diseases who living in their home. Documentary, sociological (SF-36) and statistical methods are used. The results of the study show that of the 150 people who were surveyed, 43.3% described their overall health status as "mediocre" and "poor"; 33.13% believe that their health condition significantly limits them to perform their daily activities; 52.44% feel that their disturbed emotional state has a negative effect on normal role functions; 40% think that health and emotional problems disrupt their social contacts. The research of Health-related Quality of Life (HrQoL) is a compulsory element including biomedical indicators for setting priorities in health and social policies.

Keywords: geriatric patients, health, self-esteem, quality of life

JEL Codes: I 10, I 18

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ASSESSMENT OF THE QUALITY OF LIVE AMONG WOMEN WITH ONCOLOGICAL DISEASES

Petya Stefanova

Department of Health Care

“Prof. dr Assen Zlatarov” University - Burgas

Phone: +359 88 875128119

E-mail: petiastst@abv.bg

Chief Assist. Prof. Zlatinka Lecheva, PhD

Department of Health Care

“Prof. dr Assen Zlatarov” University - Burgas

Phone: +359 88 7503035

E-mail: zlatlech@gmail.com

Abstract: The relevance of the topic is due to the fact that malignancies are widespread and have a negative impact on the immediate and long-term health of the individual and quality of life. The problem is of great medical, economic and social importance, which also defines it as socially significant. The purpose of the paper is to investigate the determinants of quality of life with cancer and to analyze the results in the context of medico-social care. We interviewed 71 female NGO members with breast cancer, cervical cancer, colorectal cancer. Constant research and analysis of the needs of cancer patients and assistance in meeting their needs through up-to-date medical information, improved access to treatment, provision of psychological assistance, vocational training and restoration of work are needed. The students of the “Nursing” major, taught in “Prof. Asen Zlatarov” University developed new specific knowledge and skills for preserving, supporting and improving the quality of life of cancer patients and their relatives and close ones. The lifestyle of the individual and the whole social group is considered healthy, if it corresponds to the criteria of positive health activity and motivation, anti-risk behavior, self-care and mutual support, partnership and social engagement for health concerns.

Keywords: Quality of life, Women with oncological diseases, Non-government organization.

JEL Codes: I10, I12

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FRI-2G.104-1-HC-17

ASSESSMENT OF ATTITUDES TOWARD THE EFFECTIVE MENTORING

Assist. Prof. Mariana Bachewa, PhD

Department of Health Care
South-West University "Neofit Rilski" of Blagoevgrad, Bulgaria
Phone: +359 897 96 33 14
E-mail: bachewa@abv.bg

Assist. Prof. Daniela Velichkova- Hadjieva, PhD

Department of Health Care
South-West University "Neofit Rilski" of Blagoevgrad, Bulgaria
E-mail: dani_60@abv.bg

Assoc. Prof. Rosica Doinovska, PhD

Department of Health Care
South-West University "Neofit Rilski" of Blagoevgrad, Bulgaria
E-mail: doinovska@mail.bg

Abstract: The importance of mentoring in the education of nurses long been recognized and is seen as an essential component in the training of health care professionals. Both the mentor and the mentee build specific relationships and both parties commit to maintaining this type of relationship. Healthy relationships are based on a partnership between mentees and experienced individuals who are committed and responsive to the needs of the trainee. Mentoring in Bulgaria is perceived as a traditional method for practical training in the profession of nurse and midwife. The purpose of the study is to analyze and evaluate the attitudes for effective mentoring among basic mentors in the practical training of medical students. The questionnaire method was used and the data from 37 correctly completed questionnaires were analyzed. Statistical data processing is performed by software system SPSS-19.0.

Keywords: mentors, efficiency, attitudes, nursing education

JEL Code: I21

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FRI-2G.104-1-HC-18

SIDE EFFECTS OF THERAPEUTIC APPROACHES AND QUALITY OF LIFE OF PATIENTS WITH ONCOLOGICAL DISEASES

Assoc. Prof. Kristina Zaharieva, PhD

Department of Health Care,
University of Ruse "Angel Kanchev"
Phone: +359 88 5193003
E-mail: kzaharieva@abv.bg

Assoc. Prof. Teodora Nedeva, MD, PhD

Department of Health Care,
University of Ruse "Angel Kanchev"
Phone: +359 88 7468695
E-mail: tsherbanova@uni-ruse.bg

Assist. Prof. Tatyana Atanasova

Department of Health Care,
University of Ruse "Angel Kanchev"
Phone: +359 88 5635514
E-mail: nursing_russe@abv.bg

Abstract: The quality of life of cancer patients is not a static condition and may undergo significant changes in the course of therapy. It is of great importance to be able to recognise the side effects (pain, depression, sleep and sexuality changes, cognitive and reproductive problems, diarrhea, constipation, oral mucositis, osteoporosis, lymphadema, alopecia) of the applied therapeutic approaches, as their proper control influences positively the patients' quality of life. The quality of life is influenced by the physical, mental, social, spiritual and family well-being of patients with malignancies. The purpose of the study was to determine the respondents' awareness of the side effects of therapeutic approaches and the impact of controlled side effects on their quality of life. A survey was conducted among 135 respondents aged 35-65 with different social, family status, employment and education during the period 10.10.2018 - 30.05.2019. The results of the survey strongly support that the respondents' good awareness of the side effects of therapeutic approaches and their timely, adequate control have a positive impact on quality of life. Knowledge and skills of patients with cancer to self-control the side effects of therapy are a potential opportunity to improve their quality of life.

Keywords: quality of life, cancer patients, quality of life aspects, side effects of drug and radiation therapy
JEL Codes: I1-I19

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FRI-2G.104-1-HC-19

SOME ACCENTS WHEN TUSSAVIT-SYRUP TREATMENT

Assoc. Prof. Svilen Dosev, MD, PhD

Department of Health Care

University of Ruse "Angel Kanchev"

Phone.: 0888885988

E-mail: dr.dosev@gmail.com

Assist. Prof. Kina Velcheva, PhD

Department of Health Care

University of Ruse "Angel Kanchev"

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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FRI-2B.313-1-L

FRI-2B.313-1-L-01

RIGHTS AS EXPERIENCES

Elitsa Kumanova

Associate Professor in Theory of law and state, PhD

Angel Kanchev University of Ruse, BG

E-mail:ekumanova@uni-ruse.bg

Abstract: *The essential characteristic of law as a measure of social freedom elucidates why human rights are metamorphosing as a methodological key of contemporary legal concepts. The modern theories of human rights consider that the biosocial essences of human beings predetermines the recognition and guarantee of a wide range of personal, political, social and cultural rights..*

Keywords: *protection of rights, human rights*

JEL codes: *K14*

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FRI-2B.313-1-L-02

ABOUT THE KINSHIP BETWEEN THE PHILOSOPHY OF LAW AND THE GENERAL THEORY OF LAW

Svetla Marinova

Associate Professor in Theory of law and state, PhD

Department of Public Law

University of National and World Economy

E-mail: smarinova@mail.bg

Abstract: *The contributing points in the influence of the Philosophy of Law on the General Theory of Law are explored. Through the development of natural law and the question of the legal basis, the philosophy of law makes a necessary and great step to separate legal theory into an independent object of knowledge. Kant's critical method plays a crucial role in humanizing and promoting the right. Kant's philosophical method of inquiry and Kant's critical method have become a fruitful basis for the establishment of science philosophy of law, the imposition of philosophical thinking in science general theory of law.*

Keywords: *philosophy of law, regulation, dimension of law.*

FRI-2B.313-1-L-03

CULTURAL IDENTITY AS A FUNCTION OF THE STATE

Asst. Prof. Ivelin Velchev,

Faculty of Law, Public Law

“Angel Kanchev” University of Ruse

Tel.: 0889 261 356

E-mail: ivelchev@uni-ruse.bg

Abstract: *Culture, along with language and religion, is a lasting and defining characteristic of ethnicity. Culture is the objective basis of ethnicity. It unites and at the same time differentiates one community from another, one ethnicity from another, one ethno-social community from another. The national character of the state is a consequence of its mission - to preserve the self-organized ethno-social community. This also includes the protection and guarantee of its culture. From this point of view, we define the actions for preserving the national culture and creating the necessary conditions for its development as a cultural function of the state. peculiar.*

Keywords: *State, Ethnic, Culture, Function, Constitution*

EXECUTION OF THE LAW. LAW ENFORCEMENT PROCESS – MAIN CHARACTERISTICS. GROUNDS FOR INCLUDING THE STATE.

Asst. Prof., Doroteya M. Dimova-Severinova, PhD
Department of Public Law,
University of Ruse, Bulgaria
Tel.: 00359888795885
E-mail: ddimova@uni-ruse.bg

Abstract: *The meaning of the law derives from its social purpose of being a means of imposing a certain order. The realization of the law in social reality is the practical embodiment, transition and transformation of the normative existence of the law into public practice, into reality.*

*The execution of the law is **autonomous** when it comes directly from the conditions in the hypothesis of the legal norm law and **not autonomous**, when the occurrence of a legal fact is not a sufficient prerequisite for the legal consequences to occur. Law enforcement as a process of public-governmental implementation of legal norms is a specific manifestation of the social existence of the law:*

The present report has three purposes: to analyze the substantive characteristics of the two types of execution of the law; to bring out the essential features of law enforcement as a specific activity of public-governmental authorities; to attempt to define the grounds for the involvement of the state in the independent execution of the law.

Keywords: *execution, law enforcement, grounds, main characteristics*

JEL Codes:

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FRI-2B.313-1-L-05

AUDIT PRODUCTION UNDER TAX AND SOCIAL INSURANCE PROCEDURE CODE. ADMINISTRATIVE REGULATION

Velislava Acheva, PhD
Faculty of Law
Department of Public Law,
University of Ruse "Angel Kanchev"
E-mail: vacheva@uni-ruse.bg

Abstract: *An audit is a control procedure conducted by the revenue bodies of the National Revenue Agency (NRA), aimed at establishing tax liabilities and mandatory social security contributions of taxpayers or establishing liability for third party liabilities. In order to carry out the audits lawfully, the revenue authorities are obliged to exercise the powers conferred on them by the Tax and Social Insurance Procedure Code, which are most closely related to the VAT Act, the Excise Duties and Tax Warehouses Act and the Accounting Act. Audit proceedings should be transparent and proceed through several stages - assignment, execution and completion.*

In most cases, the audit establishes tax and liability obligations, as well as liability for third party liabilities. Audit proceedings are subject to control by the National Revenue Agency

Keywords: *control procedure, audit, liability obligation*

JEL Codes: *K340, K330*

FRI-2B.313-1-L-06

CURATORSHIP OF PERSONS WITH UNSOUND MIND IN ANCIENT ROME

Simona Marinova, PhD student

Department of Public Law,
Angel Kanchev University of Ruse

Tel.: +359 878 332428

E-mail: sdmarinova@webmail.uni-ruse.bg

Abstract: *The modern methods of protecting the rights and interests of persons with mental disabilities derive from the legal institution of guardianship (tutela) and curatorship (curatela) in Roman law. The paper examines the curatorship of people with mental deficiencies in Ancient Rome by looking at the preconditions for establishment of curatorship, its characteristics and the legal consequences for the curator in case of maladministration of the property of the ward.*

Keywords: *curatorship, guardianship, ward, curator, roman law, persons with unsound mind, persons with mental disabilities, mental incapacity, tutela, cura, curatela, cura furiosi, actio negotiorum gestorum*

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COMING INTO FORCE AND COMING INTO EFFECT OF THE LEGAL ACTS

Teodora Mladenova, PhD student
Department of Public Law, Law Faculty
University of Ruse, Ruse
Tel.: 359878830983
E-mail: tmladenova@uni-ruse.bg

Abstract: *Coming into force or entry into force (also called commencement) is the process by which legislation, regulations, treaties and other legal instruments come to have legal force and effect. The term is closely related to the date of this transition. Coming into force generally includes publication in an official gazette so that people know the law exists, which generally releases it into the public domain. By means of an explicit commencement date (and sometimes time of day) written into the act itself. It is possible for different sections of an act to come into force at different dates or times.*

Keywords: law, legislation, commencement, transition

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FRI-2B.313-1-L-08

MATTERS OF APPEALING PROCEDURES OF PENAL DECREES

Dilyana Kalinova

Ass. prof. Dilyana Kalinova, PhD

University of Ruse

Law Faculty

Department of Public Law

E-mail: dkivanova@uni-ruse.bg

Abstract: *The procedure for challenging penal decrees is executed by the Administrative Violations and Sanctions Act. It is judicial and takes place in two instances. Contestation is the second phase of the administrative-criminal process, which is possible rather than binding. The consideration of these proceedings - to which court, on what grounds, what the powers of the court, raises some questions that may be the subject of scientific debate - such as to what extent the powers of the administrative court of cassation (under Code of Administrative Procedure) are relevant to regarding the contestation of penal provisions.*

Keywords: *penalty, penal decree, administrative-criminal process, administrative punishment, administrative violation*

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FRI-2B.313-1-L-09

CONSTITUTIONAL COURT'S CASE-LAW IN 2019 CONCERNING THE CONDITIONS FOR APPOINTMENT AND FOR DISMISSAL OF CIVIL SERVANTS

Assoc. Prof. Zornitsa Yordanova, PhD

Department of Public Law, Law Faculty,

“Angel Kanchev” University of Ruse

Phone: 082 888-758

E-mail: ziordanova@uni-ruse.bg

Abstract: *In the paper the author analyses three decisions of the Constitutional court of the Republic of Bulgaria from this year (2019) in which the Court unanimously declared unconstitutional some new legal requirements for appointment of civil servants stated in the Civil Servants Act and in the Customs Act, as well as a new condition for dismissal from office of Directors in the Customs administration provided for in the Customs act. The respective decisions of the Court are presented and some main conclusions are made concerning the constitutional limits in imposing conditions for appointment and removal from office of civil servants.*

Keywords: *Constitutional court, case-law, civil servants, conditions for dismissal, requirements for appointment*

JEL Codes: *D 73, H 83*

FRI-2B.313-1-L-10

EU TAX POLICY – GOALS AND PERSPECTIVES

Assoc. Prof. Elina Marinova, PhD

Department of Public Law, Faculty of Law

“Angel Kanchev” University of Ruse

E-mail: elina_marinova @uni-ruse.bg

Abstract: The paper outlines the tax policy of the European Union as a concept, goals and regulatory framework. The achievements of EU coordination and harmonisation in the tax field are presented. Attention is drawn to the current context of taxation (globalization, tax competition, digitalisation, financial and economic crises) and the challenges to EU tax policy related to fair taxation, combating tax abuse, cooperation, eliminating tax loopholes. The taxation policy of EU began as a measure to ensure the proper functioning of the single market, and as a consequence the cooperation and harmonisation in the field were limited to this target. Nowadays the further development of the EU and the changes in the economy confer a broader scope of the tax policy.

Keywords: *Taxation, European Union, Coordination, Cooperation, Single market, Tax abuse, Tax administration*

FRI-2B.313-1-L-11

TRENDS IN THE DEVELOPMENT OF THE EUROPEAN PUBLIC PROCUREMENT FRAMEWORK - POSITIVES AND WEAKNESSES

Assist. Prof. Vanya Panteleeva, PhD

Faculty of Law

Department of Public Law,

University of Ruse "Angel Kanchev"

Tel.: +359 887 412 662

E-mail: vpanteleeva@uni-ruse.bg

Abstract: *In 2016, a new Public Procurement Act was adopted. The main reasons for drafting and voting on a whole new legal framework were two. First, the need to transpose EU public procurement directives which Bulgaria has not yet introduced or has done so incompletely. Secondly, the repeated changes and additions to the repealed PPA since 2004 the amendments reached 33, some of which created controversial practices. In the next lines will look at more important aspects of the transposed European ones norms in the new PPA, as well as some trends in the pan-European framework itself, which Bulgaria is also fully affected. Below we will try to review the European regulatory framework which was transposed into the new PPA, highlighting its development trends, positive changes and weaknesses.*

Keywords: *legal treatment, procurement, public law, EU law*

JEL Codes: *K340, K330*

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FRI-2B.313-1-L-12

FEATURES OF THE CONTROL EXERCISED BY BULGARIAN NATIONAL AUDIT OFFICE⁶

Zhivko Dimov, Doctoral Student

Department of Public Law, Faculty of Law

“Angel Kanchev” University of Ruse

Tel.: +359 82 888434

E-mail: jdimov@abv.bg

Abstract: *The state budget is the main financial plan of the state, through which centralize and redistribute a substantial part of the created national product in order to secure and guarantee the proper functioning of government bodies. Proper budgeting and spending and budgeting, as well as adequate and effective control over its implementation, are crucial to the country's economic stability. The Constitution of the Republic of Bulgaria provides that this type of control is to be exercised by a specially designated body – Bulgarian National Audit Office.*

The article examines the specifics of the control, exercised by the Bulgarian National Audit Office and the differences with the activities of other institutions with similar functions.

Keywords: *Bulgarian National Audit Office, ISSAI, External control, Legality, Expediency,*

FRI-2B.313-1-L-13

PROPOSALS AND ALERTS AS SEPARATE PROCEEDINGS IN THE COMMON SYSTEM OF PROCEEDINGS BEFORE ADMINISTRATIVE AUTHORITIES UNDER THE CODE OF ADMINISTRATIVE PROCEDURES

Yavor Marinov, Doctoral Student

Department of Public Law, Faculty of Law

“Angel Kanchev” University of Ruse

Tel.: +359 82 888434

E-mail: ymarinov@uni-ruse.bg

Abstract: *With the adoption of the Code of Administrative Procedure, the legislator has separated the proceedings before administrative authorities into an independent part. Each of the proceedings involved is characterized by specifics that requires its distinguished separation from the others. In the last chapter eight of title two of the Code, the procedure for proceedings of proposals and alerts is described. Outlining the characteristics of each administrative procedure will help to reveal the specifics of the procedure for dealing with proposals and alerts, as well as distinguishing it as an independent and essential part of the common system of administrative proceedings.*

Keywords: *Proposals, alerts, Code of Administrative Procedures*

⁶ Докладът е представен на 58-мата Научна конференция на Русенски университет „Ангел Кънчев” и Съюза на учените – Русе „Нови индустрии, дигитална икономика, общество – проекции на бъдещето“ – II от 24 до 26 октомври 2019 г., с оригинално заглавие на български език: „Особености на контрола, упражняван от Сметната палата”

FRI-2B.313-1-L-14

CHARACTERISTICS OF PROPOSALS AND ALERTS (DIFFERENTIATION FROM OTHER TYPES OF APPLICATIONS INCLUDED IN THE CODE OF ADMINISTRATIVE PROCEDURE)

Yavor Marinov, Doctoral Student

Department of Public Law, Faculty of Law

“Angel Kanchev” University of Ruse

Tel.: +359 82 888434

E-mail: ymarinov@uni-ruse.bg

Abstract: Clarifying the characteristics of proposals and alerts is extremely important in order to make these proceedings separately and to determine its place among the other administrative proceedings included in the Code of Administrative Procedure. The different names of proposals and alerts suggest specificities that characterize them as such. These particularities can be inferred through their mutual comparison, but also through their comparison with other types of applications - claim, complaint, protest.

Keywords: Proposals, alerts, Code of Administrative Procedures

FRI-2B.313-1-L-15

SIMILAR FEATURES AND DIFFERENCES BETWEEN THE COMPLAINT AND THE PROTEST IN THE ADMINISTRATIVE PROCESS

Doctoral student Miglena Kisiova

Department of Public Law, Faculty of Law

“Angel Kanchev” University of Ruse

Tel.: 0883 47 70 36

E-mail: mnoncheva@uni-ruse.bg

Abstract: The document aims to examine and analyze the similar characteristics and differences between the complaint and the protest in the administrative process of the Republic of Bulgaria. These are the two remedies used by the administrative process in proceedings to challenge administrative acts. On the other hand, these are also ways of protecting the legal interests of different legal entities.

Due to the specificity that the complaint is used by citizens and organizations to protect their personal rights and interests, it is necessary to distinguish between the two methods. Who can submit them, when, under what conditions? Whether the same legal rules apply to both?

Their role in the administrative process is crucial to how specific administrative proceedings would develop. In order to produce legal effects, both methods must be regular and admissible. Failure to do so would result in the complaint or protest being left without motion or without consideration.

Keywords: complaint, protest, administrative process, similar, differences

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FRI-2B.312-1-L

FRI-2B.312-1-L-01

**APPEARANCE OF LEGAL ENTITIES UNDER THE CURRENT
LEGISLATION**

Assistant professor Anastas Georgiev, PhD

Department of Civil Law, Law Faculty,

“Angel Kanchev” University of Ruse

Phone: +35982888746

E-mail: ageorgiev@uni-ruse.bg

Abstract: The start date of the registry reform in the Republic of Bulgaria is considered to be 01.01.2008, when the Commercial Register Act came into force and the Commercial Register, which lists the traders and branches of foreign traders, started functioning as a single electronic database towards the Registry Agency of the Minister of Justice. Ten years later, with the adoption of the amendments and supplements to the Law on Non-Profit Legal Entities and the Law on the Commercial Register, promulgated, SG, issue 74 of 20.09.2016, effective from 01.01.2018, it became possible for the non-profit legal entities to be transferred from the district courts to the RA. After a prolonged period of stagnation, the registry reform made a decisive step towards the establishment of a central register of legal entities and an electronic registry center of the Republic of Bulgaria. Other legal entities have maintained their registration regimes and continue to be registered with the district courts of their registered office in accordance with Chapter Fifty-fifth “Entry of Legal Entities” of the Code of Civil Procedure.

Keywords: registry reform, legal entities, Registry Agency.

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FRI-2B.312-1-L-02

**A POSSESSOR OR A HOLDER IS THE PERSON AFTER THE ENTRY
INTO FORCE OF THE JUDGMENT ON THE RESPECTED CLAIM
IN PROPERTY LAW (RESTITUTION OR DECLARATORY) BROUGHT
BY THE OWNER?**

Principal assistant professor, Sergey Kalinkov, PhD

Department of Civil Law, Law Faculty

“Angel Kanchev” University of Ruse,

E-mail: skalinkov@uni-ruse.bg

***Abstract:** The current legislation in art. 116 of the Obligations and Contracts Act (CPA) in connection with art. 84 of the Property Act (SA) explicitly refers to the grounds for interruption of the limitation acquiring period, with the onset of which a new statute of limitation period begins. The purpose of this article is to determine, on the basis of the theoretical views and the case-law approach, in which cases the defendant will have the status of "possessor" after the entry into force of the judgment on the respected claim in property law (restitution or declaratory) and in which cases "holder."*

***Keywords:** possessio, holding, statute of limitations, claim, pretension*

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THE INTERDICTIONAL PROTECTION OF THE POSSESSOR IN THE ROMAN PRIVATE LAW

Principal assistant professor, Sergey Kalinkov, PhD

Department of Civil Law, Law Faculty

“Angel Kanchev” University of Ruse,

E-mail: skalinkov@uni-ruse.bg

***Abstract:** The factual unlawful possessio, which is not “dressed” like subjective property right, being “just a fact”, has its roots in the Roman private law. It was connected to certain legal consequences, more precisely the interdictional protection of the possessor, which is given despite the fact of property possession. The purpose of this article is to reveal the legal approach of Roman private law to this institute, as well as a distinction of the interdictions themselves, depending on the type of the violation.*

***Keywords:** possessio, protection, interdictions;*

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THE OBLIGATION OF THE HEIR WHO ACCEPTED THE INHERITANCE UNDER THE BENEFIT OF INVENTORY FOR GIVING AN ACCOUNT

Senior assistant professor Ventsislav L. Petrov, Ph.D. in law

Department of Civil law studies,

Sofia University

E-mail: vencislav.petrov@yahoo.com

Abstract: The article researches the obligation of the heir who accepted the inheritance under the benefit of inventory for giving an account to the creditors of the estate and to the legatees. The object of the research includes the requirements for occurrence of this obligation, its content and the consequences of its breach. Dogmatic, teleological, historical and comparative methods are used in the research. Proposals for amendments of the legislation are made.

Keywords: heir, inheritance, succession, estate, acceptance of inheritance under the benefit of inventory, giving of account to the creditors,

JEL Codes:

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FRI-2B.312-1-L-05

ABOUT THE DISTINCTION OF COMMERCIAL TRANSACTIONS OF THE ABSOLUTE, SUBJECTIVE AND PRESUMPTIVE

Assist. Prof. Anna Nikolova, PhD

Faculty of Law, Department of Private Law

Angel Kanchev University of Ruse

E-mail: anikolova@uni-ruse.bg

Abstract: *The provision of Article 286 of the Commercial Act, which is the basis for the division of commercial transactions into absolute, subjective and presumptive ones, is the subject of thorough analysis in the report. Qualifying a particular transaction as subjective requires clarifying the question of when the transaction is related to the occupation of the merchant. The various views of the doctrine examined, and case law analyzed in order to indicate in which cases civil transactions are in fact commercial ones.*

Keywords: *absolute, subjective and presumptive commercial transactions.*

JEL Codes: *L10, L11*

FRI-2B.312-1-L-06

WITHDRAWAL OF THE MARRIAGE AGREEMENT

Giuldan Erkianova

Faculty of law, "Angel Kanchev" University of Ruse

Tel.: 0897575685

E-mail: gerkianova@uni-ruse.bg

Abstract: *The marriage contract is a new legal institute in Bulgarian family law. It is regulated by Family code in 2009 year. Art. 18 of the Code regulate three types of property relations between spouses: legal regime of intercommunity, legal regime of separation and marriage contract. For the first time people can self-regulate their property relations in civil marriage with a contract. Each bilateral contract can be terminated. The marriage contract also can be terminated (art. 42 of the Family code). In this report it is been considered conditions for terminate the marriage contract.*

Keywords: *marriage contract; termination; family law; property relations; conditions*

FRI-2B.312-1-L-07

ANALYSIS OF PRE-EMPLOYMENT PROTECTION IN CASE OF DISMISSAL

Svetlana Basheva – PhD Student
Department of Private Law, Law Faculty
University of Ruse “Angel Kanchev”
Tel.: +359 888 412 133
E-mail: sbasheva@uni-ruse.bg

Abstract: Preliminary protection under the Labor Code constitutes a precarious procedure, which is a precondition which the employer is obliged to observe in the case of dismissal, on the substantive grounds in Article 333 of the Labor Code, and the categories of civil servants and their aids. The law on the civil servant regulates in different ways the relationship in carrying out the civil service, and termination of employment. The differences between the two types of legal regulations, are characterised by the difference in the two governing laws, which determine their peculiarities. An attempt is made here to compare the pre-employment labour law protection to the pre-employment civil service law, as well as the possibilities for applying the protection provided under the Labour Code of Practice, where the Civil Service employment law does not make provisions.

Keywords: labor law, preliminary protection, pre-employment labour law protection, pre-employment civil service law

JEL Codes:

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FRI-2.101-1-L

FRI-2.101-1-L-02

**INSTITUTIONALIZING TERRORISM AS A FACTOR OF
SOCIO-POLITICAL DESTRUCTION IN THE CONTEXT OF
THE DEVELOPMENT OF GLOBAL SOCIO-POLITICAL PROCESSES**

Assoc. Prof. Kremena B. Rayanova, Ph.D. in law

Department of Law,

University of Ruse

E-mail: krayanova@uni-ruse.bg

Abstract: *The transformative paradigm is at the heart of the scientific approach to terrorism as a destructive political factor. This approach reveals the content of the socio-political process in relation to specific socio-political circumstances and also allows us to analyze patterns of historical dynamics. Socio-political processes are seen as the dynamics of the socio-political system and more globally, as an activity of socio-political players in the implementation of their decisions, as an independent sphere of social development.*

Thus, the role and place of terrorism as a factor of destabilization can only be assessed through the prism of process evaluation of interaction within the socio-political process, as an object-oriented destructive impact. On this basis, terrorist activity targets the interdependent components of the socio-political process.

Keywords: *socio-political, modern terrorism, modern political*

JEL Codes:

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FRI-2.101-1-L-03

SOME PROBLEMS IN THE APPLICATION OF PROBATION

Chief Ass. Svetlin Antonov, PhD

Department of Criminal Law,

“Angel Kanchev” University of Ruse, Bulgaria

Tel.: +359 82888729

E-mail: spantonov@uni-ruse.bg

Abstract: *The enforcement of the probation measures raises some problems, whose resolution is important for the achievement of the goals determined by Art. 36 of the Penal code. These problems are further complicated when more than one punishment is imposed on the sentenced person. Thus the possible hypotheses are enforcement of probation combined with effective imprisonment, conditional sentencing, parole, and with another probation. This analysis aims to highlight some controversial aspects that exist in theory and practice. Some were resolved through the legislature throughout the years, while others are completely or partially absent from the legal framework.*

Keywords: *Crime, punishment, imprisonment, probation, probation supervision*

ACTUAL PROBLEMS IN THE USE OF SPECIAL INTELLIGENCE MEANS AS A TECHNIQUE FOR ESTABLISHING EVIDENCE IN THE CRIMINAL PROCEDURE OF THE REPUBLIC OF BULGARIA

Lyuboslav Lyubenov, PhD Student

Department of Criminal Law and Security,

University of Ruse „Angel Kanchev“, Bulgaria

Tel.: +359 883417447

E-mail: lvlyubenov@uni-ruse.bg

Abstract: The reason for drafting this short paper is to accept the need for further consideration and refinement of the existing shortcomings in the legal regulation of special intelligence as a technique for establishing and verifying evidence in the criminal proceedings of the Republic of Bulgaria. In particular, it is an attempt to answer the question - what is the legal nature of special intelligence means and how does their application affect the accused's rights of defense? For this purpose, the publication analyzes the degree of correspondence between the rulings of some of the main principles of the criminal process and the regulation of special intelligence means. It has been studied in principle from the point of view of the potential of special intelligence to uncover objective truth. The "toxic" impact of special intelligence on the rights of the defense and the activity of proof as a whole has been investigated.

Keywords: criminal proceedings, special intelligence means, right of defense, accused, evidence

JEL Codes: K410, K420

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FRI-K1-1-QHE

FRI-K1-1-QHE-01

**MODERNIZATION OF HIGHER EDUCATION IN BULGARIA
IN AN EUROPEAN AND GLOBAL CONTEXT**

Assoc. Prof. Maria Fartunova, PhD

G. S. Rakovski National Defence Academy

Tel.: +359 889 603 623

E-mail: m.fartunova@abv.bg

***Abstract:** The publication presents the challenges of higher education in the context of globalization. The European perspective presents the development of higher education, with the current expansion and socialization. The impact of political change on higher education systems is examined.*

Guidelines and solutions for the modernization of the national higher education system are presented, related to: digital transformation of higher education; flexible forms of training; realization of the graduates' labor market; student and teaching mobility; recognition of previous training; systems for assessing the quality of education; research in higher education institutions.

***Keywords:** Globalization, Socialization, Higher Education, Quality of Education; Systems for Assessing the Quality, Mobility; Research*

***JEL Codes:** I23*

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FRI-K1-1-QHE-02

HIGHER EDUCATION SOCIALIZATION IN EUROPE AND BULGARIA

Assoc. Prof. Maria Fartunova, PhD

G. S. Rakovski National Defence Academy

Tel.: +359 889 603 623

E-mail: m.fartunova@abv.bg

Abstract: The paper examines the social aspects of higher education in a national, European and global context.

Social considerations include: social groups and social status, representation of social groups; access to higher education (gender, physical condition, ethnicity, age structure). The possibilities are considered: support for students (mentors, financing, professional realization); interruption or completion of education; mobility; continuing education; lifelong learning; recognition of previous training; flexibility and updating of programs; program monitoring.

Good practices are presented regarding the socialization of higher education, incl. in the digital transformation of higher education.

Keywords: Higher Education; Socia Status, Socialization, Programs, Good Practices, Mobility, Monitoring.

JEL Codes: I23

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FRI-K1-1-QHE-03

CONCEPT FOR DATABASE MANAGEMENT SYSTEM FOR TRACING OF GRADUATES' PROFESSIONAL REALIZATION

Cor. Mem. Prof. Hristo Beloev, DTSc, DHC mult.

Department of Construction and Mechanics of Structures,

"Angel Kanchev" University of Ruse

Tel.: 082 888 465

E-mail: hbeloev@uni-ruse.bg

Assist. Prof. Daniela Yordanova, PhD

Department of Business and Management

"Angel Kanchev" University of Ruse

Phone: 082 888 520

E-mail: dyordanova@uni-ruse.bg

Prof. Ivan Evstatiev, PhD

Department of Electronics,

"Angel Kanchev" University of Ruse

Phone: 082 888 772

E-mail: ievstatiev@uni-ruse.bg

Assos. Prof. Miroslav Mihailov, PhD

Department of Construction and Mechanics of Structures,

"Angel Kanchev" University of Ruse

Tel.: 082 888 782

E-mail: mmihaylov@uni-ruse.bg

Abstract: *The paper proposes an analysis of current state of art of University of Ruse's quality management system in correspondence with existing legal framework and requirements of The National Evaluation and Accreditation Agency (NEAA). Education in universities must comply with European Standard Guidelines and National Act for Higher Education and must fit within preset ten standards of NEAA. Four of these standards include requirements for evaluation of stakeholders for provided education in different aspects. Analysis show high level of compliance between applied quality insurance system in University of Ruse and legislative requirements. Nevertheless some more inquiries can be applied for improvement of performance at university and faculty level. A concept for database management system for tracing of graduates' professional realization is proposed.*

Keywords: *Stakeholders in high education, Accreditation, Quality assurance in high education, Concept for database management system for tracing of graduates' professional realization*

JEL Codes: J08, J23, J24, M54

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FRI-K1-1-QHE-04

METHODOLOGY FOR EXAMINATION OF STAKEHOLDERS' OPINION RELATED WITH UNIVERSITY GRADUATES' PROFESSIONAL REALIZATION

Assist. Prof. Daniela Yordanova, PhD
Department of Business and Management
"Angel Kanchev" University of Ruse
Phone: 082 888 520
E-mail: dyordanova@uni-ruse.bg

Assoc. Prof. Milena Kirova, PhD
Department of Business and Management
"Angel Kanchev" University of Ruse
Phone: 082 888 520
E-mail: mkirova@uni-ruse.bg

Abstract: The paper proposes a methodology for examination of stakeholders' opinion related with university graduates' professional realization in terms of requirements for provision of educational quality in Bulgarian universities. The methodology is based on developed concept for database management system for tracing of graduates' professional realization for the purposes of University of Ruse describes few questionnaires for different stakeholders' opinion evaluation by use of web-based approach. The questionnaires respond to covering the standards 2, 3, 7 and 9 of The National Evaluation and Accreditation Agency for programme accreditation of professional fields and is a supplement to existing University of Ruse system for assurance of quality of education.

Keywords: Methodology, Stakeholders in the process of university education and realization of university graduates, web based inquiry, questionnaires, Standards of The National Evaluation and Accreditation Agency

JEL Codes: J08, J23, J24, M54

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FRI-K1-1-QHE-05

PROJECT DEVELOPMENT GUIDELINES FOR IMPROVING THE STUDENTS EMPLOYABILITY VIA EFFICIENT CAREER COUNSELING

Prof. Nikolay Naydenov, DSc

Department of Management and Business Development,

“Angel Kanchev” University of Ruse

Phone: 082-888 279

E-mail: nnaydenov@uni-ruse.bg

Prof. Ivan Evstatiev, PhD

Career Development Centre,

“Angel Kanchev” University of Ruse

Phone: 082-888 245

E-mail: ievstatiev@uni-ruse.bg

Vanya Nikolaeva, MSc

Career Development Centre,

“Angel Kanchev” University of Ruse

Phone: 082-888 245

E-mail: vnaydenova@uni-ruse.bg

Abstract: The paper promotes a discussion on the level of career guidance and consulting of university graduates and alumni in the EU aiming to justify the development of international project for improving their employability through efficient career guidance. A deep a priori analysis of university frames for career guidance and consulting in the EU has been developed in order to justify the territorial scope and focus of an appropriate project for implementation of EU countries innovative good practices into the activities of University career centers and Offices of the The National Employment Agency in Bulgaria. The indicative content of an adapted EU certification program for career guidance and counseling in the field of labor market services delivered by University career centers and Offices of the National Employment Agency has been further developed on the basis of this study. It has also been pointed out that greater efficiency and impact would have projects funded by Human Resources development Programs and Territorial Cooperation Programs. Promising international partners seem to be universities the countries in the territory of the Danube Program and INTERREG Program: Romania, Greece, Turkey, Serbia and Macedonia.

Keywords: Career counselling, Students employability, International Projects.

JEL Codes: J2, J4

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STRATEGY OF DIGITAL TRANSFORMATION OF THE HIGHER EDUCATION IN BULGARIA (WHAT SHOULD WE BE ABLE TO DO TO BEGIN THE DIGITAL TRANSFORMATION OF EDUCATION?)

Cor. Mem. Prof. Hristo Beloev, DTSc, DHC mult.

Department of Agricultural Machinery,
"Angel Kanchev" University of Ruse
Tel.: +359 2 888 465
E-mail: hbeloev@uni-ruse.bg

Prof. Angel Smrikarov, PhD

Centre for Innovative Educational Technologies,
"Angel Kanchev" University of Ruse
Phone: +359 2 888 743
E-mail: ASmrikarov@ecs.uni-ruse.bg

Prof. Tzvetomir Vassilev, PhD

Department of Computer Science,
"Angel Kanchev" University of Ruse
Phone: +359 2 888 475
E-mail: TVassilev@ecs.uni-ruse.bg

Assoc. Prof. Aneliya Ivanova, PhD

Department of Computer Systems and Technologies,
"Angel Kanchev" University of Ruse
Phone: +359 2 888 768
E-mail: aivanova@ecs.uni-ruse.bg

Abstract: *The generation of the seven screens – the TV, computer, laptop, tablet, phablet, smart phone and smart watch – cannot and should not be taught in the same way as their parents were taught. One may not and should not write on a blackboard with a white chalk while teaching this generation. Replacing the blackboard with a white one and the chalk with a marker doesn't change things, i.e. this is not the way to motivate present day pupils and students to accumulate knowledge and to develop skills for successful integration on the job market.*

What needs to be done is adapt the education system to the digital generation by applying massive and effective ICT-based innovative educational technologies and didactic models. Along with that it is necessary to integrate research in the education process in order to shift the emphasis from mechanical acquisition of facts to the discovery of knowledge and development of skills.

But we have to emphasize that the information and communication technologies are not a panacea to all problems in the education system, rather they are just a tool which could make the lectures and workshops more informative and more attractive to the digital generation. THE TEACHER WILL RETAIN ITS KEY ROLE IN AN INTERACTIVE TEACHING PROCESS ORIENTED TO THE LEARNERS' NEEDS.

Here we should also mention that the reputation of a teacher and the effect of his/her activities will depend more and more not only on his/her level of mastery of the course content and on his/her pedagogical competence, BUT ALSO ON THE EXTENT TO WHICH (S)HE APPLIES MODERN INFORMATION AND COMMUNICATION TECHNOLOGIES FOR COLLECTING, PROCESSING AND TEACHING THE SPECIFIC TEACHING MATERIAL.

In other words – the education in the digital era has to be reconsidered and the educational paradigm must be changed BECAUSE LEARNERS DO NOT WANT TO STUDY THE OLD WAY ANY MORE AND TEACHERS SHOULD NOT KEEP ON TEACHING IN THE SAME WAY.

That is why it was developed in Bulgaria a STRATEGY OF DIGITAL TRANSFORMATION OF THE HIGHER EDUCATION.

THE GOAL of the strategy is to adapt the education system to the digital generation by introducing and implementing effectively innovative educational technologies and didactic models in teaching, thus providing the opportunity for EVERYBODY to learn at ANY time and at ANY place with the help of ANY teacher, using ANY end device - computer, laptop, tablet, phablet, smart phone, etc.

THE MAIN TASKS of the strategy are:

- 1. Keeping and guaranteeing the leading role of teachers and lecturers in the education by raising their qualifications in the field of innovative educational technologies.*
- 2. Developing traditional learning.*
- 3. Developing of synchronous distance learning (in real-time).*
- 4. Developing of asynchronous distance learning (at any time).*
- 5. Developing of blended learning.*
- 6. Implementing other innovative educational technologies.*
- 7. Implementing innovative didactic models.*

Keywords: *digital transformation of the higher education, traditional learning, synchronous and asynchronous distance learning, blended learning*

JEL Codes: *I20*

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VISION FOR THE CLASSROOM OF THE FUTURE (FUTURE EDUCATION SPACE)

Prof. Angel Smrikarov, PhD

Centre for Innovative Educational Technologies

“Angel Kanchev” University of Ruse

Phone: +359 2 888 743

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

Assoc. Prof. Galina Ivanova, PhD

Department of Computer Systems and Technologies,

“Angel Kanchev” University of Ruse

Phone: +359 2 888 768

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

Eng. Yuksel Aliev, PhD Student

Department of Computer Systems and Technologies,

“Angel Kanchev” University of Ruse

Phone: +359 2 888 519

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

Abstract: The report presents the authors' vision for the future classroom. This room will feature an interactive whiteboard and an interactive monitor. Each student will have an interactive table. What is written on the interactive table will appear on the interactive monitor. They will be used in teaching 3D scanner & 3D printer, virtual reality, augmented reality, holograms. Internet connection will be fast and broadband. This will allow video conferencing.

A future education space will be created at the University of Ruse by the end of the year. There will be a TV set in front of the hall that will give short films about innovative educational technologies.

Keywords: interactive whiteboard, interactive monitor, interactive table, 3D scanner & 3D printer, virtual reality, augmented reality, holograms, video conferencing

JEL Codes: I20

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FRI-K1-1-QHE-08

IMPROVING THE QUALITY OF EDUCATION BY M-LEARNING

Principal Assistant Tzvetelin Gueorguiev, PhD

Department of Machine Tools and Manufacturing,

“Angel Kanchev” University of Ruse

Tel.: +359 82 888493

E-mail: tzgeorgiev@uni-ruse.bg

Abstract: *The paper presents a step-by-step guide on how to develop m-learning modules for a set of subjects in the field of quality management. There is a growing need of applying digital learning materials and implementing e-learning and m-learning, both in classroom and open settings. Student satisfaction is affected by the quality and quantity of digital media coupled with traditional learning approaches. The modules presented in this paper are taught to Bulgarian and international students and are received with readiness and eagerness to learn by the students. The proposed solutions are free and easy to use by educators. This way of teaching provokes student involvement and customization of individual learning experiences.*

Keywords: *Quality, Education, M-Learning, E-learning, Google sites.*

JEL Codes: *I23, D83, L86*

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URL: <https://sites.google.com/view/suk2019/> Web site for the subject ‘Quality Management Systems’.

URL: <https://sites.google.com/view/upisu2019om11> Web site for the subject ‘Operations Management’.

IDENTITY AND ITS PROJECTION ON DIGITAL WORLD

Assoc. Prof. Miglena Pencheva, PhD

Department of Management and Business Development,

“Angel Kanchev” University of Ruse

Phone: +359 82 888 715

E-mail: mpencheva@uni-ruse.bg

Abstract: The paper reviews chunk of existing sources with respect to identity and its projection on digital world. These concepts are explored with purposes of: 1) to define core concepts of identity and digital identity; 2) to outline main challenges they impose to contemporary world; 3) to frame the side concepts with respect to digital identity. The report provides recent finding with respect to digital identity. There are outlined implication of other societal phenomenon with respect to contemporary generation and digital competence both in every day life and on the workplace.

Keywords: Identity, Digital identity, Managing digital identity

JEL Codes: M10, M12, M15

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FRI-K1-1-QHE-10

THE NATIONAL ECOSYSTEM AND THE PLACE OF THE UNIVERSITY OF RUSE IN THE ECOSYSTEM OF RUSE AND THE REGION

Assoc. Prof. Tanya Grozeva, PhD

Department of Repair, reliability, machinery, logistics and chemical technologies and Materials-handling Equipment, "Angel Kanchev" University of Ruse

Phone: 082 888 258,

E-mail: tgrozeva@uni-ruse.bg

Abstract: In Bulgaria, the ecosystem has been developing since the late 1990s, as such is considered to be already built in Sofia, and our country has become the Silicon Valley not only in the Balkans but in almost all of Eastern Europe. The link between education and real business is key to the development of the international IT ecosystem, which has been booming over the last decade, and the demand for skilled personnel has continued to grow.

Ruse, with its university, traditionally focused on technical majors, a strong high school of mathematics and many small and medium-sized IT companies, is one of the places where the information technology sector has the potential to be leading for the economy in the city and in the region. The material base is constantly improving, the tendency for the formation of an entrepreneurial ecosystem is tangible, the environment for the development of technological start-ups is offered, and the eyes are directed to the automotive industry. dialogue with business, promoting entrepreneurship training, participating in numerous European-funded projects, investing in innovation and constantly seeking a suitable place in cross-border Bulgarian Ro-Romanian region and the international area around the Danube basin.

Keywords: ecosystem, ICT sector, IT community, University of Ruse, dialogue with business, entrepreneurship

JEL Codes: I20

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FRI-K1-1-QHE-11

CHALLENGES TO ENSURING SUSTAINABILITY OF A NEW STUDY PROGRAMME IN A COMPETITIVE CONTEXT

Assoc. Prof. Liliya Todorova,
Department of Public Health and Social Work,
“Angel Kanchev” University of Ruse
Tel.: +359 886781013
E-mail: litod@uni-ruse.bg

Abstract: *The University of Ruse is a pioneer in introducing Occupational Therapy as a new educational degree and profession in Bulgaria. For already 13 years, the academic staff has invested their time and efforts to build a programme that meets national requirements and is internationally approved. Now the profession has reached a stage when it is becoming recognised and there is a growing need for trained practitioners. The next challenge is to ensure sustainability of the education in a highly competitive context and demographic problems. The report focuses on factors that bring about vulnerability and strategies to ensure sustainability. It is based on the author's reflections while building the first Occupational Therapy programme in Bulgaria.*

Keywords: *occupational therapy, sustainability, higher education*

JEL Codes: *I140, I240*

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FRI-K1-1-QHE-12

ENSURING THE QUALITY OF HIGHER EDUCATION BY CREATING TRANSPARENCY IN ACADEMIC STAFF DEVELOPMENT PROCEDURES

Assoc. Prof. Orlin Petrov, PhD

Department of Electrical Power Engineering,

“Angel Kanchev” University of Ruse

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 of academic staff. One of the factors affecting the quality of academic staff is ensuring transparency in the procedures for growing up in academic positions. The legal and regulatory requirements for the procedures for the development of the academic staff are considered. An analysis was made of the measures and means to ensure transparency as the composition grew. The practice of the University of Ruse and the measures for ensuring transparency of these procedures are described. The relevant conclusions are made.

Keywords: Quality of Higher Education, Academic Staff, Transparency Procedure

JEL Codes: I20, I203

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FRI-K1-1-QHE-13

THE ROLE AND CONTRIBUTION OF THE UNIVERSITY LIBRARY TO THE IMPLEMENTATION OF THE COMMUNICATION STRATEGY OF THE UNIVERSITY OF RUSE, BULGARIA AND UNIVERSITY'S IMAGE

Prof. Juliana Popova, PhD

Department of European Studies, International Relations and Security,

“Angel Kanchev” University of Ruse, Bulgaria

Phone: +359 82 888 255

E-mail: jppopova@uni-ruse.bg

Eng. Elisaveta Nedeva

University Library,

“Angel Kanchev” University of Ruse, Bulgaria

Phone: +359 82 888 477

E-mail: enedeva@uni-ruse.bg

Abstract: *The paper presents the contribution of the University Library at the University of Ruse, Bulgaria to the successful implementation of the Communication Strategy and Annual Communication Plans of the university through the support and active participation of the library team in numerous events held at the university. The theoretical part of the paper includes a review of theoretical sources about the grounds of a communication strategy and components of the institutional image. Some good practices about the role of the university library in the organization and promotion of events at the University of Ruse are discussed and analyzed.*

Keywords: *Communication strategy, institutional image, university library.*

JEL Codes: 035

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RESEARCH AND EVALUATION OF LIGHTING SYSTEMS AND LIGHTING DESIGN

Assist. Prof. Teodor Kyuchukov, PhD

Agrarian and Industrial Faculty

Department of Industrial Design

“Angel Kanchev” University of Ruse

E-mail: tkyuchukov@uni-ruse.bg

Abstract: The paper reviews three approaches for the study and evaluation of the lighting systems. The constructive and holistic approaches are presented with content and concrete realization in lighting design. The aesthetic approach reviews the evaluation of the lighting design using a methodology based on the aesthetic acceptability status. The rating system is represented by a 5-point rating scale - with verbal and numerical evaluation. The evaluation procedure is conducted by independent experts. The individual assessments of experts form a complex assessment. For the different classes of application of the lighting systems, the rating is normalized according to the weight of the aesthetic criterion of the respective class.

Keywords: constructive approach, holistic approach, aesthetic approach, evaluation, lighting systems, lighting environment, lighting design, rating scale, verbal and numerical evaluation, experts, aesthetic criterion, classes of application, ZET-model.

JEL Codes: L10, L11

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**PHYSICO-CHEMICAL BASIS FOR THE SYNTHESIS OF CERAMIC
PIGMENTS WITH A STRUCTURE OF VARIOUS SILICATES USING
ALTERNATIVE RAW MATERIALS**

Assoc. Prof. Oleksandr Zaichuk, DcS

Department of Ceramics and Glass,
SHEI Ukrainian State University of Chemical Technology, Ukraine
E-mail: zaichuk_av@ukr.net

Oleksandra Amelina, PhD

Department of Ceramics and Glass,
SHEI Ukrainian State University of Chemical Technology, Ukraine
E-mail: amelinaalex1@gmail.com

Assoc. Prof. Tsvetan Dimitrov PhD

Department of Chemistry and Chemical Technologies,
University of Ruse "Angel Kanchev", Branch Razgrad
E-mail: tz_dimitrow@abv.bg

Abstract: The research is aimed at developing the physical and chemical basis of the resource- and energy efficient technology of ceramic pigments of a wide range of colors with a specifying mineralogical composition and high physical and technical parameters. It was theoretically proved and experimentally implemented of the possibility of obtaining diopside lilacs, uvarovite greens and pink malayaite pigments with the use of granulated blast-furnace slag as an initial component was established. The features of the formation of their mineralogical composition are studied. The effective role of zinc, strontium and barium oxides in the formation of the structure of a diopside solid solution at low temperatures (1050-1100°C) due to a change in the geometry of structure-forming metal-oxygen polyhedra and distortion of the diopside chain is shown. It has been proved that with an increase in the acidity of pigment batches in the $\text{CaO} - \text{MgO} - \text{Al}_2\text{O}_3 - \text{SiO}_2 - \text{Cr}_2\text{O}_3$ system by means of equimolecular replacement of free silicon dioxide in their composition with phosphorus (V) oxide, the purity and intensity of green color of uvarovite pigments increases, and their firing temperature decreases to 1100-1150°C. The activity of blast furnace slag components in combination with the effective mineralizing effect of B_2O_3 additive allows performing the firing of pink pigments with the formation of the malayaite mineral at a low temperature of 1200°C.

Keywords: Ceramic pigments, Granulated blast furnace slag, Thermodynamic analysis, Crystal phase composition, Color properties, Glass coatings

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FUNCTIONAL COOKIES WITH THE ADDITION OF BREWER'S BARLEY MALT AND REDUCED SUCROSE ADDITION

Prof. Marko Jukić, PhD

Prof. Daliborka Koceva Komlenić, PhD

Josip Juraj Strossmayer University of Osijek, Faculty of Food Technology Osijek

Tel.: +385 31 224 300

E-mail: marko.jukic@ptfos.hr; daliborka.koceva@ptfos.hr

Assoc. Prof. Nastia Vasileva, PhD

Assistant Gjore Nakov, MSc

Department of Biotechnology and Food Technology, Branch Razgrad,

“Angel Kanchev” University of Ruse

Phone: +359 84 660 826

E-mail: gnakov@uni-ruse.bg

Assoc. Prof. Jasmina Lukinac, PhD

Josip Juraj Strossmayer University of Osijek, Faculty of Food Technology Osijek

Tel.: +385 31 224 300

E-mail: jlukinac@ptfos.hr

Abstract: The aim of this study was to investigate the effect of replacing part of wheat flour (20, 40 and 60 %) with special brewer's malted barley flour and effect of reduced sucrose (66.6%, 33.3% and 0%) on cookies quality. Four different special types of malt were used: Amber, Cara, Pilsner and Black. Moisture, dimensional and textural properties, colour and sensory properties of cookies were evaluated. Analyses of total polyphenol content and antioxidant activity were also conducted.

Based on the results of the research carried out it can be concluded that reduced sucrose addition significantly increased the moisture content and thickness of cookies. Width, spread factor and specific volume of cookies decreased proportional to the reduction of added sucrose. These changes are less pronounced in the samples with the addition of malted flour. Sucrose reduction significantly decreased snapping force and samples with addition of black type of malted flour had the highest snapping force values. Brightness decreased proportionally with the addition of malted flour. Malt addition significantly increased total polyphenol content and antioxidant activity of cookies. According to sensory analyses, cookies with the addition of lighter malts have a pleasant sweet and full flavour, while cookies with black malt have intense smell and unpleasant bitter taste.

It can be concluded that special brewer's malted barley flour can be successfully used in the production of functional cookies with simultaneous reduction of sucrose addition.

Keywords: functional cookies, malted barley flour, sucrose reduction

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FRI-LCR-KS(R)-03

ALTERNATIVE ENERGY SUPPLY OF FOOD INDUSTRY

Prof. Alexander Seregin, DcS

Department of theoretical mechanics and resource-saving technologies

National University of Food Technologies, Kiev, Ukraine

Tel.: +38 044 289-11-10

E-mail: sereginoo@ukr.net

Abstract: Global energy supply problems are shifting to the level of autonomous energy supply for food businesses. In addition to environmental issues, there are a number of factors that affect the competitiveness of food businesses. Unstable energy supply, fluctuations in energy prices associated with the use of traditional energy sources, impede the development of companies and corporations. Over the last 10 years, electricity prices for Bulgarian industrial enterprises have increased several times.

In some cases, renewable energy is in close proximity to the manufacturing industry and can solve the energy and environmental problems of the business.

In spite of the numerous publications related to the problems of renewable energy resources, the level of scientific and methodological justification of the regulatory and legal, financial and administrative measures designed to stimulate the transition to the administrative supply of energy from the food industry is not in line with the current stage of the development of energy technology science and the needs of economic practice.

Therefore, the analysis of the strategic directions of alternative energy supply at the level of specific processing enterprises is relevant both in theory and in practical terms.

Keywords: Energy, Resources, Energy saving, Resource saving, Energy supply, Waste

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FRI-CR-1-CT(R)

FRI-CR-1-CT(R)-01

**STUDY OF THE FORMATION OF CERAMIC-METAL COATINGS
FOR SPECISL ALLOYS**

Prof. Victor Goleus, DcS

Department of Chemical Technology of Ceramics and Glass,
Ukrainian State University of Chemical Technology

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 and Chemical Technologies,
University of Ruse "Angel Kanchev", Branch Razgrad
E-mail: tz_dimitrow@abv.bg

Senior Reseacher Tatyana Kozyreva, Junior reseacher Andrey Saley, PhD

Department of Chemical Technology of Ceramics and Glass,
Ukrainian State University of Chemical Technology

***Abstract:** The main advantages of ceramic-metal thermal insulation coatings are resistance to virtually all aggressive environments, high strength, wear resistance, hardness, low density and stability of mechanical properties over a wide temperature range. The paper reviews the process of forming ceramic-metal coatings on a chromium-nicel alloy was investigated. The analysis of the effect of the composition of the ceramic-metal coating on crack formation and surface quality of the coating is carried out. The basic properties of the developed ceramic-metal coatings are given.*

***Keywords:** Ceramic-metal coatings, Chromium-nicel alloy, Protection, Burning*

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FRI-CR-1-CT(R)-02

IONIC SILVER ZEOLITE, METHOD OF ITS PRODUCTION AND ITS USE FOR MEDICAL PURPOSES

Todor Mihalev, PhD

Executive Environmental Agency

E-mail: rl_burgas@abv.bg

Doktor Tsvetan Balkanski

Private practice

Abstract: The invention relates to ionic silver zeolite, which represents zeolite with particle size of 60 -100 μm and size of pores of 3 - 4 \AA , silver ions from 0,03 mg/g up to 3 mg/g.

The method of its production, in accordance with the invention, is as follows:

A) deionized water is saturated through electrolysis with silver ions by application of electricity with voltage of 8-10 V on silver electrodes for a duration of between 0,5 and 2 hours until silver ion concentration of between 0,03 mg/l and 3 mg/l is reached.

B) natural zeolite is subjected to grinding and sieving down to a fraction with particle size of 60 -100 μm . After that, it is rinsed with a 5%-solution of Sodium Chloride. A second rinsing through deionized water follows until the Chloride ions are removed. The so cleaned zeolite is thermally activated by heating it at 400°C - 450°C for 2-3 hours until the full release of the zeolite water.

C) Then follows the mixing of the zeolite 3-4 \AA with the water saturated with ionic silver for a duration of 1 to 2 hours with intensive stirring at a ratio of silver water from 0,03 mg/l up to 3 mg/l : zeolite 1 g. The mixture filtered under vacuum with a 50 μm filter. The drying is performed at 25°C until the complete removal of moisture.

The ionic silver zeolite, in accordance with the invention, is intended for use in human and veterinary medicine as an antibacterial and antimicrobial agent. For internal use with maximum saturation of ionic silver from 0,03 mg/g up to 0,1 mg/g and for external use from 1 mg/g up to 3 mg/g, as one part of the zeolite pores remain free, which multiplies its drying effect and it enhances its ability for additional ion-exchange, by detaching its Sodium and Calcium ions, together with a sufficient quantity of silver ions.

Advantages of this method - inexpensive, as there is no application of high temperatures, no additional agents are used, which makes it environmentally friendly. The method provides the possibility to control the quantity of silver ions, adsorbed in the zeolite, and it also ensures the obtaining of a product, which is suitable for medical application, as it possesses the property to release the biocidal agent with a predetermined speed and achieve optimal biological availability in the treated organism.

Keywords: Zeolite, Ionic silver zeolite, Methods,

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INCREASING THE STRENGTH OF QUARTZ CERAMICS

Assoc. Prof. Olena Khomenko, PhD

Department of Chemical Technology of Ceramics and Glass,
Ukrainian State University of Chemical Engineering, Ukraine
E-mail: elenahths@ukr.net

Assoc. Prof. Tsvetan Dimitrov PhD

Department of Chemistry and Chemical Technologies,
University of Ruse "Angel Kanchev", Branch Razgrad
E-mail: tz_dimitrow@abv.bg

Student Oleksandra Makedonskaya

Department of Chemical Technology of Ceramics and Glass,
Ukrainian State University of Chemical Engineering, Ukraine
E-mail: jjqwertyqw@gmail.com

Abstract: The article explores a way to improve the operational characteristics of quartz ceramics. The method includes introducing into the slip of finely ground quartz glass finely dispersed refractory fibers of aluminosilicate composition and a boron-containing component. Modifying additives introduced into the composition of quartz ceramics in an amount up to 0.25 wt.% Fibers and up to 0.75 wt.% Boric acid made it possible to reduce the water absorption of the material calcined at 1200 °C by 25% and increase its strength by 32%. At the same time, the temperature coefficient of linear expansion of ceramics remains low, and the compressive strength increases. The electrical resistivity is slightly reduced, but the material remains in the class of dielectrics.

Keywords: Quartz Ceramics, Grinding, Slip, Casting, Firing, Water Absorption, Mechanical Strength

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AB INITIO STUDY OF MECHANISM OF PREBIOTIC REACTIONS: FROM UREA AND GLYCINAMIDE TO HYPOXANTHINE

Prof. Venelin Enchev, DSc

Assist. Prof. Sofia Slavova

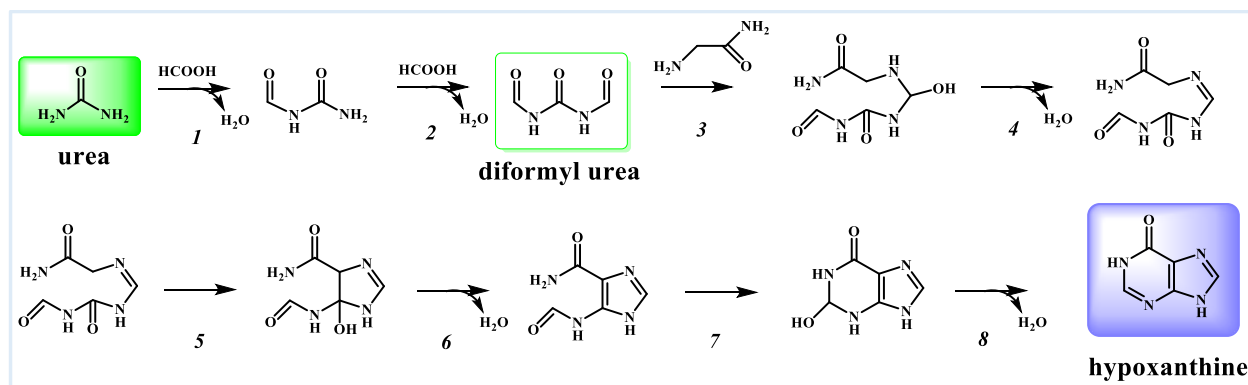
Institute of General and Inorganic Chemistry,

Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria

E-mail: venelin@svr.igic.bas.bg (V. Enchev), sslavova@svr.igic.bas.bg (S. Slavova)

Abstract: Nucleobases play a key role in the codification of life. The prebiotic synthesis of purine bases, proposed by Oro, and by Ferris and Orgel, starts from hydrogen cyanide (HCN). It has been demonstrated that adenine can be obtained by heating ammonium formate and HCN, or by heating formamide (HCONH_2) in a sealed tube. The condensation of formamide has been shown to be a robust chemical pathway affording molecules necessary for the origin of life. In 2004, Lagoja and Herdewijn have shown that the simple organic compounds urea ($(\text{NH}_2)_2\text{CO}$), formic acid (HCOOH) and glycine might have been used for the formation of hypoxanthine and they have suggested a possible reaction pathway. This experiment must be considered rather a generic approach to obtain a purine base from a simple amino acid derivative and a urea derivative.

Quantum chemical computations represent a suitable tool to reveal details about intermediates and transition states along the reaction pathways. The current study presents a quantum-chemical modelling of the condensation reaction of glycinamide and diformylurea (the condensation product of urea and HCOOH). The mechanism for the formation of hypoxanthine is studied at MP2 and SCS-MP2 levels of theory using cc-pVDZ basis set. The reaction route is shown below.



Reaction of hypoxanthine formation starts with successively formylation of urea by formic acid. In the first step the carbon atom of formic acid attacks nitrogen atom of urea forming C-N single bond. The obtained N-formylurea reacts by same mechanism with formic acid molecule to formation of diformylurea. In the next two steps, diformylurea reacts with glycinamide. The amino group of glycinamide attacks a terminal carbonyl atom in the diformylurea forming 2-((3-formylureido)(hydroxyl)methylamino)acetamide as intermediate and after proton transfer from -NH- to the hydroxyl oxygen atom, double C=N bond is formed. In fifth step five-membered ring closes, followed by the formation of double C=N bond in sixth step, forming N-(1H-imidazol-4-carboxamide-5-yl)-formamide. Seventh step is six-membered ring closure and formation of 2-hydroxy-2,3-dihydro-3H-hypoxanthine. In the last step the proton at N3 nitrogen atom in the six-member ring of 2-hydroxy-2,3-dihydro-3H-hypoxanthine migrates to the hydroxyl group at the C3 atom, resulting in hypoxanthine.

Acknowledgements: The calculations are performed on the AVITOHOL supercomputer at the Institute of Information and Communication Technologies at the Bulgarian Academy of Sciences. Funding of this work by the National Science Fund, under Grant DN09/7/2016 is gratefully acknowledged.

Keywords: Prebiotic compounds, Glycine, Urea, Hypoxanthine, Ab initio

FRI-LCR-1-BFT(R)

FRI-LCR-1-BFT(R)-01

APPLICATION OF SPECIAL METHOD FOR TREATMENT OF WATER LIQUID SYSTEMS

Senior Scientist Iryna Dubovkina, DcS

Department of heat and mass exchange in disperse systems,

Institute of Engineering Thermophysics of National Academy of Sciences of Ukraine

Tel.: ++380505295975

E-mail: dubovkinai@ukr.net

Abstract: *The paper reviews existing methods of hydrodynamic treatment of water liquid systems and shows the prerequisite to use them in foodstuff production as perspective. Great attention was given to the water liquid systems treatment by alternating impulses of pressure. The purpose of these studies was to research the influence of the technological modes of alternating impulses of pressure treatment on the water liquid systems for changing their physical and chemical properties and parameters. Experimental investigations of water liquid systems samples were carried out with use potentiometrical laboratory measurement procedures. The visualization and volume parametric imitation, modelling methods, were used for the description of the hydrodynamic conditions at experimental equipment. Investigational studies have shown that the special method such as method of the alternating impulses of pressure may be appropriate for technology of water liquid systems treatment in foodstuff production. It was found that the water liquid systems treatment by alternating impulses of pressure can greatly decrease duration of the technological process, reduce energy, power and resource consumption, increase efficiency of the treatment.*

Keywords: *Alternating impulses of pressure, Treatment, Water, Liquid systems, Model*

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FRI-LCR-1-BFT(R)-02

BINDING EXPEDIENT OF PHENOLIC ACIDS FROM THE PLANT *GRAPTOPETALUM PARAGUAYENSE* E. WALTHER TO VIRAL DNA POLYMERASE AMINO ACIDS: A THEORETICAL INSIGHT

Assist. Nina Stoyanova, MSc

Institute of General and Inorganic Chemistry,
Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria
E-mail: Nnkova.nina@gmail.com

Assist. Prof. Miroslav Rangelov, PhD

Institute of Organic Chemistry with Centre of Phytochemistry,
Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria
E-mail: marangelov@gmail.com

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

Prof. Venelin Enchev, DSc

Institute of General and Inorganic Chemistry,
Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria
E-mail: veneline@gmail.com

Assist. 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: Among the most common infections are those caused by human herpes viruses, including Herpes Simplex virus type 1 and type 2 (HSV-1 and HSV-2) spread worldwide. Common therapies for herpes infections employ nucleoside analogs, such as Acyclovir, and target the viral DNA polymerase, essential for viral DNA replication. Systemic application of these agents is often limited by the development of drug-resistance or toxicity, especially in immunosuppressed patients. A better understanding of the herpes virus replication will help the development of new safe and effective broad-spectrum anti-herpetic drugs that fill an unmet need. Recently we found that the total methanol extract from succulent plant *Graptopetalum paraguayense* E. Walther (GP) demonstrates a significant inhibitory effect on HSV-1 as well as the GP phenolic fraction. Since virus-encoded DNA polymerase 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 DNA polymerase amino acids. Twelve different phenolic 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 DNA Polymerase. The structure was protonated according to implemented Protonate3D algorithm and was scored according to implemented GBVI/WSA dG scoring function. According to this scoring function, trans-ferulic acid and gentisic acid have optimal interactions with the receptor.

From the results based on the molecular docking methods, we have modeled some hydrogen-bonded complexes between phenolic and amino acids. The received data from our quantum-chemical calculations suggest that all phenolic acids could form stable complexes with amino acids from the DNA polymerase active site. The calculations were performed at B3LYP/6-31+G(d,p) level of theory using GAUSSIAN 09 software package.

Keywords: *Graptopetalum paraguayense* E. Walther, DNA polymerase, Herpes Simplex virus, docking, quantum-chemical calculations, hydrogen-bonding

ASSESSMENT OF ENERGY EXPENDITURE ON THE KNEADING WHEAT DOUGH PROCESS

Prof. Volodymyr Telychkun, PhD

Department Machines and apparatus of food and pharmaceutical productions,
National University of Food Technology, Ukraine
E-mail: tvill@meta.ua

Prof. Stanka Damyanova, Dr. sc.

“Angel Kanchev” University of Ruse - branch Razgrad
E-mail: sdamianova@uni-ruse.bg

Student, Andrii Anisimov

Department Machines and apparatus of food and pharmaceutical productions,
National University of Food Technologies, Ukraine
E-mail: andreyanisimov0@gmail.com

Assoc.prof. Yuliya Telychkun, PhD

Department Machines and apparatus of food and pharmaceutical productions,
National University of Food Technology, Ukraine
E-mail: tvill@meta.ua

Abstract: A quantitative assessment of the quality of the process of kneading the dough in the dough machines, of both periodic and continuous this is the total and specific energy expenditure. Determination of energy expenditure is necessary for the calculation of the dough machine as well as the energy analysis of specific stages of the process. Studies were conducted on a laboratory kneading machine of periodic action. To measure the energy expenditure used wattmeter. An analysis of the experimental data showed how energy expenditure varied throughout the experiment and confirmed three stages of the kneading wheat dough process. Comparing the calculated theoretical values with the obtained experimental values, they were found to be different. Studies of the process of kneading wheat dough prove the need for changes in the method of calculating energy expenditure for kneading, eliminating the formal approach to this process and taking into account the energy expenditure of structural transformations.

Keywords: dough, mixing machine, energy expenditure, kneading, qualities.

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FRI-LCR-1-BFT(R)-04

ROLE OF FOOD AND NUTRITION IN CANCER

Assoc. Prof. Cristina Popovici, PhD

Department of Food and Nutrition, Faculty of Food Technology
Technical University of Moldova, Republic of Moldova
E-mail: cristina.popovici@toap.utm.md

Assoc. Prof. Tatiana Munteanu, PhD

Department of Economic Theory and Marketing, Faculty of Economic Engineering and Business
Technical University of Moldova, Republic of Moldova
E-mail: tatiana.munteanu@tem.utm.md

Abstract: Cancer imposes an enormous burden on societies in more and less economically developed countries alike. The occurrence of cancer is increasing due to the growth and ageing of the population, as well as the increasing prevalence of established risk factors, such as smoking, being overweight (relating to abnormal and/or inappropriate food consumption), physical inactivity, and changing reproductive patterns associated with urbanization and economic development. Potential anticancer effects of food-related components should be further researched in clinical trials on different models for their effectiveness and toxicological documentation. Furthermore, extensive research work should be carried out on these components to evaluate their possible applications, toxicological and particular genotoxic profile against a wide range of cancer in both either in-vitro or in-vivo.

Keywords: food, nutrition, cancer.

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REVIEW OF THE WORKING BODIES OF VERTICAL BEAD MILLS

PhD student Kateryna Hrininh

Department of Machines and apparatus of food and pharmaceutical productions

National University of Food Technology, Ukraine

Phone: +380972123056

E-mail: neackriss@gmail.com

Assoc. Prof. Oleksii Gubenia, PhD

Department of Machines and apparatus of food and pharmaceutical productions

National University of Food Technology, Ukraine

Phone: +380989612869

E-mail: gubena@meta.ua

Abstract: *It is considered existing configurations of working members of vertical bead mills for grinding the cosmetic, pharmaceutical and food products by a wet methods. In standard designs of rotors with disks and/or pins, due to the presence of centrifugal forces, there is a stagnant zone in which the movement of the beads and the product is practically not observed. As a result the product has an uneven particle size distribution, and the time spent on the process increases. The configuration of the rotor with a reduced annular gap provides a reduction in the time of grinding of solid materials in suspension, with a smaller volume of grinding chamber.*

Keywords: *beads, configuration, rotor, grinding, disk.*

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FRI-LCR-1-BFT(R)-06

NOVEL TRENDS IN MEAT PACKAGING: ACTIVE PACKAGING ON MICROBIOLOGICAL ATTRIBUTES OF DIFFERENT TYPES OF FRESH MEAT AND MEAT PRODUCTS

Davor Daniloski, MSc

Faculty of Technology and Technical Sciences,

"St Kliment Ohridski" University - Bitola, Republic of North Macedonia

E-mail: danilodavor@outlook.com

Prof. Anka Trajkovska Petkoska, PhD

Faculty of Technology and Technical Sciences,

"St Kliment Ohridski" University - Bitola, Republic of North Macedonia

E-mail: anka.trajkovska@uklo.edu.mk

Abstract: *The investigation of different types of active meat packaging (vacuum and modified atmosphere packaging) in various packaging materials and their influence on the microbiological quality of packed fresh meat has become increasingly popular over the last decade. Meat represents cellular, biochemically and structurally complex system, susceptible to many undesirable changes, such as microbial growth, lipid oxidation and sensorial change. This is directly related to consumer's acceptance. Meat packaging objective is to control and optimise meat quality, to confirm meat hygiene and safety, to extend its storage stability, and directly result in lower the utilisation of preservatives throughout the storage. Active packaging (AP) system provides such functionalities to facilitate these demands and offers role beyond the traditional protection and inert barrier to the external environment. This article reviews the main advantage of AP system for fresh meat or meat products. Also, in this review information about some dominant microorganisms in fresh meat or meat products, such as aerobic mesophilic bacteria (AMB), aerobic psychotropic bacteria (APB), lactic acid bacteria (LAB) and pseudomonas counts are provided.*

Keywords: Active Meat Packaging, Aerobic Mesophilic Bacteria (AMB), Aerobic Psychotropic Bacteria (APB), Lactic Acid Bacteria (LAB), Meat, Pseudomonas Counts, Shelf-Life

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APPLICATION OF IONIZING RADIATION FOR TREATING OF MODERN MATERIALS IN FOOD PROCESSING AND PACKAGEING INDUSTRY

Assist. Prof. Delyan Gospodinov, PhD

Prof. Stefan Stefanov, PhD

Department of Machines and apparatus in food processing industry,

University for food technologies Plovdiv

E-mail: dgosp@abv.bg, stvstefanov@yahoo.com

Assoc. Prof. Vilhelm Hadjiski, PhD

Department of Technical mechanics,

University for food technologies Plovdiv

E-mail: hawi@abv.bg

Mihail Bechev, student

University for food technologies Plovdiv

Abstract: *There has been an increase in the applications of ionizing radiation for the past few years for treating of structural materials in food processing industry as well as materials intended to be used for packing and preserving of food products and drinks. The specific mechanisms of interaction of ionizing radiation with the matter is related to irreversible changes of the microstructure of the treated materials which alters their physical, chemical and mechanical properties. This enables the creation of new materials as well as the application of innovative technologies for production and processing of existing materials. The paper reviews some of these newly developed technologies, their advantages and disadvantages.*

Keywords: *ionizing radiation, treating, processing, production, materials, polymers, cellulose, composites*

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SAT-CR-P-2-CT(R)

SAT-CR-P-2-CT(R)-01

**MULIPARAMETER OPTIMIZATION FOR GENERATION OF
TECHNOLOGICAL AND LOGISTIC SOLUTIONS FOR PRODUCTION
AND USE OF BIODIESEL**

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-student

Laboratory "Process System Engineering", Institute of Chemical Engineering,
Bulgarian Academy of Sciences, Sofia. Bulgaria

Phone: +359 89 446 0421

E-mail: evgeniy_ganev@abv.bg

Prof. Boyan Ivanov, DcS

Laboratory "Process System Engineering", Institute of Chemical Engineering,
Bulgarian Academy of Sciences, Sofia. Bulgaria

Phone: +359 89 871 9913

E-mail: bivanov1946@gmail.com

Assoc. Prof. Dragomir Dobrudzhaliyev, PhD

Laboratory "Process System Engineering", Institute of Chemical Engineering,
Bulgarian Academy of Sciences, Sofia. Bulgaria

Phone: +359 88 909 9038

E-mail: dragodob@yahoo.com

Abstract: *The problem discussed in this article can generally be expressed as follows. We have a set of energy crops that should be converted into biodiesel, which include crops such as sunflower, rapeseed and more. We envisage a ten-year planning horizon that includes government regulations, manufacturing, construction and carbon tax. For the purposes of the study, we rely on the superstructure of an integrated biofuel supply chain, including a range of collection points and a range of search areas, as well as potential locations for individual facilities and biorefineries.*

Keywords: *Biodiesel, Supply chain, Multi criteria decision making*

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SAT-CR-P-2-CT(R)-02

APPLICATION OF THE METHOD FOR SAMPLING OF SILT LOADING ON ASPHALTED ROADS

Asst. Prof. Dimitrinka Ivanova

Department „Ecology and environmental protection”

Faculty of Natural Sciences

„Prof. Dr. Assen Zlatarov” University, Burgas

E-mail: dimisivanova@gmail.com, divanova@btu.bg;

Veselina Yordanova - Student

Department „Ecology and environmental protection”

Faculty of Natural Sciences

„Prof. Dr. Assen Zlatarov” University, Burgas

Emine Ahmed - Student

Department „Ecology and environmental protection”

Faculty of Natural Sciences

„Prof. Dr. Assen Zlatarov” University, Burgas

Abstract: *In the most cities in the country, road transport provides the best opportunity for a free movement of the people, leading to rapid increase of the vehicles and their concentration. This, in turn, is particularly anxiously because the air pollution increases. The road traffic is an ongoing source of urban atmospheric pollution. The main mechanism by which motor vehicles cause particulate matter (PM) contamination is the suspension of road dust. According to epidemiological studies and reports from the EEA and WHO, the dust particles contribute to respiratory, pulmonary, cardiovascular diseases, heart attacks, and premature death in humans in large cities, which makes for all institutions to show care.*

The dust emissions from the asphalt roads depend on the silt loading on the road surface itself. Therefore, the purpose of the present study is to apply a methodology in the city of Burgas for the sampling of road sediment with which experimental data can be collected on the condition of the road network in relation to the existing silt loading.

Keywords: *Air pollution, road vehicles, silt loading, particulate matter*

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MICROENCAPSULATION OF ROSE OIL BY SELF-ASSEMBLY METHOD

Assist. Prof. Stanislav Bayryamov, PhD

Department of Repairing, Reliability, Mechanisms,
Machines, Logistic and Chemical Technologies,
“Angel Kanchev” University of Ruse
E-mail: sbayryamov@uni-ruse.bg

Assoc. Prof. Maria Nikolova, PhD

Department of Material Science and Technology,
University of Ruse “Angel Kanchev”, Bulgaria
E-mail: mpnikolova@uni-ruse.bg

Abstract: Every biologically active compound shows activity in its suitable native form. Unfortunately, the most of them are unstable, due to their partial degradation under environmental conditions. The stability of these products could be increased by microencapsulation which is a process of compound packing (called core material) with shell material as a result of physical-, physico-chemical or chemical interactions. The prepared particles including the desired product as core material, have size around several microns, preserve it from unfavorable ambient conditions (to be stable for a long period of time) and allow the compound to have prolonged effect by its gradually permeation through the microcapsule shell.

In this paper, the authors describe the synthesis of rose oil microcapsules through a self-assembly precipitation process of calcium carbonate used as shell material. The procedure included a combination of TWEEN 20 and SPAN 80 as surfactants (nonionic detergents, used as emulsifying agents). Due to their closely spaced uncharged free functional hydroxyl groups, TWEEN 20 and SPAN 80 could interact with calcium ions on the droplet surface, obtaining mixed micelles with positive charges on their surface. The self-assembly process of calcium carbonate microcapsule shell preparation was initiated by subsequent dropwise addition of sodium carbonate to the previously prepared positive charged micelles. The results are in accordance with the publications of other authors, who describe the microcapsules preparation with CaCO_3 as shell material by the self-assembly process, using TWEEN 80 and SPAN 80.

Keywords: Biopolymers, Fragrances, Microencapsulation, Self-Assembly Process, Natural Compounds, Rose Oil, Droplets, Surfactants.

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SAT-CR-P-2-CT(R)-04

INHIBITION OF STEEL IN 0.1 M H₂SO₄

Assoc. Prof. Temenuzhka Haralanova, PhD

Department of Chemistry and Chemical Technologies,
University of Ruse, Razgrad subsidiary, 7200 Razgrad, Bulgaria
E-mail: tharalanova@uni-ruse.bg

Assist. Prof. Christian Girginov, PhD

Department of Physical Chemistry,
University of Chemical Technology and Metallurgy, 1756 Sofia, Bulgaria
E-mail: girginov@uctm.edu

Dr. Stephan Kozhukharov, PhD

LAMAR- Laboratory for Advanced Materials Research
University of Chemical Technology and Metallurgy, 1756 Sofia, Bulgaria
E-mail: stephko1980@abv.bg

Abstract: In the present study the corrosion rate of steel in an aggressive acidic medium with the addition of the organic substance (1- (2-benzoylphenyl)-2-hydroxyethanone) at three temperatures was investigated. This compound was laboratory synthesized for the purpose of testing its inhibitory effectiveness in a corrosion medium of 0.1 M H₂SO₄. A gravimetric method was applied in order to determine the corrosion rate and the corresponding degree of protection. It has been found that, despite the existence of a specific structure and appropriate functional groups, this substance (at relatively low concentrations) does not reveal a high degree of protection of steel in sulfuric acid environment. However, the study performed helps to clarify the relation between the inhibitory properties of different classes of organic compounds and the presence of different functional groups in their structure.

Keywords: corrosion, inhibitors, 1- (2-benzoylphenyl)-2-hydroxyethanone

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ANTIBACTERIAL PERFORMANCE OF CHITOSAN BASED MEMBRANES LOADED WITH TETRACYCLINE FOR WOUND HEALING APPLICATIONS

Assoc. Prof. Dilyana Zvezdova, PhD

Department of Preclinical and Clinical Subjects,

Prof. Assen Zlatarov University

E-mail: zvezdova@abv.bg

Anife Veli, PhD

Radoslava Nikolova, PhD

Central Scientific Research Laboratory,

Prof. Assen Zlatarov University

E-mail: anife_veli@abv.bg, radost_vv@yahoo.com

Abstract: *In this study, the possibility of immobilizing an antibiotic (tetracycline) onto chitosan (CS) and chitosan/zeolite (CSZ) composite membranes for wound healing applications was investigated. To study the loading capacity of tetracycline onto the CS/CSZ membranes UV-spectroscopy was employed. The main challenge was to provide antibacterial properties through a local delivery of antibiotics in order to prevent infection in wounds during the wound treatment procedures. The antibacterial activity against Escherichia coli ATCC 25922 and Staphylococcus aureus ATCC 29213 strains of the developed membranes was assessed through disk-diffusion method by means of Mueller-Hinton agar. The results obtained show that chitosan/zeolite membranes loaded with tetracycline exhibited better antimicrobial properties compared to other studied objects.*

Keywords: Chitosan, Chitosan/zeolite composite membranes, Zeolite, Tetracycline, Escherichia coli, Staphylococcus aureus.

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SAT-CR-P-2-CT(R)-06

MACHINES AND TECHNIQUES FOR PROCESSING FIBERS AND FINISHED PRODUCTS

Assoc. Prof. Tanya Grozeva, PhD

Department of Repairing, Reliability,
Mechanisms, Machines, Logistic and Chemical Technologies,
“Angel Kanchev” University of Ruse, Bulgaria
E-mail: tgrozeva@uni-ruse.bg

Assist. Prof. Stanislav Bayryamov, PhD

Department of Repairing, Reliability,
Mechanisms, Machines, Logistic and Chemical Technologies,
“Angel Kanchev” University of Ruse, Bulgaria
E-mail: sbayryamov@uni-ruse.bg

Abstract: *The incorporation of various substances, both from natural sources and artificially synthesized onto filamentary polymers, is a process with many-sided applied aspects. The immobilization of components with antiseptic or organoleptic properties on various natural, semi-synthetic and artificially produced polymer fibers is receiving increasing consumer demand. There are several basic ways to determine the type of machine used in the aromatization of textile product via the incorporation of various substances. The so-called "finishing processes" can be carried out at different stages of the production process (i.e. on fabrics, yarns, fibers, etc.), the processing sequence being very variable and dependent on the end-user requirements. The process of flavoring the finished textile material can be done on the finished fabric or on the fibers, from which their knitting will occur. Here, we expose a brief overview of these machines and techniques for processing fibers and finished products depending on the sort of final product, without claiming their detail and completeness.*

Keywords: Immobilization, Incorporation, Textile Product, Fiber, Cotton Fabrics, Natural Substances, Machines, Techniques

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PREPARATION OF UREA-FORMALDEHYDE MICROCAPSULES FILLED WITH ROSE OIL BY *IN SITU* POLYMERIZATION METHOD. INFLUENCE OF THE SURFACTANT CONCENTRATION

Assist. Prof. Stanislav Bayryamov, PhD

Department of Repairing, Reliability, Mechanisms,
Machines, Logistic and Chemical Technologies,
“Angel Kanchev” University of Ruse
Phone: +359 82 888 228; +359 82 888 459
E-mail: sbayryamov@uni-ruse.bg

Assoc. Prof. Maria Nikolova, PhD

Department of Material Science and Technology,
University of Ruse “Angel Kanchev”, Bulgaria
E-mail: mpnikolova@uni-ruse.bg

Abstract: *The microencapsulation process is greatly facilitated in the presence of emulsifier. In this article, urea-formaldehyde microcapsules, filled with rose oil, were prepared by in situ polymerization in oil in water emulsion system. In the microencapsulation procedure, SDS was used as emulsifier with various concentrations. The experimental results described that the microencapsulation efficiency increases with increasing of the emulsifier concentration. This is due to the decreasing of the droplets diameter during the emulsification step, which allows the synthesis of smaller microcapsules at in situ polymerization step. As in situ polymerization process of the UF pre-polymer proceeds on the droplets surface, the mean droplets diameter determines the diameter of the finally prepared microcapsules. The mean particle size and the size distribution were analyzed using optical microscope, which supports the thesis presented above. The presence of a huge amount of emulsifier is undesired, because of increasing of the reaction media viscosity, following with the microcapsule size rising. Moreover, the presence of a large quantity of surfactant is economically disadvantageous.*

Keywords: *urea, formaldehyde, droplet, pre-polymer, surfactant, mono methylol urea, in situ polymerization, rose oil*

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SAT-CR-P-2-CT(R)-08

KINETIC STUDY OF THE NON ISOTHERMAL ANALYSIS OF CHITOSAN SHRIMP SHELLS FROM BLACK SEA

Assos. Prof. Dilyana Zvezdova, PhD

Department of Preclinical and Clinical Subjects,

Prof. Assen Zlatarov University

Prof. Jakimov str.1, 8010 Burgas, Bulgaria

E-mail: zvezdova@abv.bg

Ass. Prof. Nedelcho Nedelchev

Department of Computer and Information Science

Prof. Assen Zlatarov University

Prof. Jakimov str.1, 8010 Burgas, Bulgaria

E-mail: nnedelchev@btu.bg

Abstract: *In the present study, thermal decomposition kinetics of chitosan from shrimp shells from the Black Sea was investigated by a thermal analyzer. These studies were conducted to use chitosan for medical purposes.*

Firstly, the experiments were performed at three different heating rates from 30 °C to 800 °C under air environment. A decomposition thermal analysis of chitosan from shrimp shells on the Black Sea was carried out. The destruction processes of a complex solid-phase were researched. The correlation dependencies for approximate solution of Arrhenius integral were applied to the study of kinetics of destruction. It was used a complex criterion to assess the quality of the decomposition. The results led us to assume that the real adequacy is achieved by decomposition of five subprocesses. The results of were analyzed.

Keywords: *Non-isothermal kinetic study, Chitosan from shrimp shells, Complex processes, Complex method, Decomposition to single -model.*

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A REVIEW OF METHODS AND TECHNIQUES FOR CHARACTERIZATION OF STRUCTURE, MORPHOLOGY AND DISPERSION STABILITY OF MICROCAPSULES

Assoc. Prof. Maria P. Nikolova, PhD

Department of Material Science and Technology,
University of Ruse "Angel Kanchev", Bulgaria
E-mail: mpnikolova@uni-ruse.bg

Assist. Prof. Stanislav Bayryamov, PhD

Department of Department of Repairing, Reliability,
Mechanisms, Machines, Logistic and Chemical Technologies,
University of Ruse "Angel Kanchev", Bulgaria
E-mail: sbayryamov@uni-ruse.bg

Abstract: Many different active materials such as flavours, enzymes, drugs, vitamins, etc., are subject to microencapsulation inside microspheres made from different polymeric and non-polymeric materials. These microcapsules release their content at certain time and depending on the end use of encapsulated moieties, they could be implemented in agriculture, food, cosmetic, pharmaceutical, textile or other products. The paper reviews the existing methods and techniques for characterization of microcapsules with various morphologies, structures and properties. These characterization techniques include methods for determination of composition, visualizing tools, size measurements, examination of structure, crystallinity, and dispersion stability of microcapsules. The paper summarizes the common physicochemical techniques for microcapsule characterization and thus, provides a useful tool for researchers working in this area.

Keywords: Microcapsules, Morphology, Structure, Composition, Characterization methods,

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SAT-CR-P-2-CT(R)-10

ANALYTICAL METHOD FOR DETERMINATION OF CONCENTRATIONS OF POLYCYCLIC AROMATIC HYDROCARBONS IN FINE PARTICULATES

Assist. Prof. Stela Naydenova

Department „Ecology and environmental protection”

Faculty of Natural Sciences

„Prof. Dr. Assen Zlatarov” University, Burgas

E-mail: steltion@gmail.com

Anife Veli, PhD

Department „Central Scientific Research Laboratory” (CSRL)

Faculty of Natural Sciences

„Prof. Dr. Assen Zlatarov” University, Burgas

E-mail: anife_veli@abv.bg

Zilya Mustafa, PhD

Department „Central Scientific Research Laboratory” (CSRL)

Faculty of Natural Sciences

„Prof. Dr. Assen Zlatarov” University, Burgas

E-mail: zmustafa@abv.bg

Senior Assist. Prof. Lenia Gonsalvesh-Musakova, PhD

Department „Central Scientific Research Laboratory” (CSRL)

Faculty of Natural Sciences

„Prof. Dr. Assen Zlatarov” University, Burgas

E-mail: lenia_gonsalvesh@abv.bg

Abstract: This study aims to develop a routine methodology for the qualitative and quantitative determination of 19 PAHs in particulate matter (PM). The procedure is based on active sampling on a glass fiber filter for 24h, by a high flow pump, followed by ultrasonic extraction, purification by column chromatography and GC-MS analysis was. The developed methodology was validated in terms of linear range, limit of detection, limit for quantification, precision and accuracy of each of the 19 analytes. The limits of detection and the limit of quantification are, respectively, in the range of 1.1 to 4.3 pg/ μ L and 3.3 to 13 pg/ μ L, as the lowest is registered for the naphthalene and the highest for the coronene. The developed method can be defined as accurate and precise for the 19 analytes tested, as a recovery of 80-120% and RSD below 6% are achieved. The developed method was successfully applied to urban PM samples and the results showed that none of the detected PAHs concentrations exceeds the set average annual concentration of 1 ng m⁻³ for BaP.

Keywords: Air pollution, PM_{2.5}, PM₁₀, PAHs, GC/MS

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SAT-CR-P-2-CT(R)-11

SYNTHESIS OF HIGHLY POROUS DIELECTRIC MULLITE CERAMICS WITH WOOD SAWDUST AS PORE- FORMER

Assistant Fila Yovkova, PhD

Prof. Irena Markovska, PhD

Department of Silicate Tehnology

Assen Zlatarov University, Burgas, Bulgaria

E-mail: fila_03@abv.bg, imarkovska@btu.bg

Prof. Magdalena Mitkova, PhD

Department of Organic Chemistry

Assen Zlatarov University, Burgas, Bulgaria

E-mail: mmitkova@btu.bg

Dimitar Georgiev, PhD student

Department of Silicate Tehnology

Assen Zlatarov University, Burgas, Bulgaria

E-mail: postadg@abv.bg

Assos. Prof. Dimitar Rusev, PhD

Assoc. Prof. Yancho Hristov, PhD

Assen Zlatarov University, Burgas, Bulgaria

E-mail: drr.rusev@gmail.com, janchrist@abv.bg

Abstract: Mullite ceramics with high porosity and dielectric properties are synthesized. For this purpose, two widespread wastes are used: $\gamma\text{-Al}_2\text{O}_3$ from the petrochemical industry and wood sawdust from the woodworking industry. 3% TiO_2 is added to the corundum powder in order to obtain a solid solution and to reduce the synthesis temperature. X-ray diffraction analysis showed that the predominant phase in all compositions is mullite. Corundum and cristobalite are occurred as secondary phases. Porous materials with open porosity of the order of 68% were obtained. The ceramics could find application in the capacitor production.

Keywords: mullite ceramics, waste alumina, porous materials

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PREPARATION OF UREA-FORMALDEHYDE MICROCAPSULES FILLED WITH ROSE OIL BY *IN SITU* POLYMERIZATION METHOD. INFLUENCE OF THE STIRRING RATE, STIRRING TIME, AND REACTION TEMPERATURE OF THE STIRRING PROCESS

Assist. Prof. Stanislav Bayryamov, PhD

Department of Repairing, Reliability, Mechanisms,
Machines, Logistic and Chemical Technologies,
“Angel Kanchev” University of Ruse
E-mail: sbayryamov@uni-ruse.bg

Assoc. Prof. Maria Nikolova, PhD

Department of Material Science and Technology,
University of Ruse “Angel Kanchev”, Bulgaria
E-mail: mpnikolova@uni-ruse.bg

Abstract: The microencapsulation by in situ polymerization method includes three stages: 1) Pre-polymer synthesis; 2) Emulsification stage; 3) Polymerization stage (microcapsule shell formation). The emulsification stage could be divided into two substages: A. Droplets formation; B. Pre-polymer molecular adsorption on the droplet surface. As the second stage consists of oil in water emulsion preparation, its dependence from the changing in reaction conditions is obviously and determines this step as the most important. At this step, the stirring rate, stirring time and the temperature of the stirring process influence on the microencapsulation process by determining the mean droplets diameter and pre-polymer particles adsorption on the droplets surface. Increasing of the stirring rate leads to decrease of the droplets size. The same results were achieved when the stirring time was increased. The influence of the temperature during the emulsification stage is ambiguous. For instance, during the substage of droplets formation, enhancement of the reaction temperature leads to reduce of the droplets diameter. However, after the droplets formation with the desired size, increasing of the temperature leads to pre-polymer desorption from the droplet surface. For this reason, the emulsification stage could be accompany with temperature increasing, and after that, at the middle of the emulsifying step - decreasing of the reaction temperature - to allow the successful pre-polymer molecular adsorption on the droplet surface. This article examines the changes of the above described parameters, to optimize the conditions of the microencapsulation process. The present study is in accordance with the previous results of other authors and complements them to some extent.

Keywords: urea, formaldehyde, urea-formaldehyde (uf) polymer, droplet, pre-polymer, emulsion, stirring rate, stirring time, stirring temperature, mono methylol urea, in situ polymerization, rose oil.

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COMPUTER PROCESSING OF THERMODYNAMIC DATA FOR CALCULATION OF EQUILIBRIUM CONSTANT

Assoc. Prof. Temenuzhka Haralanova, PhD

Department of Chemistry and Chemical Technologies,
University of Ruse, Branch Razgrad, 7200 Razgrad, Bulgaria
E-mail: tharalanova@uni-ruse.bg

Ch. Assistant Mariyka Petrova, PhD

Department of Chemistry and Chemical Technologies,
University of Ruse, Branch Razgrad, 7200 Razgrad, Bulgaria
E-mail: mgpetrova@uni-ruse.bg

Senior Lecturer Ilina Ivanova

Department of Biotechnology and Food Technology,
University of Ruse, Branch Razgrad, 7200 Razgrad, Bulgaria
E-mail: iivanova@uni-ruse.bg

Abstract: *There is a number of ways for calculating the equilibrium constant of a chemical reaction. One of them is through the variation of Gibbs' standard energy.*

The present work presents a way of calculating the thermodynamic characteristic of chemical equilibrium by computer processing of reference data. The development is an example of students' independent extracurricular work. The method of calculation is in line with current trends in the development of science, with the establishment of interdisciplinary links of information technology with chemistry. Modern chemistry training is demonstrated through the use of modern computer methods.

Keywords: *chemical equilibrium, equilibrium constant, Gibbs energy, relational data, electronic application.*

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SAT-CR-P-2-CT(R)-14

LIQUID JET GAS EJECTORS: DESIGNS OF MOTIVE NOZZLES, PERFORMANCE EFFICIENCY

Assoc. Prof. Ponomarenko Vitaly, PhD

Department of Technological Equipment and Computer Technology Design
National University of Food Technologies, Kyiv, Ukraine
E-mail: vponomarenkov@ukr.net

Assoc. Prof. Tsvetan Dimitrov PhD

Department of Chemistry and Chemical Technologies,
University of Ruse "Angel Kanchev", Branch Razgrad
E-mail: tz_dimitrov@abv.bg

Postgraduate. Andriy Slyusenko

Assoc. Prof. Lulka Dmitriy, PhD

Department of Technological Equipment and Computer Technology Design
National University of Food Technologies, Kyiv, Ukraine
E-mail: andriy_slyusenko@ukr.net, lulkadm@ukr.net

Abstract: *Liquid jet gas ejectors are widely used to provide a variety of technological processes due to constructive simplicity, high intensity of the processes, and possibility for installation in any location.*

However, the drawback of this equipment is a low performance coefficient which does not exceed 40%.

Taking into account the fact that jet apparatus design is a simple one, the role of each element and its set-down has a great impact. One of the ways to increase efficiency of this equipment is the choice of the motive nozzle's type. Known scientific data related to such a choice are very disputable and need further elaboration.

The purpose of this research is the study of ejectors' work of different types of the jets: jet nozzles, centrifugal and jet nozzles on the basis of injectors with a center plug and axial blind hole, as well as universal pulverizing jet with the inclined underwater passage. The pulverizing jet works in the range of centrifugal to jet streaming depending on the height of the open passage.

Conducted researches of the ejectors with the specified types of the active jets demonstrated a significant impact of the used jets on performance coefficient of the jet apparatus.

Keywords: *ejector, motive nozzle, ejection coefficient, efficiency*

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CHARACTERIZATION TECHNIQUES FOR MICROCAPSULES IMMOBILIZED ON TEXTILES

Assoc. Prof. Maria Nikolova, PhD

Department of Material Science and Technology,
University of Ruse "Angel Kanchev", Bulgaria
E-mail: mpnikolova@uni-ruse.bg

Assist. Prof. Stanislav Bayryamov, PhD

Department of Department of Repairing, Reliability,
Mechanisms, Machines, Logistic and Chemical Technologies,
University of Ruse "Angel Kanchev", Bulgaria
E-mail: sbayryamov@uni-ruse.bg

Abstract: Microencapsulation of fragrances or other active substances for industrial application in textiles is vastly used for development of innovative textile products. The elaboration of such new products with added-value properties can increase their competitiveness, durability, stability, permeability, fire-resistance, chemical protection, bactericidy, etc. To achieve the desired mechanical and physicochemical properties the textiles containing immobilized microcapsules should be properly characterized at laboratory and industrial scale. For that reason, the paper covers the basis and theory of immobilized microcapsule characterization methods and it could be used as reference resource for material scientists, chemists and engineers to choose which techniques could be appropriate for particle characterization needs.

Keywords: Microcapsules, Morphology, Characterization methods, Release, Aroma

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STRUCTURE PROPERTIES INVESTIGATION OF CHITOSAN NANOCOMPOSITE BIOFILMS

Assoc. Prof. Dilyana Zvezdova, PhD

Department of Preclinical and Clinical Subjects,

Prof. Assen Zlatarov University

E-mail: zvezdova@abv.bg

Abstract: *This work is intended to shed more light on the options for a creation of nanocomposite chitosan biofilms suitable as a drug loaded and delivery substance. It possesses a specific adapted stimulation matrix that delivers a drug into the patients body over a prolonged period of time. Pure chitosan and nanocomposite chitosan/zeolite biofilms are created. It is established that the chitosan nanocomposites with zeolite nanoparticles have better solubility compared to pure chitosan biofilms. Scanning electron microphotographes (SEM) are meant to evaluate a morphology and physical film structure. X-ray microanalytical analyses are carried out on the film surface and Al, Si, Fe content distribution is established. The chitosan/zeolite nanocomposite biofilm possesses a thru physical porosity, resp. a larger specific surface area and diffusion properties are more suitable for a medical bandage, tissue engineering attributes, biosensitive devices etc.*

Keywords: *Chitosan, Chitosan/zeolite, Nanocomposite, Biofilms, Zeolite, Mechanophysical structure.*

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SAT-CR-P-2-CT(R)-17

AUTOMATED CALCULATION OF EQUILIBRIUM CONSTANT USING THE TOMKIN - SCHWARZMAN METHOD

Ch. Assistant Mariyka Petrova, PhD

Department of Biotechnology and Food Technology, Razgrad Branch,
“Angel Kanchev” University of Ruse

Phone: 359 988716355

E-mail: mgpetrova@uni-ruse.bg

Assoc. Prof. Temenuzhka Haralanova, PhD

Department of Chemistry and Chemical Technologies,
University of Ruse, Razgrad subsidiary, 7200 Razgrad, Bulgaria

E-mail: tharalanova@uni-ruse.bg

Senior Lecturer Iliana Ivanova, PhD

Department of Biotechnology and Food Technology,
University of Ruse, Branch Razgrad, 7200 Razgrad, Bulgaria

E-mail: iivanova@uni-ruse.bg

Abstract: *The quantitative characteristic of equilibrium in a chemical system is the thermodynamic quantity Equilibrium constant. There are various methods for calculating the equilibrium constant of a chemical reaction. One of them is the Tymkin-Schwartzman method.*

The present work presents an automated method for calculating the equilibrium constant of a chemical reaction by computer processing of reference data. The method of calculation is related to the establishment of interdisciplinary links between physicochemistry and information technology. The development could be used in the students' independent extracurricular work. It is an example of modern chemistry training through the use of modern computer skills.

Keywords: *electronic application, tabular data, chemistry, equilibrium constant, Tymkin - Schwartzman.*

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SAT-CR-P-2-CT(R)-18

SYNTHESIS AND STUDY OF SPINEL CERAMIC PIGMENTS IN THE SYSTEM $\text{COO.ZNO.AL}_2\text{O}_3$

Assoc. Prof. Tsvetan Dimitrov PhD

Department of Chemistry and Chemical Technologies,
University of Ruse "Angel Kanchev", Branch Razgrad
E-mail: tz_dimitrov@abv.bg

Tsvetalina Ibrevva PhD - Student

Department of Silicate Tehnology
Assen Zlatarov University, Bourgas, Bulgaria
E-mail: cvetila@abv.bg

Prof. Irena Markovska PhD

Department of Silicate Tehnology
Assen Zlatarov University, Bourgas, Bulgaria
E-mail: imarkovska@abv.bg

Abstract: Synthesis and study of spinel ceramic pigments in the system $\text{CoO.ZnO.AL}_2\text{O}_3$: The aim of paper is the synthesis of new spinel ceramic pigments. The blend prepared was ground in a ball mill and subjected to heat treatment. Spinel ceramic pigments were synthesized at 800°C-1200°C. The optimal temperature for the synthesis and the most appropriate mineralizer were defined. The phases established by X-ray diffraction and infrared spectroscopy are determined. The colour characteristics were measured spectrophotometrically with Tintometr RT 100 Lovibond. The particle sizes of the pigments were determined by transmission electron microscopy. The best pigments are applied in white cover glaze for faience.

Keywords: pigments, colour, ceramic, spinel

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BIODEGRADABLE OILS, LUBRICANTS AND ADDITIVES. METHODS FOR THEIR PREPARATION

Assist. Prof. Vasil Kopchev, PhD

Department of Repairing, Reliability, Mechanisms,
Machines, Logistic and Chemical Technologies,
“Angel Kanchev” University of Ruse
E-mail: vkopchev@uni-ruse.bg

Assist. Prof. Stanislav Bayryamov, PhD

Department of Repairing, Reliability, Mechanisms,
Machines, Logistic and Chemical Technologies,
“Angel Kanchev” University of Ruse
E-mail: sbayryamov@uni-ruse.bg

Abstract: Biodegradable oils and lubricants and their additives play an important role in modern automotive industry, due to their ecological purity and biodegradability. There are several methods for synthesis of these products including as classical and conventional reactions in synthetic organic chemistry as well as standard protocols for peptide synthesis. They include transesterification reactions, esterification, aminolysis, reaction of condensation etc. Some of them involves using of catalysts, for instance p-toluene sulfonic acid, another applies azeotrope distillation via Dean-Stark apparatus, and third of them utilizes condensing reagents, for instance DCC, TBTU, HBTU etc. When milder conditions had to be provided, condensing reagents were applied. Based on these methods a variety of compounds could be synthesized, depending on the compound structure and necessary conditions. This paper describes the methods and protocols mentioned above, that allow preparing some derivatives of glycerol, trimethylol propane and pentaerythritol, used as basestocks and raw materials for biodegradable oils, lubricants and additives production.

Keywords: Trimethylol propane, Glycerol, Biodegradable oils, Biodegradable additives, Oleic acid, Amino acids, Transesterification, Condensation reaction, Aminolysis, TBTU

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PREPARATION OF UREA-FORMALDEHYDE MICROCAPSULES BY PRELIMINARY SYNTHESIS OF STABLE PRE-POLYMER FOR ITS LONG TIME STORAGE

Assist. Prof. Stanislav Bayryamov, PhD

Department of Repairing, Reliability, Mechanisms, Logistic and Chemical Technologies,
"Angel Kanchev" Univesity of Ruse

E-mail: sbayryamov@uni-ruse.bg

Abstract: *In situ polymerization method in water emulsion system, used for the preparation of microcapsules, consists of three main stages. The first one includes the UF pre-polymer synthesis at the pH range of 8÷8.3. The second stage which is the emulsifying step, consists in the preparation of oil in water emulsion by mixing of the pre-polymer solution with the core material. At this step the UF pre-polymer molecules are adsorbed on the surface of the previously formed droplets of core material. At the final stage, microcapsules are prepared by the UF pre-polymer polymerization at the droplets surface initiated by the lowering of the pH of the reaction mixture.*

As the most authors prepare the UF pre-polymer solution just before the second (emulsifying) step, this determines the need of the pre-polymer preparation everytime strictly before the microencapsulation process. In this paper, the author describes the preparation of rose oil microcapsules by preliminary synthesis of a stable pre-polymer and its storage for a long time. Thus the prepared pre-polymer could be used many times by taken in portions, thus facilitating the whole microencapsulation process.

Keywords: Urea, Formaldehyde, Droplet, Pre-Polymer, Mono Methylol, In situ Polymerization, Rose Oil.

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SAT-LCR-P-2-BFT(R)

SAT-LCR-P-2-BFT(R)-01

**MOLECULAR PROPERTIES AND BIOACTIVITY SCORE OF NEWLY
SYNTHESIZED DERIVATIVES OF BEXAROTENE**

Assoc. Prof. Yana Koleva - PhD

Department of Physical Chemistry and Organic Chemistry,
Bourgas "Prof. Assen Zlatarov" University
E-mail: yanuriana@abv.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

Assist. Prof. Nadya Agova - PhD Student

Ivelin Iliev - Pharmacy Student

Department of Pharmaceutical Sciences, Faculty of Pharmacy,
Medical University-Varna "Prof.Dr.Paraskev Stoyanov"
E-mail: Nadya.Agova@mu-varna.bg, i__iliev@abv.bg

Abstract: Bexarotene is a member of a subclass of third-generation synthetic retinoid. It is used as a treatment for cutaneous T cell lymphoma (CTCL). Bexarotene binds to and selectively activates retinoid X receptors (RXRs) which function as ligand-activated transcription factors that control gene expression, regulate cell differentiation and proliferation. The aim of this work is to calculate the probable molecular physicochemical properties and bioactivity scores of bexarotene and five newly synthesized derivatives of the bexarotene by software Molinspiration as potential drugs. The data analysis for all newly synthesized derivatives of bexarotene were found to haven't drug likeness property in some respects and their bioactivity scores are active for GPCR ligand and Nuclear receptor ligand and are moderately active for Ion channel modulator, Kinase inhibitor, Protease inhibitor and Enzyme inhibitor.

Keywords: synthetic retinoids, bexarotene derivatives, predict, bioactivity score, molecular properties

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SAT-LCR-P-2-BFT(R)-02

MECHATRONIC MODULE FOR WEIGHT DOSING OF VISCOPLASTIC FOODS

Prof. Oleksandr Gavva, Dr

Department of machines and apparatus of food and pharmaceutical production
National University of Food Technologies
E-mail: gavvaoleksandr@gmail.com

Borys Mykhailyk, PhD student

Department of machines and apparatus of food and pharmaceutical production
National University of Food Technologies
Phone: 098-455-28-72
E-mail: bmykhailyk@gmail.com

Nataliya Kulyk, PhD

Department of machines and apparatus of food and pharmaceutical production
National University of Food Technologies
E-mail: nataliya.kulyk@ukr.net

Abstract: In the paper, the processes of extrusion and dosing of viscoplastic food products using a tensometric weighing system has been considered. The study has been carried out to determine the dynamic forces that affect the tensometric system in filling packagings process. The loads that products were stressed by when passing a screw feeder have been evaluated. The filling process has been investigated by simulation using the FlowVision software. To ensure uniform loads on the weighing system, the changes in the indications of the filling system when using a telescopic tube have been studied. The design of a mechatronic module for dispensing viscoplastic food products by weighting method has been proposed.

Keywords: Weight dosing, strain gauge system, simulation modeling, mechatronic module

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LIMITING FACTORS IN PROCESSES OF ANEAROBIC FERMENTATION OF SUGAR CONTENT MEDIA

Prof. Anatoly Sokolenko, DcS

Department of Mechatronics and Packaging Technology,
National University of Food Technologies, Ukraine
Tel.: +38 097 596 05 35
E-mail: mif63@i.ua

Prof. Oleksandr Shevchenko, DcS

Vice-rector for scientific work,
National University of Food Technologies, Ukraine
Tel.: +38 073 455 46 94
E-mail: tmpt@ukr.net

Sergei But, PhD

The Department of Preservation Technology,
National University of Food Technologies, Ukraine
Phone: +38 067 505 87 57
E-mail: S.booth@ukr.net

Abstract: A known and recognized factor for limiting the dynamics of anaerobic fermentation and the accumulation of ethyl alcohol in liquid media is the amount of osmotic pressure, which is attributed to C_2H_5OH due to the relatively limited solubility of carbon dioxide. However, the presence of culture media in states close to saturation under conditions of endogenous synthesis of CO_2 is the reason of the increase in mass transfer resistance at the interface between the phase of the yeast biomass and the liquid phase. Due to the laws of solubility of gases in liquid media, it is proposed to use artificial medium transfer to unsaturated states due to changes of pressure in the gas phase in the ingenious volume with corresponding pauses in time. Such a sharp decrease in pressure means effective desaturation with the formation of a dispersed gas phase and causes intense mass exchange with an increase in hydrodynamic regimes in the circulating circuits and decrease in osmotic pressure. The subsequent increase in pressure in the gas phase leads to the collapse of residues of dispersed carbon dioxide with cavitation effects and decrease in the mass transfer resistance of endogenous synthesis.

Keywords: anaerobic fermentation, hydrodynamics, mass transfer, culture medium, saturation, desaturation.

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INFLUENCE OF KELP ALGAE ON WHEAT BREAD STALING

Mimi Petrova -PhD Student

Department of Commodity Science.

University of economics - Varna

Tel.: +359 882 00 96 96

E-mail: m.petrova@ue-varna.bg

Abstract: Bread is a product of high and constant consumption both in Bulgaria and in other countries around the world. The use of various additives to improve quality and to retard bread staling is a widespread practice, which has been the main subject of numerous studies. Nowadays an innovative practice is the use of algae and algae products as supplements to improve the quality, nutritional value and shelf life of bread. The change of total, plastic and elastic deformation of the bread crumb enriched with 2% and 4 % algae Kelp was investigated during storage period of 3, 24, 48 and 72 hours. The significant influence of the algae on the deformation characteristics of the bread crumb was found. The results obtained in the experimental studies strongly indicate that the addition of Kelp algae to the wheat bread formulation leads to a delay in the hardening of the bread crumbs, preservation of plasticity and, respectively, to a delay in the process of bread staling.

Keywords: bread staling, algae, Kelp, deformation characteristics

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ADIABATIC DYNAMINA OF COOLING MASHING THROUGH CREATION OF VACUUM IN THE FERMENTATION APPARATUS

Assoc. Prof. Oleksii Boiko, PhD

Department of Mechatronic and Packaging Technology
National University of Food Technology, Kyiv, Ukraine
Tel.: +380 95 1262506
E-mail: boikooo@gmail.com

Asist. Svitlana Mironenko

Department of Mechatronic and Packaging Technology
National University of Food Technology, Kyiv, Ukraine
Phone: +380 67 9100109
E-mail: boikooo@gmail.com

Abstract: Transformation of the material flow of sugar as part of the solution corresponding to equation Gay-Lussac, and they are the result of the transformation of life of yeast.

The lifetime occurrence of gas bubbles to hit at up-liquid space should be divided into two periods. First period - an increase of bubbles on the surface where it originated. It is characterized by a gradual increase in its size at the site of formation. Second period - the ascent, which is characterized by the growth of the bubble by reducing the hydrostatic pressure in the fluid surrounding the gas bubble.

After the occurrence of gas bubble grows in size due to its diffusion of dissolved gases, and evaporation of the liquid phase volume. After reaching a critical size bubble breaks away from the surface on which it arose, and expires and is removed from the solution at up-liquid space.

When surfacing vapor-gas bubbles in the bulk liquid in the bubble volume evaporates molecules of ethanol, water and diffusion of molecules of carbon dioxide. To determine amount of these substances and the end of the size it is necessary to determine the surface area and mass transfer while the process.

It is proved the feasibility of using adiabatic cooling and formed with secondary steam to reduce energy consumption breweries and alcohol industry. Researched possibilities of fermentation of plant material with simultaneous removal of ethanol. The possibility of using technology processing grain si-Rovinj reduced pressure to increase the extract of corn flour in the production of beer. Confirmed experimentally possible to remove the ethanol by adiabatic boiling at temperatures that don't deactivate yeast cells.

Keywords: transformation of sugar, gas bubbles, yeast

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SAT-LCR-P-2-BFT(R)-06

PARAMETRIC SYNTHESIS OF MECHATRONICS MODULE OF DISPENSING OF LIQUID FOOD PRODUCTS

Prof. Mykola Iakymchuk,
Department of Mechatronics and
Packaging, National University of Food Technologies
Kyiv, Ukraine
Tel.: +380667676119
E-mail: mykolaiakymchuk.2016@gmail.com

PhD student Horchakova Olha,
Department of Mechatronics and
Packaging, National University of Food Technologies
Kyiv, Ukraine
Tel.: +380937288675
E-mail: horchakovaom@gmail.com

Abstract: *The article proposes a methodology for creating new packaging equipment for the distribution of liquid food stuffs, which has a flexible structure and is versatile when changing the dose or packaging material. The authors substantiate the development of a new generation of metering equipment by using the concept of mechatronic design principle. A new design of mechatronic dispensing module based on the use of pneumatic hose closures is proposed and substantiated. A distinctive feature of the hose closures is the cross section, which can be adjusted by changing the air pressure. A mathematical model for calculating the effective cross-sectional area of a pneumatic hose gate as a function of control pressure change is presented. It is established that such dependence is nonlinear and is characterized by a small range of variation of the effective area. This effect significantly affects the method of operation of the mechatronic module with pneumatic hose shutter and the choice of its elements.*

Keywords: *dosage, mechatronic module, effective area, liquid product.*

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A SURVEY OF THE PLANT *GRAPTOPETALUM PARAGUAYENSE* E. WALTHER FOR ANTI-INFLUENZA VIRUS ACTIVITY

Assoc. Prof. Petia Genova-Kalu, PhD

National Centre of Infectious and Parasitic Diseases, Sofia, Bulgaria

E-mail: petia.d.genova@abv.bg

Assist. Prof. Ivayla Dincheva, PhD

Assoc. Prof. Ilian Badjakov, PhD

AgroBioInstitute, Plant Genetic Resources Group,

E-mail: ivadincheva@yahoo.com, ibadjakov@gmail.com

Prof. Venelin Enchev, DSc

Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences

E-mail: veneline@gmail.com

Assist. Prof. Nadezhda Markova, PhD

Institute of Organic Chemistry with Centre of Phytochemistry

Bulgarian Academy of Sciences

E-mail: nadya@orgchm.bas.bg

Abstract: Among different kinds of viruses, one of the most common human respiratory tract pathogens that have high level of morbidity and death rate is influenza virus. Influenza viruses belong to the Orthomyxoviridae family and contain a segmented, negative-strand RNA genome (virion RNA, vRNA). Although different classes of antiviral drugs are currently being offered or are still being developed, there are increasing reports of drug resistance to influenza virus due to mutations of surface proteins. Therefore, the development of novel anti-influenza pharmaceuticals to prevent and control future influenza epidemics is necessary. Medicinal plant extracts have proved to be a rich source of candidate compounds for the development of new therapeutically agents with anti-influenza virus activity. Traditional herbal medicines in Far Eastern countries have played an important role in health care of this area, especially in Japan, China, and Korea. The aim of the present study was to evaluate in vitro the anti-influenza virus activity of the succulent plant *Graptopetalum paraguayense* E. Walther (GP), an edible plant in Taiwan.

Methanol extract from leaves of GP was obtained by standard method. The composition of each fraction was determined by GC-MS analysis. The antiviral effect and cytotoxicity were investigated on MDCK SIAT cells, which were infected with two human influenza virus strains: A/Puerto Rico/8/34 (H1N1) and B/Yamagata/16/88. To evaluate the anti-influenza activity after virus infection in vitro we performed the following post treatment assays: MTT-test, virus-induced cytopathic effect (CPE) and hemagglutination inhibition test (HI). The results were expressed as 50% inhibitory concentration of the viral effect (IC₅₀). Oseltamivir phosphate (with trade name Tamiflu®) was used as positive control.

The three main fractions: A (lipids), B (amino and organic acids, carbohydrates) and C (phenolic acids) as well as the total GP extract exhibited low cytotoxic effect in vitro. The results were dose-dependent. The fraction C and methanol GP extract significantly inhibited H1N1 virus replication on MDCK SIAT cells in concentration range 0.001 - 1 mg/mL, when compared to the positive control. GP extract applied in maximal nontoxic concentration (0.01 mg/mL) reduced viral yield by $\Delta \log 10 1.3$, where IC₅₀ was 10 times lower (0.1 mg/mL). Using representative strains of influenza virus it was shown that apparently, the inhibitory effect was strain-specific. The phenolic fraction C effectively suppressed the replication of influenza virus type A by 87.3%, compared with antiviral drug Tamiflu®, which protects infected MDCK SIAT cells almost 95%.

This is the first report on the anti-influenza virus activity of the total extract and fractions isolated from *Graptopetalum paraguayense* E. Walther. The results of this study shed light that fraction C and total GP extract could be promising inhibitors of influenza A virus. Therefore, a deeper characterization of the plant's active compounds and investigation of the mechanism of antiviral action should be carried out.

Keywords: *Graptopetalum paraguayense* E. Walther, phenolic fraction, influenza virus type A and type B, anti-influenza virus activity, cytotoxicity

Acknowledgements: This work was supported by the Bulgarian National Science Fund under Grant DN19/16/2017.

SAT-LCR-P-2-BFT(R)-08

VACUUM COOLING OF BISCUIT SEMI-FINISHED PRODUCTS

Assoc. Prof. Mykola Desyk, PhD

Department Machines and apparatus of food and pharmaceutical productions,
National University of Food Technology, Ukraine
E-mail: nikdesyk@gmail.com

Prof. Volodymyr Telychkun, PhD

Department Machines and apparatus of food and pharmaceutical productions,
National University of Food Technology, Ukraine
E-mail: tvill@meta.ua

Prof. Stanka Damyanova, Dr. sc.

“Angel Kanchev” University of Ruse - branch Razgrad
E-mail: sdamianova@uni-ruse.bg

Assoc. prof. Yuliya Telychkun, PhD

Department Machines and apparatus of food and pharmaceutical productions,
National University of Food Technology, Ukraine
E-mail: tvill@meta.ua

Abstract: *It is suggested a method of cooling biscuit semi-finished products under vacuum. It is established that the duration of cooling of biscuit products is reduced from 30-40 minutes, at cooling of products in an environment with a temperature of 20°C and relative humidity ϕ 75%, to several minutes, and there is no need to use the stage of its standing. The influence of the regime parameters of the vacuum cooling process on humidity, temperature and structural-mechanical parameters of biscuit semi-finished products is investigated. During storage of finished biscuit products for 72 hours, the loss of moisture by blanks cooled by vacuum evaporation method is 0.7% less than the cooled convection method and stood for 8 hours. Pressure plays an important role in the quality of the cookie semi-finished product. In particular, reducing the pressure under dilution conditions to 3 kPa leads to a decrease in the cooling temperature of the finished biscuit semi-finished product to 24 °C, reducing the time during which it cools from 480 to 2-5 minutes, increasing the elastic deformation by stabilizing the structure of the finished product. Samples cooled by the vacuum evaporation method have better structural and mechanical quality indicators compared to the samples cooled by the convection method and stood for 8 hours.*

Keywords: *Vacuum, cooling, biscuit.*

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NUTRITIONAL TOXICOLOGY - AN OVERVIEW

Stanislava Georgieva, MPharm

Department of Pharmacology, Toxicology and Pharmacotherapy,
Medical university - Varna
E-mail: stassy.s@abv.bg

Prof. Dr. Petko Penkov Marinov, PhD

Department of Pharmacology, Toxicology and Pharmacotherapy,
Medical university - Varna
E-mail: petko.marinov@mu-varna.bg

Abstract: *The development of the food industry, the usage of modern ingredients and new methods in nutrients manufacture have led to a demand of knowledge improvement in one key area - food toxicology. Food toxicology is a subtopic of toxicology that toxicants and toxins in foods as well as the connections between the toxins and nutrients and potential health effects. Food safety is an important area of research that is part of food toxicology. In its scope are legislation, economics and ethical problems that have to do with nutrient toxicity.*

Keywords: *food toxicology, toxicology, nutrient toxicity, food safety*

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THE MICROSTRUCTURE OF GERONTOLOGIC FOOD PASTES

Assoc. Prof. Oleg Galenko, PhD

Department of Meat and Meat Products,

National University of Food Technology, Ukraine

E-mail: galen@i.ua

Abstract: Technology of production the pastes which are balanced by micronutritional composition is researches for the purpose of developing and widening of assortment of gerontologic products.

Designed paste has a more balanced micronutritional composition compared with control samples. Found that in the control sample of pastes content of Ca and P is dramatically unbalanced - 1: 9.8 at recommended 2: 1. While increasing content of protein-mineral gerontologic enricher, the content of Ca is increasing and content of P is decreasing. Thus when you add 10% protein-mineral gerontologic enricher to paste recipes, you get almost perfect ratio of Ca: P = 1: 0.5. Also found that the addition of 5% protein-mineral gerontologic enricher (recipe №1) is not sustainable because it is not optimal for gerontologic products - the content of Ca is just 174.1 mg per 100 g or 13.7% of the daily requirement.

The microstructure of the developed paste includes in its composition the muscle tissue in the form of muscle fibers fragments up to 0.7-0.8 mm. Muscle tissue has a microstructural changes which are typical for temperature impact - moderate destruction of muscle fibers, resulting in swelling, appearance of gaps and fragmentation. The cells found in the nucleus of muscle fibers in the form of shadows, in the connective tissue they survive better.

It is recommended to use the developed product in nutrition of elderly and centenarians.

Keywords: meat, nutrition, herodiet, paste, protein, calcium.

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OPTIMIZATION OF MEAT-CONTAINING SEMI-FINISHED PRODUCTS FORMULATIONS WITH THE MICROBIOLOGICAL DERIVED PROTEASES APPLICATION

Prof. Vasyl Pasychnyi, DcS

Head of the Department of meat and meat products,
National University of food technologies, Kyiv
Tel.: +380-67-66-11-12
E-mail: pasww1@ukr.net

Dmytro Shvediuk, postgraduate

Problematic scientific research laboratory,
National University of food technologies, Kyiv
Tel: 068-46-99-344
E-mail: shvedyuk.d@ukr.net

Abstract: The article is devoted to the influence of microbiological derived proteases on the functional and technological characteristics of meat-based semi-finished products, which included in their recipes the fillets of broiler chickens, chickpeas and lentils. Optimal modes of hydration and pre-treatment of plant raw materials have been established for further enzymatic treatment with *Aspergillus niger* proteases (1). Thus, the experimental samples presented semi-finished products with different content of vegetable and meat raw materials, which resulted in the determination of the optimal formulation and its comparison with the data obtained by modeling the formulation by chemical composition and nutritional value (2, 3). According to the data obtained, the maximum value of water holding capacity (78.6%) was recorded in the semi-finished product using boiled chickpeas in combination with step-by-step enzymatic treatment with the introduction of 35 mg of enzyme raw material per gram of substrate. Limit formulations of meat-based semi-finished products are also modeled, based on organoleptic characteristics and minimal value of water holding capacity during heat treatment (frying). The change of the herbal component in the composition of the formulation, as well as its combination, had a significant effect on the consistency and organoleptic characteristics of the finished product, but had little effect on the pH and yield of the studied products (4, 5). The further aim of the research should be to determine the shelf life of meat-containing semi-finished products in all thermal states (under freezing conditions at -40 and -18 °C and at + 4-6 °C), as well as to adjust the organoleptic parameters of finished semi-finished products.

Keywords: meat, semi-finished products, microbiological derived proteases, plant stuff.

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MICROBIOLOGICAL AND PHYSICOCHEMICAL ANALYSIS OF HONEY AND CINNAMON YOGURT

Ira Taneva, PhD, eng.

Ivan Dimov, PhD, eng.

Trakia University - Stara Zagora, Faculty of Technics and Technologies,

E-mail: ira_64@abv.bg

Gjore Nakov, PhD student

University of Ruse „Angel Kanchev”, Branch Razgrad,

47 Aprilsko vastanie str., 7200 Razgrad, Bulgaria

Abstract: In recent years, there has been increasing interest in the development of new functional fermented dairy products using natural antioxidants as additives that have a beneficial effect on the body. In this study, the effect of the amount of cinnamon added in 0.5%, 1.0% and 1.5% on the coagulation process was monitored. The addition of cinnamon in the amount of 1.5% by weight of milk, suppresses the activity of lactic acid bacteria and slows down the coagulation of milk. During storage of yoghurt, a gradual decrease in pH was observed in all samples, with the larger amount of cinnamon slowing the rate of acid formation from 5.0 to 4.4. High antioxidant activity was recorded in the sample with the highest amount of cinnamon during the whole yogurt storage period - 30.82%. The highest values of total lactic acid bacteria during storage were observed in sample S1 ($2.7 \cdot 10^9$) at day 7 and the lowest in sample S3 ($1.1 \cdot 10^9$). This trend persists throughout the storage period, but even on day 14 of storage, the amount of lactic acid bacteria in sample S3 is $3.1 \cdot 10^8$, which complies with the requirements of Codex alimentarius.

Keywords: yogurt, cinnamon, coagulation, antioxidant activity, total lactic acid bacteria

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COMPLEX ANALYSIS OF QUALITY INDICES OF ICE CREAM WITH THE USE OF MILK AND PROTEIN CONCENTRATES

Assoc. Prof. Tetiana Osmak, candidate of Engineering Sciences

Department of Milk and Dairy products Technology
National University of Food Technology, Kyiv, Ukraine
E-mail: osmaktg@ukr.net

Full Professor Galyna Polischuk, doctor of Engineering Sciences

Department of Milk and Dairy products Technology
National University of Food Technology, Kyiv, Ukraine
E-mail: milknuft@i.ua

Assoc. Prof. Oksana Kochubei-Lytvynenko, candidate of Engineering Sciences

Educational and Scientific Institute of Food Technologies
National University of Food Technology, Kyiv, Ukraine
E-mail: okolit@email.ua

Master Artur Mykhalevych

Department of Milk and Dairy products Technology
National University of Food Technology, Kyiv, Ukraine
E-mail: artur0707@ukr.net

Abstract: *The scientific and practical interest in the dairy industry is the development aimed at obtaining food with high nutritional value, which corresponds to the basic concept of balanced and rational nutrition. These products include the technology of frozen desserts (ice cream) using milk-protein concentrates. At the Department of Technology of Milk and Dairy Products of the National University of Food Technologies (Kyiv, Ukraine), ice cream formulations were developed, which include full-fledged protein concentrates - cottage cheese and soy protein concentrate.*

An objective indicator for assessing the quality of frozen desserts is a comprehensive analysis of organoleptic, physico-chemical characteristics and biological value. Taking into account the complex interaction of qualitative indicators of ice cream, by determining the optimal ratio - milk base: protein component, the rational mass fraction of protein concentrates in ice cream formulations were determined. It is proved that with the help of graph-mathematical method it is possible to predict mass fraction of introduction of protein enrichers in ice cream composition, which will provide a finished product with optimal quality indicators.

Keywords: *ice cream, milk-protein concentrates, graph-mathematical method, complex analysis*

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SAT-LCR-P-2-BFT(R)-14

ASSESSMENT OF THE QUALITY OF THE TREATED WASTEWATER IN RELATION TO THE AMOUNT OF ELECTRICITY CONSUMED IN WWTP

Assist. Prof. Dr., Rayka Kirilova Vladova

Institute of Chemical Engineering at Bulgarian Academy of Sciences,

Acad. G. Bontchev Street, Bl.103, 1113 Sofia, Bulgaria

Phone: (+359 2) 979 34 81

E-mail: raika_vladova@abv.bg

Prof. Dr., Natasha Grigorova Vaklieva-Bancheva

Institute of Chemical Engineering at Bulgarian Academy of Sciences,

Acad. G. Bontchev Street, Bl.103, 1113 Sofia, Bulgaria

Phone: (+359 2) 979 34 81

E-mail: vaklieva@bas.bg

Abstract: *In recent years, environmental impact measures regarding the quality of treated wastewater have become increasingly stringent. This requires development and application of new technologies for the removal of the biological and chemical pollutants. However, realization of most of them is related to the large energy consumption. In order to improve their energy efficiency all flows and processes in the wastewater treatment plants should be estimated. The purpose of this study is to provide information about the amounts of the wastewater treated on the territory of two municipal wastewater treatment plants in Southwestern Bulgaria, as well as their energy consumption per m³ of treated wastewater. Moreover, an analysis of the raw and the treated wastewater in respect of BOD, COD, total content of N and P has been conducted. The amounts of energy consumed at each stage of the wastewater treatment plants have been calculated. It has been found that the processes of biological wastewater treatment aeration have the greatest energy consumption.*

Keywords: *wastewater treatment, digestion, energy balance, energy efficiency*

ACKNOWLEDGEMENT:

This work has been supported by the Bulgarian Ministry of Education and Science under the National Research Programme “Young scientists and postdoctoral students” approved by DCM # 577 / 17.08.2018.

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RESEARCH OF THE QUALITY INDICES OF SOUR MILK PASTE

Assoc. Prof. Oksana Kochubei-Lytvynenko, PhD

Educational and Scientific Institute of Food Technologies,
National University of Food Technologies, Ukraine
Tel.: +38097-522-64-56
E-mail: okolit@email.ua

Assoc. Prof. Ulyana Kuzmyk, PhD

Department of Milk and Dairy Product Technology,
National University of Food Technologies, Ukraine
Tel.: +38098-767-02-82
E-mail: ukuzmik@gmail.com

Assoc. Prof. Nataliia Yushchenko, PhD

Department of Technology and restaurant Ayurvedic products,
National University of Food Technologies, Ukraine
Tel.: +38097-522-64-56
E-mail: YuNM_NUFT@ukr.net

Abstract: *One of the most important parameters of food quality and safety is the indicator of water activity. By reducing the activity of water, the binding energy in the material is increased and, as a rule, the ability of microorganisms to use moisture for metabolism is reduced, the rate of most chemical reactions responsible for the deterioration of dairy products is reduced. In order to confirm the effectiveness of the developed spice compositions for sour milk pastes and to predict the storage capacity, the water activity index was investigated. Studies of moisture-binding properties were performed by the activity of water (A_w). Determination was performed on a water activity analyzer "HygroLab 2" (Rotronic, Switzerland) on the basis of the Problem Research Laboratory of the National University of Food Technologies. It was found that the activity of fermented milk paste water (based on soft dietary non-fat cottage cheese) was 0.97, while in the control (soft dietary non-fat cottage cheese) it was 0.96. The water activity index did not undergo significant changes, which is within the error range and confirms the stability of the properties of the high-molecular compounds (starch, proteins, cellulose solution) during storage.*

Keywords: *sour milk paste, spices, stabilization of the structure*

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MODELING OF THE PROCESS OF KNEADING THE YEAST DOUGH BY MODERN WORKING ELEMENTS

Assoc.prof. Vitalii Rachok, PhD

Department Machines and apparatus of food and pharmaceutical productions,
National University of Food Technology, Ukraine
Phone: +380665848545
E-mail: RachokV3478@gmail.com

Prof. Volodymyr Telychkun, PhD

Department Machines and apparatus of food and pharmaceutical productions,
National University of Food Technology, Ukraine
Tel.: +380674665890
E-mail: tvill@meta.ua

Assoc.prof. Yuliya Telychkun, PhD

Department Machines and apparatus of food and pharmaceutical productions,
National University of Food Technology, Ukraine
Phone: +380665658549
E-mail: tvill@meta.ua

Abstract: The scheme of the mathematical modeling of the process of mixing of the yeast dough in a dough machine of continuous action is developed. Based on the results of simulation of the mixing process, cam operating elements, the distribution of strain of displacement and dissipation of yeast dough in the working chamber were obtained. As the angle of the position of the cam element increases on the shaft, there is an increase in the shear stress. The greatest indices of shear stress occur in the area of cam clamping elements and in the contact area of the cam with the walls of the case, numerical values reach within 7000-8000 Pa. For the rest of the camera, the displacement stress reaches 1000-3000 Pa. Distribution of dissipation shows that in parts of the working chamber there is the formation of heat in the area of flow. With the increase of the angle of the cam of the cam element, there is a gradual increase in temperature. At the site of mixing 12 pairs of cams, the temperature of the yeast dough increases by almost 5° C. Taking into account that before the simulation, the initial temperature reached $t=30^{\circ}\text{C}$, and upon completion of the mixing process did not exceed 35°C , the pastry preparation parameters were observed. The greatest heat release occurs in the area of the cam clamping elements.

The results of mathematical modeling are confirmed by physical experiments on a test dough mixing machine of continuous action, an error within 5%.

Keywords: Dough, Cam, Kneading, Modeling, Rotation, Dissipation

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SENSORY EVALUATION AND OVERALL ACCEPTANCE OF RASPBERRY JAM WITH DIFFERENT SWEETENERS

Assistant Prof. Viktorija Stamatovska, PhD
Faculty of Technology and Technical Sciences - Veles
"St. Kliment Ohridski" University- Bitola, Republic of North Macedonia
E-mail: viktorija.stamatovska@uklo.edu.mk

Assistant Gjore Nakov, MSc
Department of Biotechnology and Food Technologies
University of Ruse "Angel Kanchev", Branch Razgrad, Bulgaria
E-mail: gnakov@uni-ruse.bg

Prof. Ljubica Karakasova, Ph.D
Faculty of agricultural sciences and food
"Ss. Cyril and Methodius", University in Skopje, Republic of North Macedonia
E-mail: karakasoval@yahoo.com

Abstract: Jam is a popular foodstuff because of its appealing taste and long shelf life. However, the high sucrose content typical of most preserves causes health problems for frequent consumers and limits recommended intakes for diabetes patients. There is a great interest for jam production with a lower amount of sucrose or with another type of sweetener replacement. The objective of this research was to evaluate sensory parameters of low sugar raspberry jams with different sweeteners (fructose, sorbitol, agave syrup and a low amount of sucrose). The sensory analysis of jams was performed by scoring method for jelly products assessment. The sensory characteristics (smell, taste, color and consistency) were assessed by 10 highly experienced testers, using a different number of points: for color 0-4, for smell 0-2, for taste 0-8, and consistency 0-6. The total assessment (overall acceptability) of jams was obtained by adding the individual points for each sensory characteristic with a possibility of maximum total point score of 20 points. Sensory evaluation of processed jams showed good acceptability. Jams with sorbitol, had the highest total average score and better sensory characteristics as compared to jams where other sweeteners were used.

Keywords: Sensory evaluation, Raspberry jams, Different sweeteners

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SAT-LCR-P-2-BFT(R)-18

STRUCTURAL AND PARAMETRIC SYNTHESIS OF FUNCTIONAL MECHATRONIC MODULES OF MACHINES FOR FORMATION OF TRANSPORTATION PACKAGES OF FOOD PRODUCTS

Prof. Oleksandr Gaava,

Department machines and apparatus of food and pharmaceutical industries,
National University of Food Technologies, Kyiv, Ukraine

Tel.: +380977700997

E-mail: gavvaoleksandr@gmail.com

PhD student Vladyslav Yakymchuk

Department machines and apparatus of food and pharmaceutical industries,
National University of Food Technologies, Kyiv, Ukraine

Phone: +380508289227

E-mail: vladyslawyackymchuk@ukr.net

Abstract: *The paper deals with the direction of control of the mechatronic systems operation, which poorly researched and almost not realized about correction of the energy resource of the system. The authors propose a technique for implementing the energy efficiency management of a mechatronic packaging module system, which based on the classical principle of least action, according to which movement of working bodies ensured. It envisaged that the control system will be able to estimate the possible trajectories of movement of the working bodies by analyzing the energy costs of the mechatronic packaging system. For the realization of this task in mathematical model was added an additional vector of energy control, the value of which significantly influences the calculation of the characteristic of the control output. Proposed to estimate the energy costs of a mechatronic packaging system by analyzing the integral energy characteristics obtained during the technological cycle of packaging, taking into account the energy consumed.*

Keywords: *Efficiency, Effectiveness, GPS, Seismic Protection Methods, Model*

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THE EFFECT OF PACKAGING ON THE COOKED SAUSAGES STABILITY DURING STORAGE

Prof. Vasyl Pasychnyi, DcS

Head of the Department of meat and meat products,
National University of food technologies, Kyiv
Tel.: +380 67-661-11-12
E-mail: pasww1@ukr.net

Yulia Zheludenko, postgraduate

Problematic scientific research laboratory,
National University of food technologies, Kyiv
Tel: +380 98-222-65-29
E-mail: alborada@bigmir.net

Abstract: The article is devoted to the study of the different types of packaging influence on the microbiological stability and resistance to oxidation of cooked sausages. The modified atmosphere packaging, oxygen scavengers, and oxygen scavengers with an evaporator ethanol use has been found to more effectively inhibit the microflora development compared to control. At the same time, according to the obtained data an ethanol evaporator with an oxygen scavenger use has no significant effect on the quantity of Mesophilic Aerobic and Facultative Anaerobic Microorganisms in sausages cooked compared to using only an oxygen scavenger on the 20 days of storage ($7,0 \times 10^6$ cfu/g and $5,5 \times 10^6$ cfu/g respectively). It can be concluded that the evaporator ethanol presence in the package does not lead to significant changes in the microflora during cooked sausages storage. During the experiment, the acid value of all test samples increased during entire storage, however, the control sample growth rate was the highest, the lowest for the sample with the oxygen scavenger. The rate of oxidation products accumulation has been increasing on the 3 days of storage. The samples with the oxygen scavenger had lower peroxide value during the entire storage period. It confirms the efficiency of oxygen scavengers use for cooked sausages.

Keywords: cooked sausages, active packaging, oxygen scavengers, stability, storage.

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SAT-LCR-P-2-BFT(R)-20

INTRODUCING CEEPUS NETWORK “ADRIATIC-PANNONIAN-BLACK SEA FOOD CONNECT” DESIGN CONCEPTS

Assoc. Prof. Cristina Popovici, PhD

Technical University of Moldova, Republic of Moldova

E-mail: cristina.popovici@toap.utm.md

Prof. Marko Jukic, PhD

Josip Juraj Strossmayer University of Osijek, Croatia

E-mail: marko.jukic@ptfos.hr

Gjore Nakov, PhD student

University of Ruse “Angel Kanchev”, Branch Razgrad, Bulgaria

E-mail: gnakov@uni-ruse.bg

Prof. Liviu Gaceu, PhD

Transilvania University of Brasov, Romania

E-mail: liviu.gaceu@unitbv.ro

Assoc. Prof. Jasmina Lukinac, PhD

Josip Juraj Strossmayer University of Osijek, Croatia

E-mail: jasmina.lukinac@ptfos.hr

Abstract: The main goal of the CEEPUS network “Adriatic-Pannonian-Black Sea Food Connect” (APBSFC) is to improve the international cooperation in education and research between CEEPUS partners in Central and South-Eastern Europe who conduct study programs in the fields of food technology, biotechnology and nutrition. In academic year 2019/2020 eight partner institutions from seven different countries are active participating units of the CEEPUS network: Bosnia and Hercegovina, Bulgaria, Croatia, Republic of Moldova, Republic of Macedonia, Romania, Serbia. The Main Objectives of APBSFC network are: Establishment of sustainable mobility system for students and teachers among partners in the region of Central and South-Eastern Europe; Preparing students for a global food industry labour market; Providing possibilities for exchange and transfer of teaching and research experience; Fostering the cooperation between education, science and industry to improve and expand the content and structure of existing study programmes at all partner universities; Improvement of relations between the partners through various types of mobility; Developing the official joint thesis supervision program (Thèse en cotutelle) between partners and establishing formal agreements to suit the needs and interests of participating institutions. APBSFC network serves as a tool to assure cross-border cooperation and contribute to overall excellence and visibility of partner's institutions in Europe and lead to utilization of its academic potentials and establishment of efficient funding mechanisms. Teaching, research and professional activities in cross-border cooperation should provide significant results, being practically implemented in the food industry sector, thus contributing to economy growth with social and regional benefits.

Keywords: Food network, international cooperation, education, research.

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Long Program Description of the CEEPUS network No. CIII-HR-1404-01-1920 “Adriatic-Pannonian-Black Sea Food Connect”, 2019, 13 p.

PSYLLIUM USING IN THE TECHNOLOGY OF MEAT GROUND SEMI-COOKED PRODUCTS

Post-graduate Victoria Grechko

Department of technology of meat and meat products,
National University of Food Technologies
E-mail: hrechko1515@gmail.com

Candidate of Technical Science, Associate Professor Ihor Strashynskyi

Department of technology of meat and meat products,
National University of Food Technologies
E-mail: sim2407@ukr.net

Doctor of Technical Sciences, Professor Pasichnyi Vasil

Department of technology of meat and meat products,
National University of Food Technologies
E-mail: Pasww1@ukr.net

Abstract: *The meat semi-cooked products technology supposes to use in the recipes the functional ingredients, the range of which is too wide & finished products not always correspond to the healthy food. That is why it is appropriate enough to think about the adding of the cellular tissue during the production of healthy food.*

The adhesive substance, which Plantago psyllium aril contains, is very interesting: the transparent colorless thick liquid, which falls into the category of plant origin thickeners.

All over the world this product is used everywhere in the food segment & as practical purposes. Psyllium doesn't disperse completely in the water, but it swells & makes heavy-bodied dispersion. The main target of this research was organoleptic estimation of meat ground semi-cooked products to find the acceptable quantity of the psyllium cellular tissue which had been added, moreover the evaluation of the ready cutlets value after the heating.

Keywords: *Psyllium, Poultry meat, Cellular tissue, Meat mince, Result.*

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SAT-LCR-P-2-BFT(R)-22

THE UTILISATION OF OPUNTIA FICUS INDICA AS FUNCTIONAL FOOD AND IMPROVEMENT OF ATHLETES' PERFORMANCES

Davor Daniloski, MSc

Faculty of Technology and Technical Sciences,
"St Kliment Ohridski" University - Bitola, Republic of North Macedonia
E-mail: danilodavor@outlook.com

Gjore Nakov, MSc

Department Biotechnology and Food Technology, Branch Razgrad,
"Angel Kanchev" University of Ruse, Bulgaria
E-mail: gnakov@uni-ruse.bg

Abstract: An increased consumer awareness about health and wellness has shifted the consumers' interest towards healthy eating, preventive care, and secondary source medication. These factors together have led to the exponential growth in the functional beverages market. The dietary intake of compounds aimed for human consumption from Prickly pear cactus (*Opuntia ficus-indica*) have been studied for decades because of their beneficial and protective effects on different chronic diseases such as cancer, diabetes mellitus and cardiovascular disease due to their antioxidant properties to reduce inflammation caused by oxidative stress. Exercise capacity is frequently reduced in people living with chronic diseases. Having a fundamental knowledge of how exercise affects insulin and blood glucose especially in athletes' performances and how to manage these patients is important. The findings of this review represent that *Opuntia* spp. products have tremendous reductions in serum glucose and insulin, indicating potential as a functional food candidate. This review also provides experimental evidences about the most important phytochemicals and antioxidants that contribute in order to give the basis of their use in the prevention and cure of some chronic diseases.

Keywords: Antioxidant, Cactus pear, *Opuntia*, Chronic diseases, Glucose, Insulin, Prickly pear

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APPLICATION OF HYDROCOLLOIDS INJECTION IN PROCESSING OF DIFFERENT TYPES OF MEAT RAW MATERIALS BY SOUS VIDE TECHNOLOGY

Prof. Vasyl Pasychnyi, DcS

Head of the Department of meat and meat products,

National University of food technologies, Kyiv

Tel.: +380-67-66-11-112

E-mail: pasww1@ukr.net

Dmytro Garmash, postgraduate

Problematic scientific research laboratory,

National University of food technologies, Kyiv

Tel: +380-63-42-43-444

E-mail: garmash93@gmail.com

Abstract: The article deals with the peculiarities of application of food composition based on hydrocolloids in the processing of various kinds of meat raw materials by Sous Vide technology. Sous Vide technology allows to maintain high organoleptic characteristics and increase product yield by vacuum packing and heat treatment reduction (1). However, the use of hydrocolloids and their effect on the products processed by the technology of su is still rational from a technological point of view and a little researched aspect from the scientific point of view (2). Given that most hydrocolloid-based food formulations have been developed for traditional heat treatment modes (72-85 °C), changes in raw materials with reduced treatment temperatures to 55-65 °C require research (3). According to the design of the experiment, the main raw material was selected meat of broiler chickens (with division into red and white), pork tenderloin and beef. The nutritional composition used in the injection process included the following ingredients - guar gum, sodium citrate, carrageenan purified, xanthan gum, glucose monohydrate (4). After injection and drainage of residual moisture, the samples were portioned - pork was formed into pork chops, the beef was sliced into 100-120 g pieces, and the fillets and thighs of the broiler chickens were portioned as natural semi-finished products. Vacuum portioned samples were cooked with varying temperature variations in the range of 55-65 °C, after which functional and technological parameters were determined (moisture holding capacity, total moisture content, ductility and pH of the product). The control group of the samples was treated similarly, but the injection brine only included salt. According to the obtained results, was established the positive effect of the nutritional composition on all studied parameters

Keywords: meat, Sous Vide technology, hydrocolloids, poultry, thermal treatment.

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QUALITATIVE INDICATORS OF EDIBLE FILMS AND COATINGS

Prof. Stefan Stefanov, PhD

Department of Machines and apparatus for the food and flavour industry
University of Food Technologies, Plovdiv
Tel.: +359 32 603 814
E-mail: stvstefanov@yahoo.com

Ass. Prof. Yordanka Stefanova, PhD

Department General and Inorganic Chemistry with Chemistry Education
Plovdiv University "P. Hilendarski", Plovdiv
Tel.: E-mail: jorpste@yahoo.com

Assoc. Prof. Vilhelm Hadjiiski, PhD

Department of Technical mechanics and machine science
University of Food Technologies, Plovdiv
E-mail: hawi@abv.bg

Assoc. Prof. Donka Stoeva, PhD

Assist. Prof. Deljan Gospodinov, PhD

Department of Machines and apparatus for the food and flavour industry
University of Food Technologies, Plovdiv
E-mail: bodurova@gmail.com, dgosp@abv.bg

Abstract: *The article gives an overview of the main characteristics of the edible films and coatings used in food packaging. The qualitative indicators by which they can be compared are analyzed and their practical application is analyzed. Some basic documents related to the test methodologies are discussed. The technical means for carrying out some basic tests of edible films and coatings are also indicated.*

Keywords: *Edible film, Edible coating, Edible packaging, Testing, Quality indicators, Characteristics.*

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ACTIVE PACKAGING - PRODUCING, ADVANTAGES AND TRENDS OF USAGE

Assoc. Prof. Iliana Kostova, PhD

Department of Biotechnology and Food Technology, Razgrad Branch,
“Angel Kanchev” University of Ruse
Phone: +359882836776
E-mail: ikostova@uni-ruse.bg

Eng. Darina Georgieva

Department of Biotechnology and Food Technology, Razgrad Branch,
“Angel Kanchev” University of Ruse
Phone: +359892348483
E-mail: ddarina0412@gmail.com

Prof. Stanka Damyanova, DcS

Department of Biotechnology and Food Technology, Razgrad Branch,
“Angel Kanchev” University of Ruse
Phone: +359882669689
E-mail: sdamianova@uni-ruse.bg

Prof. Albena Stoyanova, DcS

Department of Essential oils
University of Food Technologies, Plovdiv, Bulgaria
Tel.: +359894337990
E-mail: aastst@abv.bg

Abstract: An overview is presented with regards to the active packaging, their use and benefits. Various materials and mechanisms for their development are discussed as well as their effectiveness on the products for which they are used. The tendencies in the application of active packaging are presented: they preserve the quality of the product throughout the shelf life, extend its shelf life, increase the level of product safety, reduce the use of preservatives and are a good opportunity to develop new products.

Keywords: Active Packaging, Increasing Shelf Life, Food Safety, Antimicrobial Agents, Storage

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